STUDY ON PROGRESS IN IMPLEMENTING

THE EU FOREST STRATEGY

Final Report

Group of joint tenderers

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ABSTRACT

The aim of this study is to help build a knowledge base for the review of the EU Forest Strategy that was adopted by the European Commission in 2013. The EU Forest Strategy addresses 8 priority areas that were identified as being particularly relevant for forests and the forest-based sector until 2020. These priority areas address: (i) support of rural and urban communities, (ii) competiveness and sustainability of the forest-based sector and bio economy, (iii) forests and climate change, (iv) protection of forests and provision of ecosystem services, (v) information on forests and how they are changing, (vi) innovation and value-added products in forestry, (vii) coordination and cooperation in forest issues, and (viii) the global dimension of forests.

The analysis shows that the EU Forest Strategy plays a central role as key reference document addressing forest-related priorities as well as fruitfully stipulating information exchange and coordination. It does so mainly within sectoral boundaries. As regards rural development, the Common Agricultural Policy funds for forestry measures are a key instrument for supporting sustainable forest management and the objectives of the EU Forest Strategy. These rural development funds cover a wide range of forestry measures, where implementation is subject to national priorities and the uptake of funds varies. The area of fostering competitiveness of the sector is amply addressed in the EU Forest Strategy. An increased coordination of the forest-resource sector and the forest-based industries is promoted to gain a competitive advantage in a bio-based economy. Climate change is high on the political agenda. The focus on mitigation is currently considerably larger than the one on forest adaptation and resilience to ecosystem changes due to changing climatic conditions. Conservation and protection of forest ecosystems is a broad topic with a variety of activities. Implementation of ecosystem service schemes are still in their infancy. Recently, the Natura 2000 implementation has undergone a fitness check. Forest management plans incorporating biodiversity aspects appear as key instruments, but are implemented in varying forms. Renewed political commitment to enhance coherence with socio-economic objectives, funding and stakeholder engagement will be important to mediate between multiple forest-related goals and objectives. The implementation of a harmonised EU forest information system is lagging behind. A new bottom-up process with member states is being established, which is seen as instrumental for future forest data provision. Actions on the innovation potential and related research activities can be judged as significant. Yet, it will require clear strategies for capitalising and disseminating their outcomes, as well as further activities for knowledge exchange and coordination. Finally, activities on the global dimension of forests are progressing significantly, including Forest Law Enforcement, Governance and Trade (FLEGT), Reducing Emissions from Deforestation and Forest Degradation (REDD+), and the EU Timber Regulation. More actions to safeguard coordination of EU and Member States' activities hold promise.

RÉSUMÉ

Cette étude a pour but d'aider à constituer la base de connaissances pour la révision de la stratégie de l'UE pour les forêts qui a été adoptée par la Commission européenne en 2013. La stratégie de l'UE pour les forêts porte sur huit domaines prioritaires qui concernent les forêts et le secteur forestier jusqu'en 2020. Ces domaines prioritaires sont les suivants : i) soutien aux communautés rurales et urbaines, ii) compétitivité et durabilité du secteur forestier et de la bio économie, iii) forêts et changements climatiques, iv) protection des forêts et fourniture de services écosystémiques, v) information sur les forêts et leur évolution, vi) innovation et produits à valeur ajoutée dans le secteur forestier, vii) coordination et coopération en matière forestière, et viii) dimension mondiale des forêts.

L'analyse montre que la stratégie de l'UE pour les forêts joue un rôle central en tant que document de référence clé répondant aux priorités liées aux forêts ainsi que l'échange d'informations et la coordination. Elle le fait principalement à l'intérieur des frontières sectorielles. En ce qui concerne le développement rural, les fonds de la politique agricole commune destinés aux mesures forestières constituent un instrument clé pour soutenir la gestion durable des forêts. En général, ces fonds couvrent un large éventail de mesures forestières, tandis que leur mise en œuvre dépend des priorités nationales. L'utilisation des fonds varie, en particulier pour les actions environnementales. Le domaine de la promotion de la compétitivité du secteur est amplement abordé dans la stratégie forestière de l'UE. Une coordination accrue du secteur des ressources forestières et de la filière bois est nécessaire pour obtenir un avantage concurrentiel dans une bio économie. Le changement climatique figure en bonne place sur l'agenda politique. Beaucoup plus d'efforts se concentrent sur les options d'atténuation que sur l'adaptation des forêts et la résilience aux changements écosystémiques dus aux conditions climatiques changeantes. La conservation et la protection des écosystèmes forestiers ont une variété de priorités. La réalisation de programmes de services écosystémiques n'en est encore qu'à ses débuts. Récemment, la mise en œuvre de Natura 2000 a fait l'objet d'un contrôle d'aptitude. Les plans de gestion forestière qui intègrent les aspects de la biodiversité apparaissent comme des instruments clés, mais sont appliqués sous des formes diverses. Un engagement politique renouvelé pour améliorer la cohérence avec les objectifs socio-économiques, le financement et l'engagement des parties prenantes sera important pour assurer la médiation entre les multiples buts et objectifs liés aux forêts. La mise en œuvre d'un système harmonisé d'information forestière est en retard. Un nouveau processus ascendant avec les États membres est en cours de développement, qui est considéré comme essentiel pour la fourniture de données forestières harmonisées. Les actions sur le potentiel d'innovation et les activités de recherche peuvent être considérées comme importantes. Il faudra des stratégies claires de capitalisation et de diffusion des résultats, ainsi que de nouvelles activités d'échange et de coordination des connaissances. Enfin, les activités liées à la dimension mondiale des forêts progressent de manière significative, notamment l'application des réglementations forestières, la gouvernance et les échanges commerciaux (FLEGT), la réduction des émissions dues à la déforestation et à la dégradation des forêts (REDD+) et le règlement de l'Union sur le bois. D'autres mesures visant à garantir la coordination des activités de l'UE et des États membres sont prometteuses.

1. INTRODUCTION

1.1. The EU Forest Strategy

In 2013, the European Commission adopted the New European Union (EU) Forest Strategy as a response to multiple emerging challenges forests and the forest-based sector were facing (European Commission, 2013d). Replacing the 1998 EU Forestry Strategy, it takes a holistic approach and develops an integrative framework in response to the increasing demands on forests. It addresses societal and policy priorities, covers the multiple benefits of forests and addresses the whole forest value-chain. The EU Forest Strategy is led by three guiding principles:

- Sustainable forest management and the multifunctional role of forests, delivering multiple goods and services in a balanced way and ensuring forest protection
- Resource efficiency, optimising the contribution of forests and the forest sector to rural development, growth and job creation
- Global forest responsibility, promoting sustainable production and consumption of forest products

Based on cooperation with the Member States and stakeholders, the EU Forest Strategy establishes the following **2020 forest objectives** (European Commission, 2013d, 2015e):

To ensure and demonstrate that all forests in the EU are managed according to sustainable forest management principles and that the EU's contribution to promoting sustainable forest management and reducing deforestation at global level is strengthened, thus:

- contributing to balancing various forest functions, meeting demands, and delivering vital ecosystem services;
- providing a basis for forestry and the whole forest-based value chain to be competitive and viable contributors to the bio-based economy.

The EU Forest Strategy addresses the following set of eight interlinked Priority Areas, with a number of Strategic Orientations identified for each of them:

<u>Contributing to major societal objectives</u>

1. Supporting our rural and urban communities.
2. Fostering the competitiveness and sustainability of the EU's forest-based industries, bioenergy and the wider green economy.
3. Forests in a changing climate.
4. Protecting forests and enhancing ecosystem services.

<u>Improving the knowledge base</u>

5. What forests do we have and how are they changing?
6. New and innovative forestry and added-value products.

<u>Coordination and communication</u>

7. Working together to coherently manage and better understand our forests.
8. Forests from a global perspective.

The 2014 Council conclusions[1] welcomed the EU Forest Strategy and its holistic and balanced approach, addressing both forests as such and their value chains. They stressed that the Forest Strategy should enhance coordination and facilitate the coherence of forest-related policies by allowing for synergies with other sectors that influence forest management. Also

[1] See http://www.consilium.europa.eu/media/28282/142685.pdf.

the European Parliament adopted an own-initiative report in 2015[2] and, likewise, the Committee of the Regions and the European Economic and Social Committee also adopted opinions on the Strategy document in 2014.[3]

In order to further operationalise the EU Forest Strategy, the Commission Services, in cooperation with the Standing Forestry Committee and the Civil Dialogue Group on Forestry & Cork, prepared a Multi-annual Implementation Plan (MAP) as a support tool for helping them implement the EU Forest Strategy (European Commission, 2015e).

1.2. The evolved policy content

Since 2013, the policy context relevant to the EU Forest Strategy has evolved. Relevant events at the global and pan-European levels include the 7th Ministerial Conference on the Protection of Forests in Europe held in Madrid in 2015, the entry into force of the Paris Agreement on Climate Change in 2016) the COP 13 to the UN Convention on Biological Diversity in Cancun in 2016, the adoption of the UN 2030 Agenda for Sustainable Development and its Sustainable Development Goals in 2016, and the adoption of the UN Strategic Plan for Forests 2017-2030 in 2017.

At the EU level, the evolved context includes the setting of the Juncker Commission's ten priority areas for action, the EU 2030 Climate and Energy Framework including the proposals for a Regulation on Land Use, Land-Use Change and Forestry and the recast of the Renewable Energy Directive, and the Commission's conclusions and action Plan following the fitness check of the Birds and Habitats Directives. In 2016, the evaluation of the implementation of the FLEGT Action Plan (2003-2014), as well as the review of the first two years of implementation of the EU Timber Regulation were completed. Ongoing policy work includes the review of the EU Timber Regulation, the review of the EU Bio economy Strategy, the agreement on and implementation of the Circular Economy Action Plan and the discussions on the future of the Common Agricultural Policy framed by multifunctional forestry.

1.3. Rationale and objectives of the study

As stipulated by the EU Forest Strategy, a review will be carried out by the end of 2018 to assess progress in the implementation of the EU Forest Strategy. This study helps compiling the factual background for this review conducted by the European Commission.

Against this background the objective of the study is two-fold:

1. Review of progress in implementation:

To make an assessment of the implementation of the EU Forest Strategy, covering the eight priority areas identified in the Strategy and the associated strategic orientations.

To this end, the assessment will consider the Multi-annual implementation Plan (MAP) and the actions listed therein addressing the strategic orientations identified for each priority area in the EU Forest Strategy.

[2] See http://www.europarl.europa.eu/sides/getDoc.do?type=REPORT&reference=A8-2015-0126&language=EN
[3] See https://www.eesc.europa.eu/en/our-work/opinions-information-reports/opinions/new-eu-forest-strategy

2. Progress towards objectives:

To assess progress towards the achievement of the objectives of the EU Forest Strategy, in the light of the assessment made (1) and taking into account the evolved policy context, identifying, to the extent feasible, any remaining gaps and shortfalls.

The assessment should also reflect on the priorities for the Commission services in the period 2015-2017 as defined in the MAP, and contribute to the review of priorities for the subsequent period

The present study will help form the knowledge base for the review stipulated in the Strategy by gathering, collating and analysing relevant information from the European Commission, Member States and other relevant sources.

This report is structured into chapters presenting analysis along the Priority Areas of the Forest Strategy (chapters 3 to 11), followed by conclusive chapters 12 and 13. In more detail, Chapter 2 lays down the methodology employed and the data used in the analysis. Chapters 3 to 10 provide the bulk of analytical information for each Priority Area. These chapters include assessments of the state of implementation, the contributions towards achieving the EU Forest Strategy's objectives, as well as on possible future options in the evolved policy context (see the following chapter for details). Given the importance of coordination and communication in the EU Forest Strategy, Chapter 11 analyses the involvement of policy-makers and stakeholders in implementing the EU Forest Strategy. The subsequent Chapter 12 assesses the contributions of the EU Forest Strategy implementation towards achieving its objectives, followed by Chapter 13 providing a thematic synopsis of the findings and conclusions.

2. METHODOLOGY

2.1. Study themes

The study covers the EU Forest Strategy's eight Priority Areas, the Strategic Orientations, and the Actions defined in the Multi-annual Implementation Plan (Forest MAP). It does so at EU level, including the 28 EU Member States. The analysis covers the period from September 2013 until July 2018.

This study is based on evidence regarding results, effects and (expected) impacts of the Actions carried out as part of the Forest MAP. The study covers the following seven study themes, which represent seven out of eight linked Priority Areas of the EU Forest Strategy:

1. Fostering the competitiveness and sustainability of the EU's Forest-based Industries, bio-energy and the wider green economy;
2. Forests in a changing climate;
3. Protecting forests and enhancing ecosystem services;
4. What forests do we have and how are they changing?
5. New and innovative forestry and added-value products;
6. Working together to coherently manage and better understand our forests;
7. Forests from a global perspective.

These themes serve as the main organising elements of the study, with Priority Area 1 on "Supporting our rural and urban communities" being addressed only to the extent it was not

covered by the "Evaluation study of the forestry measures under Rural Development" (Alliance Environnement et al. 2017).

2.2. Guiding questions and presentation of responses

Four elements were considered for each study theme: the state of implementation of the planned actions, the involvement and roles of actors and stakeholders therein, the outcomes and contribution of actions to reaching the EU Forest Strategy's objectives, and the gaps or insufficiencies in actions. Consequently, the following five detailed **questions (Qs)** guided the analysis:

Q1: What is the current implementation state of the planned actions?

Q2: To what extent have the appropriate stakeholders and policymakers been involved in the implementation of actions and/or dissemination of results?

Q3: To what extent have the actions carried out contributed effectively and efficiently to the Strategic Orientations and the objectives of the EU Forest Strategy?

Q4: In the light of the new policy context, how relevant is the contribution of the Forest MAP, its priorities and actions to the achievement of the EU Forest Strategy's objectives?

Q5: In the light of the new policy context, are there any gaps in the actions carried out and planned?

In accordance with the request for a compact report and as detailed below, the responses to the 5 questions (Q1-Q5) are presented in three thematic sub-chapters under each Priority Area, and one overarching chapter (chapter 11), all of them being part of the analytical work carried out:

- Thematic chapters on ***state of implementation*** analyse the activities done with regard to the Strategic Orientations and the planned actions, thus answering **Q1**.
- Thematic chapters on ***achievements and effects*** are covering **Q3** and **Q4** and respond to the respective questions on effective and efficient contributions (if possible), as well as relevance.
- Thematic chapters on ***gap analysis*** are responding to **Q5** and present observed gaps in actions and possible future priorities and actions, including the aspects of generating added value and coherence of the EU FS implementation. It is important to stress that these should not be seen as concrete policy recommendations or necessities.
- The separate chapter 11 on the ***involvement and participation of policy-makers and stakeholders*** presents aspects of participation and stakeholder involvement across all thematic priorities, thus answering **Q2** in a synthesised manner.

2.3. Methods and sources of information

In order to address questions Q1-Q5 this study builds upon both, **existing information** as well as supplementary **additional, new data**. The former has been elicited by document analyses methods, while the latter was derived from surveying methods through stakeholder and Member States questionnaires and, where necessary interviews. The following sections describe those methods in detail. Existing information was elicited especially for answering questions Q1, Q2, and Q3, while additional, mostly qualitative data was employed mainly on Q4, Q5, and the qualitative aspects of Q3. In cases where more than one data source was

available on a particular aspect, data were triangulated. Contradictions among data from different sources were reconciled by giving priority to the more objective source of information , where documents were considered providing higher objectivity than, e.g. individual replies to questionnaires or interviews.

*2.3.1. Document analyses for **existing information***

Existing, factual data that contributed to answering the five questions, especially Q1, Q2, and Q3, were obtained from a literature review and a subsequent document analysis of more than 500 obtainable sources.

The literature review was conducted on each of the seven study themes by the contractor's seven thematic teams of specialists. It included reports, studies, research articles, meeting minutes, and other documentation such as database queries in multiple databases relevant to the diverse actions under the EU Forest Strategy. The selection of those sources was based on two criteria: First, information with immediate relevance, i.e. direct link to or mention in specific actions, were considered. This includes, e.g. information from project databases such as CORDIS for actions foreseeing a study or project, or meeting minutes for actions foreseeing to increase cooperation and coordination. The document review included, for instance, the meeting documentation of the Standing Forestry Committee, the Civil Dialogue Group on Forestry & Cork, and the Expert Group on Forest-based Industries and Sectorally related Issues, and the Strategic Working Group on Forests and Forestry Research and Innovation of the Standing Committee on Agricultural Research (SCAR). Second, information with broader relevance for the implementation of an action were considered based on the extensive expertise of the thematic working groups within the study team. This included systematic searches in scientific literature as well as in grey literature repositories containing consultancy studies and reports. Moreover, relevant official documents of the European Council and the European Parliament have been retrieved from publicly available online registers. Also, materials from the European Economic and Social Committee and the Committee of Regions have been reviewed.

Subsequent to this broad literature review, the method of document analysis was conducted on those literatures. The document analysis informed this study by identifying contributions of the reviewed literatures to either of the five questions Q1-Q5 under each of the seven study themes. For arriving at this, relevant reports, review as well as research studies have been qualitatively synthesized by the thematic teams, and interpretations were made with regards to their contribution to either of the five study questions Q1-Q5.

The literature review and the subsequent document analysis on existing factual information were used as the main data sources under this study. On remaining open questions or aspects thereof, additional supplementary data was sought including qualitative information.

*2.3.2. Questionnaires and targeted interviews for **additional data***

Additional qualitative data, especially on questions Q3, Q4, and Q5 were obtained from a questionnaire survey as well as from a small number of targeted interviews. The questionnaire served as the main instrument for obtaining additional, supplementary qualitative data needed for addressing these questions. The intention of the questionnaire survey was not compiling comparative, quantitative data, but rather qualitative indications on issues relating to the implementation and utility of the EU Forest Strategy. It mainly aimed to elicit qualitative assessments of and experiences in implementing the EU Forest Strategy, as well as its contributions and potential gaps in the evolved policy context. It was targeted at Member

States as well as stakeholder organisations, in slightly different forms. Interviews were then used to fill some very specific remaining information gaps only, mostly addressed to members of Commission Services.

The **Member State questionnaire** was conducted as a targeted online survey but also provided the option to work on basis of a MS Word file. It included an inventory of the Actions of the Forest MAP, an assessment of the progress in implementing the EU Forest Strategy, its relevance (e.g., to national forest policy), perceived gaps, and the organisational setup (e.g., coordination and communication). The questionnaire was addressed to Member State representatives in the Standing Forestry Committee and was distributed via email through the SFC's contact list. Coordinated replies among different administrations from within Member States were an option but no requirement, and were impeded mainly by time constraints. All 28 Member States were contacted for the survey and responses were received from all but three Member States (United Kingdom, Luxembourg and Greece) in the period between late May and late June 2018. Together with the status of implementation, the Member States were also asked to specify activities in their country contributing to the objectives of the EU Forest Strategy. While it should be noted that the level of detail in the Member States' responses varied considerably, their assessments of the progress in implementing the EU Forest Strategy provided feedback to the Community level implementation and the involvement of the stakeholders.

The **stakeholder questionnaire** was designed as an open online survey and addressed to the widest possible range of relevant organisations in order to elicit a balanced view on the added value and implementation of the Forest Strategy. This broad outreach was based on an existing, cumulative database maintained at the European Forest Institute, reaching out beyond the circles in forestry or forest-based sector networks. The distribution list covered some 350 e-mail addresses to e.g. environmental and business NGOs, as well as labour and other social organisations. Additionally, targeted invitations were sent to the Civil Dialogue Group on Forestry and Cork, as well as to the Expert Group on Forest-based Industries and Sectorally Related Issues. The replies received might, however, more strongly represent organisations with a strong interest in core forest matters than organisations with a more marginal interest in the substance matter of the EU Forest Strategy.

The response period for the questionnaire was between late May and mid-June 2018. A total of 125 complete and partly incomplete replies were received from a range of organisations covering social, business, as well as environmental interests. Figure 1 further analyses and details the survey replies, indicating a good coverage of producers of forest goods & services such as e.g. numerous forest and land owner associations from both, European and national scales. Also well represented are environmental NGOs from multiple national as well as from international and European levels. Forest-based industries, including e.g. associations from industrial sub-sectors as well as forestry contractors have also contributed their views to a substantial share. Limited feedback was received from trader as well as consumer groups of forest goods & services. In addition, Figure 2 illustrates countries from where stakeholder organisations replied to the questionnaire. The high shares of replies from Belgium and "other" indicates a high response rate from organisations at the EU level or with a European scope.

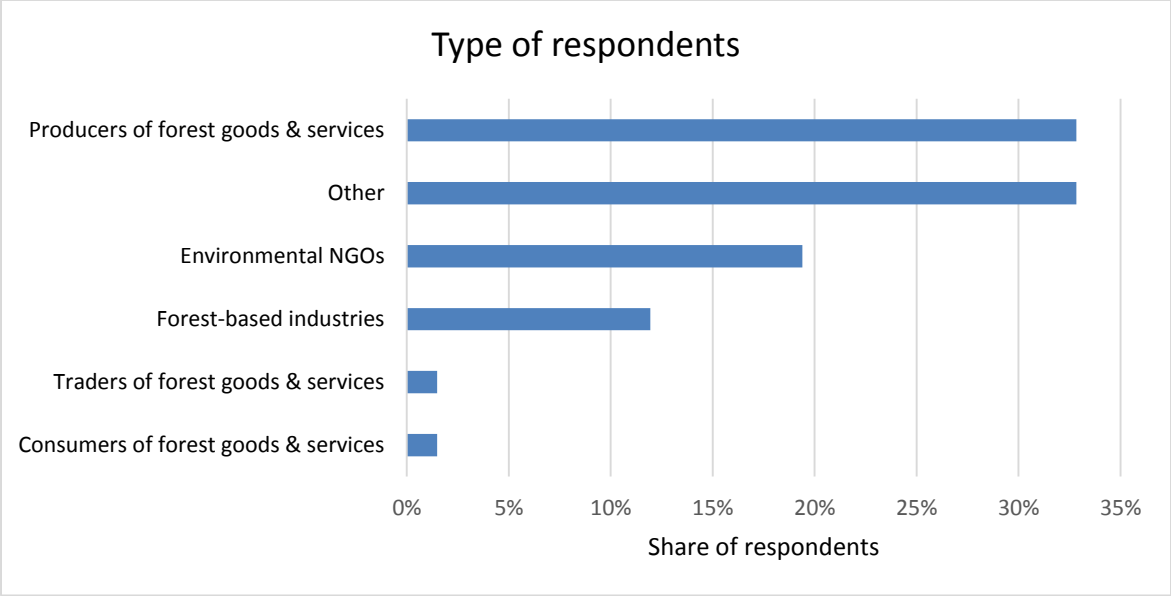

Figure 1: Types of respondents to the questionnaire survey according to their relation to forests and forest goods & services.

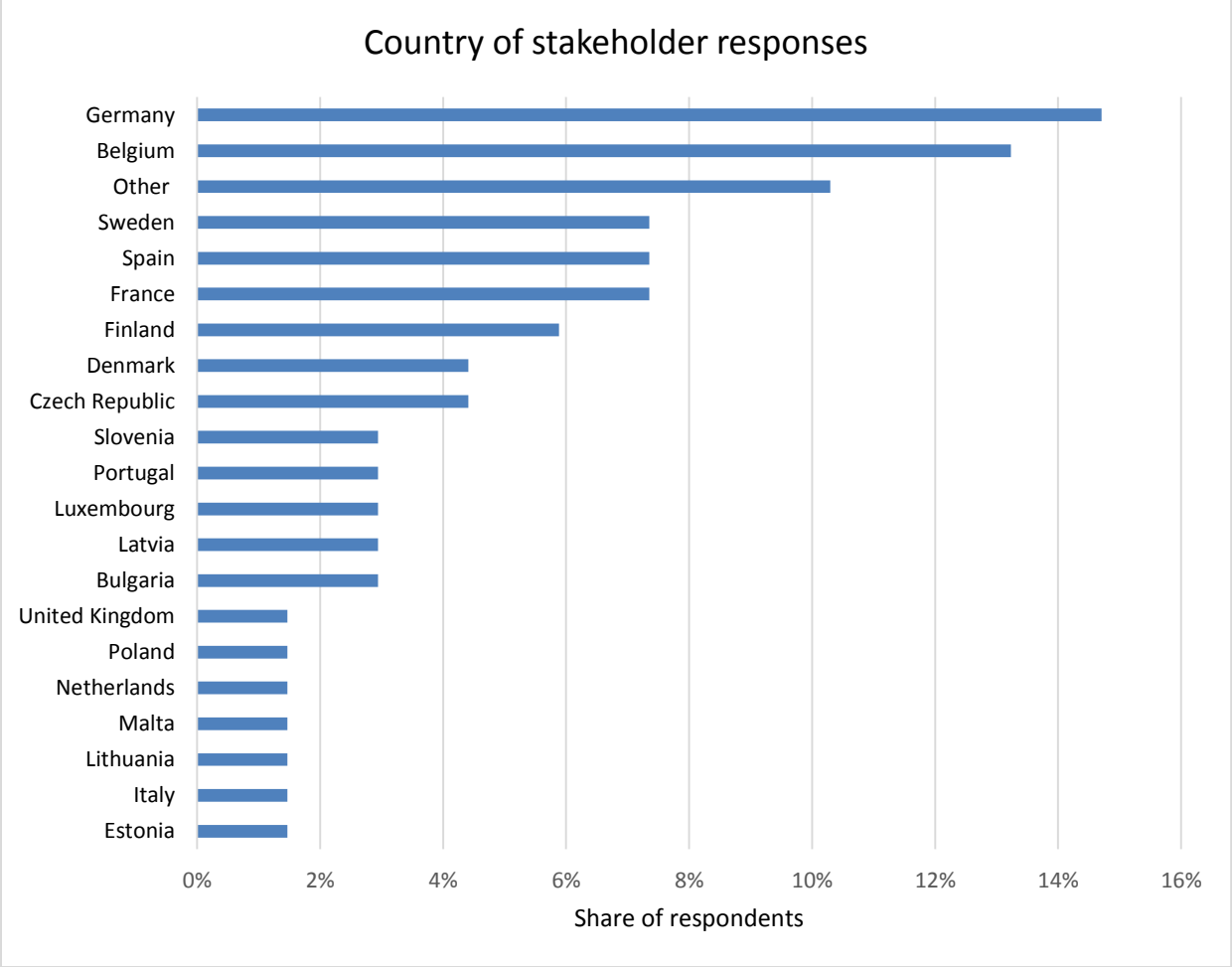

Figure 2: Countries of stakeholder responses to the questionnaire survey.

To allow for a comparison between the Member States' and stakeholders' responses, parts of the questionnaires were identical. It should also be noted that all responses were regarded as expert assessments, meaning that no official statements were requested on behalf of the Member States or stakeholder organisations. This affects the generalisability of information and the conclusions that can be drawn from the questionnaires. The level of detail and input received varied considerably, which needs to be considered in the analysis.

The **interviews** were designed to address very specific open questions on particular Actions which could not be covered by existing data. They were used to provide individual views and indications only, rather than highly reliable factual data. This way they supplemented the study in an ad-hoc manner, rather than based on a systematic approach. Personal and phone interviews were carried out between late February and early July 2018. In total, 22 targeted interviews were conducted, mainly with members of Commission Services, including DG Agri, Devco, Env, Grow, and EEA. On specific issues, such as e.g. coordination practices among the Commission and Member States at international fora, interviews were also conducted with experts from Member States and stakeholders. Although inputs were collected from several organisations and national ministries, the study does not distinguish which department has been active in which Action or has given which input. The information collected from Commission representatives covers descriptions of the implementation and self-assessment of the progress made, including inputs on the involvement of stakeholders in specific Actions of the Forest MAP.

2.4. Operationalising questions Q1-Q5

The five study questions, including their key aspects, have been addressed and operationalised in the following ways:

Current implementation state of the planned actions (Q1)
In order to address Q1, all planned actions were identified also considering the Forest MAP. In addition to the planned Actions mentioned in the Forest MAP, other relevant activities at EU level and/or by Commission Services, which clearly also contributed to the respective Strategic Orientation of the EU Forest Strategy, were taken into account for arriving at a comprehensive assessment of the implementation state. The implementation state of each of those actions has then been assessed distinguishing into:

- *Not Implemented:* If no activities have been carried out with regard to the planned Action up to the present time (July 2018).
- *Partly Implemented:* This category consists of two options
  - Parts of the planned Action have been carried out but the expected outcome for the planned Action has not been fully reached
  - It is an ongoing Action where some activities have been carried out but where the Action is expected to continue further, e.g. until 2020.
- *Fully Implemented:* If the expected output of the planned Action has been completed, in line with the expected outcomes.

In addition to those three assessment categories, the analysis also indicates whether the planned Actions are of a continuous and, hence, ongoing nature. Also, the study indicates whether Actions, be they fully or partly or not implemented, have been delayed as compared to the intended timelines.

The state of implementation (Q1) was assessed based on existing factual information. This was derived primarily from documents covered in the literature review, which provided *direct* insights into the state of implementation (e.g. policy guidance documents on a specific Action or documents accompanying or resulting from a specific Action). In addition, reviewed documents providing indirect and secondary insights into the stage of implementation and possible implementation deficits (e.g. reports, reviews, or research studies on a specific Action) were employed for arriving at findings on Q1. Only in very few cases where such documented or secondary information on the state of implementation was missing, supplementary information from the questionnaire survey or interviews was used (e.g. under the study theme on cooperation and coordination).

Involvement of appropriate stakeholders and policymakers (Q2)

Q2 focuses on how the EU Forest Strategy has involved stakeholders and policy-makers, as well as on improving cooperation in implementing the actions. This cooperation was considered horizontally (across actors of relevant policy areas at EU and Member States level) and vertically (between actors at the international, EU and Member States level). The organisational set-up in this context refers to the established bodies relevant in the implementation of the EU Forest Strategy at the EU or Member State level. The study considered whether or not those *appropriate* stakeholders and policymakers had been involved, which were formally foreseen in the planed actions. The relating roles were obtained from the Forest MAP, which clearly attributes them to specific actors for each Action.

Q2 was then assessed based on existing factual information. This was derived primarily from documents covered in the literature review, which provided *direct* insights into the involvement of national and EU-level policymakers and stakeholders (e.g. policy guidance documents on a specific Action or documents accompanying or resulting from a specific Action). In addition, reviewed documents providing indirect and secondary insights into the involvement of appropriate policymakers and stakeholders (e.g. reports, reviews, or research studies on a specific Action) were employed for arriving at findings on Q2. Only in very few cases where such documented or secondary information on involvement was missing, supplementary information from the questionnaire survey or interviews was used (e.g. under the study theme on cooperation and coordination).

In addition, some actions under the EU Forest Strategy establish particular modes of participation, including e.g. specific research projects or bottom-up local partnerships under the Rural Development policy. Such instances generally contributed positively regarding the question of involving the appropriate stakeholders.

It should be noted that the assessment of involving stakeholders and policy-makers was elevated from the level of the study themes and, hence, is addressed in a separate section of the report.

Contribution of actions to Strategic Orientations and the EU Forest Strategy objectives (Q3)

Under Q3 this study considered the extent to which the Strategic Orientations are catered and the EU Forest Strategy's objectives and intended results are being achieved or are expected to be achieved and the extent to which outputs and/or the desired effects have been or will be achieved with the best possible use of inputs.

In order to address Q3, the current state of implementation of the actions was used as assessment reference. Evidence was mainly collected from existing factual sources as well as from those Commission Services involved in implementing the actions. The derived findings were supplemented with views from Member States and relevant stakeholders on good practices and shortcomings in the implementation of the actions. Consequently, the seven thematic teams of specialists used the insights from their analyses on Q1 and checked if the actual state and way of implementation of an action caters the Strategic Orientations and contributes to the EU Forest Strategy's objectives. This assessment was done qualitatively and based on the expert knowledge of the seven thematic teams of specialists on each of the actions. In order to account for additional relevant activities which were performed under the EU Forest Strategy and which also clearly contributed to the Strategic Orientations and/or the objectives of the Forest Strategy, thematic analysis was employed. There the contractor's seven thematic teams, based on their expert knowledge as well as survey and interview insights, identified relevant activities at EU level which thematically relate to any Strategic Orientation. This step helped identifying highly relevant activities, which might not be listed in the Forest MAP, but which help to comprehensively account for the strategy character if the EU Forest Strategy. Whether actions have effectively and efficiently contributed to the objectives is, to the extent feasible, considered in relation to the results that have been achieved to date.

The results on this question are presented in sub-chapters "Achievements and effects" to each of the Priority Areas (chapters X.2). Based on these detailed analyses, chapter 12 then provides a summary of the extent to which the multiple actions, through the Strategic Orientations, contributed to the objectives of the EU Forest Strategy. This was done by qualitatively assessing the extent to which the current implementation state of each action, through the Strategic Orientation, contributes to a specific aspect of the objectives. This assessment distinguished into three extents, i.e. indifferent contribution, contribution, and strong contribution. Further details on the assessment procedure are presented in chapter 12.

In light of the new policy context:

- **Relevance of the Forest MAP, its priorities and actions to the achievement of the EU Forest Strategy's objectives (Q4);**
- **Gaps in actions (Q5)**

The evolved policy context, in which the EU Forest Strategy and its actions operate, is described in the introductory chapter 1.2. From the perspective of the eight thematic Priority Areas of the EU Forest Strategy, even more specific policy context might have evolved. Hence, the evolved policy context has differentiated implications for each Priority Area.

The relevance of the contribution of the Forest MAP, its priorities and planned actions for achieving the EU Forest Strategy's objectives in this evolved policy context (Q4) was assessed based on two steps: First, the existing factual information and document analyses carried out under Q1 and Q3 provided the basis of implemented actions and their contributions to the achievement of the EU Forest Strategy objectives. Second, the seven thematic teams of specialists then, based on their expert knowledge and specifically for each thematic Priority Area, qualitatively judged in which regards the actions continue being relevant or how their relevance could be increased given the evolved policy context. These assessments were done in a qualitative, descriptive way and based on the expert knowledge of the seven thematic teams.

In addressing the relevance of planned actions against the background of the evolved policy context, the experts simultaneously identified policy-relevant fields thus far uncovered by the EU Forest Strategy and its current actions, thus addressing Q5. These indications are expert-based deductions from the evolved policy context and were then combined with qualitative and indicative insights on the evolved policy context from the Member State as well as stakeholder questionnaire survey. Based on this systematic combination of data sources the study team then identified potential fields for future activities. These must be seen as qualitative analytical work, and should not be confused with personal opinions. Also, this analytical work presents some potential options for possible future activities, and not concrete policy recommendations. In this understanding, the analytical work may contribute to the review process of the EU Forest Strategy.

2.5. Validity and limitations of the methodology

When considering the validity of assessments made in this report, the following points should be noted:

- The EU Forest Strategy is an instrument through which actions at multiple levels are coordinated. Although some of the planned actions identify timelines and responsible actors, there are no specific financial resources earmarked for the implementation of the Forest Strategy, making it difficult to thoroughly assess if the actions contributed to the achievement of objectives efficiently.
- Actions planned under the EU Forest Strategy are often already part of other ongoing activities and processes being carried out by relevant actors at EU or national levels. It is thus difficult to establish rigorous causalities between the adoption of the EU Forest Strategy and the existence of specific actions included therein, even when the Actions themselves are clearly defined. This does not impair on the strategy's umbrella function for more cooperation and coordination or on any of the concrete study questions, but illustrates the challenging task of defining which information to include or exclude from this study.
- In the same line of reasoning, a plethora of actions and activities are being carried out at sub-national, national, and EU levels, which were not initially planned under the EU Forest Strategy, but which are clearly in line with the objectives and Strategic Orientations of it. This is especially true for multiple activities and approaches e.g. under the CAP Rural Development Policy and for many activities in the Member States.
- Parts of the information gathered through the questionnaires and interviews are qualitative in nature and could be subjective. To some extent, they also depend on the knowledge and understanding of the individuals responding to the questionnaires or interviews. The study team has addressed this challenge by crosschecking and triangulating the information between the questionnaire and other sources of information from the review of existing factual information.
- The EU Forest Strategy covers several policy domains that relate to forests (e.g., energy, climate and rural development). The questionnaires were distributed through a wide, yet established network of forest-related contacts mainly at EU level. This limits the potential to generalise the results beyond the respondents to the survey and the questions addressed by it. The study team has addressed this through the document reviews (e.g., studies and reports), the review of other relevant bodies (e.g., Council and the European Parliament) and forest-related fora (e.g., FOREST EUROPE).
- The general, possibly subjective inputs provided in the questionnaire required interpretation by the study team. This interpretation is subject to the study team's own expertise. The study team addressed this by dividing the responsibility of compiling and reviewing responses across the themes and when drafting the analysis and conclusions to cross-check any partial assumptions that may have been made. Viewpoints from both inside and outside the implementation of the Forest MAP have provided valuable inputs for the study.
- This study has been conducted in a relatively limited time frame. This made quick turn-over times necessary for both the study team and the accompanying steering group consisting of members of Commission Services.

Individual responses from interviews and questionnaire surveys provided throughout the study period were kept confidential and are not presented in this report or disclosed to any

entity outside the study team. It should furthermore be added that conclusions made in the analysis are based on the factual information, combined with the study team's external expertise, unless specified otherwise.

3. SUPPORTING OUR RURAL AND URBAN COMMUNITIES

The EU Forest Strategy recognises the growing need for forests and the role that forests play in terms of supporting economic welfare, job creation in rural and urban areas, and the provision of societal benefits through the forest-based sector. Hence, through this Priority Area, it is actively emphasised that the Rural Development Funds should be used to support the implementation of Sustainable Forest Management (SFM) and that Member States should use these and other opportunities provided, such as state-aid rules.

The strategic programming approach for rural development provides the basis for the inclusion of forestry measures in the Rural Development Programmes according to the specific needs of the Member States and regions. This includes, but is not limited to, afforestation, development of agroforestry systems, protection and restoration measures, investments to modernise forestry technologies, optimising the forest-based sector's contributions to the bio economy by improving resilience, environmental values and mitigation potentials of forest ecosystems, as well as supporting the shift toward a low-carbon and climate-resilient economy.

While it is recognised that rural development is a crucial aspect of the EU Forest Strategy, it should be noted that this Priority Area was not a study theme for the present study. The present section will therefore only consider relevant actions outside the scope of the recent evaluation study of the forestry measures under rural development (Alliance Environnement et al., 2017).

3.1. State of implementation

3.1.1. Assess and improve the effect of forestry measures under rural development policy

The Strategic Orientation on improving the effects of forestry measures under rural development policy is principally addressed through several evaluations covering Rural Development Programmes under the current and the preceding programming period (2007-2013 and 2014-2020). These are defined as actions in the Forest MAP and include:

- The synthesis of mid-term evaluations of Rural Development Programmes 2007-2013 has been published (Schuh et al., 2012). It can also be noted that the production of the report – Summary of the ex-post evaluations of 2007-2013 Rural Development Programmes – was launched in 2017, with an expected publication date set for 2018.[4] As noted in the roadmap for the evaluation, it covers the measures implemented in the 2007-2013 Rural Development Programmes and it will consist of a synthesis of the ex-post evaluations submitted to the Commission by the respective managing authorities for each Rural Development Programme.
- The report – Synthesis of ex ante evaluations of Rural Development Programmes 2014-2020 – was published for the European Commission in 2015 (Kantor, 2015). The study, which focuses on Rural Development

[4] See https://ec.europa.eu/info/law/better-regulation/initiatives/ares-2017-3071256_en.

Programmes and National Rural Network Programmes 2014-2020, includes a thematic cluster that focuses on forestry.

- Annual activity reports on Agriculture and Rural Development were published by DG AGRI for the 2013-2017 period and are publicly available as part of their planning and management documentation. The annual reports essentially detail achievements, initiatives that were taken as well as the financial and human resources spent during each year (DG AGRI, 2014, 2015, 2016, 2017, 2018).

These steps can be considered as a process towards revisiting the forestry-relevant measures in the CAP in the ongoing period and as input for the forthcoming design of the CAP.

As part of the same Strategic Orientation, it can also be noted that progress was made in the development of forest-relevant financial instrument products. The European Investment Bank (EIB) presently offers a range of products that supports forestry holdings, forestry ecosystems and forestry products' processing activities, which is a positive development. The EIB consequently provides for a range of financial instruments that utilise resources under the European Structural and Investment Funds (ESIF) for financial products (e.g., loans, guarantees and equity). The EIB finances projects promoting EU objectives that have interlinkages with RDPs and the financing of large-scale projects. The EIB has furthermore played a role in providing loans to help some EU Member States finance their RDPs. These financial instruments (which refers explicitly to the EU Forest Strategy[5]) are thus being used to support economically viable projects, including promoting EU Forest Strategy objectives. Several commitments under the EIBs environmental funds[6] are dedicated specifically to the forest-based sector. One example is the EcoEnterprises Fund,[7] which focuses on sustainable agriculture, forestry, ecotourism and non-timber forest products.

The EIB furthermore offers project and intermediate loans, to finance projects promoted by private and public-sector companies or entities, or public-private partnerships, among others, located in the EU, neighbouring countries or globally. In a partnership between EIB and the EC, the Natural Capital Financing Facility (NCFF)[8] supports projects delivering on biodiversity and climate adaptation through tailored loans and investments. The NCFF provides support for projects on payment for ecosystem services, green infrastructure, innovative pro-biodiversity and adaptation investment, and biodiversity offsets. This includes a funding frame of € 120-150 million, to which the EC contributes € 50 million as a guarantee for the investments and finances a € 10 million support facility. The EIB has consequently, in line with the outcomes specified in the Forest MAP, developed financial instrument products that can benefit forestry holdings, forestry ecosystems and forestry products' processing activities.

3.1.2. State aid modernisation package, including revising the conditions for block exemptions in the forestry sector

State aid modernisation is another Strategic Orientation. The related action, which is ongoing, is addressed through the Forest MAP as an evaluation of the instruments applicable to State aid in the agricultural and forest-based sectors and in rural areas[9], which is expected to be completed in 2019. The purpose of the evaluation is to consider the implementation of instruments applicable to State aid, in particular, regarding the impact on the internal market.

[5] See http://www.eib.org/en/projects/sectors/forestry/index.htm.
[6] See http://www.eib.org/products/lending/equity_funds/environmental_funds/index.htm.
[7] See https://ecoenterprisesfund.com/.
[8] See http://www.eib.org/products/blending/ncff/index.htm.
[9] See https://ec.europa.eu/info/law/better-regulation/initiative/24338/attachment/090166e5b1cf7eb0_en.

The results of the evaluation will be used for the review of the State aid rules and with the view to establishing a new State aid framework for the agricultural and forest-based sectors and for rural areas for the next programming period (2021-2028).

The evaluation of instruments applicable to State aid is thus expected to have implications on the future design of RD policy.

3.1.3. Improve the valuing of the benefits that forests give to society and, through sustainable forest management, should find the right balance between delivering the various goods and services

Another Strategic Orientation under Priority Area 1 relates to the valuing of benefits that forests give to society. This is however only addressed to a limited extent as the action defined in the Forest MAP is interlinked with ongoing work under Priority Area 4 and the development of a conceptual framework for valuing ecosystem services, notably the Mapping and Assessment of Ecosystems and their Services (see section 6).

Other actions are mentioned for SFC analysis and debate on preparing forestry-related recommendation for the post-2020 Rural Development Policy, as well as forestry-related recommendation for post-2020 State aid guidelines. The former was implemented as analyses and debate have taken place in the SFC. They have not been formally shaped into a recommendation because the actual evolution of the policy has superseded the need for this formality. However, the reflections and discussions taken place in the SFC have been considered when designing the proposal for the new CAP. The latter action is ongoing, because the assessment and discussions are still taking place, and the topic has been taken to the SFC several times.

Section 14.3 summarises the detailed state of implementation of actions under this Priority Area.

3.2. Achievements and effects

The state-of-play for actions related to the Rural Development Programmes for the current programming period (2014-2020) suggests that most of the actions are fruitfully ongoing or have been implemented successfully, including efforts to implement forestry-relevant measures on Members States level.

It is clear from this work that forestry measures under RDPs continue to play an important role in supporting not only SFM but also the EU Forest Strategy objectives. To this can be added that the EU Forest Strategy appears to have, at least thematically, influenced national funding strategies, even though it has not dominated national forest agendas (Alliance Environnement et al., 2017). This supports the assumption that the EU Forest Strategy has to date had an added value in respect to the RDPs. One example of this is the increasing prevalence of topics such as wood mobilisation, support for forest advisory systems, fire prevention, touristic and social services, or improving technology in the forest-based sector in several RDPs.

3.3. Gap analysis

The recent evaluation study of forestry measures under Rural Development confirms the continued importance of the EU Forest Strategy (Alliance Environnement et al., 2017). The uptake of forestry-related measures on the national level proved to be significant, including

efforts to improve the value of existing forests, improving the accessibility of forests, fostering new afforestation and improving the competitiveness. However, the needs of the forest sector were addressed only to a limited extent as compared to the agricultural sector and rural community development (Alliance Environnement et al., 2017). With this in mind, the EU Forest Strategy adds value in terms of coordinating as well as facilitating the promotion of forest-related issues at Member States level. The EU Forest Strategy brings well-needed attention to these issues , which is especially important as the quality and quantity of funding for forestry measures would likely decrease without EU support. .

It would however be relevant for the EU Forest Strategy to more actively addresses the impact from other sectors that affect rural development, including the (direct and indirect) effects and trade-offs these policy instruments (e.g. energy, trade, agriculture) have on forests (Aggestam et al., 2017, Aggestam and Wolfslehner, 2018). The recent evaluation study on forestry measures under rural development also notes that the Rural Development framework itself, and the need for Member States to address international commitments, has resulted in a strong focus of the forestry measures (at Member States level) on the environmental and climate priorities for the Rural Development policy, and less on economic priorities (Alliance Environnement et al., 2017). Similar results, with regards to cross-sectoral trade-offs were already noted in the evaluation of the EU Forest action plan (Pelli et al., 2012).

Findings from the evaluation of instruments applicable to State aid in the agricultural and forest-based sectors and in rural areas indicate that state aid guidelines require further evaluation.

It can also be noted that relatively little has been done to address urban and peri-urban forestry and trees in the EU Forest Strategy, to date. While this topic has been addressed in the overall title of the Strategic Orientation, there is no concrete action specifying this topic. It appears relevant as traditional land use planning and zoning has not been able to efficiently deal with the development of green spaces in urbanising Europe (Davies and Lafortezza, 2017, Kabisch and Haase, 2013). Another challenge in the context of urban and peri-urban forestry and trees is that the urban-rural interface often lacks comprehensive planning (Nilsson et al., 2009, Abrantes et al., 2016, Carter, 2018), where important parts of the urban forest and trees are situated. It may for this reason be an opportunity to address and/or refer to this highly relevant topic, not only under rural development section but moreover in an integrated way throughout the EU Forest Strategy.

4. FOSTERING THE COMPETITIVENESS AND SUSTAINABILITY OF THE EU'S FOREST-BASED INDUSTRIES, BIO-ENERGY AND THE WIDER GREEN ECONOMY

The Blueprint for the EU forest-based Industries (EU F-BI), which accompanied and complemented the EU Forest Strategy in 2013, emphasised the direct and indirect importance of wood as a raw material for woodworking (e.g., construction and furniture), growing (e.g., packaging) and emerging forest-based industries (e.g., bio-based chemicals, biofuels), while stressing the importance of having sustainably managed EU forests for wood production as well as other ecosystem services (European Commission, 2013a). This blueprint is echoed in Priority Area 2 in the EU Forest Strategy, which focuses on fostering competitiveness and sustainability of EU F-BIs and calls for minimising "*negative effects on climate and the environment while providing livelihoods*". This is an especially important challenge given the importance of wood as a natural, renewable, reusable and recyclable raw material and the role that forest based sector plays in providing employment across its diverse value chains, not only in rural areas, but also in urban and peri-urban ones. For instance, in 2013 the EU F-BI accounted for approximately 7-8 per cent of the EU's manufacturing GDP and employed over 3.5 million people within more than 400.000 small and medium size enterprises and multinational corporations. The increasing competition between different forest-based industries and products such as from existing wood-processing industries, bio-energy and the emerging bio-economy, highlights the continued need to balance wood production against other functions provided by forest ecosystems, such as carbon storage, nutrient cycling, water and air purification, recreation and public health.

The Strategic Orientations and their associated actions for this Priority Area set out to address a number of these key challenges. These include, but are not limited to, the promotion of wood as a sustainable, renewable, climate and environment friendly raw material; developing criteria for sustainable forest management; facilitating increased sustainable wood mobilisation; and stimulating market growth of EU F-BI products. The actions are consequently connected with measures and continued efforts to boost sustainable growth and to facilitate the transition towards a circular, low-carbon and green economy.

4.1. State of implementation

Regarding the EU forest-based industries (F-BI: woodworking, furniture, pulp & paper, printing[10]), which are under the competence of EU Industrial Policy, these have been addressed through a separate part of the overall strategy package: "A Blueprint for the EU Forest-based Industries" (SWD (2103) 343). Although the F-BI Blueprint was the subject of a separate inter-service consultation and, as stated in its conclusions reporting will be principally to the Expert Group on Forest-based Industries, in so far as elements of section 3.3.2 of the overall strategy (Fostering the competitiveness and sustainability of the EU's Forest-based Industries; bio-energy and the wider green economy) refer to F-BI activities, the following items are relevant:

- Several thematic programmes and projects within the European Innovation Partnership on Raw Materials[11], have been established under both Horizon 2020 and COSME. These include activities within the Commission's Bio-economy Strategy, including the Bio-based Industries Joint Undertaking projects. More broadly, work on research and innovation in the forest-based sector, including the F-BI, is coordinated and supported by the Forest-based Sector Technology Platform (see also sections 4.1.6, and 8).

[10] NB for NACE Rev. 2 definitions, please see "A Blueprint for the EU Forest-based Industries", SWD(2013)343.
[11] See https://ec.europa.eu/growth/sectors/raw-materials/policy-strategy_en

- Part of the sector (pulp & paper) has a representative in the High-Level Group on Energy Intensive Industries, whilst the woodworking sector has a representative in the High-level Group of the EIP Raw Materials.
- The Commission (DG GROW) has carried out an in-depth study on furniture information12 which generated a range of options from voluntary provision of information to mandatory labelling. So far, industry has not taken up any of the options.
- The Commission (DG GROW) has conducted a cumulative cost assessment (CCA) of the impacts of the key EU legislation on two of the four EU F-BI sub-sectors (woodworking; pulp & paper)13, with results published in November. 2016.
- As announced in the Circular Economy Action Plan, and to support resource-efficient use of biomass, the Commission will prepare guidance on the cascading use of woody biomass. This will take into account the results of the Commission's (DG GROW) study on the optimised cascading use of wood, published in 2016[14]. Guidelines will be developed during 2018, as part of the implementation of the Circular Economy Action Plan. The guidance will include the Horizon 2020 and ultimately Horizon Europe projects for the dissemination of related good practices.
- To help coordinate these activities and for advice on a wide range of subjects, the Commission has established the Expert Group on Forest-based Industries and Sectorally Related Issues[15], formed of representatives from sectoral industries, their member-state counterparts and various civil-society bodies. This meets roughly twice per year, with intervening sub-group meetings on demand.

4.1.1. Explore and promote the use of wood as a sustainable, renewable, climate and environment-friendly raw material more fully; assess the climate benefits of material and energy substitution by forest biomass and harvested wood products and the effect of incentives for using forest biomass in creating market distortions

To prepare to ground for new ways of exploring and promoting wood, a series of studies were a tangible outcome.

1.1.1.1. Study on climate benefits of material substitution by forest biomass and harvested wood products: perspective 2030 "ClimWood"

The final report of ClimWood2030 – Climate benefits of material substitution by forest biomass and harvested wood products: Perspective 2030 – was published in 2016 (Rüter et al., 2016). Related work has furthermore been pursued through FORMIT[16] – Forest management strategies to enhance the mitigation potential of European forests – as part of a framework project on developing key criteria, know-how and methodologies for assessing forest management strategies.[17]

ClimWood2030 furthers an understanding on the ways in which the EU forest-based sector contributes to climate change mitigation, focusing on carbon sequestration and storage, carbon storage in harvested wood products, substitution of wood products for functionally equivalent materials and substitution of wood for other sources of energy, as well as displacement of emissions from forests outside the EU. This work provides insights into the

[12] See https://ec.europa.eu/growth/content/study-optimised-cascading-use-wood-0_en
[13] See https://ec.europa.eu/growth/content/study-assessment-cumulative-cost-impact-specified-eu-legislation-and-policies-eu-forest-0_en
[14] See https://ec.europa.eu/growth/content/study-optimised-cascading-use-wood-0_en
[15] Commission Decision 4321 (2014)
[16] Summary of the final FORMIT report: https://cordis.europa.eu/project/rcn/104508_en.html.
[17] Summary of the final FORMIT report: https://cordis.europa.eu/project/rcn/104508_en.html.

potential contribution of material uses of wood on climate change mitigation and how the carbon balance may be affected by market developments. Inter alia, the project concludes that forests and wood-based products play an important role for the GHG balance of the EU. It will require an optimal mix between forest protection, cascade use, and balance between material and energy use to maximise these benefits.

1.1.1.2. Study on climate benefits of forest biomass use for energy generation in the EU by 2030.

A second package of studies related to the benefits of forest biomass use for energy generation. The study – Carbon impacts of biomass consumed in the EU: quantitative assessment – was published in 2015 (Matthews et al., 2015). The study evaluates implications of increasing forest bioenergy use for the natural environment and climate, including an assessment of forest-derived woody biomass for energy use within the EU up to 2030. Related work has been pursued through BioSustain – Sustainable and optimal use of biomass for energy in the EU beyond 2020 – on how to ensure sustainable supply, combined with optimal use of biomass for energy in the period after 2020 as part of the work for a revised Renewable Energy Directive (Bogaert et al., 2017). A third study has recently been published on carbon impacts of biomass consumed in the EU [18]

These studies provide qualitative and quantitative assessments of the direct and indirect greenhouse gas (GHG) emissions associated with different types of solid and gaseous biomass used for electricity and heating/cooling in the EU under several scenarios focusing on the period up to 2030. All scenarios achieve significant reductions in total annual GHG emissions, including those scenarios involving increased bioenergy consumption in the EU, but choices between bioenergy sources lead to variable impacts on overall GHG emissions. All studies provide a range of different scenarios, and indicate that bioenergy has potential to reduce GHG, but needs to be dealt with carefully. In particular the use of solid wood for bioenergy and the effects of increased wood demand for bioenergy beyond 2030 require special scrutiny to avoid adverse effects.

1.1.1.3. Study report on impacts on resource efficiency of future EU demand for bioenergy.

A further field of attention in the Strategy addresses the impacts of EU demand for bioenergy on resource efficiency. The final report of ReceBio – Study on impacts on resource efficiency of future EU demand for bioenergy – was published in 2016 (Forsell et al., 2016a). It can also be noted that ReceBio was followed by an additional study on the same topic (Forsell et al., 2016b). The reports examined the resource efficiency implications of increased EU use of bioenergy for electricity and heat until 2050.

These studies found a massive increase in bioenergy demand up to 2030, with controversial consequences. Inter alia, they predicted that the increased demand for bioenergy will lead to an increase of 10% in wood production in the EU. Without additional biomass produced from fast-growing plantations, the pressure to use roundwood directly for energy and EU biomass imports will increase heavily, thereby negatively influencing the competitiveness of the pulp and paper industries.

[18] See https://europeanclimate.org/wp-content/uploads/2018/05/CIB-Summary-report-for-ECF-v10.5-May-20181.pdf

These studies are explicitly integrated in the Forest MAP and the action points have been fully implemented.

Moreover, it is of note that a review on the utility of sustainability criteria and indicators in subsequent life-cycle phases for all uses of wood is still in the planning stage. The respective MAP is hence not implemented yet. Since the Council Conclusions on the Circular Economy required only guidance for cascading and under the Recast of the Renewable Energy Directive (RED II) no further requirements were made for the development of criteria assessing the sustainability of forest-based biomass, potential further work on their downstream phases was not pursued.

Finally, a MAP point is to assess possible synergies with other initiatives and measures to seize opportunities of bio economy for wood-based materials. In a report of the EU F-BI Expert Group on the evaluation of the Bio economy Strategy and its action Plan[19], potential synergies in a bio economy and circular economy are addressed, concluding that these synergies are not fully developed yet. Hence, while there is further need on the substance, the action as such has been implemented.

4.1.2. Develop objective, ambitious and demonstrable EU sustainable forest management criteria that can be applied in different policy contexts regardless of the end use of forest biomass, by the end of 2014. Appropriate measures will be presented by the Commission

1.1.1.1. Objective, ambitious and demonstrable EU Sustainable Forest Management criteria

In relation to developing recommendations on relevant operational indicators for SFM criteria, the Report of the Ad-hoc Working Group under the Standing Forestry Committee on Sustainable Forest Management Criteria and Indicators was published in 2015.[20] The group recommended using the Criteria and Indicators framework of FOREST EUROPE and the updated Pan-European Indicators for Sustainable Forest Management that were endorsed by the ministers at the 7th Ministerial Conference in Madrid 2015 (Annex 1 to Madrid Ministerial Declaration)[21]. The summary report of the Ad-hoc Working Group also recommended to use a short list of the key indicators for communication purposes to convey the concept of Sustainable Forest Management (SFM) to the public. The Commission took note of the Ad-hoc Working Group, the report and considered it. The SFC adopted it as an input to future discussions.[22]. The outcome has been taken on board in the preparation of the sustainability criteria for forest biomass under RED II. The respective action in the Forest MAP can be considered as implemented.

From the EC side, further relevant activities are the development of criteria on the impacts of EU bioenergy use, and respective further developments of the recent agreement on RED II.

The Commission is proposing/taking appropriate measures recurrently, building on the agreed criteria and indicators at EU and Forest Europe level, and trying to ensure respect to the

[19] See https://ec.europa.eu/research/bioeconomy/pdf/publications/bioeconomy_expert_group_report.pdf.
[20] See https://ec.europa.eu/agriculture/sites/agriculture/files/forest/publications/pdf/sfcci-report_en.pdf.
[21] See http://foresteurope.org/sfm-criteria-indicators2/.
[22] See https://ec.europa.eu/agriculture/sites/agriculture/files/forest/standing-committee/opinions/opinion-bioenergy-sustainability_en.pdf

criteria agreed by all MS under the relevant processes, to ensure these criteria are applied irrespective of the end use of biomass.

4.1.3. Assess potential wood supply and facilitating increased sustainable wood mobilisation; develop good-practice guidance for this and for the "cascade" principle, as well as on resource- and energy-efficient manufacturing processes

A study by Indufor (2013)[23] on wood raw material supply and demand for the EU wood-processing industries served as a starting point to provide quantitative data for the FB-I. In the consequent implementation of the EU Forest Strategy a series of particular issues were planned to be addressed in more detail.

1.1.1.1.Study on the optimised cascading use of wood

In order to get insights in optimised ways of cascading wood, the final report of CASCADES – Study on the optimised cascading use of wood – was published in November 2016 (Vis et al., 2016). The objectives of CASCADES were to assess the environmental and socio-economic impacts of cascading use and to identify barriers that prevent the cascading use of wood. This also included the identification of possible measures adapted to local conditions to overcome barriers. As such, the study recognises barriers both with regards to the provision and utilisation of wood, including technical barriers (e.g., cleaning of recovered waste wood), market barriers (e.g., the dependence on upstream products) and governance barriers (e.g., lack of integrated approaches towards energy and material applications of biomass). It was suggested that these barriers can only be overcome through a mix of approaches that depend on specific local circumstances.

The European Commission has been working on guidance on the cascading use of biomass, as outlined in the action Plan for the Circular Economy (European Commission, 2015b). This work has, amongst other things, included the organisation of a stakeholder workshop and consultations to help prepare the guidance on cascading use of woody biomass in 2018.[24] The aim is to promote the resource efficient and sustainably driven use of woody biomass by providing policy-makers and stakeholders with a tool to share good practices in cascading. Delivery of the guidance is due in autumn 2018. Against this background, the respective action can be considered as partly implemented.

1.1.1.2.Studies on biomass availability, including in relation to SFM

Further objectives focus on the availability of biomass, in particular in relation to SFM. In this respect, The INFRES project studied developing technological and logistical solutions to accelerate the development of forest-based biomass supply. Results from the project demonstrate that fossil energy input could be reduced by 20 per cent due to the increased use of biomass and that raw material losses could be reduced by 15 per cent. The project also highlighted that the cost of biomass supply can be cut by 10 to 20 per cent, and the CO_2 emissions of feedstock supply by 10 per cent. Overall, INFFRES demonstrate the importance of quality management of forest biomass along biomass along the supply chain. The final

[23] See https://ec.europa.eu/docsroom/documents/10017/attachments/1/translations/en/renditions/native
[24] See https://ec.europa.eu/growth/content/workshop-guidance-cascading-use-woody-biomass_en.

report of INFRES – Innovative and effective technology and logistics for forest residual biomass supply in the EU – was published in 2015 (Alakangas et al., 2015).

SIMWOOD promotes collaborative wood mobilisation in the context of multifunctional forest management across European forest regions. It developed a novel integrated approach that addresses five domains in wood mobilisation, namely governance, ownership, management, harvesting and functions. It developed regional profiles for wood mobilisation, regional mobilisation strategies, and feasibility studies. The final report of SIMWOOD – Sustainable Innovative Mobilisation of Wood – was published in April 2018[25], following a handbook was issued in 2017 (Orazio et al., 2017).

BIOMASS – the Biomass Assessment Study of the Joint Research Centre (JRC) – was initiated in 2015. It is still ongoing, but a number of technical reports have been published already (e.g., Biomass Flows in the European Union).[26] JRC has been given the task, under a set of ToR and scenarios agreed by all relevant EC services, to produce state-of-the-art biomass-related information, and to conduct analyses of EU and global biomass potential, supply, demand and related sustainability. This assessment is designed to provide a solid knowledge base to support the development and implementation of policy measures and to develop and analyse scenarios for biomass supplies and demands for all the main biomass types, including agricultural, wood, marine and municipal waste. Against the background of addressing issues raised in the Strategic Orientation, also the respective Forest MAP point can be considered as ongoing.

1.1.1.3. Study on identification of good practices in resource, energy and process efficiency for wood-processing industries

The study for this action was developed as far as the proposal stage (raw materials policy support actions for the Circular Economy, resource efficiency in wood processing, recovery and recycling). However, it has not yet been implemented while priority has been given to the development of the cascading guidelines. Accordingly, it can be considered as work in progress and ongoing.

1.1.1.4. Implementation of the European Innovation Partnerships on Raw Materials and for Agricultural Productivity and Sustainability

The European Innovation Partnership for Agricultural productivity and Sustainability (EIP-AGRI) was launched in 2012 in response to the European Union's strategy 'Europe 2020' for smart, sustainable and inclusive growth (European Commission, 2010). As part of this process, the European Rural Networks' Assembly was launched as the main governance body of the European Network for Rural Development (ENRD) and EIP-AGRI Networks in 2015. This assembly includes a permanent subgroup on innovation for agricultural productivity and sustainability, which meets approximately three times per year. [27]

In accordance with the Strategic Implementation Plans (SIPs) of the EIP-AGRI (2018), EU Forest Strategy related activities focused on wood mobilisation, notably with action area n° II.10 "Optimised raw materials flows along value chains: action 3 Sustainable wood mobilisation". This included two face-to-face meetings with 20 European experts that

[25] See https://cordis.europa.eu/result/rcn/226622_en.html.
[26] See http://publications.jrc.ec.europa.eu/repository/bitstream/JRC106502/kjna28565enn.pdf.
[27] See https://ec.europa.eu/eip/agriculture/en/about/permanent-subgroup-innovation-agricultural.

identified relevant questions in relation to sustainable mobilisation of forest biomass derived from practice. Ideas included, amongst other things, innovative virtual timber sales/marketing hubs. The final report of the Focus Group was published in February 2018[28]. It identified success and hampering factors to steer supply of forest biomass, and highlighted the importance to improve the cooperation with small-scale forest owners. Also, follow-up activities in Finland and Sweden have been reported. The respective action in the Forest MAP can be considered as fully implemented.

Identification of relevant practices and other elements for the forest-based industry and Member States regarding resource efficient use of biomass

This action has been discussed in the EU FB-I Expert Group meetings from the point of view of cascading use of wood. Thus, although no separate outputs on this topic have been provided by the Expert Group, it can be assumed that a number of the good practices they provided for the cascading guidance de facto cover this topic. Furthermore, the issue is addressed in the Guidance for the Circular Economy Action Plan. Hence, the action can be considered as partly implemented.

4.1.4. Stimulate market growth and internationalisation of EU Forest- based Industry products and improve sectorial knowledge, including on sustainable construction and consumer information on furniture.

1.1.1.1. Assess the needs for improving market transparency and consumer awareness: study on "The EU furniture market situation and a possible furniture products initiative"

For the aspect of improving market transparency and consumer awareness, the final report for this action – EU Furniture Market Situation and a Possible Furniture Products Initiative – was published in 2014 (Renda et al., 2014). The report provides a comprehensive overview of the structure and competitiveness of the EU furniture sector. It developed a set of policy options, ranging from very soft (e.g. industry-led voluntary information) to hard legislation (e.g. regulation). From amongst these, it highlights that the most suitable actions to promote the competitiveness of the EU furniture industry are soft-policy initiatives as part of an industry-led process to provide more info to consumers. However, there has been no follow-up on this by the industry.

It can also be noted that, separately from this study, the European Council has considered a "made-in" initiative as part of introducing a mandatory marking of origin on industrial products (Article 7 of the Consumer Safety draft regulation). This package is however presently blocked in the Council[29], but is fully implemented against the background of the Forest MAP.

1.1.1.2. Stimulate favourable investment conditions in construction

The PERFORMWOOD project – Performance standards for wood in construction - delivering consumer service life need – was launched prior to the EU Forest Strategy, however, its final report was published in 2014.[30] The project focused on the consolidation of the technical

[28] See https://ec.europa.eu/eip/agriculture/en/publications/eip-agri-focus-group-forest-biomass-final-report
[29] See https://www.consilium.europa.eu/media/22779/st09357en16.pdf.
[30] See summary of the final report: https://cordis.europa.eu/result/rcn/155719_en.html.

background for standardisation to deliver a new standardisation document on the service-life performance of wood in construction for standard CEN TC 38.

The European Construction Sector Observatory (ECSO)[31], an initiative under COSME, aims to inform European policymakers and industry stakeholders on market conditions and policy developments through regular analysis and comparative assessments. ECSO has released an analytical study on stimulating favourable investment conditions in 2016 [32] as a response to the EU's Construction 2020 Strategy (European Commission, 2012). The study provides an overview of the investment trends in and by the construction sector in 10 Member States and focuses on policies that influence investments in the construction sector in general. It concludes that the main drawbacks since the economic crisis 2008 seem have been overcome, but there are no explicit analytical points as regards wood construction.

While the respective action calls for MS activities, the promotion of the use of wood in construction has been limited so far to a few Member States, notably Sweden, Finland, Austria and the UK. For example in Finland a National Wood Construction Programme was initiated as one of the Priority Areas in the Strategic Programme for the Forest-based Sector. The feasibility of the implementation may prove difficult, due to established construction cultures, legal restrictions and value chains that are very difficult and time consuming to change, but as examples like in Finland and Austria show, wood construction even in multi-story houses is gaining prominence. While more evidence needs to be systematically gained, the corresponding action in the Forest MAP can be considered as partly implemented.

1.1.1.3. Raising awareness of forest-based industries on available tools to facilitate internationalisation

During the second Barroso Commission, a number of "Missions for Growth" were undertaken to the major trade partners of the EU. These were led by the Industry Commissioner, V-P Tajani and attended by EU business leaders from selected EU industry sectors. On a number of these missions, industry leaders from the F-BI took part, that have resulted in a number of new commercial deals, notably for the furniture sector.

More generally, while COSME has a budget of 2.3 billion euros, there is no explicit information available with regards to the share of beneficiaries that are affiliated to the forest-based sector in the funds managed by COSME or the European Enterprise Network, except for a few business start-up grants. There has been interest in the SME grants, but there is a lot of competition and, according to the Forest-Based Sector Technology Platform (FTP), these instruments may be somewhat out of scope for the forest-based sector. Nevertheless, ECSO (as noted above) can be considered as one initiative that contributes towards raising awareness on behalf of the forest-based industries. A respective action in the Forest MAP can be considered as partly implemented.

[31] https://ec.europa.eu/growth/sectors/construction/observatory_es

[32] See http://ec.europa.eu/DocsRoom/documents/19342/.

4.1.5. Facilitate access to third markets for EU Forest-based Industry products and raw materials via bilateral trade agreements, and by improving information on import conditions and raw material exports

1.1.1.1. Access to third markets for EU Forest-based Industry products and raw materials, and trade-related commitments at bilateral and multilateral levels

Following below is a summary of the current state-of-play for the most important bilateral and multilateral trade agreements: [33]

- Negotiations with the United States on the Transatlantic Trade and Investment Partnership (TTIP) were stopped until further notice at the end of 2016. Prior to that, detailed offers had been exchanged on wood product, together with some discussions on rules of origin, and on sectoral background issues, such as sustainability and legality. (It should be recalled that trade in pulp and paper products with the USA has been tariff free since 2003, following a 10-year phase-out under the Uruguay Agreement (1993)).
- The Comprehensive Economic and Trade Agreement (CETA) with Canada has provisionally entered into force in 2017, having since received the ratification of all Member States. In terms of forest products trade, CETA effectively shifts the former duty-free plywood quota to other countries than Canada. Administratively, an EU-Canada Working Group has been set up for exchanges on subjects of mutual sectoral interest.
- The EU-Japan Economic Partnership Agreement (EPA) was finalised in July 2017, pending approval from the European Parliament and the Member States. The EPA phases out most of the import duties paid by EU companies which export wooden products to Japan, which previously summed up to €1 billion annually, and opens the Japanese market to further EU exports of wood-based products, particularly wood-based panels and engineered wood products for building. Whilst many tariffs are removed at entry into force, those on a number of key products are phased out over seven years and a few over a longer period.
- The F-BI Expert Group has extensively discussed trade barriers put in place by, for example, Russia (wood-export taxes), Ukraine (roundwood export ban) and Belarus (roundwood export ban). The first of these has been successfully addressed through a bilateral agreement with Russia, under which both sides meet several times per year. On the EU side, a tariff-rate quota (TRQ) is managed under the "Wood Regulation"[34] by the Wood Committee. Whilst the situation in Belarus cannot easily be reversed, even though that country aspires to join the WTO and so should not contravene GATT Art. XI, the Ukrainian wood-export ban flagrantly contravenes not only that WTO provision – as a WTO member - but also Ukraine's bilateral Deep and Comprehensive Free Trade Agreement (DCFTA[35]) with the EU. Accordingly, complaints and requests to uplift the ban have been made at every level, including between Presidents Juncker and Poroschenko at EU-Ukraine Summits in July 2017 and July 2018. Meanwhile, the Commission's DG NEAR has led an EC-member-state task force on several missions to Kiev to study and advised the government on reform options for the forest-based sector in Ukraine. In parallel, several EU MS, notably Germany and Austria, have discussed possible bilateral technical assistance to Ukraine for the sector.
- Negotiations with China with regards to updating the 1985 Trade and Economic Cooperation Agreement were launched in 2007. They have however not progressed significantly since 2011, principally due to a divergence between the mandate and expectations of the parties.
- The EU and 16 other members of the World Trade Organization (WTO) have been negotiating an Environmental Goods Agreement (EGA) to remove barriers to trade in environmental or "green" goods that are crucial for environmental protection and climate change mitigation since 2014. Whilst the EU has participated constructively, discussions are still ongoing, with quite wide differences as to material and

[33] See the complete list of ongoing trade negotiations (from May 2018): http://trade.ec.europa.eu/doclib/docs/2006/december/tradoc_118238.pdf.
[34] See https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=celex:32012R0498.
[35] See http://trade.ec.europa.eu/doclib/press/index.cfm?id=1425.

product scope (e.g. should bamboo and cork be included; should coniferous and/or non-coniferous wood be included? Which criteria for environmental goods?)

- The Mercosur negotiations with four South-American countries (Argentina, Brazil, Paraguay, Uruguay) in addition to Venezuela are still ongoing. EU countries and enterprises are large exporters and investors in the region, so an agreement could further trade relationships. As regards the forest-based sector, there is a net import to the EU in wood and charcoal, while a net export of pulp paper, and paperboard.

The respective Forest MAP action on international trade agreement can be considered as fully implemented.

1.1.1.2. Assess the need for improving information on sectoral trade information and production inputs

Although there has been no initiative on this action by the EU F-BI Expert Group, DG GROW in conjunction with Eurostat, UNECE, FAO and the ITTO has worked continuously to improve sectoral information on production and trade. This has included the development of new product definitions and codes, as well as work on a closer correspondence between PRODCOM and Combined Nomenclature codes and their definitions. This action can be seen as partially implemented, and still ongoing.

4.1.6. Support the Forest-based Sector Technology Platform and encourage new initiatives, such as private-public partnerships, e.g. in the bio-based sector, which foster research and innovation.

1.1.1.1. Facilitate access to funding for innovation and adaptation to change

The Forest-based Sector Technology Platform (FTP) plays a prominent role in supporting funding for the forest-based sector Research and Development, and Innovation efforts that focus on the projects launched within the EU Framework Programme for Research and Technological Development (see more in section 8.)

This is also echoed by a recent study into forest bio economy research and innovation in Europe, which confirmed that the annul value of approved forest-based bio economy-related projects has increased over the period of the current and the previous framework programme (Lovric et al., 2017). The study demonstrates that dominant topics have been bioenergy, bio refinery, construction and final wood products and sustainability assessment. Topics for which the funding has increased in Horizon 2020 compared to FP7 relate to sustainability assessment, wood supply chain and downstream processing, while topics for which the funding has decreased are forest inventory and economics, forest ecosystem services, non-wood forest products and wood properties. However, there is a series of forestry projects that have recently been recently and started, e.g. on forest genetics, resilience, management tools and inventories.

Results from the recent assessment of ERA-NETs and COST actions in the EU forest-based sector furthermore support the importance of these funding schemes to initiate and implement forest-related research and innovation projects through transnational networks and collaborative actions (Kleinschmit von Lengefeld and Kies, 2018). These funding opportunities may however seem small when compared to the €1 billion that is being invested

into knowledge and innovation in agriculture, food and rural development[36] for 2018-2020.The respective action in the Forest MAP can be considered as ongoing and will continue until 2020.

4.1.7. Launch a cumulative cost assessment of EU legislation and policies affecting forest-based industry value chains. The results could contribute to a wider analysis of impacts, including costs, benefits, and coherence, of policies and legislation

An assessment of the cumulative cost impact of specified EU legislation and policies on the EU forest-based industries was published in 2016 (Rivera León et al., 2016). This work was part of the Commission's Regulatory Fitness and Performance (REFIT) programme, which aims to keep EU law simple, remove unnecessary burdens and adapt existing legislation without compromising on policy objectives (European Commission, 2016b). The study found that the cost impacts of EU legislation on the forest-based industries varies significantly depending on the forest-based value chain and product group. Amongst other findings, the assessment determined that the cost of EU legislation represents 10.8 per cent of the added value for wood-based panels, 5 per cent for pulp, 4.2 per cent for paper and paperboard and 2.6 per cent for sawn wood, while costs for printing and furniture could not be studied in detail because they largely relate to SMEs where figures are difficult to obtain. The results show also that environmental and climate change and energy policies amount to more than 70% of the regulatory costs for both the woodworking and the pulp, paper & paperboard subsectors. The required action in the Forest MAP, hence, can be considered as fully implemented.

4.1.8. Needs and provisions for education, training and skills development in forest-based sector

The need for education and training is reflected both in the F-BI Blueprint which accompanied the EU Forest Strategy and also in the Forest MAP. The provisions for education, training and skills development is in line with the new skills agenda for Europe (European Commission, 2016k) and the Blueprint for sectoral cooperation on skills (European Commission, 2017b). The European Commission reported on the new skills agenda during the EU F-BI Expert Group meeting in 2018, highlighting that the paper-based value chain (pulp & paper manufacturing + paper-based printing) has been selected for the new round of sectoral pilots of the Blueprint. Proposals for this closed in February 2018. It can also be added that the sectoral Social Dialogue Committee for the Paper industry[37], that for the Printing Industry, and the sectoral Social Dialogue for the Woodworking Industry[38] defined skills and qualifications as well as vocational education and training as key areas of work for the Committees (e.g., through joint opinions, resolutions, studies and guidance). Hence, the action can be considered as partly implemented. It will continue until 2020.

Section 14.3 summarises the detailed state of implementation of actions under this Priority Area.

[36] https://ec.europa.eu/info/news/european-commission-announces-eu1-billion-funding-more-sustainable-agriculture-food-and-rural-development_en
[37] See http://ec.europa.eu/social/main.jsp?catId=480&intPageId=1819&langId=en.
[38] See http://ec.europa.eu/social/main.jsp?catId=480&langId=en&intPageId=1859.

4.2. Achievements and effects

Priority Area 2 on the competitiveness and sustainability of EU's forest-based industries covers a comprehensive range of heterogeneous actions, ranging from trade to cascading use of wood and energy to construction and furniture. Many actions under the different SOs of this priority theme have been successfully implemented or are ongoing, with documented influence on the scientific understanding, preparation of legislation, as well as concrete actions towards improving the competitiveness of the sector.

The funding schemes that are interlinked with Priority Area 2 have as such played an important role in its implementation (Kleinschmit von Lengefeld and Kies, 2018, Lovric et al., 2017). The degree to which the EU Forest Strategy has been implemented through different funding instruments can be considered as an achievement. One of the most successful instruments has been WoodWisdom-Net ERA-NET, complementing projects funded directly by the Commission within the two Framework Programmes. Though not emphasised in the strategy, the BBI can be seen as a positive platform for inter alia the forest-based industries.

The overall EU funding for the forest-based sector research has significantly increased during the strategy implementation period (see Figure 3), also in comparison to other sectors such as the textiles industry. According to the FTP database, forest-based sector related research projects received a total of 615 million € public funding over 2013-2017 and 249 projects were started in this period. The increase in public funding coincides with the adoption of the EU Forest Strategy, which can be counted as one of the key achievements. Some of the research priorities have already achieved commercialisation, such as Nano cellulose and biofuels, allowing further research efforts to be focused on new priorities. Having a clear reference to FPT in the EU Forest Strategy furthermore provides legitimacy and recognition for the sector and has allowed for common strategic priorities.

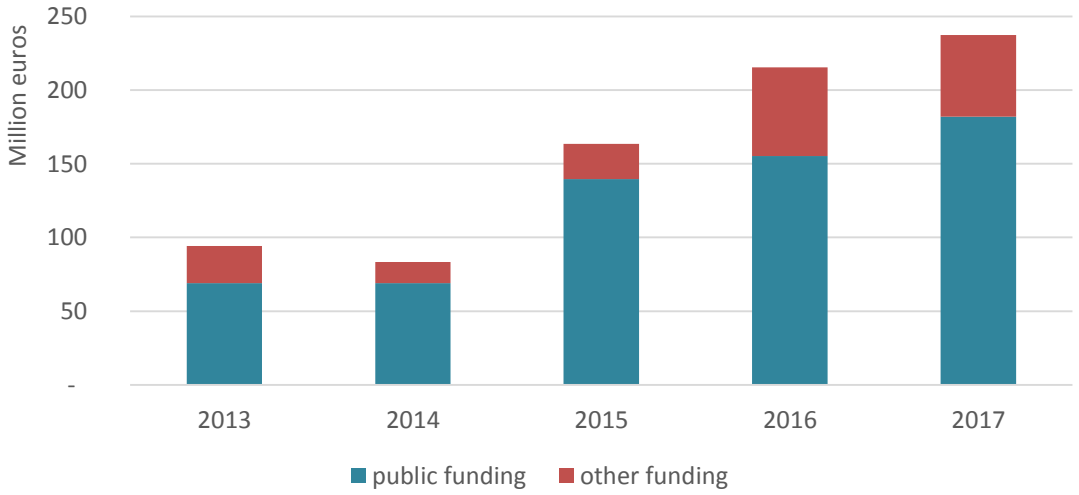

Figure 3. Funding received for forest-based projects, by starting year (*Source*: FTP database).

Studies commissioned by the European Commission (e.g., BioSustain, ReceBio, CASCADES, ClimWood, BioImpact) have contributed to scientific insights associated with the Strategic Orientations of this Priority Area. Results from these projects and studies may contribute towards a more sustainable bioenergy policy. This includes but is not limited to the

proposals for amending the Energy Efficiency and Renewable Energy Directives (European Commission, 2016g, European Commission, 2016h). The regulation on the inclusion of greenhouse gas emissions and removals from land use, land use change and forestry (LULUCF) adopted into the 2030 climate and energy framework (European Commission, 2014b) in May 2018 furthermore emphasises the relevance of these actions and the effects that they may have.

Legislative packages, such as the 2030 climate and energy policy framework, are likely to have strong impacts on the cost structure of FB-I, and on biomass supply, demand and flows, since they must be balanced with environmental, economic and social sustainability in Europe and globally. Having this in mind, the preparation of the 2030 climate and energy framework (including the LULUCF regulation and the recast of the Renewable Energy Directive) as such benefitted from the EU Forest Strategy. For example, bioenergy sustainability assessment studies were utilised to identify key issues such as the sources of biomass, the GHG reduction potential, the efficiency in production and combustion of fuels, the impacts on other biomass users, and the coherence with other policies, e.g. the circular economy.

It can also be noted that the implementation of the Circular Economy Action Plan and the review of the EU Bio economy Strategy are closely related to the competitiveness of the forest-based industries. For instance, the circular economy theme provides generous research and innovation resources: 650 million euros for the Horizon 2020 initiative 'Industry 2020 in a circular economy'[39] and 5.5 billion euros of structural funds. However, the closest direct link between the forest-based sector and the circular economy has been efforts to promote the cascade use of wood and new generation bio refinery. The forest-based sector will be faced with needs to take advantage of the emerging circular bio economy to fully benefit from the available resources, increase resource efficiency, waste management, and adopt common criteria in Green Public Procurement, standardisation and eco labelling.

Further, the Cumulative Cost Assessment study has been supported by industry, both during its implementation and with regards to findings concerning the future competitiveness of the forest-based industries. For instance, during the EU F.BI Expert Group meeting in 2016, CEPI expressed its satisfaction for the study, stating that it reflects the real cost of EU policy for forest-based industries.

One further concrete effect of the EU Forest Strategy and interrelated policies (e.g. EU Bio economy Strategy) is the improvement of investment conditions of wood construction in several Member States. While these actions may be only partially attributable to the EU Forest Strategy, it can be seen to provide further guidance and visibility to Member States actions.

The survey results reveal that national approaches for bioenergy and wood construction are high on the agenda. Many countries developed guidelines and strategies to address these issues. More than 70 activities related to this Priority Area were reported, many of them in progress. In the context of the bio economy, more integrated approaches on forest resource use are desired to make the sector more competitive both with and against other sectors. The

[39] http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-ind-ce-2016-17.html#c,topics=callIdentifier/t/H2020-IND-CE-2016-17/1/1/1/default-group&callStatus/t/Forthcoming/1/1/0/default-group&callStatus/t/Open/1/1/0/default-group&callStatus/t/Closed/1/1/0/default-group&+identifier/desc

results of the cumulative cost accounting are deemed important to clarify divergent and common interests of public authorities and the forest-based industries. This should be based on realistic accounts of wood mobilisation, cascade use, following common sustainability criteria, which is a major asset of the forest-based sector. Enhanced communication strategies to raise public awareness for wood-based material and products is an additional focus.

4.3. Gap analysis

Significant international developments that may influence the competitiveness of the forest-based industries include the Paris Agreement on Climate Change and the UN 2030 Agenda for Sustainable Development. However, the timeline of 2020 is evidently too short to achieve substantial changes. Relating to the EU 2050 goal this gives broader reference. Initiatives such as Science Based Targets initiative[40] shall support a transition process towards increased competitiveness in a bio-based economy, and hence attract investors. As example, a material displacement factor analysis could consider the impact of the Paris Agreement on the expected emissions of the energy producing sector as this may influence the environmental profiles of substitute products. This relates also to the LULUCF regulation.

The recently adopted European Strategy for Plastics in a Circular Economy (European Commission, 2018a), and concrete actions considered thereunder, may provide room for competing products, including those made of current woody biomass materials and the upcoming products from second generation of lignocellulosic feedstocks. These developments could be addressed to consider the potential impact these developments may have on the forest-based sector, including actions that can support the transition towards a circular bio-based economy.

There are increasing difficulties in defining sectoral boundaries in statistics. For example, the NACE classification code makes a distinction based on intermediate or end products, not based on the raw material. The issue is not new, for example, regarding furniture that may be made from various mixes of raw materials. Such classification cannot account for emerging bio economy either, i.e., substituting established feedstock materials for wood-based ones, such as producing bio-based ethylene in place of fossil-based ethylene. There will be increasing difficulties for defining sectoral boundaries and actors included in forest-based value chains: either forest industries may assume new roles in target markets such as the textile industry or, for example, chemical industries acquire forest-based firms to ensure second-generation feedstock supply (Hurmekoski et al. 2018). Therefore, statistics may yield an increasingly biased picture on the development of a forest-based bio economy. This may relate to composite products and assembled products from different sources, so that an assignment to a particular sectoral value-chain will become difficult. The practical consequence is that the definition of forest-based industries adopted in the blueprint on forest-based industries yields a different picture than using an alternative definition of the sectors and sectoral boundaries.

Survey and interview results indicate that an even stronger value chain approach for the forest-based sector would be needed, also to strengthen its importance at the EU and national levels. This comes along with the need for more systematic information on wood resources to improve supply and demand chains and allow for a better resource planning including good practice guidance for wood cascading and mobilisation, as well as viable market-based approaches to foster resource efficiency and sustainable use of woody biomass.

[40] https://sciencebasedtargets.org/

Lastly, global trade circumstances changed unexpectedly in recent times. For instance, restrictions were introduced with regards to export quotas for birch logs from Russia, wood export restrictions from Belarus, and a ten-year roundwood export ban from Ukraine, but also developments such as Brexit. These recent political developments need to be reflected in further sector development for both importing and exporting countries.

5. FORESTS IN A CHANGING CLIMATE

Climate change is seen as one of the major drivers impacting European forests. Increasing forest disturbances and extreme hazardous weather events heighten the risk to both productivity and provision of ecosystem services in general (Seidl et al., 2017, Reyer et al., 2017). On the other hand, forests are under scrutiny with respect to their role as sinks in the carbon cycle (Pilli et al., 2017). Forest ecosystems and wood products currently sequester about 13 per cent of the Greenhouse Gas (GHG) emissions in the EU (Nabuurs et al., 2017, EEA, 2017a, 2018). Hence, the contribution of forests in the wake of the Climate Convention including LULUCF and Paris 2015 targets is one of the important responses in climate policy. The role of forests and the best way of implementing a climate smart forest management is in the centre of the scientific and political debate. To address this double challenge, future strategies for both climate change adaptation and mitigation are required, and it has to be demonstrated how these two objectives can be linked and synchronised (Bernier and Schoene, 2009).

To actively respond to these demands, the EU Forest Strategy defined two Strategic Orientations, in that Member States should demonstrate:

- How to increase the mitigation potential of forests.
- How to enhance the adaptive capacities and resilience of forests against climate change effects.

The Forest MAP foresees activities towards better information on LULUCF actions, dedicated studies on forest management solutions and their effectiveness for climate change mitigation and natural risk reduction. Forest fires are addressed in the strategy through the promotion of a civil protection mechanism to prevent damages and limit the threat of forest fires as a carbon emitter.

5.1. State of implementation

5.1.1. Demonstrate how to increase their forests' mitigation potential through increased removals and reduced emissions, including by cascading use of wood, taking into account that the new LIFE+ subprogram for Climate action and Rural Development funding can promote and support new or existing forest management practices that limit emissions or increase net biological productivity (i.e. CO_2 removal)

LULUCF (land use, land-use change and forestry) is the key instrument for incorporating the climate change mitigation of forests into climate policy. Recently, a new LULUCF regulation was adopted on the inclusion of greenhouse gas emissions and removals from LULUCF in the 2030 climate and energy framework. The Strategic Orientation puts a strong focus on Member State implementation and is tightly connected to the Decision on accounting rules on greenhouse gas emissions and removals resulting from activities relating to LULUCF(Decision, 529/2013/EU). According to Article 10, Member States need to submit information on their most relevant current and future LULUCF actions related to the land-use activities Afforestation, Deforestation, Forest Management, Cropland and Grazing land management and may include revegetation and wetland drainage and rewetting.

The information required for these activities should include:

- Descriptions of current and past trends of emissions and removals (e.g., of GHG).
- Projections of emissions and removals for the accounting period (e.g., the current accounting period is the 2nd commitment period of the Kyoto Protocol extending from 1 January 2013 to 31 December 2020).
- Analysis of the potential to limit or reduce emissions and to maintain or increase removals.
- A list of most appropriate measures to increase the mitigation potential of the land-use activities, and a description of existing and planned policies to implement these measures, their expected effects and the anticipated time-table for implementation of the measures.

By 2016, a progress report on the implementation of their LULUCF actions was due and a next progress report is planned at the end of the accounting period in 2020.

An evaluation of the earlier progress report – Analysis of LULUCF actions in EU Member States as reported under Art. 10 of the LULUCF Decision – published in 2017, revealed the following (Paquel et al., 2017):

- Implemented actions related to "Forest management" (174 measures), "Protection against natural disturbances in forests" (152 measures), "Afforestation and reforestation" (150 measures), "Conservation of carbon in existing forests" (28 measures) and "Substitute of GHG intensive materials with HWP" (22 measures).
- The stated objectives of the actions vary across the Member States and categories of measures. Measures targeting both conservation of carbon in existing forests and grassland/grazing land/pasture management mostly have GHG emission reduction and carbon sequestration as their primary objectives.
- There is no systematic information about the planning periods available in the Article 10 reports. The most commonly reported time frames are those of the current 2014-2020 EU policy programming period, usually referring to the Common Agricultural Policy.
- actions are predominantly implemented through economic incentives (mainly the Common Agricultural Policy) and to a smaller extent also with strategic documents and legal requirements. The Member States describe the expected impacts mainly in qualitative terms. Reports contain very limited information on the actual emission consequences of polices and measures.
- LULUCF actions also relate to national forestry policies in the context of sustainable forest management and multi-functional forestry to address a balanced provision of goods and services, including biomass for energy and other commercial uses, and climate mitigation. Forest management is the most frequently reported LULUCF activity covering a broad range of actions, including many designed to enhance forest productivity and resilience to fires, including the Common Agricultural Policy support.
- Article 10 reports show low levels of quantification of the anticipated outcomes of measures and policies. However, Paquel et al. (2017) demonstrated that the total mitigation potential at EU level was found to be highest for forest management actions, particularly due to the potentially large area involved. In contrast, the mitigation potential of avoiding deforestation on a per ha basis is highest in absolute terms, but its EU level mitigation potential was found to be limited due to the small potential area involved. In general, forest related mitigation actions were deemed to be very cost effective, except for afforestation due to high prices for land.

The main measures reported are:

- Forest Management: In the assessment of Member States Article 10 reports Forest management is a broad category. It includes for instance activities related to sustainable forest management, including enhancing productivity in forests and prevention of deforestation. Economic incentives were listed as the most common instruments supporting the reported measures, closely followed by forest action plans and strategies and legal requirements such as forest codes. Next to national budget funding, the most mentioned funding scheme was the European Agricultural Fund for Rural Development (EAFRD), but also LIFE, and the former European Agricultural Guidance and Guarantee fund were mentioned. In their Article 10 reports

Member States were found to link forest management measures and policies to broader biodiversity, climate, energy, agriculture (Pillar I and II of the Common Agricultural Policy), forestry and social and employment policies.

- Afforestation: The assessment of measures related to afforestation include forest policy acts, dedicated afforestation plans, climate acts and policies and pillar II programmes of the Common Agricultural Policy. Instruments to implement the afforestation measures are diverse and were found to include economic incentives, information and awareness raising programmes, and climate and energy, biodiversity, adaptation and bio-economy strategies. Where sources of funding were mentioned these mainly related to the Common Agricultural Policy (e.g., EAFRD).
- Protection against natural disturbances in forests: Measures included under this category are Sustainable Forest Management (SFM) -with explicit mention of fire prevention, deforestation prevention and natural regeneration- and reported policies include forest strategies and acts, adaptation strategies and pillar II of the Common Agricultural Policy. Again, economic incentives were found to be an important instrument, which included for instance support for stand thinnings to reduce fire risk and for the development of fire protection plans. The few instances in which funding sources were mentioned, referred primarily to the Common Agricultural Policy support.
- Conservation of carbon in existing forests: This category included a diverse number of measures, including taking forest out of production, requirements for protection of forest land and an improved recognition of the general interest of forest carbon storage. The instruments to implement these measures were found to be a mix of economic incentives and legal requirements.

Figure 4 shows the overall distribution of the reported measures per Member State and the selected areas of intervention. The number of measures represented in the chart should be interpreted with care, as the Member States did not follow the same reporting approaches, resulting in diverse approaches to granularity of reported information detail, including disaggregation of LULUCF actions into concrete measures and policies.

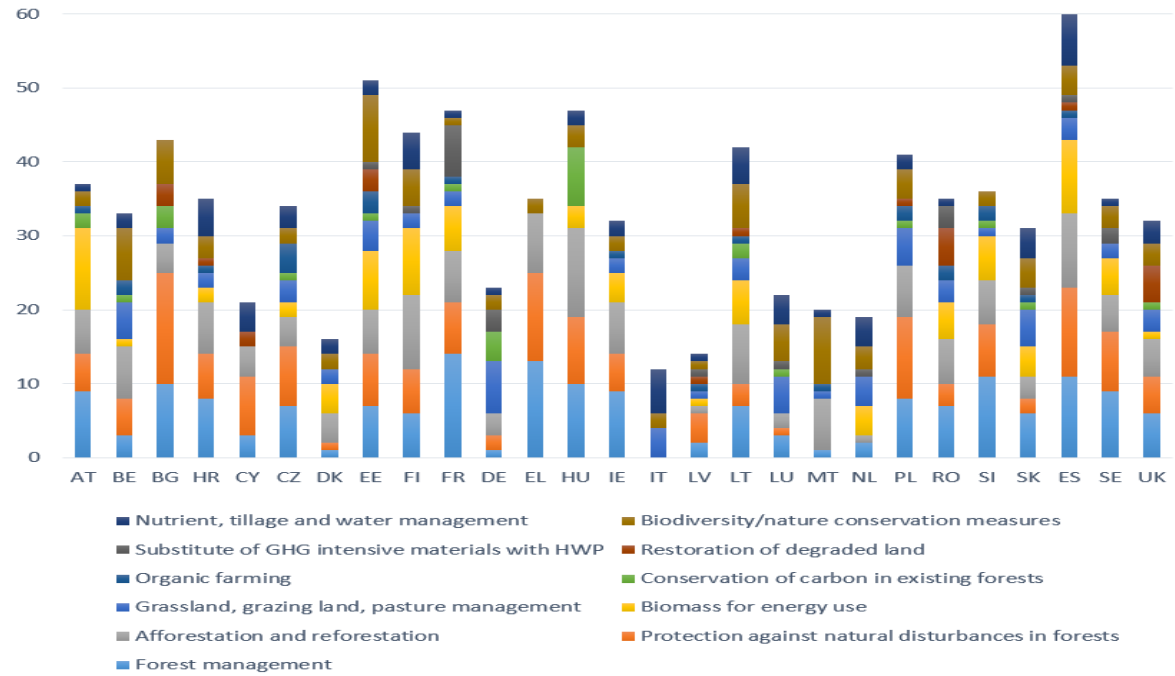

Figure 4. Reported LULUCF measures and policies per area of intervention and Member State (Paquel et al., 2017).

Additional EU policy instruments reported by the Member States as encouraging the LULUCF actions include the LIFE programme, the Birds and Habitats directives , the Nitrates Directive, the INSPIRE Directive, and the Renewable Energy Directive. On the other hand, only a few direct national level policy instruments were identified, including among others fiscal instruments to encourage a higher biomass use. In the light of the analysis, the wish in the Forest MAP for Member States to provide their information on LULUCF actions can be considered as fully implemented.

As a further point expressed in the Forest MAP, multi-disciplinary studies on climate change reduction and risk reduction are foreseen without getting too specific. At the time of publishing the EU Forest Strategy, several FP7 projects with relevance to climate change mitigation and forestry were ongoing (FORMIT, INTEGRAL, S2BIOM). Under Horizon 2020, the call ISIB-04b-2015 - Improved forest management models addressed the topic, with AlterFor being selected to address this call. Further projects concerning natural risk reduction include the FIRE-IN project funded under the Horizon 2020 call SEC-21-GM-2016-2017 - Pan European Networks of practitioners and other actors in the field of security, and the NetRiskWork project funded under the European Union Humanitarian Aid and Civil Protection programme. Another relevant project, Care4C, targeting carbon smart forestry, started very recently under the Horizon 2020 Marie Skłodowska-Curie research and innovation staff exchange call. With continuous work and research being done on this topic, the activity can to be considered to be constantly ongoing.

A third point in the Forest MAP, but not explicitly cross-referenced in the Strategic Orientations, refers to the Civil Protection Mechanism to support prevention and preparedness actions related to forest fires. The Union Civil Protection Mechanism was released in December 2013 (Decision, 1313/2013/EU). Hence, we can speak of an indirect effect on the EU Forest Strategy implementation. The Union Mechanisms at achieving a higher level of protection and resilience against disasters by preventing or reducing their effects and by fostering a culture of prevention, including due consideration of the likely impacts of climate change and the need for appropriate adaptation action. The European Commission's Emergency Response Coordination Centre (ERCC)[41], the operational heart of the EU Civil Protection Mechanism, monitors forest fire risk and incidences across Europe around the clock using national monitoring services and tools such as the European Forest Fire Information System (EFFIS).[42]

Information on the use of the Civil Protection Mechanism focuses on emergency support to fight forest fires. For example, for 2017 the Commission reported that the Mechanism was activated 17 times for forest fire emergencies in Europe. Assistance was sent 10 times through the Civil Protection Mechanism, to Portugal, Italy, Montenegro, France, and Albania. Under the Union Civil Protection Mechanism decision, the Commission also co-funds several prevention and preparedness projects. Projects funded include a Spanish-Portuguese Meteorological information system for trans-boundary operations in forest fires (SPITFIRE), wildland- urban interface forest fire risk observation (WUIWATC), efficient fire risk communication for resilient societies (eFIRECOM), wind risk prevention (WIND RISK), forest roads for civil protection (FORCIP+); management of big fires through simulation (IGNIS), networking for the European Forest Risk Facility initiative (NET RISK WORK), and early detection of forest fires (ASPires).

[41] See https://ec.europa.eu/echo/what/civil-protection/emergency-response-coordination-centre-ercc_en.
[42] See http://effis.jrc.ec.europa.eu/.

Fire-related research and innovation (R&I) activities will continue to be supported during the last programming cycle (WP 2018-2020) under different parts of Horizon 2020. Forest fires have been the subject of security research with particular importance for Portugal. EU Security research has launched several projects related to forest fires. The "AF3-Advanced Forest Fire Fighting" achieved a high level of integration between existing and new systems to improve the efficiency of current fire-fighting operations and to enhance the protection of human lives, the environment and property. DG HOME has also launched a practitioner network on fire-fighting called "Fire-in", which will help the Commission identify new research priorities.

EU cohesion policy provides funding opportunities for disaster risk management.

DG ECHO deals with risk management and disaster risk strategies, taking into account the whole risk management cycle: prevention, preparedness and response to natural (and man-made) disasters. 2017 was a year with abundant forest fires in Europe. In reaction to this, the Commission has issued a communication RescEU aiming at addressing such risks more efficiently (European Commission, 2017c). As a consequence, the Commission also issued a legal proposal to amend the Civil Protection Mechanism[43] in 2017, where the role disaster prevention is particularly highlighted. It requests from Member States inter alia to prepare prevention plans, reaching from short-term actions to long-term efforts including scenario analysis and risk assessment.

Due to its nature the action is continuously ongoing but can be considered as fully implemented in the light of the Forest MAP.

5.1.2. Enhancing climate change adaptation and resilience of forests

The main EU policy instrument addressing climate change adaptation is the EU Adaptation Strategy (European Commission, 2013c), which was published around the same time as the EU Forest Strategy. Currently, an evaluation of the implementation state of EU Adaptation Strategy is ongoing, the results of which are expect for autumn 2018. A major infrastructure developed by the Commission to support climate change adaptation is Climate-ADAPT, the European Climate Adaptation Platform.[44] It contains sources and information about climate change impacts, vulnerabilities and risks in different countries, regions and sectors, adaptation options, national strategies and case studies.

EEA regularly reports on climate change impacts using a number of indicators with relevance for forests in Europe (wind storms, forest composition and distribution, and forest fires) (EEA, 2017c). To date, 25 EU Member States have adopted a national adaptation strategy (NAS) and 16 have developed a national adaptation plan (NAP).[45] Keskitalo et al. (2015) reviewed the role of forestry in national climate change adaptation policy using cases from Sweden, Germany, France and Italy. They found that adaptation in the forest sector has mainly been reactive and stressed the large role of extreme events in driving adaptation policy forward.

[43] COM/2017/0772 final - 2017/0309 (COD)
[44] See http://climate-adapt.eea.europa.eu/.
[45] forthcoming Commission Staff Working Document – Evaluation of the EU Strategy on adaptation to climate change – expected to be published in Autumn 2018.

The EEA report 'Climate change adaptation and disaster risk reduction in Europe — enhancing coherence of the knowledge base, policies and practices' not only assesses current practices and level of know-how, but also highlights tools that national, regional and local authorities are using to tackle the impacts of weather- and climate-related hazards (EEA, 2017b). It is remarkable that most attention is given to forest fires, compared to storms and other hazards. The adaptive capacity and resilience of forests in more general terms is not much addressed. This gives an indication that forest fires have a much broader recognition as threat to public safety than other hazards.

Related to enhancing forest adaptive capacities there was one FP7 project ongoing at the time of publication of the EU Forest Strategy, MOTIVE. Under the Horizon 2020 call BB-03-2017 -Adaptive tree breeding strategies and tools for forest production systems resilient to climate change and natural disturbances- the project B4EST (Adaptive BREEDING for productive, sustainable and resilient FORESTs under climate change) was launched in May 2018.

Horizon 2020 includes a couple of future calls in the work programme 2018-2020 (RUR-01-2019, LC-RUR-11 B-2020), which may provide funding for new projects to address the topic of enhancing resilience of forests. In addition, LIFE projects such as LIFE ADAPTAMED, LIFE FORECCAsT, LIFE AFORCLIMATE, LIFE MixForChange increasingly deal with forest resilience.

Section **Error! Reference source not found.** summarises the detailed state of implementation of actions under this Priority Area.

5.2. Achievements and effects

The main influence on climate change consideration in forestry can be attributed to the Paris Agreement on Climate Change and the EU 2030 Climate and Energy Framework which are both addressed by the Forest MAP actions related to LULUCF. As a result of Article 10 of decision 529/2013/EU, Member States have to provide information on LULUCF actions. Paquel et al. (2017) suggest that this has triggered discussions and has contributed to an enhanced understanding of the mitigation potential of forests and improved consideration of forest related mitigation actions on the policy agendas in Member States.

Additionally, mitigation actions in forests have received considerable attention in the negotiations of the recently implemented new LULUCF regulation on the inclusion of greenhouse gas emissions and removals from LULUCF in the 2030 climate and energy framework. Although this is not a direct result of the previous actions, the discussions on the 2030 climate and energy framework have built on them, highlighting the mitigation potential of forest resources.

The Paris Agreement also refers to the New Strategic Orientation of the EU Forest Strategy as it seeks to strengthen adaptation efforts under the Climate Convention. Article 7 of the Paris Agreement further establishes "a global goal on adaptation of *enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change*". It calls on countries to carry out national adaptation planning processes, and requires each country to submit and periodically update an adaptation communication, which summarizes adaptation priorities, efforts, and support needs.

Most of the actions carried out under Priority Area 3 relate to the earlier Strategic Orientation to increase the forests' mitigation potential. The reporting requirements under Article 10 of decision 529/2013/EU have incited Member States to further consider their LULUCF

mitigation potential. Paquel et al. (2017) showed that forests have been a strong focus of the discussions around the LULUCF policy implementation. This clearly documents that this Strategic Orientation has received considerable attention and that there has been progress towards maintaining and possibly increasing the mitigation potential of the forests in the EU. It also appears that the issue of climate change shows a high consistency across EU policies because existing funding instruments in this domain are highly targeted and harmonised.

Some elements mentioned under the Strategic Orientation of climate change mitigation refer to cross-thematic issues, for example the cascading use of wood. Policy guidance related to cascading is under development, guidance might particularly be needed to settle resource conflicts between bioenergy and material-based use. However, it will only be successfully taken up in the end if cascade use leads to higher efficiency and profitability of the industries.

It appears from the survey that forest adaptation measures are taken up in particular through Rural Development Programmes and LIFE funds. This relates to activities such as improved forest management for risk prevention, altering tree species composition, restoration after hazards and measures to foster resilience. The mitigation potential of harvested wood products, such as in wood construction, provides an efficient and economical way to achieve reduced emission. Low carbon strategies and in situ mitigation projects such as carbon farms, but in particular strategies for combatting forest fires are relevant (e.g. varying age structure and species structures in forests). from both and adaptation and mitigation perspective. Many activities in Member States are reported on forest fires addressing particularly fire prevention, stand regulation, and fire management plans.

5.3. Gap analysis

The Strategic Orientations set up two very specific elements directed at the Member States to demonstrate their activities. On the other hand, there is a lack of planned actions in the Forest MAP specifically directed to implementing the EU Forest Strategy Strategic Orientation on climate change adaptation. The Paris Agreement emphasised the need to plan for adaptation to climate change and put forward quite specific demands for signatory countries to establish actions and communicate about adaptation to climate change, strengthening resilience and reducing vulnerability to climate change. This builds a clear request for future action.

The Strategic Orientation of climate change adaptation is mostly supported by RDP funds, but might require more concrete guidance on how to strategically develop adaptation in the future. As noted earlier, the issue of urban forests is not comprehensively addressed in most RDPs nor in the Forest MAP, so further action is required to better understand the role of urban forestry in adapting to climate change adaptation. Adaptation in this respect has to be harmonised with economic and environmental considerations, but from an entrepreneurial but also sectoral view (e.g. future timber demands). The EEA report 'Climate change adaptation and disaster risk reduction in Europe — enhancing coherence of the knowledge base, policies and practices (EEA, 2017b) contains a discussion on forest fires and also mentions storm hazards, but no examples or measures are reported on how to enhance resilience against these threats. The Climate-Adapt platform serves for collecting MS reporting on adaptation action. Some more recent publications look at forest adaptive management in Member States (e.g. Belgium, Austria, Sweden) and research is ongoing to improve the understanding of genetic adaptive capacity. There is however less evidence of progress made related to bridging knowledge gaps and mainstreaming adaptation action in forest policies. Whereas 25 Member States have published national adaptation strategies and several instruments have been established (e.g., aiming at mitigating threats from forest fires) it seems that limited actions

have been implemented to enhance the adaptive capacity and resilience of forests. The implementation of such strategies needs to be tested in the future, due to the long planning horizons in forest management, effects will be observable only gradually. Survey results from both MS and stakeholder groups imply that the LULUCF implementation is still difficult to comply with forest-related strategic priorities. This might be due to absence of available, up-to-date data, but also the role of the forest-based sector in the climate debate. A more dynamic mode of taking up emerging issues such as the outcomes of the Paris Agreement in EU Forest Strategy activities might need further attention as requested within the survey results, which largely refers to the coordination of forest-relevant activities and responses.

Overall, the implementation of the theme is strongly connected to the actions related to the Climate Convention. The EU Forest Strategy, mentioned that the earlier referred evaluation study on forestry measures in Rural Development Programmes could benefit from further demonstrating how adaptation strategies can be practically implemented and how synergies and trade-offs between climate change mitigation and active use of forests can be addressed. Also, the impacts of climate change on forests are not explicitly addressed in the Forest MAP. Rural Development measures can play an essential role here as they are already instrumental for implementing adaptation and mitigation measures. Also, the EIP Focus Group on new forest practices and tools for adaptation and mitigation of climate change is an example to connect science and practice in response to climate change challenges. Their means to support know-how transfer, knowledge exchange, and coordination of activities will continue to be important.

6. PROTECTING FORESTS AND ENHANCING ECOSYSTEM SERVICES

Priority Area 4 focuses on forest protection and ecosystem services, which clearly links to Sustainable Forest Management (SFM). The EU Forest Strategy uses the FAO definition that was developed by FOREST EUROPE to define SFM as "using forests and forest land in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfil, now and in the future, relevant ecological, economic and social functions, at local, national, and global levels, and does not cause damage to other ecosystems"

This Priority Area covers a wide range of topics in its Strategic Orientations:

- Conceptualisation of valuing forest ecosystem services.
- Soil protection and water provision and regulation.
- Improvement of the conservation status of forest species and habitats, also in the context of the Natura 2000 network.
- Implementation of the EU Biodiversity Strategy 2011-2020 and forest restoration.
- Strengthening forest genetic resources.
- Promotion of integrative forest management plans that actively consider biodiversity issues.
- Integrated mechanism for protecting forests against pests and diseases.
- Exploration of phytosanitary measures in wood packaging.
- Combatting of desertification and land degradation.

The Forest MAP lists a number of actions that are directly or indirectly related to the EU Forest Strategy. Also, the links to the forestry measures of the Common Agricultural Policy and LIFE funding programmes are explicitly linked to many of the Strategic Orientations.

6.1. State of implementation

6.1.1. Develop a conceptual framework for valuing ecosystem services, promoting their integration in accounting systems at EU and national levels by 2020

Mapping and Assessment of Ecosystems and their Services (MAES) is a key initiative of the European Commission oriented to coordinate and oversee action 5 of the Biodiversity Strategy. MAES developed a coherent framework to ensure that consistent approaches are used across Member States and at the European level. Currently, a forest and an agro-forest pilot of MAES are under implementation by the Joint Research Centre and the European Environment Agency (EEA) under the coordination of the Commission; the MAES KIP-INCA project on designing and implementing an integrated accounting system for ecosystems and their services. Outputs of MAES have been incorporated in the European Biodiversity Information System (BISE). Also, a suite of FP programmes can be seen as relevant to the EU Forest Strategy, although not directly attributed to its implementations. Projects such as FP7 projects OPERAs and OpeNESS on operational tools for the implementation of the ecosystem service concept, Horizon 2020 ESMERALDA with a broader land-use context, and FP7 projects such as ARANGE on mountain forests, INTEGRAL on integrated forest management, and the SUMFOREST Era-Net project POLYFORES on policy dimensions of forest ecosystem services. Further development of payment for ecosystem services (PES) is to be expected as a follow-up activity of the assessment methodology developed in MAES. A study commissioned by DG ENV analysed the pathways for biodiversity financing and tracking biodiversity-related expenditures in the EU budget (European Commission, 2017d). The JRC produced a SWOT analysis of PES schemes, a guidance on mapping and assessing forest ecosystems services (European Commission, 2015c), and a database on the recreational

values of recreational services of forests can be clearly assigned to this orientation. The JRC study on implementing an EU system of accounting for ecosystems and their services serves as a conceptual backbone of further enriching European Forest Accounts (La Notte et al., 2017). It conceptualises, inter alia, the drivers, input, benefits, and beneficiaries of forests and woodland, and develops indicators linking them to 7 main ecosystem service groups to be taken up for accounting (timber, crop pollination, erosion control, air purification, global climate regulation, flood control, outdoor recreation).

In practice, existing PES schemes are implemented under the Common Agricultural Policy and the respective Rural Development Programme funding. They can be distinguished between compensation mechanism for providing ecosystem services (such as in the environmental measure 15 of the CAP) and PES schemes for enhancing marketing opportunities, such as forest carbon marketing, enhanced forest management, or forest-related tourism[46]. Such examples give good insights into the applicability of new marketing schemes, but still the understanding of willingness-to-pay for non-marketable services (e.g. common goods) is at a very early stage. A recent study (Illes et al., 2017) indicates that it is difficult to separate between different land use forms such as agriculture and forestry. This implies that approaches across sectors and land-use forms will also be needed to develop widely applicable PES schemes. The recent tender study on the uptake of forestry measures in the Common Agricultural Policy (Alliance Environnement et al., 2017) also implies that payments for biodiversity protection and recreation can play an essential role, while the uptake varies greatly among the Member States. From the survey, it can be derived that first activities towards developing a conceptual framework for valuing ecosystem services are ongoing, but still far from taken up in the national accounts. It is realistic that such implementation will last beyond 2020, and can be a priority for further strategic developments in the context of forests in the EU and its Member States. On the other hand, Eurostat is further developing the EU Forestry Statistics (European Forest Accounts), where, inter alia, environmental functions of forests and forestry are being further developed.

In the respective Forest MAP section, an action has been defined to foster innovative mechanisms (e.g. Payments for Ecosystem Services) to finance the maintenance and restoration of ecosystem services provided by multifunctional forests. Based on the described activities, the action can be considered as partly implemented.

6.1.2. Maintain and enhance forest cover to ensure soil protection, water quality and quantity regulation by integrating sustainable forestry practices in the Programme of Measures of River Basin Management Plans under the Water Framework Directive and in the Rural Development Programmes

A stronger integration of forestry practices in the programme of River Basin Management is only vaguely noticeable from the evidence gained from studies and the survey. There are some examples, e.g. on regulating water run-off after forestry operations and the restoration of riparian areas in the Member States, but the water-forest nexus is rarely systematically addressed in studies and documents, and the integration of forestry practices into the Water Framework Directive is not documented thus far. SWOT analyses as proposed by Viszlai et al. (2016) can be one instrument for integrated watershed management, but require further promotion. The study on forestry measures under Rural Development Programmes (Alliance Environnement et al., 2017) shows that water protection is understood as an integral part of

[46] See e.g. https://www.forest-trends.org/ecosystem-marketplace/

multifunctional SFM by Member States. Factual implementation is consequently observable, but a more systematic approach to link water and forestry requires more explicit consideration. The study on forestry measures under Rural Development Programmes also revealed that there is considerable uptake of funding for water-related issues in particular in measures 8 and 15. Further guidance on commonly addressing forestry and water comes from the European Union Guidelines for State aid in the agricultural and forestry sectors and in rural areas 2014 to 2020, and specific instruments such as the EU action Plan Accompanying the European Union Strategy for the Alpine Region (European Commission, 2014a, European Commission, 2015a).

On the research side, the COST action CA15206 – Payments for Ecosystem Services (Forests for Water),[47] and FP7 projects, such as ACQWA,[48] REFRESH,[49] and BEWATER,[50] can be directly or indirectly connoted with the strategic goal to further integrate forest and water issues in watershed planning.

The Forest MAP identifies one action within this Strategic Orientation, the integration of sustainable forest management practices in the Programme of Measures of River Basin Management Plans under the Water Framework Directive and in the Rural Development Programmes. In the light of the analysis, the action can be considered as partly implemented.

6.1.3. Achieve a significant and measurable improvement in the conservation status of forest species and habitats by fully implementing EU nature legislation and ensuring that national forest plans contribute to the adequate management of the Natura 2000 network by 2020

1.1.1.1. Implementation of Habitats and Birds Directives, incl. adoption and implementation of management plans

The Nature Directives cover a large proportion of EU biodiversity associated with forestry systems, including 73 bird species, over 240 non-bird species and 85 habitats associated with forests or woodland, while the Natura 2000 network covers 21% of the EU's forested land. The EU Fitness Check (REFIT) of the EU Nature Legislation supported by a study by Milieu et al. (2016) analysed, inter alia, the status of the Habitats and Birds Directives, and the implementation of the Natura 2000 Network. It concludes that – in principle – the Directives are fit for purpose but implementation is still not satisfying.

Hence, the implementation of the EU's Nature Directives and the practical management of the Natura 2000 network in forests is still a work in progress and remains a major challenge for national authorities and target groups. According to the Natura 2000 monitoring process and the Fitness Check of Nature Directives, and the action plan for nature, people and the economy, a significant part of forest biodiversity in Europe is and/or has not been improving (EEA, 2015). Survey results indicate that the involvement of managers and landowners in environmental policy implementation, especially in the context of Natura 2000, is still a major issue of concern. On the other side, examples such as a French Natura 2000 pilot demonstrate that a stronger involvement of local authorities can support the commitment and ownership

[47] See http://www.cost.eu/COST_actions/ca/CA15206.
[48] See http://www.acqwa.ch/.
[49] See http://www.refresh.ucl.ac.uk/.
[50] See http://www.bewaterproject.eu/.

for conservation activities in Natura 2000 implementation. The recent EASAC report[51] on the multi-functionality and sustainability of EU's forests also highlights the need for improved coordination between national biodiversity protected areas.

An important aspect is the issue of funding. Activities in Natura 2000 can be funded by CAP forestry funds and the LIFE programme. Under the RD programming period 2014-2020, there are two measures dedicated to or relevant for supporting payments for Natura 2000 areas in forests, i.e. 7.1 to develop management plans incorporating Natura 2000 and 12.2 on Natura 2000 payments, and in wider context 15.1 for environmental activities. Financial support can be granted annually per hectare to landowners to compensate for the additional costs and income foregone related to the constraints or restrictions, if they are specified in Natura 2000 management plans or equivalent (e.g., forest management plans). Measure M 15.1 was chosen to be implemented in 17 out of the 28 EU Member States. The total planned public expenditure is around €745 million (of which €505 million comes from EARDF). However, only 10 Member States were ready to apply sub-measure 12.2 in forests by the end of 2017. The recent study of forestry measures in the CAP concluded that the coherence of the forestry measures and the tools provided to Member States and beneficiaries were in line with the EU Forest Strategy. However, the uptake of funds for environmental measure is generally low, and will require further evaluation after the end of the funding period. Reports from several case study countries and other sources furthermore show problems in defining a baseline for forest management requirements (above which compensation payments are calculated) making it difficult to use measures 12.2 and 15.1, while there already some good examples how to increase motivation for uptake (e.g. in France) (Alliance Environnement et al., 2017).

As regards the aspect of forest management plans in Natura 2000, Milieu et al. (2016) conclude in their study supporting the Fitness Check that Natura 2000 management plans are essential implementation instruments while it appears that many current forest management plans do not necessarily achieve the objectives of the Nature Directives. Stipulating the uptake of measure 7.1 will be an essential objective for the rest of the funding period and the consequent one to improve the adaptation of forest management plans. A further aspect is the time-horizon of funding instruments. While many activities are very short-termed, for instance within one funding period, there are also examples (e.g. 30 year contracts in France) and restoration projects that will have a longer-lasting effect. Member States might, however, see a risk for long-term commitments on the basis of 7 years funding periods. Overall, the critical issue is the level of commitment on MS level to further promote the uptake of available funds, foster according time-frames, and create a cooperative environment for dialogue and discourse between authorities and forest owners.

The corresponding action point in the Forest MAP relates to the implementation of the Habitats and Birds Directives, use of RD potentials for Natura 2000 payments, adoption and implementation of management plans, inclusion of biodiversity elements in management plans. The action can be considered as partly implemented. It will continue until 2020.

1.1.1.2.Mid-term review of Biodiversity Strategy

A second action points is the mid-term review of Biodiversity Strategy. The report 'Mid-term review of the EU Biodiversity Strategy to 2020' was published in 2015 (European Commission, 2015d). The review demonstrates that no significant progress towards the

[51] https://easac.eu/publications/details/multi-functionality-and-sustainability-in-the-european-unions-forests/

Biodiversity Targets has been made. With some direct or indirect relevance to forestry, some progress is reported with regards to e.g. the implementation of Target 5 (Help combat invasive alien species) by creating a list of alien invasive species of Union concern. Progress has also been achieved towards the implementation of Target 1 (Fully implement the Birds and Habitats Directives), Target 2 (Maintain and restore ecosystems and their services), Target 4 (Ensure the sustainable use of fisheries resources and achieve good environmental status), and Target 6 (Help avert global biodiversity loss). However, for Target 3B (Increase the contribution of forestry to maintaining and enhancing biodiversity) no significant progress could be observed.[52] See also section 6.3 for more information. The action can be considered as fully implemented.

1.1.1.3.Guide on Natura 2000 and forests

Finally, the Forest MAP lists a Guide on Natura 2000 and forests. The final guide – Natura 2000 and forests, Part I and II – was published in 2015. The final guide on Natura 2000 and forests represents a source of information for a better understanding and implementation of the Nature Directives and is addressed to nature and forest authorities, site managers and the civil society. It covers concerns raised by both forest owners and nature conservationists over the management of forests in Natura 2000 sites, explains the key provisions of Natura 2000 in a forestry context and promotes the integration of Natura 2000 conservation objectives into forest management. The action can be considered as fully implemented.

6.1.4. Monitor Member States´ progress as regards the uptake of forest management plans or equivalent instruments and the integration of biodiversity considerations in them, including Natura 2000 conservation objectives

As part of the monitoring process, DG ENV developed and compiled a questionnaire for Member State's input in 2013. The replies from Member States provide an overview of planning tools for forest management in the EU Member States[53]. The European Commission published in 2014 a report on "Forest Management Plans or equivalent instruments: Summary of Member States' replies to the DG ENV questionnaire" (European Commission 2014). The report provides information per EU Member State on the status of the consideration of biodiversity conservation by forest management plans (FMPs), together with further information on the national legal framework in relation to FMPs. In total, the results showed that there is high diversity of FMP approaches, legislative frameworks, and also the levels of obligation for FMPs. In 2018, the information does not seem to be up-to-date. Recent analysis showed that MS Natura 2000 management plans are often rather vague and/or remain non-mandatory for the majority of non-state/private forest owners (Sotirov 2017). Management of Natura 2000 sites in forests is often compromised when no funding or only limited financial support is made available, or when nature conservation objectives threaten to contradict forestry practices (Winkel et al. 2015; Geitzenauer et al. 2016; Sotirov 2017). The survey results indicated a few MS responses ranging from mandatory Natura 2000 plans to a stronger linkage to national monitoring instruments. However, the picture on the status of biodiversity integration in forest management plans remains fragmented, and will require further, dedicated investigation also unravelling the means to stipulate more intense implementation.

[52] See https://www.eea.europa.eu/themes/biodiversity/mid-term-review-of-the/view.
[53] See http://ec.europa.eu/environment/forests/pdf/fmp_table.pdf.

The issue of an insufficient uptake of available funds to overcome this situation has been discussed earlier, an improvement will be key to make implementation of this Strategic Orientation more effective.

The respective Forest MAP action point requests a questionnaire to Member States, compiled by the Commission Services**.** The action can be considered as fully implemented, but would require regular updates in the light an evolving policy context.

6.1.5. Strengthen the mechanisms for protecting forests against pests, building on increased cooperation with neighbouring countries, enhanced research and the ongoing review of the Plant Health Regime

The Strategic Orientation addresses the need strengthen the mechanisms for protecting forests against pests, and improving cooperation, research, and review of the Plant Health Regime.

First, the revised regulation on protective measures against plant pests entered into force in 2016 (Regulation, 2016/2031). The new plant health law has modernised the plant health regime, contributing towards the development of more effective measures for the protection of the European Union's territory and its plants. It also aims to ensure safe trade, as well as to mitigate the impacts of climate change on the health of crops and forests. The respective action in the Forest MAP can be considered as fully implemented.

A second point addresses the need for mechanisms for protecting forests against pests and invasive alien species (IAS). The core of Regulation 1143/2014 (IAS Regulation) is a list of IAS of Union concern, established through Commission Implementing Regulations (EU) 2016/1141 and 2017/1263). The IAS Regulation aims at preventing the intentional and unintentional introduction of IAS of Union concern, the early detection and rapid eradication of newly establishing populations of these species, and the management of widely spread IAS of Union concern in order to minimise their impact on biodiversity, the related ecosystem services, and, where applicable, on human health and the economy. The IAS Regulation is supporting the protection of forests by listing IAS affecting forests on the EU list, e.g. the plant species *Lysichiton americanus* (American skunk cabbage) and *Pueraria lobate* (kudzu vine) or the animal species *Callosciurus erythraeus* (Pallas' squirrel), *Sciurus carolinensis* (grey squirrel) and *Muntiacus reevesi* (muntjac deer). For instance, regarding the latter, rapid eradication of *Muntiacus reevesi* is currently ongoing in 3 MS.

While there is still no early warning system in place that covers all possible IAS, mechanisms for improved protection of forests against pests are expected to improve in line with the objectives of the new plant health law (Regulation, 2016/2031). There are several systems in place but they refer to specific communities e.g. the EPPO reports[54] on new pest outbreaks, NOTSYS on the IAS on the EU list[55], and dedicated citizen science communities[56]. Major elements to respond to emerging plant health issues include risk assessments of potential pests, prevention through the conduct of surveys and multi-annual survey programs, defining quarantine pests, and expanding the use of plant passports to better control intra-EU movements of organisms. The new regulation sets out requirements for competent authorities as well as professional operators.

[54] See https://www.eppo.int/RESOURCES/eppo_publications/eppo_reporting_service
[55] See https://easin.jrc.ec.europa.eu/notsys/
[56] See www.forest112.com

There are presently only individual activities that address early warning, particularly activities in LIFE projects, such as ObservaTree[57] or COST action FP1401 - A global network of nurseries as early warning system against alien tree pests (Global Warning),[58] might set the scene for a harmonised early warning system on forest plant risks in the future. Directly related to this action are further activities of the European Commission, in particular the regulation on prevention and management of the introduction and spread of invasive alien species (Regulation, 1143/2014) and protective measures against pests of plants (Regulation, 2016/2031), as well as the EASIN initiative[59], a network on European alien species information. All these instruments shall help to support timely identification and prevention of pest and alien species in full line with the Strategic Orientation.

Accompanying activities such as the DG ENV study on development of risk assessments to tackle priority species and enhance prevention (European Commission, 2018c) and the DG AGRI study on preparatory action on EU plant and animal genetic resources strengthen the viewpoint that the action is pursued with stringency. Also, several research projects have been dealing with plant health and phytosanitary aspects of risk prevention, such as ISEFOR[60], Q-Collect[61], REPHRAME[62] and POnTE[63], though they are not directly linked to the EU Forest Strategy implementation.

Experiences from the Member States show that such mechanisms go hand in hand with management of genetic resources, invasive alien species, and respective information tools. Online services on harmful organisms and forecasts of outbreaks such as Slovenia might be an interesting good practice example.

The respective action in the Forest MAP to strengthen the mechanisms for protecting forests against pests and invasive alien species (IAS), and to develop early warning systems as well as provide early warning information for risks such as pests, diseases and IAS, can be considered as partly implemented.

6.1.6. Implementation of the Strategic Plan for Biodiversity 2011-2020

The central source of information on the implementation of the EU Biodiversity Strategy and the Strategic Plan is the mid-term review of the EU Biodiversity Strategy to 2020 (European Commission, 2015d). It summarises the commitments and the progress made since 2011 and serves a concrete activity in the Forest MAP that has been fulfilled. Respective Staff Working Documents report on the operational implementation of this goal on EU level. However, the review states that no significant improvement has been achieved in the status of species and habitats affected by forestry. Biodiversity and habitats are still under strong pressure in forests and woodland, favourable conservation assessments have decreased and 80% of the previous unfavourable assessments remain unfavourable/unknown or have deteriorated (Commission Staff Working Document EU Assessment of progress in implementing the EU Biodiversity Strategy). It was summarised that forest management plans or equivalent instruments can play an important positive role in achieving the target, but their potential remains largely unused. Further, EU-level data on the status of forest habitats outside Natura 2000 are limited. The

[57] See https://www.observatree.org.uk.
[58] See http://www.cost.eu/COST_actions/fps/FP1401.
[59] See https://easin.jrc.ec.europa.eu/
[60] See https://cordis.europa.eu/project/rcn/95536_en.html
[61] See http://www.q-collect.eu/
[62] See https://cordis.europa.eu/project/rcn/99808_en.html
[63] See https://www.ponteproject.eu/.

Restoration Prioritisation Framework as referenced in the Strategic Orientation was published in 2013. It highlights both forest management plans and innovative funding and marketing instruments for ecosystem services as crucial for effective implementation of biodiversity goals in forests. Improving the knowledge base on forest biodiversity is one of main priorities for response action. Many of these areas have been addressed in the section above and are considered as initialised, while the effects remain unclear vis-à-vis the diagnosis of the mid-term review. Timely effects might be observed only during the final evaluation of the EU biodiversity strategy which started in 2018.

Activities to increase the knowledge base as part of biodiversity management can be directly or indirectly related to the specific part of the Strategic Orientation. A number of activities on increasing the knowledge base on biodiversity conservation has been conducted, many of them with relation to forestry, most notably the EEA studies on European Ecosystem Assessment (EEA, 2015) and on state and trend of forest ecosystems (EEA, 2016), studies on biodiversity financing and tracking biodiversity-related expenditures in the EU budget (European Commission, 2017d), and on implementation of 2020 EU Biodiversity Strategy and priorities for the restoration of ecosystems and their services in the EU (Lammerant et al., 2013), and the Eurostat study on monitoring progress towards the SDGs in an EU context (Eurostat, 2017). Many of these sources are cross-cutting, with forestry aspects integrated. They provide assessments and overviews on the status of forest biodiversity and novel ways to respond to these (negative) trends, as discussed earlier.

The respective action in the Forest MAP can be considered as partly implemented. It will continue until 2020.

6.1.7. Strengthen forest genetic resources conservation

Strengthening forest genetics conservation comprises a number of activities. The most practical implementation of strengthening forest genetic resources conservation can be found in Rural Development Programmes. Further, a preparatory action on EU plant and animal genetic resources has been launched, where needs for the conservation and sustainable use of plant and animal genetic resources have been identified, actively supported by EU Member States and the EUFORGEN Programme.

Working with FAO's Commission on Genetic Resources for Food and Agriculture (CGRFA)[64] is important. The European Commission has established an Intergovernmental Technical Working Group on Forest Genetic Resources (ITWG-FGR)[65] to address issues relevant to the conservation and sustainable use of Forest Genetic Resources (FGR), and to advise and make recommendations on the report preparation process. In 2013, FAO adopted a Global Plan of action for the Conservation, Sustainable Use and Development of Forest Genetic Resources (FAO, 2013). One aim of the Global Plan of action is to "*promote access to, and sharing of, information on forest genetic resources at regional and national levels*". As of 2014, EUFORGEN contributes to the implementation of the regional- level priorities of the GPA- FGR in Europe, in coordination and consultation with Member States.

EUFORGEN plays a crucial role in promoting conservation and sustainable management of forest genetic resources at pan-European level. In 2016, the European Commission invited EUFORGEN to give an update on its activities at the Standing Forestry Committee (SFC).

[64] See http://www.fao.org/nr/cgrfa/cgrfa-home/en/.
[65] See http://www.fao.org/forestry/86904/en/.

Since 2015, DG SANTE is investigating with EUFORGEN if information on forest resource availability in Europe in relation to conserved germplasm can be correlated through appropriate informatics tools. In 2017, EUFORGEN was invited to report on its activities at the Civil dialogue group on forestry and cork. All Member States are implementing the Pan-European strategy for genetic conservation of forest trees, a strategy developed and monitored by through EUFORGEN (de Vries et al., 2015).

The corresponding action in the Forest MAP can be considered as partly implemented. It will continue until 2020.

6.1.8. International Standard for Phytosanitary Measures nº 15 on wood packaging materials

Wood packaging material imported into the EU underlie the International Standard for Phytosanitary Measures number 15 (ISPM15:2009) and is recognised by EU by through a Directive on protective measures against the introduction of organisms harmful to plants or plant products and against their spread (Directive, 2004/102/EC). Currently, initial activities towards an impact assessment and a possible extension of the obligation are being explored, such as a discussion on this topic in the SFC. However, the time horizon for this goal and the associated Forest MAP action have a time horizon of 2020 and it may therefore be a topic for further implementation through the EU Forest Strategy.

The respective action in the Forest MAP can be considered as partly implemented. It will continue until 2020.

6.1.9. Relevant information and data to the Parties to the UN Convention to Combat Desertification

The European Commission actively supports the United Nations Convention to Combat Desertification (UNCCD), which was adopted in 1994. However, while there are a number of activities and studies (e.g., the DG ENV study on the evolution of some deforestation drivers and their potential impacts on the costs of an avoiding deforestation scheme) with developing countries, also 12 EU Member States have declared that they are affected parties under the convention. While the topic of deforestation gains increasing importance globally, there is no focused activity on this action. There has been a feasibility study on an EU action Plan on deforestation, but no follow-up so far. In the EU Forest Strategy, there is an explicit reference to the European Forest Data Centre (EFDAC) and the European Soil Data Centre (ESDAC). EFDAC has been integrated into the FISE system, but provides no explicit information on desertification and soil degradation as per September 2018. ESDAC[66] provides no further information on desertification and degradation of forest land in the EU as per September 2018. It appears that there is only little impact on follow-up implementation activities so far. However, it might be so that the gaining momentum of the SDGs might push the topic of deforestation further, as for example the Staff Working Document on key European action supporting the 2030 Agenda and the Sustainable Development Goals indicates. It seems that deforestation will be stronger discussed in the context of climate change (such as REDD) and biodiversity loss, which is the case on global level. The integration of these topics will also be useful in the EU Member States context.

[66] See https://esdac.jrc.ec.europa.eu/

The respective action in the Forest MAP can be considered as partly implemented. It will continue until 2020.

In addition to the nine Strategic Orientations, the Forest MAP states two further actions not referenced in the EU Forest Strategy. First, the Forest MAP states the goal to enhance the European Forest Fire Information System (EFFIS) via the LIFE programme and the Civil Protection Mechanism. A database survey unveils eight LIFE projects related to forest fire since 2013, out of which 6 have been conducted in Spain. Furthermore, the EU has invested across various EU Framework Programmes, from FP6 to Horizon 2020, the LIFE and Civil Protection Programmes, the EU has invested around 100 million Euros in 33 forest fire-related research projects. The Horizon 2020 WP 2018-2020 will focus on innovative visions for ecosystem-based forest and wild land management to reduce fire risk as a response to climate and land use change. Out of the cohesion fund (2014-2020), there will come almost 8 billion EUR in climate change adaptation and risk prevention, many of its activities on prevention of and preparedness for natural disasters such as forest fires. Overall, the EFFIS system can be judged as one of the most advanced element of the Forest Information System for Europe (FISE).

The Forest MAP action to co-finance, through the LIFE programme and Civil Protection Mechanism projects that contribute towards the enhancement of the EFFIS can be considered as fully implemented.

Regarding the second element, a guidance document – Supporting the Implementation of Green Infrastructure – was published in 2016 (Trinomics, 2016). The Commission also provided guidance in relation to the development and application of a strategic framework to set priorities for ecosystem restoration in 2014[67], however, more explicit EU guidance on integrating ecosystems and their services into planning and policy decisions is expected to be published later in 2018. However, this aspect is only mentioned as one point in the Forest MAP, and not in the Strategic Orientation, which might indicate that it could gain a higher priority in the future. So far, only little activity can be shown in this field, as supported by the survey results. The respective point in the Forest MAP can be considered as partly implemented.

Section 14.3 summarises the detailed state of implementation of actions under this Priority Area.

6.2. Achievements and effects

The Priority Area on forest ecosystems provides many different aspects related to biodiversity conservation, but also protection of forests against harmful organisms and events. Accordingly, the objectives may differ in scope. The EU Forest Strategy has taken up a lot of cross-sectoral elements in this Strategic Orientation in order to secure coherence with other relevant policy domains.

Progress for some of the more specific strategic goals can be documented as follows:

- The mapping, assessment, and valuation of (forest) ecosystem services in the MAES initiative is very productive, including a forest and agro-forestry pilot. The project provides tangible outcomes in terms of operational definitions and tools for ecosystem assessment and valuation as prototype also for MS. Efforts

[67] See http://ec.europa.eu/environment/nature/biodiversity/strategy/target2/index_en.htm.

to discuss MAES activities and communicate them to the forest-based sector and Member States, as it is currently done regularly in the frame of the SFC and the CDGFC, should be continued.

- There has been further progress in incorporating forest ecosystem services into the European Forest Accounts in the Eurostat data.
- The implementation of the Habitats and Birds Directives and the Natura 2000 implementation may have been widely addressed on the forestry agenda but the conservation status of protected forest habitats and species in Europe is poor and has not been improving. The Fitness Check concluded that the Habitats and Bird Directives are fit for purpose but that they require increased to commitment to promote uptake of measures e.g. biodiversity management plans
- Activities on forest genetic resources are progressing both in coordination and research. The activities require strong coordination by Member States, which are the main drivers for this activity. Rural Development Programmes can provide dedicated support for conservation of forest genetic resources.
- New instruments and mechanisms for pest control begin to take shape. While a consistent approach in starting implementation can be found, a comprehensive early warning system, does not exist yet. It will require a systematic approach to couple thematic warning network in the future
- The European Forest Fire Information System (EFFIS) is well advanced compared to other forest information tools. A shift from firefighting to prevention investments is deemed to be more efficient according to the latest forest fires expert debate.
- RDP is the main funding source for biodiversity and ecosystem services. According to a database query 86 LIFE projects which have started since the adoption of the EU Forest Strategy can be linked to biodiversity aspects and demonstrate operational approaches of biodiversity consideration in forest management.

It should be acknowledged that the creation of cross-linkages (also cross-sectoral) to all relevant topics addressed by this Priority Area is a major improvement compared to the earlier EU Forest Strategy. The new policy context for forests and biodiversity, with reference to Natura 2000, is already being determined by the EU action Plan for "Nature, People and the Economy" put forward by the European Commission in 2017 following the EU 'Fitness check' of the EU's Birds and Habitats Directives. In this regard, the sub-action "Mid-term review of Biodiversity Strategy" was of relevance to achieve this new upgraded framework.

Overall, also due its thematic richness, the Strategic Orientation seems to have triggered a lot of initiative in the Member States. This is also supported by results from the survey, which demonstrate a higher impact from Priority Area 4 from both Member States and stakeholders. More than 90 activities have been reported, mostly in progress, with the issue related to forest genetic resources on top. This demonstrates that the Member States proactively address this emergent issue and facilitate respective infrastructure. Also, implementing biodiversity and the issue of biodiversity integration into management plans is reported as very active. Most of the reported activities are work in progress, so it might be worthwhile to get a more comprehensive overview on Member State activities at the end of the EU Forest Strategy period, to help identify good practices in the field of ecosystem services and forest protection. The EU coordination bodies such as the SFC, the CDFC or the Coordination Group for Biodiversity and Nature do and will provide adequate knowledge exchange on this approaches.

6.3. Gap analysis

Biodiversity and ecosystem services in general are mentioned as essential elements of SFM, and hence in the context of the FS objectives. The main concern is that the state of EU biodiversity does not improve. As regards forestry, the conclusions of the REFIT process show inter alia that adapted forest management plans need further scrutiny as they have been identified as promising tools to respond to biodiversity loss..

As regards forest biodiversity conservation, an effective Natura 2000 implementation is in the centre of attention. There are still problems on the actual management of Natura 2000 areas with lacking information on MS implementation. It was found that lack or late implementation of Natura 2000 management plans constitute a major gap, while management plans were identified as crucial tool for biodiversity conservation on the ground. The establishment and management of Natura 2000 still finds low legitimacy and acceptance from forest owners and land users with low uptake of existing funds for environmental measures in forest management.

The 2015 Mid-Term Review of the EU Biodiversity Strategy to 2020 assesses among other the progress towards "Target 3b Increase the contribution of forestry to maintaining and enhancing biodiversity". The review finds no significant progress towards the target at mid-term (2015), but highlights the ongoing means of mobilising funding to support biodiversity, build biodiversity partnerships and build on ongoing activities to increase biodiversity knowledge. EU forest area has increased as compared with the EU 2010 biodiversity baseline. However, the conservation status of forest habitats and species covered by EU nature legislation shows no significant signs of improvement. EU level data on the status of forest habitats outside Natura 2000 is limited. The proposed response measures, forest management plans or equivalent instruments, can play an important positive role in achieving the target, but their potential, remains largely unused. Further, the study on Rural Development forestry measures revealed a limited uptake of measure directly to be related to forest biodiversity conservation. Main factors are the high administrational burdens for relatively small forest areas, and the hesitation to collaborate with environmental agencies. New forms of cooperation (also on regional and local levels) are needed, learning from best practice examples how to successfully implement Natura 2000 implementation and facilitate conflict-resolution. Overall, the transmittance from EU instruments, their implementation in MS, and the uptake of instruments and funding on the ground is the crucial causal chain for improvement. While this sounds trivial, it would be required to get better systematic insights into these mechanisms for further policy instruments to tackle the main obstacle for biodiversity conservation in a matrix of EU instruments, the implementation in MS, and their uptake of instruments.

Further opportunities for more emphasis in the final period of the EU Forest Strategy comprise:

- Further work on phytosanitary measures for wood packaging materials until 2020, which is at a very early stage of agenda-setting currently.
- Speeding up data generation on forest land degradation and desertification, and the role of the EU therein. As deforestation is one of the key terms in the FS objectives in might deserve more attention for an evidence-based implementation.

7. WHAT FORESTS DO WE HAVE AND HOW ARE THEY CHANGING?

The EU Forest Strategy recognises that an advanced forest knowledge base is a prerequisite for a better understanding and better policy support in an increasingly complex environment. Hence, Priority Area 5 – what forests do we have and how are they changing – actively tackles how forest information systems can be improved, harmonised and further developed. In the Strategic Orientations, the European Commission and Member States focus on:

- Setting up the Forest Information System of Europe (FISE).
- Aligning EU forest information, and harmonising forest monitoring.
- Developing a database on forest reproductive material.
- Further developing more theme-specific information modules related to forests.

The Strategic Orientations already appear quite technical, but the Forest MAP still provides some additional specifications, such as to finance forest information alignment via LIFE and EU Framework Programmes for Research and Technological (Horizon 2020), to support data harmonisation in the frame of national forest inventories and an uptake of Mapping and Assessment of Ecosystems and their Services (MAES) results with regards to improving the information on ecosystem services provision.

7.1. State of implementation

7.1.1. Set up of the Forest Information System of Europe (FISE) integrating diverse information systems and data platforms into a dynamic modular system that combines data and models into applications

The idea for a harmonised EU forest information system has a long history that can be linked to several EU regulations. It started with an EU Regulation to establish a European Forestry Information and Communication System (EFICS) in 1989, and was followed up by the Preparatory action EFICP. In the consequence, Forest Focus, which came into force in 2003 (Regulation, 2152/2003) builds on two former Council regulations for monitoring the impacts of atmospheric pollution (Council Regulation (EEC)3528/86) and of fires (Council Regulation (EEC)2158/92) on forest ecosystems, and subsequently repealed by regulations relating to the Programme for the Environment and Climate action (LIFE) (Regulation, 614/2007, 1293/2013).

The EU Forest Strategy has given priority to the establishment, running and further development of FISE, aiming to make it a central instrument with respect to the Strategy. The intent was that FISE should support the collection, harmonisation and analysis of forest-relevant data and information on a central and integrative platform. The JRC has been working on methods for setting up such a system, including the development of the first prototype version of FISE, that cover four modules on forests and natural disturbance, forests and the bio-economy, forests and climate change, and forests and ecosystem services.[68]

The FISE prototype was discussed within the Commission and it was also presented to Member State representatives in 2015 and 2016 for feedback, both through the Standing Forestry Committee and the Council Working party. Feedback was collected on the usability and structure of the system, and taken up for the further development of the prototype. Earlier input on required information types for the system had been collected via a study carried out by an ad-hoc working group of the SFC on forest information.

[68] See http://fise.jrc.ec.europa.eu/.

FISE is built up around 4 thematic modules, i.e. (i) forest disturbances, (ii) forest ecosystem services, (iii) forest and climate change, and (iv) forests and the EU bio economy.

It should however be noted that the current FISE prototype is a restricted access website (access via ECAS) to give opportunity for further consolidation of data and that it continues to be under development. Formally, a public version FISE has not been officially launched yet which explains why operational and up-to-date use of data and uptake with regards to policy support is not provided.

Many of the 119 datasets in the FISE prototype[69] - including information concerning tree species distribution, carbon sequestration, biomass, forest cover and tree defoliation - are outdated and would require updating. All in all, FISE will take additional time to provide harmonised EU-wide datasets on forests. Since early 2018 the preparations have been going on for transferring relevant FISE content from the JRC to the European Environment Agency (EEA), and for the redeployment of the system within the EEA environment. According to the current planning, a first version of a system pilot with a few forest parameters will be ready for extensive user testing by the end of 2018, and the full system deployed by the end of 2019. This can be seen as part of ongoing efforts to streamline the reporting of environmental information (European Commission, 2017a). In support of the FISE updating and transfer to the EEA, the JRC is currently collecting National Forest Inventory data from publically available websites. 823 datasets on forest have been gathered, besides NFI related data there are additional 800 datasets published based on forest cover satellite imagery from various sources (mainly Copernicus).

There is one directly related action point in the Forest MAP to set up of the Forest Information System of Europe. The action has been partly implemented.

7.1.2. Align EU forest information so that it is primarily based on data collected by Member States with EU data architecture requirements; Improve, make comparable and share forest information and monitoring; develop several modules that could contribute to the EU's forestry statistics and forest accounts

In aligning forest-related information, it can be noted for Strategic Orientation B that the recent Batumi declaration (para. 10) from the Eighth Environment for Europe Ministerial Conference in 2016 emphasise the need to establish SEIS in Europe and Central Asia by 2021. However, the UNECE SEIS progress report, which was released in conjunction with the Ministerial Conference, further highlights that the EU is underperforming with regards to data sharing (ECE/BATUMI.CONF/2016/8). While efforts to streamline environmental reporting is laudable, it should be noted that data provided by Member States (through the European Environment Information and Observation Network) to the EEA does not equate to making it accessible in line with the SEIS principles (European Commission, 2008, 2013b). However, in terms of gathering data within INSPIRE requirements has improved a significantly. Also, JRC is constantly working on the harmonisation of NFI data, which is work in progress. The EU is also an active participant in the UN Committee of Experts on Environmental-Economic Accounting (UNCEEA). Data gathering is now also done in close collaboration between UNECE, FOREST EUROPE and Eurostat.

While separated and an independent process from the EU Forest Strategy, it is important to highlight the activities of the pan-European Ministerial Conference on the Protection of

[69] See http://data.jrc.ec.europa.eu/collection/FISE.

Forests in Europe (FOREST EUROPE) as it provides a major tool to streamline national reporting on SFM and serve also as a reference to the EU. The current set of Pan-European indicators for SFM was endorsed by the ministers at the Seventh Ministerial Conference in Madrid 2015, as Annex 1 to the Madrid Ministerial Declaration. This development has contributed towards streamlined reporting, although large differences occur between countries' definitions, methods and reporting years. However, while these are positive developments, limited streamlining and harmonisation has in fact occurred in practice. New methods for data collection are developing slowly as forest inventories largely stay the same with regards to the methods applied. To this can be added that the Standing Forestry Committee Ad Hoc Working Group on SFM have highlighted that "*within the EU the most appropriate level to ensure forests are being managed under SFM principles is the national level. National legislation, together with best practice guidelines and forest authority, etc., is the best way to ensure SFM practices*." (SFC, 2015, p.7). This demonstrates the increased demand for vertical communication between the EU and Member States on developing harmonised data flows for reporting on SFM.

The question on how new information is used to increase forest resilience is difficult to answer because of the long-time dimension of effects, and activities can currently only be observed at their initial stage. The EU Forest Strategy aims at broadening the information base related to forests in modular way. Key issues to be implemented are natural disturbance such as fires and pests, the role of forests in bio economy, climate change and forest ecosystem services. It further highlights the need to be connected with the Eurostat European Forest Accounts.

The EFFIS system on forests fires, which is the most elaborated module of the FISE is considered to be the most operational example for resilience-specific information. As part of the Copernicus Emergency Management Service it also actively supports the international coordination for combatting forest fires and fire risk assessment. Other modules contain links to external databases, such as for storms and pests, but which are only partly up-to-date and fully functional. A module on forest mapping provides a forest area map with rather old and outdated data, but new forest raster maps based on satellite imagery have been created following a unified standard and the FAO definition of forest cover, containing data on forest area, forest cover percentage, forest patches, and a classification of forest patterns. Further modules in FISE, on bio economy, climate change, and ecosystem services are only partially developed and are to be taken up again once the basic forest data are fully consolidated. To this can be added that the Commission Expert Group on Forest Information, which has set out to exchange information to increase forest resilience, has principally organised meetings through its expert group on forest fires and the expert group forest health and pests.[70]

A respective action point in the Forest MAP addresses to build, via LIFE and H2020 funding, on the information collected by existing national/regional forest information networks, develop and implement new methods for the collection and reporting of sustainable forest management criteria and indicators, and use new information about forests to increase their resilience to threats arising from population changes.

As regards project implementation, most activities fall under FP7, which have dealt with specific elements that contribute to additional forest information. The FORMIT FP7 project (finished in 2016) aimed at developing European forest management strategies to enhance

[70] See http://ec.europa.eu/transparency/regexpert/index.cfm?do=groupDetail.groupDetail&groupID=416.

climate change mitigation, but results are not publicly available. With regards to tree genetics FP7 GenTree, FP7 Forger and FP7 Trees4Future contributed to improving the knowledgebase, coordination and infrastructure; however, results did not flow into the EU information systems. FP7 StarTree generated new data on the role of non-wood forests products, which so far had been drastically underestimated by official statistics.

Finally, on the issue of forest biodiversity the FP7 Project FunDivEUROPE was significant in contributing to quantifying the effects of forest biodiversity on ecosystem functions and services. On wood mobilisation, the FP7 SIMWOOD project was carried out. Its results are incorporated in a wood mobiliser as part of the JRC websites[71]. In the LIFE context, as outlined in the Forest MAP, no respective projects were found. Also, overarching activities that connect resilience and information in H2020 are missing. Obviously, synthesis projects of finalised activities could be an option to questions of resilience to activities on information services.

It appears important to clearly demonstrate the progress made in these projects, and take them up in respective harmonisation efforts, as by the JRC and in synergy with the FOREST EUROPE process and MS contributions to various data platforms within and outside the EU context. However, the flow of information from mentioned research projects to the FISE is limited. The survey shows that in several MS there are ongoing efforts to harmonize data collection and NFIs, and to contribute to international organisations, networks and platforms like JRC, EUFORGEN, ENFIN, EUFGIS. The action can be considered as partly implemented. It will continue until 2020.

The aspect of Fully harmonized information from data collected by National Forest Inventories addresses the goal to generate guidance on new methodologies for harmonised forest information and the Forest MAP actively address the need for support through LIFE and Horizon 2020. Firstly, JRC has been collaborating through Framework Contracts, with consortia that involved NFIs in the development of harmonized information at European level (including activities on forest fires, biomass, basal area, LULUCF, etc.). One further activity coming from research side is the Horizon 2020 DIABOLO (Harmonization and improvement of forest data) project, which started in 2015.[72] The project strives to gain improvements in the methods of data collection, to support consistent, up-to-date forest information to support the development of EU policies and international processes, and to develop methodologies to make innovative use of data collected until 2019. So far, few results are publicly available, and they mostly focus on the signalling problems of harmonisation instead of providing solutions.

Indirectly related to the EU Forest Strategy, but highly relevant for a harmonised national reporting, is common forest resource questionnaire which is currently employed in 2018 by both the UNECE/FAO Forest Resource Assessment (FRA) and the FOREST EUROPE process in preparation of the State of Europe's Forest Europe 2020. In parallel, a FOREST EUROPE working group has been active in further improving the Pan-European criteria and indicators for sustainable forest management, inter alia to further improve the consistency and comparability of forest-based information, e.g. by developing SFM headline indicators. EU expert (JRC, Eurostat) are contributing to this work together with MS experts, so synergies between EU and Forest EUROPE activities are likely.

[71] See https://simwood.jrc.ec.europa.eu/.
[72] See http://diabolo-project.eu/.

Against this background, the action can be considered as partly implemented. It will continue until 2020.

7.1.3. Promote the further development of the EU database of forest reproductive material, including hyperlinks to national registers and maps

The main development towards an EU database on forest reproductive material can be related to the Forest Reproductive Material Information System (FOREMATIS).[73] FOREMATIS was established in response to a regulation for national lists of the basic material of forest reproductive material and provides access to the data of the national registers, containing details with regards to approved basic reproductive material, including data on areas and geographic location (Regulation, 1597/2002), and is regularly updated on the basis of MS contributions. The respective action in the Forest MAP can be considered as fully implemented.

7.1.4. Information on ecosystems and their services

As outlined in section 6, the MAES project- Mapping and Assessment of Ecosystems and their Services – has made considerable progress in defining ecosystem services and developing methodologies for assessment and accounting. A forest and agro-forest pilot is currently being conducted, developing an assessment framework and indicators for forest condition. It aims to develop a system of drivers, pressures and forest ecosystem conditions. Little information on the pilot is currently available, but there is a report on a Swedish forest pilot study[74], for example. Further, as mentioned earlier, the Biodiversity Information System (BISE) is expected to serve as central monitoring instrument for biodiversity conservation, and included also the MAES system. This can serve as a central approach to achieve a harmonised approach to data and information on forest ecosystem services, and will require respective and transparent communication with MS for further implementation. The respective action can be considered as fully implemented.

Section **Error! Reference source not found.** summarises the detailed state of implementation of actions under this Priority Area.

7.2. Achievements and effects

The development of FISE is a central objective expressed in the EU Forest Strategy, which is addressed at both the European Commission and Member States level. It is one task to develop a centralised database and IT infrastructure. Another very challenging task is the harmonisation of forest monitoring and data collection approaches for core parameters across MS.

The transfer from JRC to EEA offers a new opportunity that comes up with a bottom-up approach for data consolidation using publically available data. While this change in concept might have caused some delays, recent progress in 2018 on additional datasets tends to show an increasing momentum now. Given these new modes of further developing FISE, synergies with all data-relevant organisations should be sought, which appears in line with this bottom-up understanding, responding to the modular needs of such an information system.

[73] See http://ec.europa.eu/frmis/index.xhtml.
[74] See https://www.naturvardsverket.se/Om-Naturvardsverket/Publikationer/ISBN/6600/978-91-620-6626-0/

EFFIS, the forest fires database has proved to be the most advanced element within this Priority Areas. In combination with the Copernicus Emergency Management Service,[75] EFFIS has created added value with regards to the international coordination of combatting forest fire and risk assessments. In total, FISE is still under construction with work in progress, with 823 datasets on NFI gathered up to now. The full implementation of a complete, up-to-date and harmonised database that serves a robust policy-support will be a task beyond 2020.

Other activities towards more integrated and harmonised forest information include the DIABOLO project and the follow-up of FOREMATIS.

The activities show that the provision of up-to-date data and the development of data infrastructure is a significant challenge. Currently, there is a good level of updates by MS in the FOREMATIS system, but data is still incomplete and not fully up-to-date. While serving different purposes, efforts in linking the European Information System on Forest Genetic Resources EUFGIS (http://portal.eufgis.org/), which provides geo-referenced information on the conservation of forest genetic resources, and FOREMATIS on the availability and location of forest reproductive material will be an important progress. The linking of the two Information Systems and the characterisation of the material will be an important tool for the user of the Forest Reproductive Material.

The MAES project has contributed significantly to setting a standard for ecosystem service assessment and mapping, the project and its results are widely recognized. The EU Forest Strategy has actively addressed the importance of MAES also for the forest sector.

All these initiatives contribute to the objectives of the EU Forest Strategy in that the role of enhanced and harmonised forest information is crucial for demonstrating that the EU's forests are managed sustainably and how EU contributes to SFM. It will also be important to use a common framework across different sectoral instruments (e.g. forestry, biodiversity, climate change reporting), while further pursuing a modular approach to take-up specific advances in forest data collection.

On the MS side, National NFIs and related monitoring instruments appear to be dynamic in their evolution. Many activities to update and enrich monitoring efforts are reported, and active participation in efforts to harmonise monitoring. New, multi-methods monitoring systems could employ new technologies incl. airborne and laser-scanning data to allow for more up-to-date data provision.

7.3. Gap analysis

Improving the knowledge base on forests and harmonising forest monitoring and information tools is of utter importance for future policy-making in an increasingly complex forest policy and management environment. While there are several initiatives at EU and MS levels, a comprehensive tool that supports political decision-making in the broad context of SFM does not yet exist. Given the central position with a specific Strategic Orientation in this Priority Area of the EU Forest Strategy, the progress on FISE has to be judged firstly on this element. Overall, a system prototype has been set up but this prototype is still far from being comprehensive and up-to-date and it has not been published yet taking additional time to be made. It does not come as a surprise since the history of data harmonisation efforts is long.

[75] See http://emergency.copernicus.eu/.

This refers particularly to the uptake of new information modules. After all, the complex of a forest information system comprises problems to solve in the dimension of data collection, data harmonisation, and providing processed data access. These three aspects are tackled with different activities and different pace. FISE as an infrastructure will require progress in the other two arrays to generate full potential on forest information. Naturally, this will take additional time and effort. Problems of outdated and incomparable datasets still exist, keeping information and datasets up-to-date is not at last a question of resources and capacities both on EU and MS level.

The collection, exchange and harmonisation of data is a laborious process. Further efforts are needed to systematically collect data on all ecosystem services and values generated by European forests (e.g., wood production, biodiversity, recreation) considering regional diversity in environmental and cultural circumstances as well as interests of Member States.

This will be important to accurately respond to emerging information needs considering changing forest conditions. In this respect, FISE needs still more visibility, further promotion, and commitment by MS to strengthen its databases and their use of it. After all, up-to-date databases and maps are needed to inform forest-related policies. The new FISE should also develop towards multi-scale and multi-temporal tools and maps. Accurate datasets based on permanent inventories as introduced by some MS, and airborne data (derived from satellites and Lidar from planes) would help overcome some of the shortcomings, but this would require active promotion and funding for MS.

Also, the survey results unveil that timely, regular information is a key issue to make progress on to make forestry issues more transparent. While a lot of national representatives and stakeholders are involved in different activities, it appears difficult to keep track on the outcomes and developments of activities, and how they manifest in the performance of forestry and the forest-based sector.

8. NEW AND INNOVATIVE FORESTRY AND ADDED-VALUE PRODUCTS

Innovation has been addressed as one of the lead paradigms of the Framework Programme for Research and Innovation Horizon 2020[76] for increasing EU competitiveness. This holds particularly true for the forest-based sector, which is undergoing massive change. On the side of forestry, new adaptive management regimes are required to respond to environmental challenges and change, often competing claims for forest ecosystem services, coupled with altered market dynamics. A diversification of the forest-based sector, an expected stagnation for mature segments of the forest-based industries (e.g., pulp and paper) and the creation of opportunities for new value-added wood products in a developing bio economy requires substantial innovation beyond marginal adaptation.

The EU Forest Strategy has addressed these issues through Priority Area 6 – New and innovative forestry and added-value products – to enhance the forest-based sector's sustainability and its contribution to the rural economy through Sustainable Forest Management (SFM), improve its capacity to face biotic and abiotic stresses, and develop

[76] See https://ec.europa.eu/programmes/horizon2020/.

better forestry production systems and products. Specifically, the Strategic Orientations associated with Priority Area 6 highlights that the:

- European Commission should assist Member States and stakeholders in transferring technological and scientific knowledge to forest practice and the market through Horizon 2020 and the European Innovation Partnership on Agricultural Productivity and Sustainability (EIP-AGRI),[77] supporting the development of new products with higher added-value.
- European Commission and Member States should cooperate to advance research and modelling tools to better understand the complexity of forest-based issues regarding social, economic and environmental changes.
- Standing Committee on Agricultural Research (SCAR)[78] should be used to strengthen coordination of research and innovation work between the EU, Member States and stakeholders.
- Results and good practices should be disseminated through the EU forest governance structure and other relevant fora.

The Forest MAP reiterates the importance of the EU's Framework Programme for Research and Innovation to reinforce research and innovation action in the sector. It furthermore mentions the Forest-based Sector Technology Platform (FTP) and the European Innovation Partnerships as catalysts, identifies ERA-NETs[79] as specific instruments to foster transnational research, and reemphasizes the role of SCAR in terms of coordination of research and innovation between the European Commission, Member States and stakeholders.

8.1. State of implementation

8.1.1. Transferring technological and scientific knowledge to forest practice and the market, in particular through Horizon 2020 and the European Innovation Partnership on Agricultural Productivity and Sustainability, supporting the development of new products with higher added- value

Research and Innovation

EU Framework Programmes for Research and Technological Development (FP7 and Horizon 2020) are noted in the EU Forest Strategy as major funding instrument with regards to stimulating research and innovation in the forest-based sector. In this respect, the past programming period (FP7, 2007-2013) and the current programming period (Horizon 2020, 2014-2020) have supported research and innovation in the forest-based sector in several aspects. Lovric et. al. (2017) identified 387 projects related to forestry have been funded during the 2008-2017 period under FP7 and Horizon 2020. By August 2018, this number of projects within a forest context raised to 435. From a more specific, innovation research point of view, it can be noted that the EU CORDIS[80] and ERA-NET databases contain 92 research projects that can be directly related to 'innovative forestry' and 'value-added' products, hence, which directly correspond to the definition of the theme.

Research institutions from Germany, Finland, Spain, Sweden have played a major role as coordinators for projects dealing with innovation and added value products (see Figure 5), however, the participation of Member States in these activities differs significantly, with

[77] See https://ec.europa.eu/eip/agriculture/en/european-innovation-partnership-agricultural.
[78] See https://scar-europe.org/.
[79] See http://ec.europa.eu/research/era/era-net_en.html.
[80] See https://cordis.europa.eu/home_en.html.

organisations particularly from East and South-East Europe countries almost totally missing (except for EE, SI, SK) (see Figure 6).

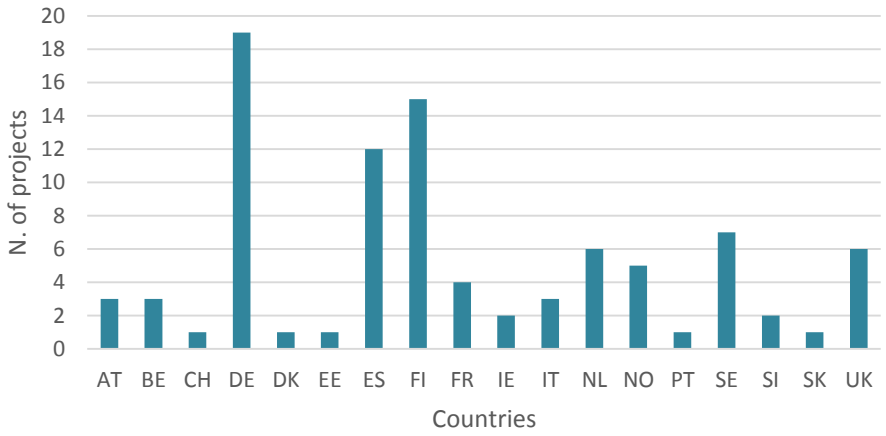

Figure 5. Country coordinating research projects related to new and innovative forestry and added value products. *Source*: CORDIS DB and ERA-NET (WoodWisdom).

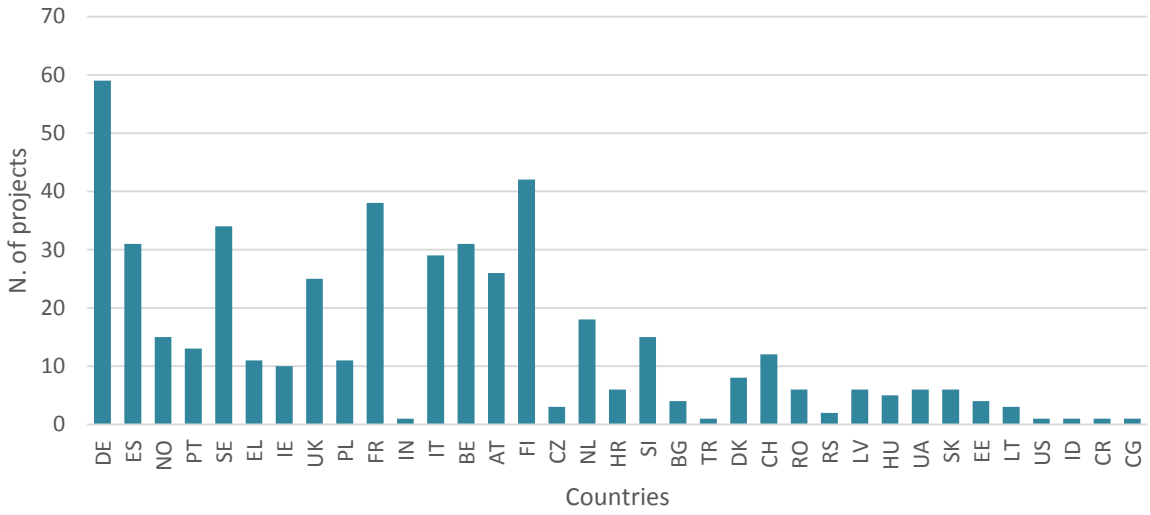

Figure 6. Countries involved in research projects related to new and innovative forestry and added value products. *Source*: CORDIS DB and ERA-NET (WoodWisdom).

Horizon 2020 projects are classified according to different schemes and types of actions. Research and Innovation Actions (RIA) (like Collaborative Projects - CP - under FP7) and European Research Grants (ERC) are mostly focused on applied research and technology development in small scale applications. The limited scale and the generally high specificity of the projects usually implies few interested stakeholders. Overall as foreseen with upcoming calls in 2018-2020 a comparable ERC funding between FP7 and Horizon 2020 can be estimated.

The Innovation actions (IA) under the Horizon 2020 framework may be considered as having a broader dissemination and exploitation potential, as they focus more on testing, demonstrating and piloting on larger scale. Coordinating and Support actions (CSA) are on the other hand principally focused on dissemination, networking and awareness raising, or in

bringing scientific community together to develop further reaching action in emerging research areas.

ERA-NET is supporting public-public partnerships and funds trans-national research and innovation projects, allowing programme collaboration in any part of the research–innovation cycle. Finally, Small and Medium Enterprises (SME) Instruments offer entrepreneurs the chance to step forward and request funding for breakthrough ideas with the potential to create entirely new markets or revolutionise existing ones[81]. Figure 7 highlights that projects dealing with networking, coordination and supporting are prevailing on projects focused only on research activities.

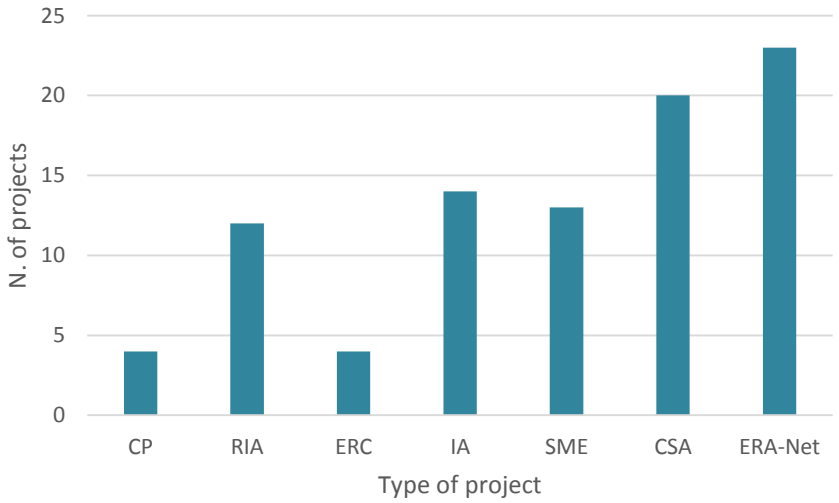

Figure 7. Horizon 2020 and FP7 projects related to new and innovative forestry and added value products per type

The Forest-Based Sector Technology Platform (FTP)[82] has provided effective networking services for all the stakeholders dealing with forestry collecting and sharing information regarding recent researches and innovations. Furthermore, the Strategic Research and Innovation Agenda, revised and published in 2013, set the guidelines for the forest sector, identifying the needs and the core areas to be addressed. These were summarised under four Strategic Orientations: The forest-based sector in a bio-based society; Responsible management of forest resources; creating industrial leadership; and Fulfilling consumer needs. The FTP, apart from having an up-to-date database covering research projects relevant to the forest-based sector, it also has some tools that aim to improve its function as fora for all the stakeholders of the forest-based sector research. For instance, its National Support Groups (NSG) in 25 countries act as reference points at the national level in terms of coordinating research, industries as well as governmental and financial representatives. The NSGs consequently play an important role at the national level as a forum that address Member States specificities.

in the first respective action point in the MAP highlights the transferring technological and scientific knowledge to forest practice and the market, in particular through the projects

[81] See https://ec.europa.eu/programmes/horizon2020/en/h2020-section/sme-instrument
[82] See http://www.forestplatform.org.

financed through FP7 and Horizon 2020, and the periodic evaluation of framework research programmes. The action can be considered as ongoing and will continue until 2020.

European Innovation Partnerships (EIP)

A further strategic element concerns the use of the European Innovation Partnerships (EIP) instrument to support the development of new products with high-added value.

EIPs dealing with forest-related topics have been established, i.e. the EIP for Agricultural productivity and Sustainability (EIP-AGRI) and EIP Raw Materials (see Table 1).

Table 1. Activities of European Innovation Partnerships with reference to the forest-based sector

EIP	Focus Groups and workshops	Topic
EIP AGRI	FG23 Agroforestry: introducing woody vegetation into specialized crop and livestock systems	How to develop agroforestry as a sustainable farming system which can boost agricultural productivity and profitability?
	FG20 Sustainable mobilization of forest biomass	How to improve the sustainable mobilization of biomass from our forests in the EU?
	Workshop 'New value chains from multifunctional forests'	Share examples of innovative value chains for forest products and services that are currently less used than timber (e.g., Non-Wood Forest Products (NWFP) and Ecosystem Services (ES))
	FG24 New forest practices and tools for adaptation and mitigation of climate change	Which new practices and tools can improve the climate mitigation and adaptation potential of EU forests?
EIP Raw Materials	Forest-based industries	Include 4 major sectors: wood working, furniture, paper and pulp manufacturing and printing.

Source: EIP Agri and EIP Raw Material websites.

Within the EIP AGRI, two multi-actor thematic networks, the European Agroforestry Federation (AFINET)[83] and AGRI FOR VALOR[84], financed through Horizon 2020 projects, stand out in their importance for the forest-based sector. For instance, AFINET is an agroforestry innovation network that aim to build the Agroforestry Knowledge Cloud (KC) that will foster knowledge exchange by integrating and synthesizing existing pools of information based on the Regional Agroforestry Innovation Networks (RAINs) implementation. AGRIFORVALOR aims to connect practitioners from agriculture and forestry with research and academia as well as with associations and clusters, bio-industry, policy-makers; business support organisations, through multi-actor innovation partnership networks.

[83] See http://www.eurafagroforestry.eu/afinet.
[84] See http://www.agriforvalor.eu/.

Activities in the frame of EIP Raw Materials that relate to forest topics comprise inter alia work on wood mobilisation, design improvement and product management for wood-based products, and new business models for forest and wood-based enterprises and industries[85].

Annual reporting and analysis of the European Innovation Partnership on Agricultural Productivity and Sustainability, as well as the European Innovation Partnership on Raw Materials is a corresponding action point of the Forest MAP. The action is ongoing and will continue until 2020.

1.1.1.1. Active engagement in ongoing ERA-NETs like FORESTERRA, SUMFOREST and WoodWisdom- Net+

ERA-NETs are mentioned in the EU Forest Strategy as a central instrument for forest-based research and innovation coordination. ERA-NET projects essentially co-finance projects that are funded through the EU Framework Programmes for Research and Technological Development, and participating Member States contribute to this funding. FORESTERRA,[86] SUMFOREST[87] and WoodWisdom-Net[88] are three projects that were funded through FP7 and part of the ERA-NET initiative in the forest-based sector that aim to coordinate and boost networking within the sector (see Table 2).

Table 2. ERA-NET initiatives in the forestry sector with funds allocated for CSA supporting the transnational calls

Project Name	Allocated funds €	Coordinator	Participants country
FORESTERRA	2 494 195	ES	MA; IT; HR; ES; EL; SI; FI; BG; FR; DZ; TN; TR; PT
SUMFOREST	2 170 285	AT	SK; FI; DE; PL; DK; IT; SI; UK; EL; ES; SE; FR; NO; LT; IE; CH; LV; MK
WoodWisdom	1 420 729	FI	HU; FR; FI; DE; IT; TR; LV; ES; SE; NO; IE; SI

Source: CORDIS DB and ERA-NET website.

These projects, all responding to the Coordination and Support actions (CSA) under FP7, have in turn funded more specific projects relevant for these actions. More specifically, under FORESTERRA a Networking action (MedWildFireLab) and a Collaborative Project (Informed) were funded. SUMFOREST has funded seven projects: BenchValue, FOREXLIM, ForRisk, FutureBioEcon, REFORCE, REFORM, and POLYFORES. WoodWisdom is the most complex of the three initiatives and has funded more than 60 forest-related projects since the earlier call in 2006. For example, in the WoodWisdom Joint Call JC4 (2013-14), 23 projects were funded, organized across 4 themes (value added products, industrial processes, competitive customer solutions, sustainable management of forest resources, with an aggregated value of close to 30m €. Participation in WoodWisdom funded project is described in Figure 8. Here again it can be noted that participation by EU Member States is unbalanced, with few countries acting as leaders.

[85] See https://ec.europa.eu/growth/tools-databases/eip-raw-materials/en/content/eip-raw-materials-monitoring-and-evaluation-scheme
[86] See http://www.foresterra.eu/.
[87] See https://www.sumforest.org/.
[88] See http://www.woodwisdom.net/.

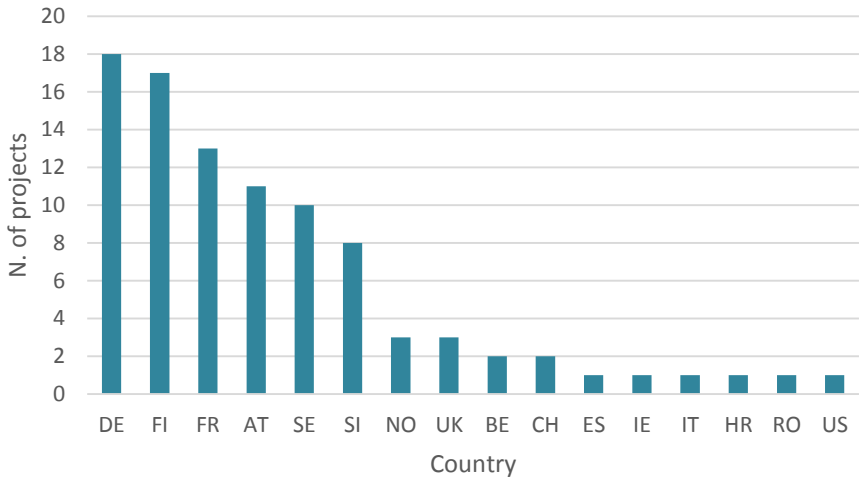

Figure 8. Participation in WoodWisdom by the EU member countries. Source: WoodWisdom website data.

It can also be noted that WoodWisdom has boosted and promoted innovative projects, 10 of them specifically contribute towards new value-added products (see Table 3).

Table 3. WoodWisdom projects funded under the Joint Call 4 (2013-2017).

Thematic area	Project	Allocated funds €	Coordinator country	Participants
Sustainable management of forest resources	Fastforest	994 000	IE	FR; IE; DE
Industrial processes	BioCoPol	730 000	CH	AT; FR; CH
	CaReWood	1 097 000	DE	FR; DE; FI; AT
	Cosepa	1 120 000	FI	SE; FI; UK; DE
	EU Hardwood	105 000	FR	FR; DE; SI; AT
	LeanWood	1 640 000	DE	DE; FR; FI
	ReWoBioRef	1 640 000	DE	FI; UK; DE; SI
	Varma	1 507 000	FI	FI; FR
Value added products	Aerowood	1 473 000	FI	FR; AT; DE; FI; SI
	Compac	1 250 000	DE	DE; FI; SE
	CreoSub	1 521 000	NO	NO; FI; DE
	HCLTP	831 000	SI	SI; DE; AT
	HemiCell	1 103 000	DE	SE; DE; FR
	LignoHTL	1 106 000	FI	FI; DE; FR
	Pronanocell	1 570 000	SE	SE; FI; DE
	Pshapes	1 290 000	FI	DE; SI; AT; FI
	Tunablefilms	745 000	FI	FI; SE; AT
	WoTim	1 460 000	FI	FI; FR; SE
Competitive customer solutions	DuraTB	2 120 000	NO	NO; FI; SE; US
	Silent Timber	1 940 000	SE	SE; AT; FR; DE; NO; CH
	Tall Facades	1 800 000	DE	FR; DE; SE
	W3B Wood believe	738 000	AT	AT; FI; DE; SI; BE
	Wood2New	1 870 000	FI	FI; BE; UK; SE; AT; SI

From the ERA-NET Cofund action under Horizon 2020 one additional project is worth mentioning namely ForestValue – Innovating the forest-based bioeconomy[89] – which is built upon three preceding ERA-NETs projects, and will work towards the transition from fossil fuel and non-renewable raw materials to a bio-based economy. This is an initiative that has mobilised funding from the Horizon 2020 programme and 31 partners from 18 countries, including countries inside and outside the EU (e.g., Finland, Austria, Czech Republic, France, Germany, Ireland, Latvia, Poland, Slovenia, Spain, Sweden, United Kingdom, Norway, Switzerland, Tunisia, Turkey, Argentina and Egypt). The first stage of the first ForestValue Joint Call closed in early 2018, mobilising an aggregated value of above € 20 m, with a deadline for full proposals in the second stage Aug 2018.

A recent SCAR assessment report[90] reported a total volume of 85m € funding for the three main forest-related ERA-NETs, out of which more than 70m € came from national funding schemes. This demonstrates that ERA-NETs have remarkably strong national commitment, and a strong multiplying effect of EU base funding with leverage effects to the MS.

Against this background, also the respective Forest MAP action point on active engagement in ongoing ERA-NETs like FORESTERRA, SUMFOREST and WoodWisdomNet+ can be considered as ongoing and will continue until 2020.

8.1.2. The Standing Committee on Agricultural Research (SCAR) will be used to strengthen coordination of research and innovation work between the EU, Member States and stakeholders

Under the Standing Committee on Agricultural Research (SCAR), two Strategic Working Groups (SWG) have been activated with a role to coordinate national research programs and support public-public and public-private sectors initiatives in the forestry sector, the previously noted, the Strategic Working Group on Forest and Forestry Research and Innovation and the Bio economy Strategic Working Group.

The SWG on Forest and Forestry Research and Innovation act as a core actor to strengthen and coordinate the research and innovation at EU level. Some of the outcomes and results of this SWG is the assessment of forest-related ERA-NETs and COST actions in the EU forest-based sector (Kleinschmit von Lengefeld and Kies, 2018) and the synthesis of forest bio-economy research and innovation in Europe (Lovric et al., 2017). The latter indicates that 387 projects related to forestry have been funded during the 2008-2017 period, while 92 projects as shown in the beginning of the section can be more closely connoted to innovation research.

The Bio economy SWG has several active connections and collaborations with, for instance, the Bio-Based Joint Undertaking (BBI JU).[91] This is a public-private partnership between the EU and the Bio-based Industries Consortium, with a total budget of 3.7 Billion Euro, 975 Million Euro from the EU (Horizon 2020) and 2.7 Billion Euro from the private sector. Under this partnership, 65 projects have been funded to date, of which some 1/3 involve the forest-based sector with a focus on strengthening forest-based value chains and products in the growing bio economy.

[89] See https://forestvalue.org/.
[90] See https://scar-europe.org/index.php/news-display/133-scar-forest-report-assessment-of-era-nets-and-cost-actions
[91] See https://www.bbi-europe.eu/.

The Forest MAP reflects one particular element taken up by the Strategic Orientation that the Standing Committee on Agricultural Research (SCAR) will be used to strengthen research coordination. The action is ongoing and will continue until 2020.

8.1.3. Cooperation on enhanced research and dissemination

A traditional initiative for improving the transnational cooperation between scientists and professionals in the forest-based sector is the European Cooperation in Science and Technology (COST) programme.[92] After the internal reorganization under Horizon 2020 (with the abolishment of the "domain" related funding under FP7) several COST actions have been implemented on topics that are of interest to the forest-based sector (see

Table 4).

Table 4. COST actions related to the forest-based sector launched after the adoption of the EU Forest Strategy.

COST action name	Description
FPS COST action FP1402	Basis of structural timber design – from research to standards
FPS COST action FP1306	Valorisation of lignocellulosic biomass side streams for sustainable production of chemicals, materials & fuels using low environmental impact technologies
FPS COST action FP1305	Linking belowground biodiversity and ecosystem function in European forest (BioLink)
FPS COST action FP1304	Toward robust projections of European forests under climate change (PROFOUND)
FPS COST action FP1303	Performance of bio-based building materials
FPS COST action FP1301	Innovative management and multifunctional utilization of traditional coppice forests - an answer to future ecological, economic and social challenges in the European forestry sector

Source: COST website.

Networking of research institutions and transfer of innovation to the next generation of highly educated forest professionals has furthermore been promoted by the European Commission through its Erasmus+ program[93] in the field of higher education. 4 Erasmus Mundus International Master programs have been running since over 10 years: the program on European Forestry, SUTROFOR, SUFONAMA and MEdFOR, involving more than 20 university institutions in the EU member countries. One EM PhD program (FONASO) has been running at 7 universities for the last 5 years. Overall, the large set of international Master courses at European higher education institutions with relevance for forestry is remarkable. The Erasmus+ Knowledge Alliance program has also been active in promoting links between academic institutions and industry with regards to the construction and furniture sector. Examples include the Katch-e and ECOSTAR project that contribute towards enhancing the entrepreneurial capacity in the forest-based sector.

However, even though the exchange between academic institutions is strong, a coordinated approach to enhance the dissemination of project results and outcomes, in particular to the policy making and practice, is still needed. Project calls to overview, synthesize, and capitalise on outcomes of finished projects can be found in Horizon 2020, but are often cross-cutting a number of thematic areas. Project websites and follow-up activities most often come

[92] See http://www.cost.eu/.
[93] See https://ec.europa.eu/programmes/erasmus-plus/node_en.

to an end after projects have been concluded, even though exploitation plans should include post-project activities. Calls of the Horizon 2020 Framework Programme actively aim for projects that synthesize and capitalise on finished project results, but eventual outcomes of such activities for the forest-based sector are not visible yet. While the SCAR- initiated study on forest-related research in the context of a bio economy (Lovric et al., 2017) provide a first comprehensive overview on past and ongoing research activities, a synchronised follow-up for dissemination and policy support currently does not exist. The EIPs can as such be a strong approach to foster downstream dissemination and coordination, but the final outcomes of these initiatives are still to be evaluated. The respective action can be considered as partly implemented. It will continue until 2020.

Section 14.3 summarises the detailed state of implementation of actions under this Priority Area.

8.2. Achievements and effects

The Strategic Orientations on innovation in the forest-based sector provided concise considerations on how to advance the innovation potential of the forest-based sector. The actions defined for this Priority Area have focused on activities related to FP7, Horizon 2020, FTP, EIPs, ERA-NET programs, and SCAR.

As found in the SCAR assessment report and also backed up by survey and interviews within this study, ERA-NETs such as WoodWisdom or SUMFOREST are well received and useful for Member States because they combine European EU and Member States interests. It also seems that the spark of Research & Development into vocational training, policy coordination, and priority setting finds successful substrate in many Member States, where the dissemination towards a broader public is more difficult. Also, initiatives to foster technology transfer and new value-added products in Member States are seen as top priorities for the further development of the sector. In fact, there are even more initiatives connected with the promotion of new and innovative forest-based products, such as the COST actions, the Erasmus Mundus programmes and the Erasmus+ Knowledge Alliance programme. To this can be added that also the FTP and SCAR play active roles in the coordination and promotion of key topics for the forest-based sector research.

With this in mind, the EU Forest Strategy and the Forest MAP have been instrumental for providing a policy foundation for forestry and the whole forest-based value chains in order to become more competitive and viable contributors to the bio economy. The Forest MAP has contributed significantly to providing further guidance to the development of Research & Development activities in the forest-based sector. This is also supported by the survey results, which suggests high impact of Priority Area 6 on the implementation of the EU Forest Strategy from both Member States and stakeholders' perspective. While there was concern at the beginning of Horizon 2020 that forest-related topics might be underrepresented, the number of projects related to the forestry sector funded and supported in line with the orientations of the EU Forest Strategy suggests that the path taken is positive and so far, successful. Furthermore, the actions in the Forest MAP are in line with the new policy context, with special reference to the EU Bio economy Strategy, the agreement on and implementation of the Circular Economy Action Plan and the future of the Common Agricultural Policy. According to the Synthesis on Forest bio economy research and innovation in Europe carried out in the frame of the SCAR SWG FOREST, the support of the European Commission in boosting innovation is fundamental and successful. For instance, private companies generate € 3 to 6 revenues for each € received by European Commission

(Lovric et al., 2017), which indicates that EC's role in driving and guiding innovation is important.

8.3. Gap analysis

Forest-based research and innovation has seen significant progress supported, as foreseen, by the EU Framework Programmes for Research and Technological Development as well as other funding instruments. However, one issue that remains relates to the unevenness of Member State representation in research and innovation projects. More specifically, there is clear a clear bias towards Northern and Western Europe in terms of the distribution of funds and project participation, while regions like Eastern Europe are lagging behind. This is a well observed trend that has not changed markedly in the past years. One reason for this might be that cooperation networks are highly centralized and tend to be rather closed (see e.g. Lovric et al., 2017). This appears clearly in the SCAR-EFI Synthesis on forest bio economy research and innovation in Europe, revealing that some of the top research organizations use to cooperate very often with the same partners.

In a new cross-sectoral context, such as the bio economy, boundaries may begin to fade as multi-disciplinary research is becoming the standard and not the exception. Nevertheless, to overcome the uneven geographical distribution in participation, further targeted instruments that fosters cooperation and ease the connection to strong groups would be needed. To deal with potential shortcomings in capacity building, a more explicit coordination of activities in the field of higher education with the Research and Development activities supported by the European Commission and other cooperation programmes might be beneficial

Another issue that should be highlighted is the uneven distribution of topics and funds when following activities along the whole forest-based value chains. There are dominant topics, such as bioenergy, bio refinery, construction and final wood products and sustainability assessment, which have received more than one hundred million Euros each in the past two Framework Programmes for Research and Technological Development (Lovric et al., 2017). Other topics such as forest inventory and economics, forest ecosystem services, non-wood forest products and wood properties show funding decreased in Horizon 2020. However, certain flagship projects such as DIABOLO on forest data harmonisation, or SINCERE on innovation for forest ecosystem services need to be highlighted. To this can be added that the advanced modelling tools are the least implemented action in this Priority Area. Overcoming knowledge gaps for complex forest-related issues seems a difficult task that will require more targeted support in the coming years.

In parallel, innovations can be found predominantly in stages from initial idea generation to design and development, but less in the subsequent stages. A stronger capitalisation of innovation along all stages of the value chain and innovation levels will require additional political attention to unravel the full potential of the forest-based sectors competitiveness. In this respect, attention should be given not only in supporting applied research, but also in assuring that the new knowledge is applied downstream, as seems to be increasingly the trend in the latest forestry topics under Horizon 2020[94], and the activities under the BBI Joint Undertaking. Further, regional clusters and cooperation will have ongoing importance to create critical mass in their activities and for the development of synergies. It might be useful

[94]See https://ec.europa.eu/research/participants/data/ref/h2020/wp/2016_2017/main/h2020-wp1617-food_en.pdf and http://ec.europa.eu/research/participants/data/ref/h2020/wp/2018-2020/main/h2020-wp1820-food_en.pdf

to more explicitly address such elements in the context of the EU Forest Strategy in the light of the evolving policy context, e.g. the bio economy.

The latter point furthermore refers to role and successful implementation activities in dissemination of results. Information on innovations provided by European Commission projects is not enough to further promote successful innovations and it appears as if dissemination and exploitation activities and the demonstration of good practices is project-based and fragmented from an EU perspective. Also, post project-life use of results remains limited, at least in terms of visibility and follow-up activities. Continued and increased efforts to invest in meta-dissemination plans to synthesize and synchronise major project outcomes would be relevant in the future. Due to the central role forests have in helping the switch from a fossil fuel based to a bio-based economy, technological innovation projects are promoted largely. Nevertheless, projects related to social innovation need further promotion, due to the importance of the forest in marginalised rural areas, especially in improving the livelihood of locals. The ongoing project on Social Innovation in Marginalised Rural Areas (SIMRA), financed under Horizon 2020, is one example.

9. WORKING TOGETHER TO COHERENTLY MANAGE AND BETTER UNDERSTAND OUR FORESTS

Enhancing coordination and communication amongst a large number of relevant actors and stakeholders from multiple sectors and policy domains is one of the key elements of the EU Forest Strategy. In accordance with the Council conclusions, it builds on clear institutionalised coordination mechanisms amongst relevant policy makers as well as stakeholder organisations. Due to this complexity, this ambitious Priority Area is significantly interlinked with many other priority areas of the EU Forest Strategy. In accordance with the Council conclusions, the Standing Forestry Committee (SFC) plays a central role for the coordination between European Commission and the Member States, while there are also other committees and multi-stakeholder platforms such as the Civil Dialogue Group on Forestry and Cork, but with different functions. Building on these structures, the Strategy highlights the following Strategic Orientations: ensuring that the SFCs work builds on other sectoral EU policies relevant for forests and the forest sector under the presumption of multifunctional forests; exploring options for better coordination, cooperation and harmonised forest information; creation of an European Forest Bureau Network to harmonise work of the national forest inventories; improving information on forests and wood to a broader public; and assessing and getting further insights into public perceptions of forests.

9.1. State of implementation

With reference to the EU Forest Strategy in general, the action of developing a Multi-Annual Implementation Plan for the EU Forest Strategy (Forest MAP) was foreseen. It is a main coordination tool for bringing together relevant actors and stakeholders, and for actively coordinating targeted activities related to forests and the forest sector along the Priority Areas and Strategic Orientations of the EU Forest Strategy. It was developed after the adoption of the EU Forest Strategy and published in September 2015 (European Commission, 2015a). Therefore, the foreseen action was fully implemented, with its implementation of the Forest MAP going on until 2020.

9.1.1. Ensure that the Standing Forestry Committee's work builds on other EU policies relevant for forests and the forest sector, ensuring that managing EU forests remains multifunctional

1.1.1.1.Role of the Standing Forestry Committee (SFC)

The mandate of the SFC includes acting as an advisory and management Committee for specific forestry measures, coordinating with MS especially through discussing views and exchanging information, as well as providing expertise to the Commission as an ad-hoc consultation forum when preparing implementing measures (e.g. before the Commission submits these draft measures to a comitology committee). In practice, the SFC is not mandated with a Comitology function (e.g., preparing and submitting decision for votes of EU implementing acts). The importance of the SFC is also stressed by the Council Conclusions and the EP resolution on the EU Forest Strategy. Its previous mandate was amended in autumn 2017 from the Commission's Comitology Register. Instead, the SFC has been encoded in the Register of Commission Expert Groups and Other Similar Entities, and now works according to the provisions for such groups.

In its work, and in accordance with the mandate defined by Council Decision of 29 May 1989 (89/367/ EEC), the SFC ensures early and enhanced input into policy making through appropriate co- ordination with all relevant Commission services. In order to achieve this, the SFC meets at least 4 times per year. Additionally, it holds joint meetings on topics of interest for EU forest policy matters. The summary records of the quarterly meetings of the SFC are publicly available through the homepage of DG AGRI and the new GREX database[95]. They provide information on the topics covered and the list of participants, including Member States representatives, stakeholders, invited experts and representatives from Directorate-Generals that were present. The deliberations include items for discussion and items for information. Tangible outputs of the SFC include opinions on forest-relevant items, e.g. a SFC opinion on the sustainable bioenergy policy in the EU post 2020 (2016), and a SFC opinion regarding the role of forests and forest sector in bio economy (2017). These opinions are transmitted to other EU institutions for their consideration in the design and/ or evaluation of relevant policy initiatives.

An analysis of the summary records, supported by interview data with Commission staff, demonstrates that the Commission Services with forest-relevant files (including DG AGRI, DG ENV, DG ENERGY, DG GROW, DG CLIMA, etc.) continuously informed SFC members about ongoing activities and legal and non-legal policy instruments in the Commission, e.g. including the provision of updates on pan-European and global forest-related policy developments. Further, this documentation also shows that MS actively use the SFC to share opinions and exchange information on national examples for forest policy implementation. Hence, coordination between Member States does take place in the SFC.

The respective action in the Forest MAP to ensure that the SFC and relevant Commission Services coordinate timely and effectively can be considered as ongoing and will continue until 2020.

[95] See http://ec.europa.eu/transparency/regexpert/index.cfm?do=groupDetail.groupDetail&groupID=3550&NewSearch=1&NewSearch=1.

1.1.1.2.Cooperation with other relevant committees and groups

The SFC is a central body for coordinating forest-related issues among MS and between MS and EC. In addition, coordination and cooperation with other relevant bodies are important, such as the Civil Dialogue Group on Forestry and Cork (CDGFC), the F-BI Expert Group, the Expert Group on Natura 2000, or other multi-stakeholder platforms for discussing issues related to forestry and sustainable forest management.

The CDGFC is a platform to hold regular dialogue on relevant policies, exchange experience, assist the Commission and advise on policy, deliver opinion and to monitor policy developments.[96] This Group has provided multiple opportunities for sectoral coordination: e.g. on the Resolution on the LULUCF in 2016, Resolution on EU Timber Regulation, Resolution on the role of forestry in the Future Common Agricultural Policy in June 2017, Resolution on the role of forests in the strategic approaches to EU agricultural research and innovation. In order to facilitate work between the Group and the SFC, the chair of the CDGFC has a seat in the SFC and participated in all SFC meetings. On top, a joint meeting between the SFC and the Group took place in December 2017 for discussing the state of implementation of the EU Forest Strategy, future priorities, and the issue of wildfires.

Secondly, the Expert Group on Forest-based Industries and Sectoral Related Issues created in 2014 met twice, with little operational cooperation with the SFC.

Thirdly, the Coordination Group for Biodiversity and Nature was set up to coordinate and exchange views on Natura 2000 implementation and the EU 2020 Biodiversity Strategy. A joint session of the Co-ordination Group for Biodiversity and Nature (CGBN) and the SFC was held in September 2017, promoting dialogue to identify further cooperation possibilities with regards to Natura 2000, EU biodiversity objectives and forests. This session included representatives from Member States, stakeholders as well as DG AGRI and DG ENV. In the meeting, discussions were dedicated to forest-relevant Nature Directives including their implementation in the action plan for nature, people and the economy, funding instruments under CAP and LIFE+, and initiatives on forest ecosystems and biodiversity. It was concluded to further screen modes for dialogue between forestry and nature stakeholder groups, and to facilitate exchange on MS experiences, best practices, and regional funding for forests.

Against this background, the respective action in the Forest MAP can be considered as ongoing. It will continue until 2020.

Additionally, the Forest MAP foresees setting up a systematic transmission of SFC opinions to relevant Directorates General. According to interviewed experts from EC and MS , as well as documents of the European Commission Services, this was implemented and will continue until 2020.

[96] https://ec.europa.eu/agriculture/forest/civil-dialogue-group_en

9.1.2. Explore various options for better coordination of sustainable forest management, harmonised forest information and cooperation between and with Member States

Within the SFC a broad range of forest-related topics of joint concern were addressed. The summary meeting minutes provide an overview of all issues that were discussed and informed about. The depths to which the broad issues of options for better coordination of sustainable forest management and cooperation between and with Member States were discussed could not be fully assessed from the existing sources. Indications from interviews with MS representatives mention that these issues might not have been addressed in the best possible depths and extent. Still, the Annual Work Plan for 2018 includes an invitation to MS for sharing their experiences, and the tentative planning for 2019 includes that "enhanced cooperation with other groups will be further explored".

As regards forest information, the SFC actively discussed related working methods and it deliberated on items, such as criteria and indicators of SFM, and the progress of FISE.

Additionally, annual Work Plans were established for 2016-2018. They are identifying coordination work on major forest-relevant policy issues. Explicit targets and deadlines are not given in every case. The Annual Work Plan for 2018 also includes an invitation to Member States to share their experiences on forest information activities. The respective action in the Forest MAP can be considered as ongoing.

9.1.3. Create a European Forest Bureau Network (National Forest Inventories – NFI) to develop harmonised criteria for NFI information

There is a wealth of informal and/or project-based activities ongoing in the European National Forest Inventory Network (ENFIN)[97], aimed at improving and harmonizing methodologies for collecting and providing more accurate and comparable information on forests and forestry. Results on harmonised criteria for EU-wide reporting on NFI information are based on two COST actions (E43 – Harmonisation of National Forest Inventories in Europe: Techniques for Common Reporting and FP1001 USEWOOD-Improving Data and Information on the Potential Supply of Wood Resources: A European Approach from Multisource National Forest Inventories), the Horizon 2020 funded DIABOLO project "Distributed, Integrated and Harmonised Forest Information for Bio economy Outlooks" (2014-2019), and a framework contract with the European Forest Data Centre.[98] This progress in developing harmonised criteria for NFI so far did not lead to the creation of a European Forest Bureau Network. Also through the conducted expert interviews no evidence for the creation of a Bureau Network could be found. Against this background, the action of the Forest MAP has been partly implemented in terms that there is some progress towards harmonised criteria for NFI information, but no formal Bureau yet.

1.1.1.1.Development of methods for NFIs

Harmonisation of forest inventories has continued being addressed over the past years, while progress is slow. This issue is particularly important for regional and/or global reporting activities. This includes, e.g., FOREST EUROPE's 'State of Europe's Forests Report', which addresses 34 quantitative and 11 qualitative SFM indicators and is based on data provided by

[97] See http://www.enfin.info/.
[98] See http://forest.jrc.ec.europa.eu/.

signatory countries and other data providers (e.g., Eurostat and JRC).[99] National data have to be reported according to specific reporting guidelines, which often require adaptation and conversion of data into the desired format to enable comparability. An EU wide harmonisation of NFI data would facilitate the European data management and joint presentation of European wide data and information including SFM related assessments. Presently, some aspects hinder full harmonisation, such as different inventory methods used; data collection based on prior-established methods; innovative approaches for data collection are used, but not shared publicly.

During the SFC meeting held in March 2017, DG ESTAT pronounced the need for a simplification of the recent UNECE/FAO/ITTO/Eurostat Joint Forest Sector Questionnaire (JFSQ), which requests annually data on forest production and trade.[100] Within the DIABOLO project, discussions in a workshop identified the following major challenges for forest data harmonisation in the EU :

- Technical limitations (e.g., low data quality for some indicators).
- EU data availability, protection and transparency (e.g., access, scope, accuracy and timeliness of information).
- Legal frameworks on data production and protection (e.g., missing legal basis after EU's Forest Focus Regulation expired; new rules coming from the EU data protection regulation, May 2018).
- Financing scarcity and competitive budget opportunities produce "noise" in the data collection and analysis.
- Trust issues in relation to: (i) sharing forest information with other sectors, and (ii) sharing socio-economic information (e.g., on forest ownership).
- Pace and responsiveness of information provision.

The fact that a number of activities on further developing NFI methods have been implemented, such as the two COST Actions and the DIABOLO project, positively contributes to this action as well. It is, hence, partly implemented and ongoing. .

9.1.4. Improve public information about forests and wood, and build on the EU Forest Communication Strategy

1.1.1.1.Cooperation with the UNECE/FAO forest communicators' network

The EU Forest Communication strategy[101] was formulated following findings of the EU wide public perception survey (Rametsteiner et al., 2009). It involved communication experts of the UNECE-FAO Forest Communicators Network (FCN) as a basis for developing a strategic framework for Forest Communication in Europe. This framework has two main aims: (a) to help close the gap between perceptions and facts regarding forests and forestry in the EU; and (b) to achieve better informed decisions on matters relevant to forests and forestry. It also provides related recommendations to achieve these aims. Interviews with communication experts indicated that the EU Forest Strategy might still need broader attention, also in the Commission Services.

[99] See http://foresteurope.org/forest-europe-together-unece-fao-launch-pan-european-data-collection-assessment-state-forests-europe/.
[100] See https://www.unece.org/forests/areas-of-work/forest-resources/methods-and-processes/pan-european-reporting-2015.html.
[101] See http://ec.europa.eu/agriculture/fore/publi/communication-strategy_en.pdf

According to the UNECE/FAO meeting report of the FCN (2017)[102] the objective of its annual meeting was to raise awareness on challenges of forests and forest communication and to find common ground for evidence-based communication on forest matters referring to global frameworks such as Sustainable Development Goals and the UN Strategic Plan for Forests 2017-30. The Joint Session adopted an Integrated Programme for Work (2018-2021), organised around the work areas (i) data, monitoring, reporting and assessment, (ii) policy dialogue and advice, (iii) communication and outreach, and (iv) capacity-building.

The respective action in the Forest MAP can be considered as partly implemented. It will continue until 2020.

9.1.5. Further assess public perception of forests

Knowing about the public perception on forests, its services, and forest-based products is a long-lasting and relevant issue for targeted raising of awareness on forest. In this respect, one activity, a Eurobarometer study to assess public perception on forests (Eurobarometer 440 on the Common Agricultural Policy) was implemented and made publicly available in 2016 by the European Commission.[103] According to this study, most respondents perceived the absorption of carbon dioxide to fight climate change (66%) and the provision of natural habitats (63%) as the most important benefits of forests. To date, several additional studies addressed the role of wood products, the forest sector and their public perceptions from different angles (e.g., Ranacher et al., 2017). Evidence from older work (e.g. Rametsteiner 2009) indicates that European citizen's mostly value forests for being "nature", but not consider the wood-based sector. This is also stressed in the EU Forest Communication Strategy, when it is emphasized that "*while most EU citizens support more active management, harvesting and management are seen as being some of the biggest threats to our forests*". The perception of forests and forestry within the public and key decision makers outside of the forest sector must be assumed not having changed significantly. The Wood Wisdom ERA-NET project W³B confirmed similar perception gaps in four European countries comparing answers from respondents with and without forest sector involvement, indicating potential drawbacks in individuals' response to forest-based sector communication.[104]

The respective action in the Forest MAP can be considered as formally implemented, though updates will be needed.

1.1.1.1.Events and information campaigns

It is difficult to systematically assess, how public information about forests and wood in the Member States and the forest-based sector was made available, as no collective data basis or publicly available webpage summarizes this information. However, a great variety of events and campaigns could be observed indicating progress in this field. They include, e.g. Scientific events and presentations (e.g., Horizon 2020 DIABOLO expert workshop in February 2018,[105] EFI ThinkForest events);[106] events organised by the European Commission

[102] See http://www.unece.org/index.php?id=44991.
[103] See https://data.europa.eu/euodp/data/dataset/S2087_84_2_440_ENG.
[104] See http://www.wood-w3b.eu/.
[105] See http://diabolo-project.eu/improving-communication-exchange-forest-information/.
[106] See https://www.efi.int/policysupport/thinkforest.

(e.g., Beyond Wood 2016, Conferences on deforestation 2017);[107] events organised by Members of the Parliament (MEPs) in the inter-service group on Climate Change, Biodiversity and Sustainable Development (e.g., Managing Forests for Sustainable Wood in 2016, Forest-based Bio economy and EU's Bio economy Strategy in 2017) and individual MEPs (e.g., Club du Bois); annually organised events by stakeholders (e.g. European Paper Week organised by CEPI, State Forest Conference organised by EUSTAFOR and the CEPF General Assembly); information campaigns, (e.g., Keep-me-posted, two-sides);[108] advocacy campaigns (e.g., FERN and its campaign on the Białowieża forest, WWF campaign on deforestation and lungs);[109] award ceremonies (e.g., European Natura 2000 Citizen's Award, Blue sky award);[110] and exhibitions (e.g., Forest City project; placing a wooden bench in park that stores 1 ton of CO^2). In addition, through individual and joint position papers, stakeholders aim to lobby decision-makers such as members of the European Commission, Parliament, EU Presidency and Member States. Those different forest-related events and campaigns are targeted to various audiences including policy-makers, researchers and the public.

The according Forest MAP action can be considered as partly implemented and ongoing.

[107] See http://ec.europa.eu/environment/forests/conference.htm; and http://ec.europa.eu/environment/forests/-conf_21_06_2017.htm.
[108] See http://www.keepmeposteduk.com/; and https://www.twosides.info/.
[109] See https://www.treedom.net/en/blog/post/wwf-campaign-deforestation-and-lungs-352.
[110] See http://www.icfpa.org/who-we-are/blue-sky-young-researcher-and-innovation-award.

9.2. Achievements and effects

The EU Forest Strategy and the Forest MAP, which leave leeway to Member States on how to achieve common goals, are important because they assemble Member States and Commission representatives with EU stakeholders around relevant topics, which affect forestry.

The Strategic Orientation to ensure that the SFC's work builds on forest relevant EU policies and to better coordinate forest-related activities to achieve policy coherence can be considered as partly effective: The Forest MAP has been set up to specify the main actions for the designed period. According to the meeting minutes, the SFC has foremost been used to share information and discuss on ongoing forest-related activities and to provide advice to the Commission on forest-related matters. Since 2017, and due to change of comitology rules, the SFC serves as an expert group that has no coordinating Committee function anymore. The Council Decision of 1989, however, establishing the SFC remains valid and the remit of the Committee established in the Decision has not been changed

As tangible output, the SFC has elaborated opinions, guidance and recommendations. For example, during the review process of EU Renewable Energy Directive, interviewed experts pointed to the effective input of the SFC with regards to sustainability criteria for solid biomass, including wood. Other experts pointed to the effective national bottom-up input, e.g. with regards to the establishment of integrative forest management pilots to drive EU-wide action, discussing and exchanging lessons-learnt in one Priority Area of the EU Forest Strategy. According to most interviewed experts, policy options for better coordination on SFM forest information harmonisation and cooperation between MS and the Commission were explored in not so great detail thus far. Also, the further developments on a Legally Binding Agreement on Forests are still pending.

The existence of the SFC Annual Work Plan for 2018 provides evidence for coordination activities within the Commission and with Member States. It builds on the Forest MAP and facilitates discussions on all relevant forest-related EU policies, including e.g. research, environment, industry, trade, and international cooperation. Work Plans draw attention to issues to be discussed in that year (e.g., review of the EU Forest Strategy, evaluation of forestry measures under rural development). Clear targets as specified in the Forest MAP are, however, not included in the SFC annual work programme .

Coordination also relates to information issues. Foremost, NFI harmonisation remains a major challenge. Despite slow progress with regards to instruments such as the European Forest Bureau Network, several research and expert-based initiatives have concentrated their efforts on increasing the supply of forest information and improving the quality and harmonization of data collection and reporting (e.g., Alberdi et al., 2016, Gschwantner et al., 2016). Their objectives were to enable monitoring of SFM progress and to meet the increasingly diversified forest-related reporting requirements at international and EU levels (Vidal et al., 2016). These efforts had been facilitated by the clear formulation of a need in this respect through the EU Forest Strategy and supported by funding of the Horizon 2020 Research and Innovation Programme. The knowledge transfer to a wider public, and intelligence on how the public responds to such information can be considered as initialised.

The action taken by the European Commission to get insights into how the public perceives the role of forests through a Eurobarometer survey has contributed successfully to get a better understanding on what are perceived benefits provided by forests,.

Finally raising awareness, knowledge, and visibility of sub-sectoral issues works in different ways. This comprises for instance from knowledge exchange on different levels via scientific conferences, expert meetings and events organised by and in the European Parliament, the European Commission and stakeholders. However, to date, no systematic assessment is available to determine how these activities effect the image of the forest-based sector. This means that it remains unclear as to how Member States have proceeded to assess further public perceptions of forests. Additional efforts will be needed to bring clarity into the question of public perceptions.

The survey results, conducted for the purpose of this study, furthermore suggest a disparity between the perceived impact from Priority Area 7 on the implementation of the EU Forest Strategy among stakeholders and Member States. Member States view progress rather positively, indicating a high degree of impact, while inputs from stakeholders rather suggest a low impact.

9.3. Gap analysis

The SFC has its merits in terms of achieving multi-level coherence, such as improving coordination and communication between Commission Services and Member States. However, horizontal activities across sectors affecting the forest-based sector rarely occur through the SFC. This can be explained by the fact that SFC mandate, up to 2017, was to advice on specific forestry measures and as an ad-hoc consultation forum for the development of forest-related policy measures and a venue of information exchange. Since 2017 the SFC's main mission is providing advice to the Commission on forest related matters . While the active coordination efforts led to more coherence of activities, it does, however, not necessarily lead to improving policy coherence within the EU and Member States forest-related policies.

MS survey results provide concerned indications that the former co-chair of the SFC is not any longer regularly contributing to and co-chairing meetings, and despite everyone being invited to attend.

Institutional changes could strengthen the work and outcomes of the SFC. This could, for example, include the timely establishment of specific (inter-sectoral) working groups on certain key forest policy issues for reaching out to other sectors and improve coherence of forest-relevant policy-making. In this respects, Joint Meetings of the SFC chaired by DG AGRI and the Coordination Group Biodiversity and Nature chaired by DG ENV[111] could be organised. Individual insights from the MS survey and interviews for this study also indicate that the link between the work of the SFC and the Council Working Party on Forests could be further explored for finding fruitful fields of coordinated work.

The SFC is well recognised for facilitating information exchange between Member State. Its political impact could be increased by stronger organisation and increased commitment of MS. This could embrace improvement of meetings by enhanced participation including also scientists, more dynamic exchange of views and experiences broadening the agenda, making use of concept papers and background studies, and being open for more cross-sectoral issues. Providing further forest-related technical and expert opinions as a solid basis for political

[111] See http://ec.europa.eu/transparency/regexpert/index.cfm?do=groupDetail.groupMeeting&meetingId=3651

deliberations and decision-taking in time, including to other relevant committees (e.g., on energy, climate, biodiversity topics) could contribute to the improvement of coordination.

Survey results further indicate that new approaches are needed to address the varied objectives of multi-functional forestry. For instance, generally, SFC meetings consider EU policy domains separately, such as discussions on the EU Biodiversity Strategy, while interactions that include several policy domains are rare. A potential guideline to address this gap could be the OECD framework for Policy Coherence in Sustainable Development (OECD, 2016).

As regards improved harmonised forest information despite various initiatives (e.g., ENFIN) and achievements in the past 10 years, different gaps exist on the way to full forest data harmonization., as concluded by a recent DIABOLO EU expert and stakeholder workshop. The Criteria and Indicators for SFM were considered a good starting point for monitoring purposes, but it was noted that also economic, informational and maybe legal instruments at the EU and Member States levels are needed to harmonise forest information and SFM coordination processes. Overall, an ongoing demand for more comprehensive forest information at both EU and national levels was identified. There are also important knowledge gaps with regards to the institutional and technical barriers for forest information exchange and harmonisation in Europe, and on ways and means (policies, funding, knowledge exchange, technical innovation) for better forest information exchange across levels (between EU and Member States) and sectors (forestry, climate, biodiversity, bioenergy, agriculture, rural development).

Finally, it can be noted that public perception of forests and the forest-based sector may require additional attention, in particular in light of recent policy developments affecting forests. For instance, systematic efforts to address public opinion through forest-related campaigns (e.g., Eurobarometer) could be thought of. While communication demands seem to have increased, advocacy and outreach activities remain fragmented across the forest-based sector and Member States. Further actions to reach relevant target groups and the general public could by ways forward.

10. FORESTS FROM A GLOBAL PERSPECTIVE

According to the FAO Global Forest Resources Assessment 2015, the rate of deforestation is still high and the reported natural forest area continues to decrease by a net 6.5 million ha per year (FAO, 2015). Commercial agriculture is estimated to account for 80% of deforestation worldwide (Kissinger et al., 2012). Deforestation is responsible for around 20 per cent of global CO_2 emissions, making it a major contributor to climate change[112]. Additionally, Baccini et al. (2017) demonstrated that forest degradation is a so far underestimated and crucial factor in climate change, accounting for 68.9% of overall carbon losses in the tropics. This makes it evident that global activities with regard to halting deforestation and forest degradation as well as promoting the sustainable management of forests are important topics on a global scale and hence also for the EU. The Strategic Orientations addressed by this Priority Area consequently aim at ensuring consistency of forest-related commitments at the international level, promoting Sustainable Forest Management (SFM), and the role of forests in the transition to a green economy in the context of EU development cooperation and external action. It furthermore addresses trade-related forest matters to help combat deforestation and forest degradation at the international level. This includes a better understanding of the impact of EU consumption with regards to deforestation and forest degradation at the international level.

10.1. State of implementation

10.1.1. Ensure consistency between EU and Member State policies and commitments on forest-related issues at international level; promote sustainable forest management across Europe and globally

1.1.1.1. Continued active involvement of the EU in relevant international forest-related multilateral fora at the global and regional level

The EU actively participates in relevant international forest-related multilateral fora at the global level (UNFF, FAO COFO, ITTO, UNFCCC, CBD, CITES, UNCCD UN-DESA/DSD,) through related Directorates-General (DGs), such as DG AGRI, DG ENV, DG CLIMA, DG DEVCO, and Member States. This includes, but is not limited to, 2 UNFF sessions (2015 and 2017), 3 COFO sessions (2014, 2016 and 2018), 5 Sessions of the ITTC (2013 to 2017), 5 Conference of the Party meetings of UNFCCC (2013 to 2017), 2 COPs of the CBD (2014 and 2016), 2 COPs of UNCCD (2015-2017), 1 COP meeting of CITES (2016) and the multiple events of the FOREST EUROPE process (2013-2018), including the Ministerial Conference in October 2015 as well as numerous Expert Level, Roundtable, and Expert Group meetings. The active involvement in relevant international and regional forest-related multilateral fora shows continued commitment by the EU and its Member States.

Official positions of the EU and its Member States are coordinated prior to the meetings, at the Council of the EU. Additional and/or amended positions are formulated on the spot when necessary. There is supporting evidence also from interviews to conclude that coordination for forest-related international and regional meetings among Commission Services and Member States takes place in a systematic way, and that the EU is continuously involved also in leading positions in relevant fora. Hence, the continuous implementation of the action is ongoing.

[112] http://ec.europa.eu/environment/forests/deforestation.htm

1.1.1.2. Enhanced consistency between EU and Member States policies and objectives/commitments on forest-related issues at international level

The international forest-related positions of the EU and its Member States are prepared in different working parties, known as the preparatory bodies of the Council of the European Union:

- The Council Working Party on Forestry (WPF) prepares the EU positions for the international meetings of the United Nations Forum on Forests (UNFF), FAO COFO and FOREST EUROPE.
- The Working Party on International Environmental Issues prepares the EU positions in relation to environmental and climate change related issues including sustainable development goals. It covers meetings of the United Nations (UN), including the United Nations Environment Programme (UNEP), the United Nations Framework Convention on Climate Change (UNFCCC), the United Nations Convention on Biological Diversity (CBD) and the United Nations Economic Commission for Europe (UNECE).
- The Working Party on Commodities (PROBA) prepares positions for the International Tropical Timber Council (ITTC) of the International Tropical Timber Organisation (ITTO).

For most forest-related multi-lateral and regional meetings, Council Conclusions are developed that represent the common position of the EU and its Member States. This shows a mutual coordination effort for forest-related topics based on shared or exclusive competences (Wydra, 2013). EU Member State representatives, Commission Services, and the European External Action Services, exchange on related positions and develop common positions for regional and international forest-related meetings. For example, EU common standpoints are accessible through the EU Delegation to the UN homepage (e.g., EU and Member States statements for UNFF11 and UNFF12) and the FOREST EUROPE's forest negotiations webpage regarding the Legally-binding Agreement negotiation. These coordinated responses suggest that there is enhanced consistency between the EU and Member States policies and objectives/commitments on forest-related issues at international level. This is supported by a recent assessment of the EU's performance in UNFF, which suggests that the EU achieved most of its predefined objectives (Delreux et al., 2017).

It should be noted that ongoing coordination efforts within the EU is complex, with some, but limited evidence on this subject gained from SFC Opinions and Civil Dialogue Group on Forestry and Cork (CDGFC) Resolutions, Council Conclusions, meeting reports and minutes. In total, it makes it difficult to assess whether the consistency between EU and Member States policies and objectives/commitments has been enhanced. The planned action, however, is ongoing and continuously implemented.

1.1.1.3. Possible ways to find common ground on the Legally Binding Agreement on Forests

Since no final agreement on a Legally Binding Agreement on Forests could be reached within FOREST EUROPE until 2015, the extra-ordinary Ministerial Conference in October 2015[113] Stated that "at an appropriate time and at latest by 2020, we will explore possible ways to find common ground on the Legally Binding Agreement.". The upcoming roundtable meeting will take place 19-20 September 2018, organised by the FOREST EUROPE Liaison Unit Bratislava. [114] The agenda includes exchanging views concerning all options for the procedural follow-up of the Madrid Extraordinary Ministerial Decision as well as on general

[113] See http://foresteurope.org/ministerial-commitments/
[114] See http://foresteurope.org/event/13675/

positions/views of signatories and observers towards a Legally Binding Agreement on Forests in Europe. The Council Working Party on Forestry has continued to exchange views among its members to prepare the EU positions for the FOREST EUROPE Round Table Meeting, thus rendering this action as ongoing.

10.1.2. Ensure continued support for global efforts to fight illegal logging through the FLEGT action Plan

1.1.1.1.Review of the EU Timber Regulation

The evaluation of the EU Timber Regulation (EUTR) was published in 2016 (European Commission, 2016e, Regulation, 995/2010). It covers the first two years of implementation and the main information source was the individual Biennial Member States' reports on the application of the EUTR and an analysis carried out by independent consultants. The review was also based on inputs received through a public consultation and direct contacts with a broad range of stakeholders, including the private sector and civil society.[115]

The following outputs/outcomes were achieved:

- EUTR Implementation Report (European Commission, 2016i)
- Evaluation of the EUTR (European Commission, 2016e).
- Final report by external consultants/contractors (Indufor et al., 2016).

The evaluation concluded in short that EUTR implementation showed progress to combat illegal logging and associated trade in illegal timber in the first two years, but more effort is needed from Member States and the private sector to ensure an effective and efficient application of the EUTR.

The Council has also adopted conclusions on the evaluation of the EUTR.[116]

The action can be considered as fully implemented.

1.1.1.2.Evaluation of the EU FLEGT action Plan (2003-2014)

The Commission undertook an evaluation of the FLEGT action Plan (European Commission, 2016f), on the basis of an independent evaluation report entitled Evaluation of the EU Forest Law Enforcement Governance and Trade (FLEGT) action Plan 2003-2014 was published in 2016 (Terea et al., 2016) . FLEGT related Council conclusions were adopted[117]. Furthermore, the European Court of Auditors (ECA) carried out a performance audit in 2015 that focused on EU support to timber‑producing countries under the FLEGT action Plan (European Court of Auditors, 2015), also shedding light on the implementation status of relating actions.

The independent evaluation report covers the 2003-2014 period of implementation of the EU FLEGT action Plan (European Commission, 2003). The report assesses progress and achievements in implementation and shortcomings and gaps. The overall evaluation was based on a wide-ranging consultation process that included the evaluation undertaken by an external consultant, surveys, single and multi-stakeholder workshops, targeted interviews, as well as unsolicited inputs from stakeholders. It concluded, amongst other things, that the EU

[115] See http://ec.europa.eu/environment/consultations/eutr_en.htm.
[116] See http://data.consilium.europa.eu/doc/document/ST-10721-2016-INIT/en/pdf.
[117] See http://data.consilium.europa.eu/doc/document/ST-10721-2016-INIT/en/pdf.

FLEGT action Plan continues to be fully relevant, but needs to address new challenges, particularly with regard to deforestation and forest conversion. The report concluded inter alia that there have been advancements in governance structures, trade agreements, and a decreased demand for illegal timber, while monitoring and implementation of VPAs remains still complex, and coordination and commitment require additional efforts taking into respect context change and new drivers for deforestation. The action, thus, was fully implemented.

1.1.1.3.Negotiation and implementation of FLEGT Voluntary Partnership Agreements (VPAs) between the EU and producer countries

The Council of Ministers of the EU gave the European Commission a mandate to conduct negotiations in view of concluding FLEGT Voluntary Partnership Agreements (VPA). While the European Commission is leading these negotiations, Member States play a key role in supporting the negotiations and implementation. The first VPA signed was with Ghana in 2009, then the Republic of the Congo and Cameroon in 2010, followed by the Central African Republic and Liberia in 2011 and Indonesia in 2013. These VPA were therefore established prior to the new EU Forest Strategy.

After the adoption of the EU Forest Strategy, Indonesia became the first country that started issuing FLEGT Licenses in 2016. The Republic of Congo, Ghana, Cameroon, the Central African Republic and Liberia are currently implementing their VPAs by developing a Timber Legality Assurance System and conducting legal and governance reforms. The EU also concluded negotiations for a VPA with Vietnam in 2017 and Honduras in 2018. While these agreements are still in the process of ratification, preparations for implementation are already ongoing. Negotiations are still ongoing with seven additional timber producer countries, including Ivory Coast, Democratic Republic of the Congo, Gabon, Guyana, Laos, Malaysia and Thailand.[118] The action is, thus, recurrent and ongoing.

1.1.1.4.Support to producer countries for FLEGT implementation

The ECA has examined the adequacy of the Commissions support to timber-producing countries to address illegal logging and associated trade (European Court of Auditors, 2015). Its report mentions that the "*Commission conceived the FLEGT action plan in an innovative way and identified the possible measures to be taken. However, it did not devise an appropriate work plan with clear objectives, milestones and a dedicated budget*" (p.7). The report further argues that assistance was not accompanied by clear criteria and that the "*impact of the aid was diluted*" (p.7) because of the many countries involved. This would suggest that more efforts are needed to develop assistance towards implementation of the action Plan.

However, it should also be noted that according to some interviewed experts, the above-noted evaluation report has also led the Commission Services to reconsider their approach as how to implement FLEGT/VPA activities and to apply a more targeted approach with regard to individual country contexts. I 2017 they organised a stakeholder conference 'Tackling deforestation & illegal logging: progress made and opportunities for future action' to present reviews and key recommendations from the evaluation and an update on the evaluation follow-up actions by the European Commission. The conference concluded that the FLEGT action Plan has succeeded in fostering partnerships and transparency, but might need more

[118] See http://www.euflegt.efi.int/where-we-work.

flexible approaches in the future, while financing and financial engineering to stipulate investments into forestry remain a challenge.

Overall, the EU FLEGT Facility[119] maintains an interactive map of FLEGT-relevant development projects funded by international donors, including EU Member States and others.[120] The map, created in 2015 as a response from the Commission, is an interactive tool, which serves for sharing information and coordinating action in support of the EU FLEGT action Plan. It provides information on all, past and ongoing, FLEGT related projects, including detailed information on project objectives, progress, budgets and participants. Even though the map works as an instrument, it should be noted, that some donors do not adequately update their project information.

Other important activities include the inclusion of timber legality requirements in public procurement policies; further developments of Bilateral Cooperation Mechanism on Forests (BCM) with China; and a draft FLEGT work plan that was shared by the European Commission with its Member States. The latter aims to be a monitoring tool and is currently being prepared. Due to the concluded as well as ongoing activities, this action can be considered as ongoing.

10.1.3. Support developing countries in their efforts to improve forest policies and regulations, strengthen forest governance, value and monitor forest ecosystems, and address the drivers of deforestation and forest degradation through REDD+.

1.1.1.1. Feasibility study on a possible EU action plan on deforestation and forest degradation and consider possible follow-up in line with 7th EAP

The feasibility study[121] was completed and reviews relevant EU policies, legislation and initiatives and ongoing international and regional efforts by private sector, governments and civil society. Building on a problem analysis, the report makes suggestions on the framing of a possible EU initiative to tackle deforestation and its root causes and drivers. This includes proposed specific objectives and a range of potential EU interventions tackling different dimension of the problem (supply and demand side drivers, as well as the role of finance & investments). All identified interventions are assessed against a shared set of assessment criteria: feasibility and effectiveness; political acceptability, technical complexity; and administrative costs. A key conclusion of the study is that given the complexity of the problem, any potential EU initiative should consider a package of interventions which addresses the supply, demand and finance dimensions, building on and reinforcing existing EU action as well as government and private sector commitments on zero deforestation and other relevant international initiatives.

The analysis is circulated in two reports that were published in 2018 as (COWI., 2018a) and (COWI, 2018b).

These reports are a follow-up action to a study on the impact of EU consumption on deforestation (Vito et al., 2013a) with the overall aim to define and assess policy options available to step up EU action on deforestation and forest degradation. In parallel, the Commission has completed a study on the environmental impact of palm oil consumption and

[119] See http://www.euflegt.efi.int/es/home
[120] See http://www.flegt.org/map-of-projects
[121] http://ec.europa.eu/environment/forests/studies_EUaction_deforestation_palm_oil.htm

on existing sustainability standards[122], with a view to strengthening the knowledge base on a subject of continuing public debates both at EU level and in many Member States (Barthel et al., 2018).

The action, even though delayed, has been fully completed. The European Commission is currently still considering whether and how it will follow-up on the feasibility study on options on stepping up EU action against deforestation and forest degradation.

1.1.1.2. Follow-up to Commission Communication COM(2014)64 on the "EU Approach against Wildlife Trafficking" and related stakeholders consultations

The follow-up to the Commission Communication on the EU Approach against Wildlife Trafficking has resulted in the adoption of the EU Action Plan against Wildlife Trafficking (European Commission, 2016d). It sets out a comprehensive blueprint for joint efforts to fight wildlife crime inside the EU, and for strengthening the EU's role in the global fight against these illegal activities. It includes a Commission Staff Working Document –'Analysis and Evidence in support of the EU action Plan against Wildlife Trafficking' published in 2016 (European Commission, 2016a). The work included broad stakeholder consultations and an Expert Conference on the EU Approach against Wildlife Trafficking. It can also be noted that the study 'Strengthening cooperation with business sectors against illegal trade in wildlife' was also taken into account in the development of the action Plan (Smithers et al., 2015). The overall objective of this study was to provide the European Commission's (EC) Directorate-General for the Environment with input and ideas for further developing cooperation with relevant business sectors in order to prevent the Illegal Wildlife Trafficking. The action can be considered as fully implemented.

1.1.1.3. Other actions of strategic importance under the Strategic Orientation

Related activities in support of the implementation of these Strategic Orientations include the ongoing implementation of the EU FLEGT action Plan, the EU Timber Regulation and VPAs, the technical and financial support provided through EU development cooperation with regard to the EUTR, REDD+ activities and technical and financial support provided through EU and especially Member States' development cooperation. Those have directly and indirectly helped to strengthen forest polices, laws as well as law enforcement in several selected countries, including through applying a structured approach for civil society participation. Besides this, the EU cooperates with a number of international, national and regional organisations and programmes to support developing countries efforts in this area, including through the EU REDD Facility[123]; the United Nations' REDD Programme; the World Bank's Forest Carbon Partnership Facility; ReCaREDD - Strengthening national and regional capacities for reporting on mitigation actions in the forest sector - and various NGOs and community organisations in developing countries (e.g., Non-State Actors Participation in Forest Governance, FLEGT and REDD+ which covers 6 regions in Africa, Asia, Latin America). There is no formal coordination with Member States regarding the implementation and support of REDD+ activities. The Commission, under the lead of DG CLIMA, is currently conducting a study on EU Financing of REDD Readiness Activities, and Results-Based Payments Pre and Post-2020: Sources, Cost-Effectiveness and Fair Allocation of

[122] http://ec.europa.eu/environment/forests/studies_EUaction_deforestation_palm_oil.htm

[123] Funded by the European Union and the Governments of France, Germany, Ireland, Spain and the United Kingdom.

Incentives. The Commission has also financed phase one and two of the Global Comparative Study on REDD+.[124]

10.1.4. Assess the environmental impact of EU consumption of products and raw materials likely to contribute to deforestation and forest degradation outside EU

A study on *The impact of EU consumption on deforestation: Comprehensive analysis of the impact of EU consumption on deforestation* was published in 2013.[125] The study comes in three parts, including an analysis of the impact of EU consumption on deforestation (Vito et al., 2013a), the identification of critical areas where policies and legislation could be reviewed (Vito et al., 2013b) and a proposal of specific Community policy, legislative measures and other initiatives for further consideration by the Commission (Vito et al., 2013c). The key results are that the majority of crops and livestock products associated with deforestation in the countries of origin are consumed at local or regional level, and are not traded internationally. In quantitative terms, 33% of crops and 8% of livestock products (with embodied deforestation) are traded outside the countries or regions of production. Of the portion which is traded internationally, the EU 27 imported and consumed 36% of crops and livestock products associated with deforestation in the countries of origin. This is equivalent to the import and consumption in the EU of a deforested land area of 9 million ha over the period 1990-2008. If we refer to the global consumption of agricultural and livestock commodities with subsumed deforestation, i.e. including also domestic and regional consumption, the impact of EU consumption is 7%. This figure can increase up to 10% if all finally processed products and all consumption sectors are added on (i.e. textile, service sectors, etc.) Consumption of oil crops - such as soy and palm oil - and their derived processed goods, as well as meat consumption play a major role in the impact of EU consumption on global deforestation (ibid.). These are comprehensively assessed in the study, and the action can thus be considered as fully implemented.

1.1.1.1. Study on the environmental implications of the increased reliance of the EU on biomass for energy imported from North America

The study – Environmental Implications of Increased Reliance of the EU on Biomass from the South East US – was published in 2016 (Strange Olesen et al., 2016). The Commission had asked for a study "to provide (the Commission) with a better understanding of the production of wood-based biomass for energy in the US and its environmental and policy implications, including the relevant regulatory and non-regulatory initiatives underway as regards sustainability aspects." The study assessed implications for biodiversity, forest area, greenhouse gas (GHG) emissions and resource efficiency in the case study area as they can be linked to the increased EU demand.

The perceived environmental implications in forest areas of the South East US were assessed and four typical effects concerning changes to management of forests and land and to market wood markets in the US were identified. When these effects are matched with EU policy objectives, it appears that biodiversity loss, deforestation and forest degradation, not meeting greenhouse gas performance and reduced resource efficiency can constitute EU policy risks. To identify appropriate EU responses to these risks, 12 intervention tools are considered,

[124] See https://www.cifor.org/gcs/partners/funding-partners/.
[125] https://publications.europa.eu/en/publication-detail/-/publication/c1d3ef3e-d07e-4229-91e5-41001b47dba8/language-en

related to external policy constraints and considerations of cost, effectiveness, administrative burden, policy coherence and innovation. Hence, the action is fully implemented.

1.1.1.2. Other actions of strategic importance under this Strategic Orientation

Other important activities include the legislative proposal for a directive on the promotion of the use of energy from renewable sources (recast) (European Commission, 2016g), which was published as part of the comprehensive Clean Energy for All Europeans package (European Commission, 2016c). The proposed legislation included, amongst other things, an impact assessment on bioenergy sustainability policy (European Commission, 2016j). It can also be noted that the proposed revision of the Renewable Energy Directive introduces EU wide sustainability criteria for biomass that include forest and proposes to utilize a risk-based approach that builds on existing legislation, and tools to assess the sustainability of forest biomass with regards to requirements related to forest management, LULUCF accounting and GHG emission savings.

Section 14.3 summarises the detailed state of implementation of actions under this Priority Area.

10.2. Achievements and effects

The EU has continued to be involved in relevant forest-related multi-lateral fora at the global and pan-European level.

Progress under Priority Area 8, and associated Strategic Orientations, is demonstrated with respect to tackling illegal logging and associated trade. Awareness of problems within the EU and developing countries has been raised (e.g., through relevant evaluation reports), which appears to have facilitated a more effective and efficient approach towards the implementation of the EU Forest Strategy objectives. For instance, according to the EU Timber Regulation evaluation "*the Regulation has encouraged more responsible sourcing policies and, therefore, demonstrated its potential to change operators' market behaviour and establish supply chains free of illegally harvested timber.*" (European Commission, 2016e, p.6). Similarly, the Commission report on the comprehensive evaluation of the FLEGT Action Plan [126] summarised that " *the FLEGT Action Plan has been effective in achieving its main objectives: it has raised awareness of the problem of illegal logging at all levels, it has contributed significantly to improved forest governance globally and particularly in targeted countries, and to a reduced demand for illegal timber in the EU. (…) Initiatives developed to support producer countries in the VPA context have, overall, produced good results in terms of improved governance, especially through the establishment of effective multi-stakeholder participation processes, capacity building, increased transparency, awareness-raising and policy dialogue."*

However, in relation to the Forest MAP action on supporting producer countries for FLEGT implementation, the ECA special report has noted that EU support to timber-producing countries was not sufficiently effective (p.7). Given the remaining implementation period for the EU Forest Strategy, it is however still too early to conclude definitively that the FLEGT implementation has not contributed efficiently and effectively towards the Strategic Orientations and objectives of the EU Forest Strategy.

[126] https://ec.europa.eu/europeaid/sites/devco/files/staff-working-document-2016-275-f1_en.pdf

In the context of this strategic orientation, the recent ITTO study on market impact of VPAs also mentions that it is too early to assess the scale or direction of the impact on EU supply of timber from VPA countries, but that a positive trend is expected (Oliver, 2015). Even more, according to the NGO FERN and Loggingoff, the EUTR can also stipulate positive developments in legal amendments even in non-VPA countries such as Myanmar[127]. Additionally, they consider the efforts of the Commission positively, specifically with regard to proactively motivate Member States for more action.

10.3. Gap analysis

The new policy context at the international level is marked by the Agenda 2030 for Sustainable Development and its Sustainable Development Goals (SDGs), together with the UN Strategic Plan for Forests 2017-2030, the Paris Agreement, the Cancun Declaration of COP 13 of the Convention on Biological Diversity, or instruments still awaiting complete signature by EU and UN MS such as New York Declaration on Forests (2014), the Amsterdam Declaration 'Towards Eliminating Deforestation from Agricultural Commodity Chains with European Countries' (2015) and the Amsterdam Declaration in Support of a Fully Sustainable Palm Oil Supply Chain by 2020 (2015). Their forest-related objectives are summarised in a table (see section 14.3) and assessed in relation to the Strategic Orientations. The EU Forest Strategy and its Forest MAP actions remain relevant in this new policy context. Two issues however become evident from the comparison. First, the EU and its Member States hold global responsibility for forest biodiversity loss, but this topic is only addressed indirectly through the Strategic Orientation on the environmental impact of EU consumption on deforestation and forest degradation. Second, it is relevant to note that the importance of private sector commitments to halting deforestation and forest degradation is not addressed by the actions under the EU Forest Strategy.

In relation to the promotion of SFM outside of the EU it can be noted that the respective action outlined in the Forest MAP relates explicitly to the Legally Binding Agreement on Forests but global forest (landscape) restoration and forest biodiversity protection globally for instance are not addressed. Furthermore, the objectives of the EU FLEGT AP are like those outlined in SDG 15 and the goal 2 and 3 of the UN Strategic Plan for Forests 2017-2030. The new policy context suggests that the debate should be open to forest-related global problems. The analysis shows that consumption of forest products is but one driver of deforestation, while in a changing global context agricultural production and associated global trade have increasing impacts on deforestation and forest degradation. Also, the EUTR evaluation has identified a need to better reflect this changing context and drivers.

The idea of zero-deforestation commodity supply chains[128] was recently added to the policy agenda, aiming to achieve that by 2020 not only forest products, but also agricultural and land-use changes for agricultural purposes should be considered as main drivers of deforestation, despite not being taken up by the EU yet. To this can be added that even though SFM has become the international core principle, both in global and regional contexts, principles of mitigation and adaptation with regards to climate change have been added to international agreements. For instance, Decision 16 on REDD+[129] agreed on at the COP 21 of the UNFCCC convention considers the need for "*alternative policy approaches, such as joint*

[127] https://loggingoff.info/wp-content/uploads/2018/06/VPA-Update-June-2018.pdf
[128] https://climatefocus.com/publications/zero-deforestation-commodity-supply-chains-2020-are-we-winning
[129] https://redd.unfccc.int/fact-sheets/unfccc-documents-relevant-for-redd.html

mitigation and adaptation approaches for the integral and sustainable management of forests", which might well relate to Priority Area 8 in an emerging policy context.

It is also worthily taking note of the ECA performance and compliance audit report. Whilst approving the aims of the FLEGT Action Plan to diminish environmental damage and loss of biodiversity caused by illegal logging, it was criticised as to how the Action Plan was implemented. In its conclusions it was said, that the support provided to timber-producing countries was not well managed by the European Commission, because of ill design and targeting. It further said that the Commission did not devise an appropriate work plan with clear objectives, milestones and a dedicated budget. The ECA also highlighted that no FLEGT licensing system was in place (at the time of the audit) and monitoring was considered unsatisfactory. Even though parts of the recommendations are currently being implemented already (FLEGT licensing, FLEGT AP work plan final draft shared with Member States, monitoring activities and tools being developed by ITTO, CIFOR, FAO and EFI), it will require ongoing attention for the future.

The topic of environmental change does not always permeate the lingo of various EU funding instruments (e.g., bilateral programmes, Partnership Instrument). This is an area of concern not only since climate change is rarely a priority issue, but also because existing priority sectors (e.g., sustainable agriculture) will require attention to trade-offs and impacts on forest protection. Therefore, mainstreaming climate change into forestry, trade, and agriculture, while also highlighting the importance of forests for food security, climate change mitigation and adaptation, water and soil protection, occupation and jobs, development, peace and security, health and migration might want to follow a more targeted approach at the national and EU levels. The creation of the Environment and Climate Change Mainstreaming Facility at DG DEVCO of the European Commission already contributes in this direction.

11. INVOLVEMENT AND PARTICIPATION: THE ROLE OF POLICY-MAKERS AND STAKEHOLDERS

The following section addresses the second question Q2 on stakeholder and policymaker involvement in implementation, as set out by the EU Forest Strategy. The involvement and participation by stakeholders, be they private or public, is essential for a balanced development of forest-related policy, programmes and regulatory frameworks affecting forests (Zingerli et al., 2004, Sotirov et al., 2015, Kleinschmit et al., 2018). Participation can, amongst other things, help to open new opportunities that improve relations with the public, enhance investment in Sustainable Forest Management, and facilitate new perspective and demands for forest products and services. It is for these reasons that coordination and communication feature prominently as a distinct working area in the EU Forest Strategy.

Generally, a fundamental and early-stage involvement of appropriate policy makers and stakeholders is reflected in the fact that three bodies have been involved in developing the list of actions in the Forest MAP, which also names appropriate actors and stakeholders for subsequent implementation. These three bodies are the Standing Forestry Committee (SFC), the Civil Dialogue Group on Forestry and Cork (CDGFC), and the Expert Group on Forest-based Industries and Sectorally Related Issues, representing a wide range of societal perspectives and interests at the EU level. The Expert Group on Forest-based Industries and Sectorally Related Issues involves a wide range of stakeholder representatives (e.g., from trade, business associations and NGOs) as well as Member States and Commission representatives as appropriate actors. Likewise, the SFC in accordance with the Council conclusions provides member State representatives an important role as appropriate actors in forest policy, and facilitates cooperation and coordination with the appropriate Commission services on forest-related policy issues at EU level. Lastly, the CDGFC provides for an institutionalised mechanism through which various stakeholder contributions can be voiced and appropriately considered under the EU Forest Strategy. Hence, the EU Forest Strategy and its implementation generally is designed making a fundamental and positive contribution towards addressing and involving appropriate policy makers and stakeholders.

11.1. Thematic assessment of participation and involvement

The EU Forest Strategy as well as the Forest MAP foresee a) specific roles for policy makers, and at times for stakeholders, for each of the actions. Moreover, b) different specific forms and aspects of participation and involvement between policy makers and stakeholders might have occurred under each of the Priority Areas and the various actions. Hence, this section analyses both aspects, before the following section presents more broad and qualitative insights into participation and involvement under the EU Forest Strategy from the survey, thus arriving at a comprehensive picture on the issue.

Involvement and participation issues under Priority Area 1, 'Supporting our rural and urban communities', have been mainly and extensively covered in the "Evaluation study of the forestry measures under Rural Development" (Alliance Environnement et al. 2017). A main element positively contributing to the involvement of appropriate policy makers and stakeholders are the institutionalised programming procedures of RDPs, involving all relevant policy actors especially at national and sub-national levels, as well as the formal stakeholder participation procedures in place in rural development programmes. This corresponds with the actors' and stakeholders' roles foreseen in the Forest MAP.

When it comes to Priority Area 2, 'Fostering the competitiveness and sustainability of the EU's forest-based industries', appropriate policy makes from EU and MS levels as well as stakeholders have been involved in the actions as foreseen. In particular, forest-based sector stakeholders' involvement has been implemented as foreseen through the activities of the Forest-Based Sector Technology Platform (FTP), the European Innovation Partnerships (EIP) dealing with forest-related topics (e.g., EIP for Agricultural productivity and Sustainability and EIP Raw Materials). The European Regions for Innovation in Agriculture, Food and Forestry (ERIAFF), which has conducted 3 workshops in cooperation with European Forest Institute (EFI), the European State Forest Association (EUSTAFOR), the European Regions Research and Innovation Network (ERRIN), COPA-COGECA, European Association of Mountain Areas (EUROMONTANA) and the Confederation of European Forest Owners (CEPF) on how to inform-prioritize-collaborate in networking EU Regions on innovation in forest management, use of wood and forest-related Services.

On the topic of Priority Area 3, 'Forests in a changing climate', the appropriate stakeholders and policy makers from MS and EU have been involved as planned. In particular, stakeholders have been involved in the development of the regulation on the inclusion of greenhouse gas emissions and removals from land use, land use change and forestry (LULUCF) into the 2030 climate and energy framework (see section 5.1.1). Also, as part of the ongoing evaluation of the EU Adaptation Strategy, public consultation workshops were organized in April 2017 and January 2018, with participation from the forestry sector.[130] In relation to fire risk management, the science-policy interface is furthermore seen as essential for gathering experts and relevant stakeholders from across Europe to identify knowledge and innovation gaps to formulate robust recommendations to improve risk management.

Under Priority Area 4, 'Protecting forests and enhancing ecosystem services' the relevant policy makers have been involved as intended. One of the main topics of concerns the implementation of Natura 2000 in forests, which requires a high degree of exchange between stakeholders, collaborative processes and management. It is worth mentioning that a Natura 2000 and Forest Guidance document has been produced in direct response to concerns raised by forest owners and managers as well as nature conservationists, over the management of forests on Natura 2000 sites (European Commission, 2015f). However, although significant progress has been made, recent findings also demonstrate that many challenges remain (Sotirov et al., 2017). Stakeholders have also been involved in the revised Plant Health Regulation (see section 6.1.5).

Genetic research is covered by both the Priority Area 4 and 5, 'What forests do we have and how are they changing?'. Work on forest genetic resources found broad involvement of the European Commission, EU stakeholder groups, and support from Member States through the European Forest Genetic Resources Programme (EUFORGEN). Under Priority Area 5 policy makers from EU and MS levels have been involved appropriately, also including the DIABOLO project with innovative aspects of participation.

Under Priority Area 6, 'New and innovative forestry and added-value products' the relevant policy makers have been involved as planned. In particular, a study found 387 project connected to issues of involvement (Lovric et. al. 2017). The Forest-based Sector Technology Platform (FTP) and the European Innovation Partnerships work as catalysts for transnational

[130] See https://ec.europa.eu/clima/events/articles/0119_en.

research, coordination of research and innovation between the European Commission, Member States and stakeholders

Working together to coherently manage and better understand our forests (Priority Area 7) has drawn on the appropriate policy makers from EU and MS levels. In particular, it incited productive collaborations with aspects of participation. Positive examples of stakeholder driven networking initiative can also be found, such as Innovawood,[131] a European network with more than 50 members from 27 different countries that aims to support the forest-based sector, wood-based products and the furniture sector. The Innovawood network has funded 18 projects in total, while only 5 after 2013. Yet another long-running initiative to improve transnational cooperation between scientists and professionals as well as technology transfer in the forestry sector is the European Cooperation in Science and Technology (COST) program. Networking of research institutions and transfer of innovation to new generations of highly educated forest professionals has also been promoted by the European Commission through its Erasmus+ program in the field of higher education. The Erasmus+ Knowledge Alliance program has been active in promoting the links between higher education institutions and the industrial sector in the construction and furniture sector (Katch-e project) and in new entrepreneurial capacity in the forest-based activities (ECOSTAR project). The involvement of the forest-based sector, e.g. under UNECE/FAO forest communicators network as well as in holding campaigns and events can be further strengthened for increasing the societal outreach.

Under a global perspective (Priority Area 8) the appropriate policy makers from MS, Commission and the Council Working Party on Forestry had been involved, The degree to which this involvement is appropriate or sufficient could not be assessed. Particularly, involvement played prominent e.g. in the public consultations on the EU approach against Wildlife Trafficking (see section 10.1.3) and the review of the EU Timber Regulation, which was based on both, national reporting received by Member States and inputs received through a public consultation process (see section 10.1.2).

11.2. Survey insights on involvement of Member States and stakeholders

More broadly speaking and based on the survey results, opinions differ on whether the overall organizational setup under the EU Forest Strategy, mainly building on the involvement of appropriate policy makers and stakeholders, effectively supports the implementation of the EU Forest Strategy. Most notable is that the Member States view the present organisational setup more favourable than stakeholders (see **Error! Reference source not found.**9).

[131] See http://www.innovawood.com/.

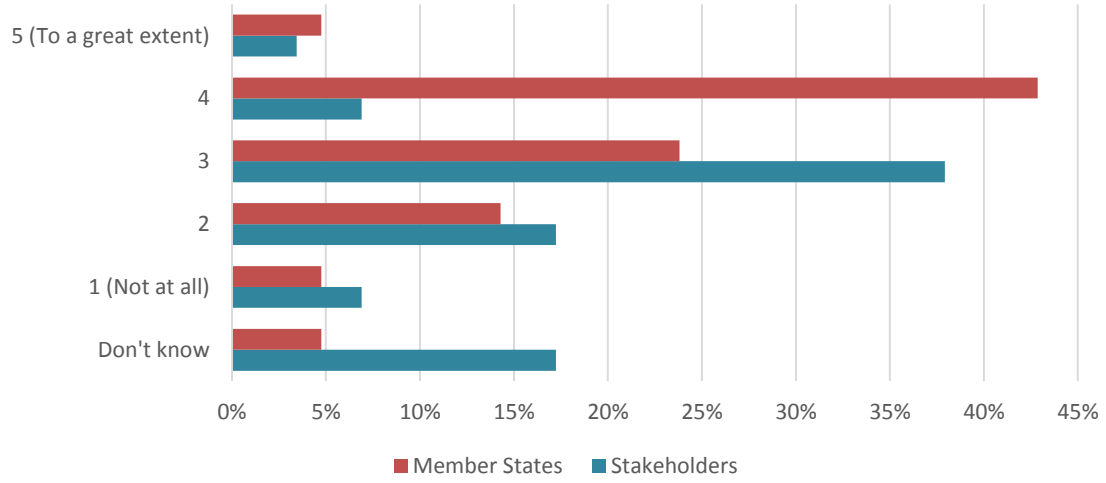

Figure 9. Approval of the organizational setup effectively supporting the implementation of the EU Forest Strategy.

Member States and stakeholders differ in the perceived degree to which stakeholders are involved in the implementation of the EU Forest Strategy, at EU level. On the one hand, Member States agree that stakeholders are being significantly involved (see Figure 10), on the other hand, stakeholders suggest that their organisations have not been adequately involved in the implementation of the EU Forest Strategy (see Figure 11). Member States also more clearly support the notion that stakeholders participated in joint meetings as well as through internal and external consultations on current topics relevant to forests.

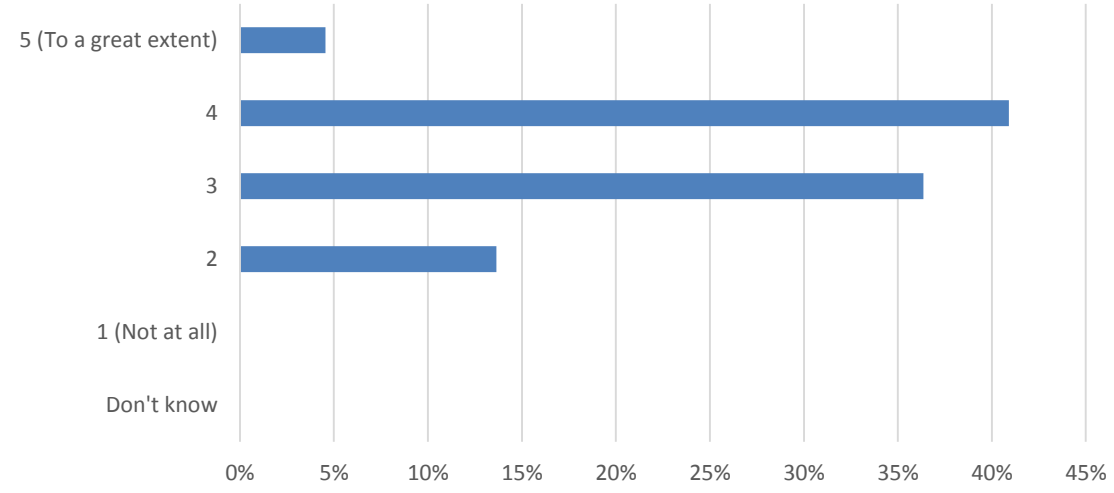

Figure 10. General involvement of stakeholders in the implementation of the EU Forest Strategy, at EU level, according to Member States.

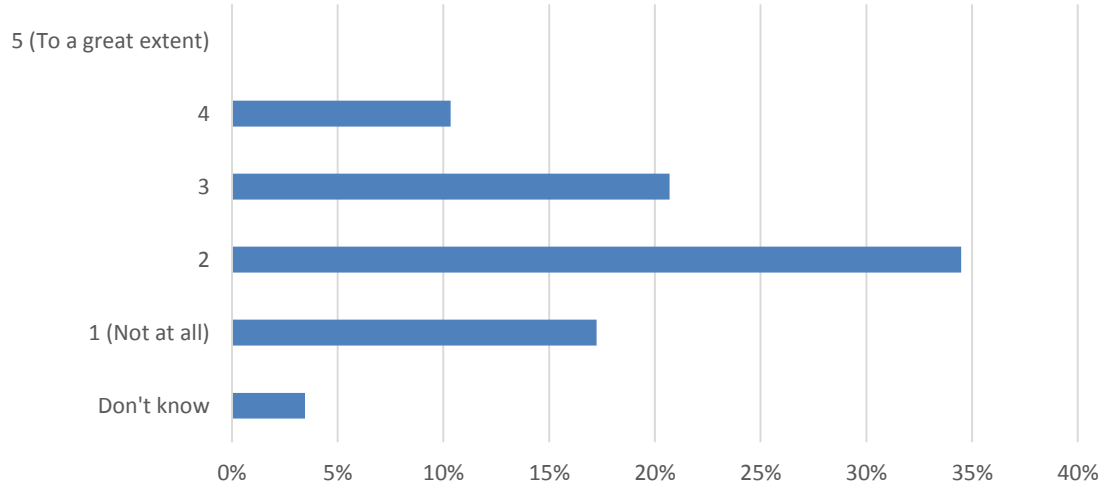

Figure 11. Stakeholder organisations involvement in the implementation of the EU Forest Strategy, at EU level, according to stakeholders.

Concerning the actual success of the Strategy in improving vertical coordination between the EU and Members States, Figure 1012 suggest that Members States consider the EU Forest Strategy to be successful. Stakeholders were also asked an equivalent question, namely, to what extent the EU Forest Strategy has improved the exchange among the Eu level and the different stakeholder categories (see Figure 113). Although the median response again falls within the central response category 3, the range of responses from stakeholders indicating a greater diversity of views regarding the role of EU Forest Strategy in coordinating relations between the EU and stakeholders. Several stakeholders in their replies remarked, for instance, that while the CDGFC (as the main multi-stakeholder platform for discussing issues related to forestry and sustainable forest management) is a good forum for exchange between Commission Services and stakeholders, their impact had been limited. Some stakeholders also noted that the EU Forest Strategy is known and being referred to, but that its impact on their daily activities remains rather limited. Considering that all the stakeholders responding to the questionnaire are explicitly from the forest-based sector, this suggests a continued and increased demand for improved cross-sectoral involvement and general awareness about the EU Forest Strategy, both horizontally and vertically. This is an issue that was already raised in the ex-post evaluation in the EU Forest action Plan (Pelli et al., 2012).

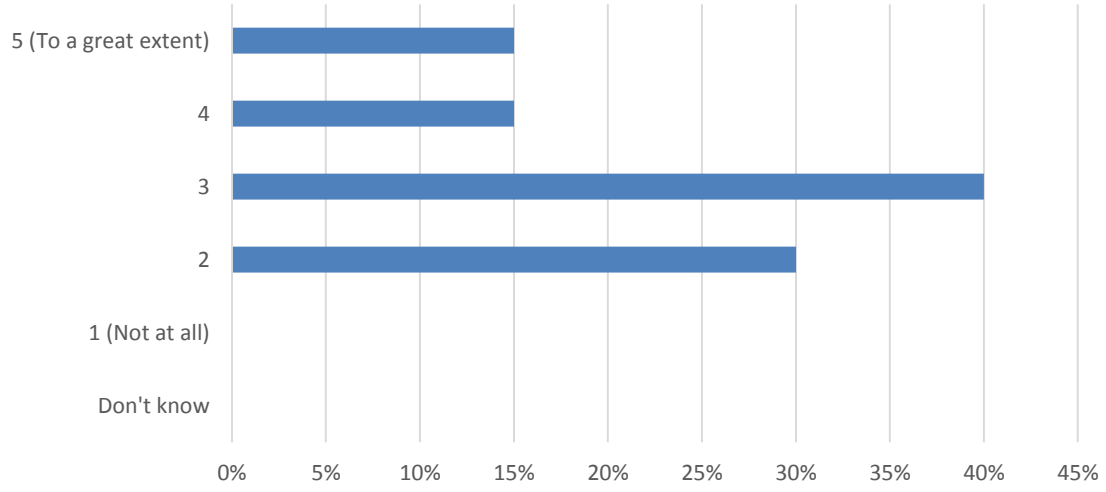

Figure 12. Success of EU Forest Strategy in improving the coordination between the EU and Member States.

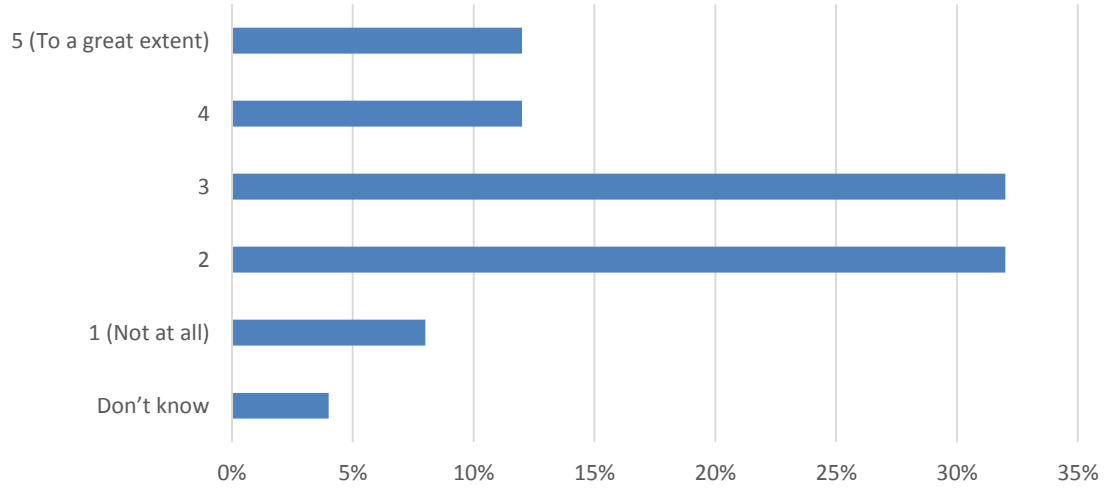

Figure 13. Success of EU Forest Strategy in improving the coordination between the EU and stakeholders.

In the survey Member States and stakeholders were asked to respond to several key issues related to involvement and participation under the EU Forest Strategy. Amongst these, it was asked how the role of the SFC could be effectively improved. The general message, which was conveyed by most Member States and stakeholders, the latter of which do not have a formal role in the SFC, is that, several respondents to the survey emphasized that it would be beneficial to increase the number of annual SFC meetings (e.g., from four to six), including having more specialized working groups and meetings on important topics, more joint meetings with relevant Commission Services and increased collaboration with other relevant networks/groups. Addressing these concerns would provide more opportunities for timely responses to developments in other policy areas, which was highlighted as crucial. The current systematic participation of Commission Services in SFC meetings was furthermore emphasized as positive and appropriate. It was also suggested that the SFC could gain substantially from improved internal coordination, such as increasing the time-period during

which background documents are available in advance of meetings and cutting down the number of information points.

12. CONTRIBUTIONS TO THE OBJECTIVES OF THE EU FOREST STRATEGY

The EU Forest Strategy explicitly mentions the EU 2020 forest objectives:

To ensure and demonstrate that all forests in the EU are managed according to sustainable forest management principles **and** that the EU's contribution to promoting sustainable forest management and reducing deforestation at global level is strengthened, thus:

- contributing to balancing various forest functions, meeting demands, and delivering vital ecosystem services;
- providing a basis for forestry and the whole forest-based value chain to be competitive and viable contributors to the bio-based economy.

Based on the analysis, the implementation of the EU Forest Strategy has thus far made substantial contributions towards achieving the 2020 forest objectives (Table 5) [132], especially in the following broad regards:

- A comprehensive analysis on the RDP forestry measures
- A variety of activities to promote wood as renewable resource
- Providing insight into the potential sustainability effects of cascade use of wood
- Stipulating political and scientific advance on the effects of using wood for bioenergy
- Stipulating cooperation and exchange among the forest-based industries
- Increased funding for forest-based sector related research
- A cumulative cost assessment of legislation for FB-I
- Striving for coherence with climate change regulations
- Stipulating funding for climate-relevant actions in forestry via RDP
- Further promoting the role of harvest wood products in climate change mitigation
- Developing concepts for forest ecosystem services and apply in pilots
- Developing cooperation mechanisms on pest control and prevention
- a Member State-driven initiative on forest genetic resources
- Setting up a prototype for a European information system, and gathering of NFI datasets
- Promoting activities for forest data harmonisation via network and funded projects
- Supporting research and innovation activities in Horizon 2020, FTP, EIPs, ERA-NET programs, and research coordination through SCAR and COST actions
- Supporting exchange among MS and between MS and the EC on e.g. good practices
- Facilitating the exchange and uptake of opinions of various committees on relevant issues
- Improving forest governance and combatting illegal logging and associated trade, through the FLEGT AP and the EUTR
- Promoting sustainable forest management through active involvement in relevant international fora

[132] Note: Varying numbers of actions are performed under each of the listed Strategic Orientations, with different stages of implementation. The **sum of actions** under a specific Strategic orientation is considered **making a contribution (+)** to any aspect of the EU Forest Strategy objectives, if one or more of the planned actions had been implemented or displays clear ongoing activities, AND if the very substance of this action / these actions is clearly contributing to any of the four aspects of the objectives. The former point is judged based on the analyses carried out under Q1 and as summarised in chapter 14.3. The latter point is qualitatively assessed based on expert knowledge of the study team. The attribute "strong contribution (++)" is assigned to cases where either a high number of such actions was performed or where one or more actions were of an outstanding substantial nature, such as e.g. the substantial funding under the Rural Development policy or Horizon 2020 and the European Innovation Partnership on Agricultural Productivity and Sustainability.

In particular, the actions carried out under the diverse Strategic Orientations of each Priority Area of the EU Forest Strategy make specific contributions towards the attainment of the objectives (Table 5). From this analysis conclusions can be drawn on the contribution - from non to strong - of the past implementation activities under each Strategic Orientation. This may be useful in adjusting them for future activities in accordance with political priorities.

Table 5: Qualitative indication of the extent to which the actions carried out under diverse Strategic Orientations contribute towards achieving the EU Forest Strategy's objectives.

Actions under the listed Strategic Orientation of the EU Forest Strategy	Objectives of the EU Forest Strategy and specific contribution of the actions under the Strategic Orientations 0 = indifferent contribution + = contribution ++ = strong contribution **Ensure and demonstrate that all forests in the EU are managed according to SFM principles**	**Ensure that the EUs contribution to promoting SFM and reducing deforestation at global level is strengthened**	contributing to balancing various forest functions, meeting demands, and delivering ecosystem services	providing basis for forestry and the whole forest-based value chain to be competitive and viable contributors to bio-based economy
Priority Area: Supporting our rural and urban communities				
Assess and improve the effect of forestry measures under rural development policy	++	0	+	+
State aid modernisation package, including revising the conditions for block exemptions in the forestry sector	0	0	0	+
Improve the valuing of the benefits that forests give to society and, through sustainable forest management, should find the right balance between delivering the various goods and services	+	0	++	0
Priority Area: Fostering the competitiveness and sustainability of the EU's Forest-based Industries, bio-energy and the wider green economy				
Explore and promote the use of wood as a sustainable, renewable, climate and environment-friendly raw material more fully; assess the climate benefits of material and energy substitution by forest biomass and harvested wood products and the effect of incentives for using forest biomass in creating market distortions	0	0	+	++
Develop objective, ambitious and demonstrable EU sustainable forest management criteria that can be applied in different policy contexts regardless of the end use of forest biomass, by the end of 2014.	++	0	+	0
Assess potential wood supply and facilitating increased sustainable wood mobilisation; develop good-practice guidance for this and for the "cascade" principle, as well as on resource- and energy-efficient manufacturing	+	0	0	++
Stimulate market growth and internationalisation of EU Forest- based Industry products and improve sectorial knowledge, including on sustainable construction and consumer information on furniture.	+	0	0	+
Facilitate access to third markets for EU Forest-based Industry products and raw materials via bilateral trade	0	0	0	++

agreements, and by improving information on import conditions and raw material exports				
Support the Forest-based Sector Technology Platform and encourage new initiatives, such as private-public partnerships, e.g. in the bio-based sector, which foster research and innovation.	+	0	0	+
Launch a cumulative cost assessment of EU legislation and policies affecting forest-based industry value chains, to contribute to a wider analysis of impacts, including costs, benefits, and coherence, of policies and legislation	0	0	0	++
Needs and provisions for education, training and skills development in forest- based sector	+	0	+	0
Priority Area: Forests in a changing climate				
Demonstrate how to increase the forests' mitigation potential through increased removals and reduced emissions, including by cascading use of wood	++	0	+	+
Enhancing climate change adaptation and resilience of forests	0	0	0	0
Priority Area: Protecting forests and enhancing ecosystem services				
Develop a conceptual framework for valuing ecosystem services, promoting their integration in accounting systems at EU and national levels by 2020	+	0	+	0
Maintain and enhance forest cover to ensure soil protection, water quality and quantity regulation by integrating sustainable forestry practices in the Programme of Measures of River Basin Management Plans under the Water Framework Directive and in the Rural Development Programmes	+	0	+	0
Achieve a significant and measurable improvement in the conservation status of forest species and habitats by fully implementing EU nature legislation and ensuring that national forest plans contribute to the adequate management of the Natura 2000 network by 2020	++	0	+	0
Monitor Member States´ progress on the uptake of forest management plans or equivalent instruments and the integration of biodiversity considerations in them, including Natura 2000 conservation objectives	+	0	+	0
Strengthen the mechanisms for protecting forests against pests, building on increased cooperation with neighbouring countries, enhanced research and the ongoing review of the Plant Health Regime	+	0	+	0
Implementation of the Strategic Plan for Biodiversity 2011-2020	+	0	+	0
Strengthen forest genetic resources conservation	+	0	+	+
International Standard for Phytosanitary Measures nº 15 on wood packaging materials	+	+	0	+
Relevant information and data to the Parties to the UN Convention to Combat Desertification	+	+	0	0
Priority Area: What forests do we have and how are they changing?				
Set up of the Forest Information System of Europe (FISE) integrating diverse information systems and data platforms into a dynamic modular system that combines data and models into applications	+	0	0	0
Align EU forest information so that it is primarily based on data collected by Member States with EU data architecture requirements; Improve, make comparable and share forest information and monitoring; develop several modules that could contribute to the EU's forestry statistics and forest accounts	+	0	0	0
Promote the further development of the EU database of forest reproductive material, including hyperlinks to national registers and maps	++	0	0	+
Information on ecosystems and their services	+	0	+	0
Priority Area: New and innovative forestry and added-value products				
Transferring technological and scientific knowledge to forest practice and the market, in particular through Horizon 2020 and the European Innovation Partnership on Agricultural Productivity and Sustainability, supporting the development of new products with higher added- value	++	0	+	++
The Standing Committee on Agricultural Research (SCAR) will be used to strengthen coordination of research and innovation work between the EU, Member States and stakeholders	+	0	0	+
Cooperation on enhanced research and dissemination	+	0	+	+
Priority Area: Working together to coherently manage and better understand our forests				

Ensure that the Standing Forestry Committee's work builds on other EU policies relevant for forests and the forest sector, ensuring that managing EU forests remains multifunctional	++	0	++	0
Explore various options for better coordination of sustainable forest management, harmonised forest information and cooperation between and with Member States	+	0	+	0
Create a European Forest Bureau Network (National Forest Inventories – NFI) to develop harmonised criteria for NFI information	0	0	0	0
Improve public information about forests and wood, and build on the EU Forest Communication Strategy	+	0	0	0
Further assess public perception of forests	+	0	0	0
Priority Area: Forests from a global perspective				
Ensure consistency between EU and Member State policies and commitments on forest-related issues at international level; promote sustainable forest management across Europe and globally	++	++	+	0
Ensure continued support for global efforts to fight illegal logging through the FLEGT action Plan	0	++	+	+
Support developing countries in their efforts to improve forest policies and regulations, strengthen forest governance, value and monitor forest ecosystems, and address the drivers of deforestation and forest degradation through REDD+.	0	++	+	+
Assess the environmental impact of EU consumption of products and raw materials likely to contribute to deforestation and forest degradation outside the EU	0	++	++	0

13. SYNOPSIS AND CONCLUSIONS

The new EU Forest Strategy presents an attempt to apply an inclusive and holistic approach towards reaching its 2020 forest objectives. The EU Forest Strategy has a comprehensive scope, integrating forest-related issues ranging from ecosystem services and climate change to the competitiveness of the forest-based sector, highlighting the needs for innovation, a knowledge-based development, cooperation, and communication as well as taking a global forest perspective. Based on the analytical work carried out in this study, it can be concluded that, while individual areas for improving established and adding new actions exist, substantial progress towards the 2020 forest objectives has been made.

These conclusions are derived from analytical work on the overall state of implementation of the actions listed under the Forest MAP as well as on subsequent work on questions regarding the role of stakeholders, the contributions of the actions to the 2020 objectives, including the evolved policy context.

A total of 32 actions listed in the Forest MAP have been fully implemented, while 36 actions are found to be ongoing. 15 actions were found being partly implemented and for three the study found no implementation. Out of all actions, 3 have experienced delays from the original timeline. More details on the implementation status within the respective Priority Areas can be found in the state of implementation sections of this report. A summary overview is provided in chapter 14.3.

The analysis of survey and interview responses has furthermore demonstrated that there is a variety of perspectives on the EU Forest Strategy and the role it can or should play. It has clearly been acknowledged, through the survey and interviews, that the EU Forest Strategy is the key reference document with regard to expressing major strategic views related to forests in the EU. It is deemed important to have one such consolidated instrument to provide a stronger voice for forest-related issues. The EU Forest Strategy serves as a strong guiding component for the Commission Services to serve as basis for e.g. European Commission staff

working documents. The respective actions of the MAP respond comprehensively to the Strategic Orientations, where the demands are clearly expressed.

Considering subsidiarity issues of forest policy furthermore makes the picture more diverse. Member States underline that it is important to have a commonly-agreed approach to reach EU and international goals and to comply with legally-binding policies, however, forest related issues remain under their authority. It is therefore important to recognise the plethora of Member States' activities, which correspond well with the objectives of the EU Forest Strategy, as essential part of the implementation. This includes activities e.g. on forest genetic resources and pest control, and national priorities in e.g. Rural Development Programmes. This was already recognised by Article 26 of the EU Council Conclusions on the EU Forest Strategy[133], which highlights the need for exploring options for better coordination between the European Commission and Member States, and among Member States, including the specific priorities of the Member States.

The question how to address trade-offs between competing objectives in forests will require further attention and is not explicitly addressed by the EU Forest Strategy. The coordination of cross-cutting policy issues is the more important the more the objectives vary. This a major strategic question in the EU, which will have to tackled more explicitly, and according to survey results a more integrated vision on the use of forest resources in the EU would contribute to soften goal conflicts on forest resources and services to avoid mutually adverse effects among policy domains.

Against this background, the following synopsis and conclusions can be drawn with regard to the eight Priority Areas of the EU Forest Strategy:

1.1.1.1.Forests and Rural Development

Major parts of this strategic orientation have been covered by a separate study on RDP forestry measures. It can be noted that the EU Forest Strategy is consistent with the RDP funding schemes in light of the EU 2020 forestry objectives.

Based on the findings of the study, the following conclusions can be drawn:

- The existence of clear forestry measures and their active and wide-spread use across the EU programming periods demonstrates the recognition of forestry and its relevance for the sustainable development of rural communities. The use of Rural Development funds on forest-related issues also underscores the major challenges with regard to improving forest resilience to increasing risks of storms, pests, floods, drought and fire, because of climate change.
- The evaluation of forestry measures under Rural Development demonstrates that networking and exchange of best practices across and within Member States has room for improvement. The EU Forest Strategy could contribute towards this demand by facilitating more exchange of experience with scientific and practice experts, improve the exchange between national and EU levels, and provide for other kinds of systematic information exchange.
- Priority Area 1 "Supporting our rural and urban communities" puts a strong focus on the rural dimension of forests and respective links to the Common Agricultural Policy measures and activities to strengthen forest advice and communication. , The issue of urban and peri-urban forestry and trees outside forests, however, is largely left vacant by the Strategic Orientations under this theme. While no actions had been

[133] See http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/agricult/142685.pdf.

foreseen in this regard, more emphasis on the role of forests for urban communities could be fruitful in the future.

1.1.1.2.Competitiveness of the sector

It can be demonstrated that the issue of fostering competitiveness of the forest-based sector has trickled significantly into the agenda following the EU Forest Strategy and the EU forest objectives. DG GROW has initiated a series of activities following the Blueprint for the EU Forest-based Industries, such as the European Innovation Partnership on Raw Materials, the High-Level Group on Energy Intensive Industries, or the cumulative cost assessment (CCA) of the impacts of the key EU legislation on forest-based industries. While the effects of such action will take a longer time period to evaluate in the light of a changing sector and evolving policy context, the analysis shows a broad uptake of relevant topics in relation to the EU Forest Strategy. In particular, issues such as cascade use of wood and sustainability of bioenergy have been actively tackled. Clarifying the future role of these elements will substantially contribute to a demonstration of sustainability of the forest-based sector.

Based on the findings of the study, the following conclusions can be drawn:

- The EC has set up a number of activities in respect to the Priority Area. For future work it might be important to conceptualise how competitiveness can be assessed and monitored, and which sectors and sub-sectors are concerned.
- The EU Forest Strategy supports having common objectives for the entire EU forest-based sector. However, it would be likely be beneficial to enhance coordination with other sectors in the context of the Circular Economy Action Plan as well as in the revision of the bioeconomy strategy, in order to better benefit from this policy pull on research and innovation funding.
- The strategic function of the Expert Group on Forest-based Industries and Sectorally Related Issues has been to re-establish and confirm sectoral priorities. Activities should cover both immediate concerns for the sector (e.g., reacting to trade restrictions) and the tackling of the long-term strategic issues (e.g., coordination of efforts) such as in the EEI for pulp and paper industries and EIP-Raw Materials for the wood working industries.
- Project activities, notably the cascading study and the sustainability assessment studies, have been successful in facilitating the preparation of guidance on the cascading use of biomass with woody biomass examples. Streamlining EU economy in compliance with the Paris Agreement and the SDGs is likely to result in a competitive advantage for wood-based products in terms of environmental and business impacts.
- The cumulative cost assessment for forest-based industries provides a first estimate of the cost impact of EU legislation on the forest-based industries. Building on this study, future work could look even more into coherence of policy instruments by mapping the overlaps, advantages and possible disadvantages of various policies and regulations and putting them in context vice versa environmental and social goals and citizens' preferences.

1.1.1.3.Forests and climate change

The EU Forest Strategy has proven to explicitly take up cross-sectoral issues such as climate change. There are urgent requirements to demonstrate the mitigation potential of forests, and simultaneously contribute to the adaptation capacity of forests. In general, the EU Forest Strategy shows a high coherence with climate change policies, in particular as regards mitigation. The analysis of activities and funding schemes show that climate change mitigation has well arrived in the forestry domain. It also shows that issues of climate change adaptation and resilience are less dominant and are abundant on strategic level, but require further guidance and support for practical implementation. It appears that issues of public attention such as forest fires lead to more mature responses.

Based on the findings of the study, the following conclusions can be drawn:

- The climate change mitigation potential of forests has been well recognized and a large share of the LULUCF measures implemented by Member states to reduce greenhouse gas emissions focuses on forest management, protection against natural disturbances in forests, or afforestation and reforestation. The LULUCF reporting requirements have stimulated Member States to further consider their LULUCF mitigation potentials.,.
- The forest sector has the potential to contribute to other sectors' efforts to decarbonise by sequestering carbon and producing biomass for substitution of fossil-based materials. Encouraging and enhancing these activities and the development of the bio economy will be important not only in the context of the Paris Agreement and the EU 2030 Energy and Climate targets, but also for rural development, growth and jobs and the whole economy.
- The EU Civil Protection Mechanism supported emergency support to fight forest fires – in 2017 alone, the Mechanism was activated 17 times for forest fire emergencies in Europe. While a small number of prevention and preparedness projects has been co-funded already by the Commission, more actions are needed across the Member states to enhance forest resilience and to strengthen forest disturbance risk prevention and preparedness.
- Twenty-five Member states published national adaptation strategies and some instruments were established aiming at mitigating threats arising from climate change such as forest fires. However, besides those, limited actions were implemented to enhance the adaptive capacity and resilience of European forests despite the global goal on adaptation recently set up under the Paris Agreement and the identified priority under the Forest strategy. Although some MS reported action in the survey, the MAP has shortcomings in identifying action in support of enhancing forests' adaptive capacities and resilience.

1.1.1.4.Forest ecosystem services, conservation and protection

Recent assessments show concern on the state of biodiversity conservation in forests. The analysis showed that the implementation of the Natura 2000 network is still a matter of concern, and that suggested instruments such as forest management plans integrating biodiversity aspects require additional scrutiny as identified in the REFIT process but also allowing for different national approaches how to approach this.. Practical implementation and MS applications in the valuation of ecosystem services are to be expected following considerable progress in implementation, coordination, and MS cooperation in examples such as pest prevention and forest genetics. All these issues are strongly connoted to the EU forest objectives and prove efficiency of both EU and MS input.

Based on the findings of the study, the following conclusions can be drawn:

- Forest ecosystems, their conservation and protection are broadly addressed in the EU Forest Strategy, hence addressing a cross-sectoral decision-making environment, where the EU Forest Strategy can address synergies in implementation... Knowledge, data and indicators implemented under the MAES framework are an important resource that goes in synergy with the EU Forest Strategy regarding forest ecosystem services, accounting and forest ecosystems condition.
- The EU Forest Strategy triggered considerable activities, for instance with regard to forest genetics, combatting pests or forest fires. It is important to deal with cross-cutting issues such as forests and water, or the provision of forest ecosystem services in a more integrated way and address such issues accordingly.
- The balancing of EU and MS competences plays an important role in the integration of forestry and environmental objectives to further improve the implementation of environmental measures in the forest sector. For instance, the uptake of environmental forestry measures in the Rural Development Programmes is low.
- While there are clear concerns on the biodiversity status in forest ecosystems, the implementation of Natura 2000 remains difficult. While the Nature Directives have been assessed as appropriate in a recent Fitness Check, the implementation status varies. Implementation of adapted forest management plans takes place

on MS level and requires increased cooperation between forest and environmental authorities, and with forest owners.

1.1.1.5.Forest information

Accomplishing a unified information system on EU forests is a long-lasting, and not fully achieved endeavour up to now. The EU Forest Information System (FISE) was planned as central activity to pursue this goal. To date, only a prototype of the FISE exists. It holds a limited set of databases and maps, of which only the forest fire system (EFFIS) and MAES are rather complete and up to date. Progress is ongoing in collecting systematic NFI data. While delayed, there are now new approaches to advance FISE with additional, harmonised data-sets.

Based on the findings of the study, the following conclusions can be drawn:

- Efficiency of efforts on forest information could be increased by seeking synergies of activities in method development, data gathering, and cooperation.
- For addressing present data gaps, synergies between authorities and relevant organisations need to be sought, going beyond project-bound limitations. This includes data availability, harmonised methodologies as well as supporting financial and capacity resources.
- Given the new policy context, an up-to-date FISE would be very relevant. Targeted user groups are highly diverse, while current user communities, as well as modalities of usages are widely unknown. Hence, the use of a comprehensive forest information system as an effective policy support tool remains a challenge for the coming years.

1.1.1.6.Innovation and value creation

The EU Forest Strategy supports a coordinated approach towards forest research and innovation as documented in activities such Horizon 2020, FTP, EIPs, and SCAR. Cooperation instruments such as COST and in particular ERA-NETs proved to be particularly efficient, the latter also because it could prove how to mobilise MS interest and co-funding. Information and coordination via platforms such as the FTP will be important to secure funding for forest-based research. In an evolving policy context, research on forests and forest products and services needs to comprise a broad range from cooperation with industries to developing novel, sustainable products and processes to social innovation and rural areas.

Based on the findings of the study, the following conclusions can be drawn:

- The EU funded many research projects related to forestry and added value products through FP7 and Horizon 2020 that are consistent with the overall objectives of the EU Strategy 2020 for smart, sustainable and inclusive growth and the idea of supporting technological innovation. It has to be noted that innovation of the sector goes beyond technology and will require feasible approaches and concepts such as ecosystem service provision, education and capacity building, and social aspects of innovation.
- The EU Forest Strategy has directly or indirectly supported the dissemination and accessibility of project results through open databases, technology platforms, thematic networks, including support towards coordinating support for sharing research results. Nevertheless, progress needs to be made with regard to a horizontal dissemination of information between European institutions and Member States with regard to the outcome of research activities. The after-life of EU projects needs special inquiry as to how a long-lasting impact and exploitation of such projects can be realised.
- The EU Forest Strategy and the Forest MAP have had a positive impact for Research and Development in the forest-based sector. However, while investments were significant, a more balanced participation by research institutions across EU Member States should be encouraged.

1.1.1.7. Coordination and communication

The Standing Forestry Committee is highlighted as central organ for coordination and cooperation among MS, and between MS and the EC. It could be demonstrated in the analysis that the inter-sectoral cooperation works well, while the political influence of the SFC in cross-sectoral issues is limited. The results show that forest communication strategies are important to for making forest-related issues recognised outside the sector. Increasing public awareness on forest-related topics is still a major issue to be further promoted.

Based on the findings of the study, the following conclusions can be drawn:

- Within the Standing Forestry Committee (SFC), different forest-related EU policies and instruments are presented and discussed, opinions are developed and an exchange with other relevant European Commission committees takes place. Opinions on current policy-relevant developments are developed and exchanged with a considerable number of European Commission services and committees. Their recognition outside the sector remains limited.
- The EU Forest Strategy, as stipulated by the Council Conclusions, lead to significant coordination efforts especially among Commission Services. This clearly contributed to the coherence of activities carried out under the EU Forest Strategy. Without changes in policies, achieving full coherence of forest-related policies will remain as a challenge. Future activities might include more effectively pushing for cross-sectoral links and impacts on processes and EU forest-related policies.
- Only limited information on public opinion on the forest and its benefits is available and related action is still fragmented across the forest-based sector and Member States. In addition, a wide array of different forest-related events, campaigns and activities took place, but their effects are unknown as a systematic assessment is lacking.

1.1.1.8. Forests from a global perspective

The state of implementation under this Priority Area is promising, with many actions being carried out and only few delays. Central actions employing REDD+ and FLEGT approaches actively engage stakeholders around the globe in a systematic manner, and policy-makers from Member States and EU level actively coordinate their activities relating to international deliberations. The contributions of the actions towards the 2020 forest objectives is substantial, while some leaving room for improving effectiveness and efficiency. Under the evolved policy context, the actions remain highly relevant, with options for further developing and adapting them.

Based on the findings of the study, the following conclusions can be drawn:

- The EU and its Member States participate actively in all relevant multilateral forest-related fora at global level. The consistency between EU and Member States policies and commitments at global level are an important subject for future policy deliberation.
- Planned reviews and reports (e.g. review of the EU Timber Regulation and the evaluation of the FLEGT action Plan) were implemented and delivered according to the timetable. Other actions, such as negotiation and implementation of FLEGT Voluntary Partnership Agreements and the support to producer countries for FLEGT implementation are ongoing while knowledge gaps remain with regards to their systematic implementation.
- Under the evolved international policy context, future actions require a continuous and targeted implementation of the FLEGT action Plan, and require highlighting the substantial contribution of existing and additional funding for SFM by the EU and its Member States, stressing the importance of private sector initiatives, and promoting SFM not only through legally-binding measures, but also through initiatives on e.g. forest (landscape) restoration.

- Future debates and actions on global deforestation might benefit from including drivers beyond the forestry sector, and highlighting the importance of forests for food security, water protection, green jobs, development, peace and security, health and migration.
- Ongoing actions to support developing countries in their efforts to improve forest policies and regulations, strengthen forest governance, value and monitor forest ecosystems require ongoing commitment and resources actively give an indication that the EU Forest Strategy contributes to promoting SFM and reducing deforestation at global level.

14. ANNEXES

14.1. Annex I. List of Abbreviations

ACQWA	Assessing Climate impacts on the Quantity and quality of Water (Project)
AFINET	European Agroforestry Federation
AGRIFORVALOR	Bringing added value to agriculture and forest sectors by closing the research and innovation divide (project)
ALU-FR	Albert-Ludwigs-Universität Freiburg
ALTERFOR	Alternative models and robust decision-making for future forest management (project)
ARANGE	Advanced multifunctional management of European mountain forests (project)
ASPires	Early detection of forest fires (project)
B4EST	Adaptive BREEDING for productive, sustainable and resilient forests under climate change (project)
B4Life	EU Biodiversity for Life
BBI JU	Bio-Based Joint Undertaking
BCM	Bilateral Coordination Mechanism
BenchValue	Benchmarking the sustainability performances of value chains (Project)
BEWATER	Making society an active participant in water adaptation to global change (Project)
BISE	Biodiversity Information System for Europe
BIOMASS	Biomass Assessment Study
BioSustain	Sustainable and optimal use of biomass for energy in the EU beyond 2020 (project)
C&I	Criteria and Indicators
CAP	Common Agricultural Policy
CARE4C	Carbon smart forestry under climate change (project)
CASCADES	Study on the optimised cascading use of wood
CBD	United Nations Convention on Biological Diversity
CDGFC	Civil Dialogue Group on Forestry and Cork
CEPF	Confederation of European Forest Owners
CEPI	Confederation of European Paper Industries
CETA	Comprehensive Economic and Trade Agreement
CGBN	Co-ordination Group for Biodiversity and Nature
CGRFA	Commission on Genetic Resources for Food and Agriculture
CIFOR	Center for International Forestry Research
CITES	United Nations Convention on International Trade in Endangered Species of Wild Fauna and Flora
Climate-ADAPT	European Climate Adaptation Platform
CLIMWOOD	Climate benefits of material substitution by forest biomass and harvested wood products (project)
COFO	Committee of Forestry, FAO
COGECA	European agri-cooperatives
COP	Conference of the Parties
COPA	Committee of Professional Agricultural Organisations
CORDIS	Community Research and Development Information Service
COSME	EU programme for the Competitiveness of Enterprises and Small and Medium-sized Enterprises
COST	European Cooperation in Science & Technology
CPF	Collaborative Partnership on Forests
DG	Directorate-General

DG AGRI	Directorate-General for Agriculture and Rural Development
DG CLIMA	Directorate-General for Climate action
DG Devco	Directorate-General for International Cooperation and Development
DG ENER	Directorate-General Energy
DG ENV	Directorate-General for Environment
DG GROW	Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs
DG HOME	Directorate-General for Migration and Home Affairs
DG SANTE	Directorate-General for Health and Food Safety
DIABOLO	Distributed, Integrated and Harmonised Forest Information for Bioeconomy Outlooks (project)
EAFRD	European Agricultural Fund for Rural Development
EC	European Commission
ECA	European Court of Auditors
ECOSTAR	European Concentrated Solar Thermal Road-Mapping (project)
ECSO	European Construction Sector Observatory
EEA	European Environmental Agency
EEAS	European External action Service
EESC	European Economic and Social Committee
EFDC	European Forest Data Centre
EFFIS	European Forest Fire Information System
EFI	European Forest Institute
EFDAC	European Forest Data Centre
EFICS	European Forestry Information and Communication System
EFIS	European Forest Information System
EGA	Environmental Goods Agreement
EIB	European Investment Bank
EIP	European Innovation Partnership
EIP-AGRI	The agricultural European Innovation Partnership
ENFIN	European National Forest Inventory Network
ENRD	European Network for Rural Development
EPA	Economic Partnership Agreement
EPPO	European and Mediterranean Plant Protection Organization
ERA-NET	European Research Area
ERC	European Research Grants
ERCC	Emergency Response Coordination Centre
ERDF	European Regional Development Fund
ERIAFF	European Regions for Innovation in Agriculture, Food and Forestry
ESDC	European Soil Data Centre
ESIF	European Structural and Investment Funds
ESMERALDA	Enhancing ecoSysteM sERvices mApping for poLicy and Decision mAking
EU	European Union
EUFORGEN	European Forest Genetic Resources Programme
EU Forest Strategy	EU Forest Strategy
EUROMONTANA	European Association of Mountain Areas
Eurostat	Directorate-General for Statistics
EUSTAFOR	European State Forest Association
EUTR	EU Timber Regulation

FACESMAP	Forest LAnd Ownership Changes in Europe: Significance for Management And Policy
FAO	United Nations Food and Agriculture Organization
FBI	Forest Based Industry
FCN	UNECE-FAO Forest Communicators Network
FERN	European Union Resource Network
FISE	Forest Information System for Europe
FLEGT	Forest Law Enforcement, Governance, and Trade
FLEGT AP	FLEGT action Plan
FONASO	Forest and Nature for Society MSc
FORCIP	Forest Roads for Civil Protection (project)
FOREMATIS	Forest Reproductive Material Information System
Foresterra	Enhancing FOrest RESearch in the MediTERRAnean through improved coordination and integration (project)
ForestValue	Innovating the forest-based bioeconomy (Co-fund)
FORMIT	FORest management strategies to enhance the MITigation potential of European forests (project)
ForRisk	Network for innovation in silvicultures and integrated systems for forest risk management
FRA	Forest Resources Assessment
FRC	Forest Risk Commodities
FTP	Forest-Based Sector Technology Platform
FunDivEUROPE	FUNctional significance of forest bioDIVersity in Europe (project)
FutureBioEcon	Sustainable future of European Forests for developing the bioeconomy
GDP	Gross Domestic Product
GenTree	Optimizing the management and sustainable use of forest genetic resources in Europe (project)
GHG	Greenhouse Gases
GPA- FGR	Global Plan of action for the Conservation, Sustainable Use and Development of Forest Genetic Resources
Horison 2020	The (eight) EU Framework Programme for Research and Innovation
HWP	Harvested Wood Products
IAF	International Arrangement on Forests
IGNIS	Initiative for Global Management of big firest through Simulation
INFRES	Innovative and effective technology and logistics for forest residual biomass supply in the EU (project)
INTEGRAL	Future-oriented integrated management of European forest landscapes
INTEGRATE	Integration of Nature Protection in Forest Management and its Relation to other Forest Functions & Services
IPBES	Intergovernmental Platform on Biodiversity and Ecosystem services
IPCC	Intergovernmental Panel on Climate Change
ISEFOR	Increasing Sustainability of European Forests: Modelling for Security Against Invasive Pests and Pathogens under Climate Change
ITTO	International Tropical Timber Organization
ITWG-FGR	Intergovernmental Technical Working Group on Forest Genetic Resources
JRC	Joint Research Centre
LBA	Legally Binding Agreement (on Forests)
LCA	Life Cycle Analysis
LIFE	EU's funding instrument for the environment and climate action

LIGNOSILVA	Centre of Excellence of Forest-based Industry (project)
LULUCF	Land use, land-use change, and forestry
MAES	Mapping and Assessment of Ecosystems and their Services
MAP	Multi-annual Plan
MEdfOR	Mediterranean Forestry and Natural Resources Management
MedWildFireLab	Mediterranean Wildland Fire Laboratory
MOSEF	Modernization of Honduras Forest Sector (project)
MOTIVE	Models for Adaptive Forest Management (project)
MS	Member State
NAP	National Adaptation Plan
NCFF	Natural Capital Financing Facility
NetRiskWork	Networking for the European Forest Risk Facility initiative (project)
NFI	National Forest Inventory
NGO	Non-Governmental Organization
NSG	National Support Group
NWFP	Non-wood forest products
ObservaTree	Monitoring Tree Health (project)
OECD	Organisation for Economic Cooperation and Development
OpeNESS	Operationalisation of natural capital and ecosystem services
OPERAs	Operationalisation of natural capital and ecosystem services
RAIN	Regional Agroforestry Innovation Network
PERFORMWOOD	Performance standards for wood in construction (project)
PES	Payment for Ecosystem Services
PINESTRENGTH	Pine pitch canker - strategies for management of Gibberella Circinata in greenhouses and forests
POLYFORES	Decision Making Support for Forest Ecosystem Services in Europe
POnTE	Pests Organisms Threatening Europe (project)
PROFOUND	Towards robust projections of European forests under climate change
PROBA	Working Party on Commodities
PROFOR	Multi-donor Program for Forests
Q-Collect	Creating a harmonized Europe-wide framework of plant pest collections (project)
RD	Research and Development
RDP	Rural Development Programme
ReceBio	Study on impacts on resource efficiency of future EU demand for bioenergy
ReCaREDD	Reinforcement of Capacities for REDD+ (project)
REDD+	Reduced Emissions from Deforestation and forest Degradation, and fostering conservation, sustainable management of forests, and enhancement of forest carbon stocks
REFIT	Commission's Regulatory Fitness and Performance programme
REFORCE	Resilience mechanisms for risk adapted forest management under climate change
REFRESH	REstoring rivers FOR effective catchment Management
REFORM	REstoring rivers FOR effective catchment Management (project)
REPHRAME	Development of improved methods for detection, control and eradication of pine wood nematode in support of EU Plant Health policy
RIA	Research & Innovation action
S2BIOM	Delivery of sustainable supply of non-food biomass to support a “resource-efficient” Bioeconomy in Europe
SCAR	Standing Committee on Agricultural Research

SDG	Sustainable Development Goals
SEIS	Special Education Information System
SFC	Standing Forestry Committee
SFM	Sustainable Forest Management
SIMWOOD	Sustainable Innovative Mobilization of Wood (project)
SME	Small and Medium Enterprises
SPITFIRE	Spanish-Portuguese Meteorological information system for trans-boundary operations in forest fires
StarTree	Multipurpose trees and non-wood forest products a challenge and opportunity
SUFONAMA	Master of Science in Sustainable Forest and Nature Management
SUMFOREST	Tackling the challenges in sustainable and multifunctional forestry through enhanced research coordination for policy decisions (project)
SUTROFOR	Master of Science in Sustainable Tropical Forestry
SWG	Strategic Working Group
SWOT	Strengths, Weaknesses, Opportunities, and Threats
TPP	Tree Pest Portal
TTIP	Transatlantic Trade and Investment Partnership
UK	United Kingdom
UN	United Nations
UNCCD	United Nations Convention to Combat Desertification
UNCEEA	UN Committee of Experts on Environmental-Economic Accounting
UN-DESA/DSD	United Nations Division for Sustainable Development Goals
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNFF	United Nations Forum on Forests
USEWOOD	Improving Data and Information on the Potential Supply of Wood Resources (project)
VPA	Voluntary Partnership Agreement
WIND RISK	Wind risk prevention (project)
WoodWisdom	WoodWisdom-Net+ Pacing Innovation in the Forest-Based Sector
WPoF	Council Working Party on Forests
WTO	World Trade Organization
WUIWATCH	European Observatory on prevention and defence against forest fires affecting urban areas and communities
WWF	World Wide Fund for Nature

14.2. Annex II. Policy documents noted in the 2013 EU Forest Strategy

Forest-related

1998 Forest Strategy (COM(1998) 649, Council Resolution 1999/C 56/01).
Forest action Plan 2007-2011 (COM(2006) 302)
Staff working document: A new EU Forest Strategy: for forests and the forest-based sector (SWD(2013) 342)
A blueprint for the EU forest-based industries (SWD(2013) 343)
EU Forest Communication Strategy
Land Use, Land-Use Change and Forestry (LULUCF) (Decision No 529/2013/E)
Green Paper on Forest Protection and Information (COM(2010) 66)
Plant Health (e.g., Directive 2000/29/EC)
REDD+ and FLEGT (Regulation 2173/2005)
EU Timber Regulation (Regulation (EU) No 995/2010)

Agriculture and Rural Development

Rural Development (e.g., Regulation 1303/2013, 1305/2013 and 1306/2013)

Products and Industry

A Stronger European Industry for Growth and Economic Recovery (COM(2012) 582)
Integrated Industrial Policy for the Globalisation Era (COM (2010) 614)
Bioeconomy Strategy (COM(2012) 60)
Resource Efficiency Roadmap (COM(2011) 571)

Energy and Climate

EU Strategy on Adaptation to Climate Change (COM(2013)216)
EU Climate and Energy Package (e.g., COM(2010) 265)
Kyoto Protocol

Environment

7th EU Environment action Programme (Decision 1386/2013/EU)
Natura 2000 (e.g., Directive 2009/147/EC and Council Directive 92/43/EEC)
LIFE+ (Regulation 1293/2013)
2020 Biodiversity Strategy (COM(2011) 244)
Convention on Biological Diversity and the Aichi targets
United Nations Convention to Combat Desertification
Water Framework Directive (Directive 2000/60/EC)

Research

7th Research Framework Programme (Decision 1982/2006/EC)
Horizon 2020 (Regulation 1291/2013)

Jobs and Growth

EUROPE 2020 - A strategy for smart, sustainable and inclusive growth (COM(2010) 2020)

Data and Information Services

Forest Information System of Europe:

- EU Forest Fire Information System
- European Forest Data Centre
- European Soil Data Centre
- Integrated Environmental and Economic Accounting for Forests

Infrastructure for Spatial Information in the European Community (INSPIRE) (Directive 2007/2/EC)
Shared Environmental Information System (SEIS) (COM(2008) 46)
Copernicus (Regulation 377/2014)

Processes and Platforms

FOREST EUROPE
United Nations Framework Convention on Climate Change
Forest-based Sector Technology Platform
Standing Committee on Agricultural Research (SCAR)
European Innovation Partnership on Agricultural Productivity and Sustainability
Standing Forestry Committee (SFC) (Council Decision 89/367/EEC)
Advisory Group on Forestry and Cork (Commission Decision 2004/391/EC)
Habitat Committee
Expert Group on Natura 2000
Advisory Committee on Forest-based Industries (Commission Decision 97/837/EC)

14.3. Annex III. Forest MAP actions: Overview of the State-of-Implementation

N.I. = Not Implemented

P.I. = Partly Implemented

F.I. = Fully Implemented

Ong. = Ongoing and/or recurrent

Del. = Delayed

	N.I.	P.I.	F.I.	Ong.	Del.
Priority Area 1: Supporting our rural and urban communities					
Assess and improve the effect of forestry measures under rural development policy					
Ex-post evaluations and synthesis of ex-post evaluations of RD programmes					
Ex-ante synthesis of RD programmes and possible round table on forestry measures contributing to rural development and rural well-being					
Annual Reports on the implementation/delivery of Rural Development Programmes					
Evaluation of forestry measures under RD policy					
Development of a financial instrument product (e.g. for loan fund, guarantee fund, or combination thereof) for the benefit of forestry holdings, forestry ecosystems and forestry products' processing activities.					
State aid modernisation package, including revising the conditions for block exemptions in the forestry sector					
Assessment of the implementation of the new state aid guidelines					
Strategic Orientation A and D The Forest MAP combines two Strategic Orientations in its list of actions: • (A) Make use of rural development funds to improve competitiveness, promote the diversification of economic activity and quality-of-life, and deliver specific environmental public goods, to contribute to promoting the social functions of sustainable forest management. • (D) With the help of rural development funding, support Forest Advisory Systems for awareness-raising; training; and communication between local forest holders and authorities.					
Use funds including the European Social Fund and the European Agricultural Fund for Rural Development to improve competitiveness, promote the diversification of economic activity and quality-of-life, and deliver specific environmental public goods, to contribute to promoting the social functions of SFM					
Support Forest Advisory Systems for awareness raising; training; and communication between local forest holders and authorities					
Improve the valuing of the benefits that forests give to society and, through sustainable forest management, should find the right balance between delivering the various goods and services.					
Refers to Priority Area 4, action 1 (see below).					

	N.I.	P.I.	F.I.	Ong.	Del.
Other: Prepare forestry-related recommendation for the post-2020 Rural Development Policy					
SFC analysis and debate					
Other: Prepare forestry-related recommendation for post-2020 State aid guidelines					
SFC analysis and debate					
Priority Area 2: Foster competitiveness and sustainability of EU's forest-based industries					
Explore and promote the use of wood as a sustainable, renewable, climate and environment-friendly raw material more fully; assess the climate benefits of material and energy substitution by forest biomass and harvested wood products and the effect of incentives for using forest biomass in creating market distortions					
Study on climate benefits of material substitution by forest biomass and harvested wood products: perspective 2030 "CLIMWOOD"					
Study on climate benefits of forest biomass use for energy generation in the EU by 2030					
Study report on impacts on resource efficiency of future EU demand for bioenergy					
Review the utility of sustainability criteria and indicators in subsequent life-cycle phases for all uses of wood					
Assess possible synergies with other initiatives and measures to seize opportunities of bioeconomy for wood-based materials					
Develop objective, ambitious and demonstrable EU sustainable forest management criteria that can be applied in different policy contexts regardless of the end use of forest biomass, by the end of 2014					
Make recommendations on relevant operational indicators related to SFM criteria					
Appropriate measures to be presented by the Commission					
Assess potential wood supply and facilitating increased sustainable wood mobilisation; develop good-practice guidance for this and for the "cascade" principle, as well as on resource and energy-efficient manufacturing processes					
Study on the optimised cascading use of wood					
Studies on biomass availability, including in relation to SFM					
Study on identification of good practices in resource, energy and process efficiency for wood-processing industries					
Implementation of the European Innovation Partnerships on Raw Materials and for Agricultural Productivity and Sustainability					
Study on possibilities to increase the growth and sustainable utilisation of forests					
Based on existing policies, identification of relevant practices and other elements for the forest-based industry and Member States regarding resource					

	N.I.	P.I.	F.I.	Ong.	Del.
efficient use of biomass					
Stimulate market growth and internationalisation of EU Forest-based Industry products and improve sectorial knowledge, including on sustainable construction and consumer information on furniture					
Assess the needs for improving market transparency and consumer awareness: study on "The EU furniture market situation and a possible furniture products initiative" (2014-2015)					
Stimulate favourable investment conditions in construction					
Raising awareness of forest-based industries on available tools to facilitate internationalisation e.g. COSME, European Enterprise Network					
Facilitate access to third markets for EU Forest-based Industry products and raw materials via bilateral trade agreements, and by improving information on import conditions and raw material exports					
Trade-related commitments at the bilateral and multilateral levels					
Assess the need for improving information on sectoral trade information and production inputs					
Support the Forest-based Sector Technology Platform and encourage new initiatives, such as private-public partnerships, e.g. in the bio-based sector, which foster research and innovation					
Facilitate access to funding for innovation and adaptation to change e.g. COSME, Horizon 2020, European Structural and Investment Funds					
Launch a cumulative cost assessment of EU legislation and policies affecting forest-based industry value chains					
Study on an assessment of the cumulative cost impacts of specified EU legislation and policies on the EU Forest-based Industries					
Identify needs and provisions for education, training and skills development in forest-based sector					
Identify needs and provisions for education, training and skills development in forest-based sector					
Priority Area 3: Forests in a changing climate					
Increase the forests' mitigation potential through increased removals and reduced emissions, including by cascading use of wood					
Member States provide their information on LULUCF actions					
Civil Protection Mechanism to support prevention and preparedness actions related to forest fires					
Member States demonstrate how they enhance their forests' adaptive capacities and resilience	*MISSING*				
Priority Area 4: Protecting forests and enhancing ecosystem services					
Develop a conceptual framework for valuing ecosystem services, promoting their integration in accounting systems at EU and national levels by 2020					

	N.I.	P.I.	F.I.	Ong.	Del.
Foster innovative mechanisms (e.g. Payments for Ecosystem Services) to finance the maintenance and restoration of ecosystem services provided by multifunctional forests					
Maintain and enhance forest cover to ensure soil protection, water quality and quantity regulation by integrating sustainable forestry practices in the Programme of Measures of River Basin Management Plans under the Water Framework Directive and in the Rural Development Programmes					
Integration of sustainable forest management practices in the Programme of Measures of River Basin Management Plans under the Water Framework Directive and in the Rural Development Programmes					
Achieve a significant and measurable improvement in the conservation status of forest species and habitats by fully implementing EU nature legislation and ensuring that national forest plans contribute to the adequate management of the Natura 2000 network by 2020					
Implementation of Habitats and Birds Directives, use of RD potentials for Natura 2000 payments, adoption and implementation of management plans, inclusion of biodiversity elements in management plans					
Mid-term review of Biodiversity Strategy					
Guide on Natura 2000 and forests					
Monitor Member States´ progress as regards the uptake of forest management plans or equivalent instruments and the integration of biodiversity considerations in them, including Natura 2000 conservation objectives					
Questionnaire to MS, compiled by the Commission Services					
Strengthen the mechanisms for protecting forests against pests, building on increased cooperation with neighbouring countries, enhanced research and the ongoing review of the Plant Health Regime					
Revised Plant Health Regulation					
Strengthen the mechanisms for protecting forests against pests and invasive alien species (IAS); develop early warning system as well as provide early warning information for risks such as pests, diseases and IAS					
Other					
Co-finance, through the LIFE programme and Civil Protection Mechanism projects that contribute towards the enhancement of the European Forest Fire Information System (EFFIS)					
Guidance on Green Infrastructure and restoration					
Strategic Orientations D, E, H and I The Forest MAP combines four Strategic Orientations in its list of actions: • (D) implement the Strategic Plan for Biodiversity 2011-2020 and reach its Aichi targets adopted in the context of the Convention on Biological Diversity, building on the upcoming common Restoration Prioritisation Framework. • (E) Strengthen forest genetics conservation (tree species diversity) and diversity within species and within populations. The Commission may support them in particular via the Rural Development Programme. • (H) Strengthen the mechanisms for protecting forests against pests, building on increased cooperation					

	N.I.	P.I.	F.I.	Ong.	Del.
with neighbouring countries, enhanced research and the ongoing review of the Plant Health Regime. • (I) Assess the impacts and consider a possible extension of the obligation to apply within the EU the International Standard for Phytosanitary Measures nº 15 on wood packaging materials.					
Implementation of the Strategic Plan for Biodiversity 2011-2020 The action can be considered as partly implemented. It will continue until 2020.					
Strengthen forest genetic resources conservation					
Apply within the EU the International Standard for Phytosanitary Measures nº 15 on wood packaging materials					
Provide relevant information and data to the Parties to the UN Convention to Combat Desertification to support the implementation of their Plans of action					
Priority Area 5: What forests do we have and how are they changing?					
Set up of the Forest Information System of Europe by collecting harmonised Europe-wide information on the multifunctional role of forests and forest resources and integrating diverse information systems (e.g. EFFIS) and data platforms (e.g. EFDAC) into a dynamic modular system that combines data and models into applications					
Set up of the Forest Information System of Europe					
Strategic Orientation B, D and E The Forest MAP combines three Strategic Orientations in its list of actions: • (B) Align EU forest information so that it is primarily based on data collected by Member States with EU data architecture requirements such as INSPIRE, SEIS and Copernicus, and follow international and regional processes. • (D) Improve, make comparable and share forest information and monitoring, building on successful experiences such as EFFIS, forest health, EU forestry statistics and the EFDAC. • (E) Develop several modules, e.g. on forests and natural disturbances like fires and pests, forest and the bio–economy, forests and climate change and forest and ecosystem services that could contribute to the EU's forestry statistics and Integrated Environmental and Economic Accounting for Forests.					
Build on the information collected by existing national/regional forest information networks and develop and implement new methods for the collection and reporting of sustainable forest management criteria and indicators					
Use new information about forests to increase their resilience to threats arising from population changes					
Contribute to deriving fully harmonized information from data collected by National Forest Inventories (NFI) and/or other forest information networks, and that implement advanced methodologies to demonstrate sustainable forest management at regional, national or supranational level according to agreed criteria and indicators					
Promote the further development of the EU database of forest reproductive material, including hyperlinks to national registers and maps					

	N.I.	P.I.	F.I.	Ong.	Del.
Promote the further development of the EU database of forest reproductive material					
Other					
MAES Project: Mapping and Assessment of the state of Ecosystems and of their Services					
Priority Area 6: New and innovative forestry and added-value products					
Transferring technological and scientific knowledge to forest practice and the market, in particular through Horizon 2020 and the European Innovation Partnership on Agricultural Productivity and Sustainability, supporting the development of new products with higher added-value					
Transferring technological and scientific knowledge to forest practice and the market, in particular through the projects financed through FP7 and Horizon 2020, and the periodic evaluation of framework research programmes					
Annual reporting and analysis of the European Innovation Partnership on Agricultural Productivity and Sustainability, as well as the European Innovation Partnership on Raw Materials					
Active engagement in ongoing ERA-NETs like FORESTERRA, SUMFOREST and WoodWisdomNet+					
The Standing Committee on Agricultural Research (SCAR) will be used to strengthen coordination of research and innovation work between the EU, Member States and stakeholders.					
The Standing Committee on Agricultural Research (SCAR) will be used to strengthen coordination of research and innovation work.					
Strategic Orientation B and D The Forest MAP combines two Strategic Orientations in its list of actions: • Cooperate on advanced research and modelling tools to fill data and knowledge gaps to better understand the complex issues around social, economic and environmental changes related to forests (e.g. identifying environmental thresholds). • Ensure that results and good practices are disseminated through the EU forest governance structure and other relevant fora.					
Cooperate on advanced research and modelling tools to fill data and knowledge gaps and ensure that results and good practices are disseminated					
Priority Area 7: Working together to coherently manage and better understand our forests					
Ensure that the Standing Forestry Committee's work builds on other EU policies relevant for forests and the forest sector, ensuring that managing EU forests remains multifunctional; and improvement of coordination and policy coherence					
Elaboration and implementation of a Multi-annual Implementation Plan (Forest MAP)					
Ensuring that the SFC, in accordance with the mandate defined by Council Decision of 29 May 1989 (89/367/ EEC) provides early and enhanced input into policy making through appropriate coordination with all relevant					

	N.I.	P.I.	F.I.	Ong.	Del.
Commission Services and cohesion of forest-related issues, contributing to policy coherence					
Working together with other relevant COM committees depending on subject (such as the Civil Dialogue on Forestry and Cork, main multi-stakeholder platform for discussing issues related to forestry and sustainable forest management or the F-BI Expert Group)					
Systematic transmission of SFC Opinions to relevant DG's					
Explore various options for better coordination of sustainable forest management, harmonised forest information and cooperation between and with Member States					
Enhancing the role of the SFC by actively involving it in elaborating guidance and recommendations. Establishing a SFC annual work programme with concrete targets and deadlines					
Create a European Forest Bureau Network (National Forest Inventories – NFI) to develop harmonised criteria for NFI data					
action1: Create a European Forest Bureau Network (National Forest Inventories – NFI) to develop harmonised criteria for EU-wide reporting on NFI information					
Development of methods for NFIs					
Improve public information about forests and wood, and build on the EU Forest Communication Strategy developed by the SFC					
Transmission of relevant information on EU policy development relevant for forests to the UNECE/FAO forest communicators' network					
Further assess public perception of forests (via a Eurobarometer survey by 2015)					
Commission will further assess public perception of forests (Eurobarometer survey 2015)					
Raising awareness, knowledge and visibility of sub-sectoral issues having impact along the overall forest-based value chains on image					
Various sectoral initiatives: events and information campaigns					
Priority Area 8: Forests from a global perspective					
Ensure consistency between EU and Member State policies and commitments on forest related issues at international level; and Promote sustainable forest management across Europe and globally, and the role of forests in the transition to a green economy in the context of EU development cooperation and external action					
Continued active involvement of the EU in relevant international forest-related multilateral fora at the global (UNFF, FAO, ITTO, UNFCCC, CBD, CITES, UNCCD, UN-DESA/DSD) and at regional level					
Enhanced consistency between EU and Member States policies and objectives / commitments on forest-related issues at international level					

	N.I.	P.I.	F.I.	Ong.	Del.
At an appropriate time, using as a basis for potential further consideration the outcome of the Intergovernmental Negotiating Committee work, the EU will explore possible ways to find common ground on the Legally Binding Agreement on Forests					
Ensure continued support for global efforts to fight illegal logging through the FLEGT action Plan					
Review of the EU Timber Regulation					
Evaluation of the EU FLEGT action Plan					
Negotiation and implementation of FLEGT Voluntary Partnership Agreements (VPAs) between the EU and producer countries					
Support to producer countries for FLEGT implementation					
Support developing countries in their efforts to improve forest policies and regulations, strengthen forest governance, value and monitor forest ecosystems, and address the drivers of deforestation and forest degradation through REDD+					
Carry out a feasibility study on a possible EU action plan on deforestation and forest degradation and consider possible follow-up in line with 7th EAP					
Follow-up to Commission Communication COM (2014)64 on the "EU Approach against Wildlife Trafficking" (also covers plant and tree species) and related stakeholders consultations					
Assess the environmental impact of EU consumption of products and raw materials likely to contribute to deforestation and forest degradation outside the EU. If appropriate, it will consider policy options for limiting such impacts, including the development of an EU action plan on deforestation and forest degradation.					
Assess the environmental impact of EU consumption of products and raw materials likely to contribute to deforestation and forest degradation outside the EU					
Study on the environmental implications of the increased reliance of the EU on biomass for energy imported from North America					

14.4. Annex IV. Relation between forest-related objectives and Strategic Orientations for Priority Area 8

International Policy Context	Forest-related objectives	Strategic Orientation				
		a	b	c	d	e
Agenda 2030: Sustainable Development Goals	**SDG 15.** Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss					
UN Strategic Plan for Forests 2017-2030 (UNFF)	**Global Forest Goal 1:** Reverse the loss of forest cover worldwide through SFM, including protection, restoration, afforestation and reforestation, and increase efforts to prevent forest degradation and contribute to the global effort of addressing climate change.					
	Global Forest Goal 2: Enhance forest-based economic, social and environmental benefits, including by improving the livelihoods of forest dependent people.					
	Global Forest Goal 3: Increase significantly the area of protected forests worldwide and other areas of sustainably managed forests, as well as the proportion of forest products from					

	sustainably managed forests.					
	Global Forest Goal 4: Mobilize significantly increased, new and additional financial resources from all sources for the implementation of SFM and strengthen scientific and technical cooperation and partnerships.				*	
	Global Forest Goal 5: Promote governance frameworks to implement SFM, including through the UN Forest Instrument, and enhance the contribution of forests to the 2030 Agenda.					
	Global Forest Goal 6: Enhance cooperation, coordination, coherence and synergies on forest-related issues at all levels, including within the UN System and across CPF member organizations, as well as across sectors and relevant stakeholders.					
Paris Agreement (UNFCCC)	**Article 5**: Integrates forest-based climate change mitigation and adaptation measures in the operational scheme of the Agreement.					
	Article 5.1: States that Parties should take action to 'conserve' and 'enhance' sinks and reservoirs of greenhouse gases including forests. This provides a legal basis to require Parties to 'conserve' and 'enhance' ecosystems when taking INDCs to address climate change.					
	Article 5.2: Encourages 'implementation' and 'support', among others, of REDD+, and alternative policy approaches such as joint mitigation and adaptation approaches for integral and sustainable management of forests. It also reaffirms the importance of non-carbon benefits of forests.					
COP 13 Convention on Biological Diversity – Cancun Declaration	(a) Promotion of sustainable forest management, as a dynamic and evolving concept aiming to maintain and enhance the economic, social and environmental values of all types of forests					
	(b) Appreciate the importance of forest ecosystems as reservoirs of biodiversity and sources of ecosystem services, highlighting their crucial role for human development, water supply, food security, nutrition and human health, especially for forest-dependent communities					
	(c) Emphasizing their relevance as carbon sinks and their critical role for developing strategies for climate change adaptation and mitigation, such as activities related to reducing emissions from deforestation and forest degradation, and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks, as well as for protection against natural hazards and disasters;					
	(d) Strengthen the implementation of the Global Soil Partnership and Global Mountain Partnership ;					
	(e) Design and promotion of incentive packages for restoration, conservation and sustainable use of forest ;					
	(f) Promote participation of the private sector in the development of production chains oriented to reduce deforestation and forest degradation while increasing the economic and social benefits of landholders and local communities;					
	(g) Promote the International Arrangement on Forests and the implementation of the United Nations Forest Instrument.					

* The mobilisation of funding and additional resources is not addressed in the EU Forest Strategy or Forest MAP.

14.5. Annex V. EU Forest Strategy Survey Results

1.1.1.1.Summary

The vast majority of countries have a National Forest Programme or an equivalent policy document, while their implementation has been moderately affected by EU Forest Strategy. These documents have been recognized as key instruments in assuring the successful implementation of EU Forest Strategy. The EU Forest Strategy also had a moderate effect on how public funds are used in forestry, but has strengthened the coordination between national actors and has strengthened links to other sectors, most notably climate change and biodiversity protection. Stakeholders have stated that moderately the same results would be achieved without EU Forest Strategy, while the Member States responses were more positive, but have stipulated lack of coordination as the cause to lack of strong effect of the EU Forest Strategy on the national forestry domains. The respondents have characterized contribution of the EU Forest Strategy towards 2020 Forest Objectives to be on medium level, where this relation has been perceived more positively by the Member States respondents.

The Member States respondents have reported total of 622 activities related to implementation of EU Forest Strategy; but these activities are unevenly distributed, ranging from 61 (Slovakia) to 3 reported activities (Malta). Only a small portion (4 per cent) of the activities are in planning, some (26 per cent) have been carried out, while that vast majority (70 per cent) are reported on as in progress. They are proportionally distributed across Priority Areas and Member States. The activities are unevenly distributed across Strategic Orientations contained within different Priority Areas of the EU Forest Strategy, where the dissemination of results, forest fires and promotion of wood usage are the topics that have been mot abundantly present, and the cooperation between different EU bodies, guidance on wood mobilization and support to producer countries in the FLEGT implementation have been present most seldom. The most pronounced gap in the implementation of EU Forest Strategy is the lack of cooperation between relevant authorities and stakeholders on one side and policy coherence between forest-focused and forest-related policies on another, followed by lack of prominence of the forest sector in the national and EU-level of policy making. On a positive note, the respondents have recognized an important role that the research projects play in the long-term implementation of EU Forest Strategy, and there is a share understanding among the respondents that successful implementation of the EU Forest Strategy requires broad participation of a wide array of different stakeholders.

In general, the respondents have stated that there is a moderate level of EU Forest Strategy implementation, and that it is still too soon to make a judgment on this issue. There is also a shared understanding that EU Forest Strategy implementation is more focused on its social than on its environmental aspects. From individual Priority Areas, the no. 6 (Research and innovation) and no. 5 (Forest information and monitoring) have been characterized as the ones that had highest level of implementation, while the lowest level of implementation was noted for no. 7 (Working together) and no. 1 (Supporting rural and urban communities). Forest MAP contribution to implementation of specific priorities by Commission Services has been judged to be on a moderate level, and is perceived less favourably by the stakeholders than by the Member States respondents. In general, the Member States respondents have a systematically more positive relation to EU Forest Strategy implementation, its contribution to 2020 Forest Objectives and Forest MAP implementation. Another finding is that the stakeholders very frequently do not have information on these relations, and have explicitly stated that they have a lack of knowledge on the developments in the policy sphere.

Although the organizational setup of the Expert Group on Forest-based Industries and Sectorally Related issues and of the Civil Dialogue Group on Forestry and Cork in their

relation to the implementation of the EU Forest Strategy is perceived moderately favourable, there is a shared understanding that improvements are needed in the communication with stakeholders (e.g. providing background documents early on) and with other sectors, and that the role of these bodies should be strengthened. Although the respondents stated that EU Forest Strategy was moderately successful in improving the coordination with Member States and stakeholders, they have also expressed a need for strengthened coordination with climate-related issues and bio economy sectors, and in general a need for the forestry actors to recognize that the sector has to operate in a fragmented EU policy landscape and to stop trying to control the sector on its own. The respondents have also recognized the problem of trade-offs between different actions and goals of the EU Forest Strategy and that greater flexibility in the implementation of the strategy is needed.

1.1.1.2.Background Information

The questionnaire distributed to stakeholders had a total of 125 responses (complete and incomplete answers included). The questionnaire distributed to Member States had responses from 19 countries. From the questionnaire distributed to stakeholders, 19 respondents come from producers, 13 from environmental NGOs, 8 from industry, 1 from trading organization and 20 from other types of organizations.

1.1.1.3.The EU Forest Strategy and National Forest Policy

In the questionnaire distributed to member states, respondents were asked does their country have a national forest strategy (or a similar programmatic document). Such document was found for a total of 11 countries (Bulgaria, Cyprus, Czech Republic, Estonia, France, Germany, Hungary, Ireland, Italy, Slovakia and Austria), while respondents from the Netherlands and Malta stated that their countries do not have such a document. They were also asked to which extent has the EU Forest Strategy had an influence on the design or implementation of national forest programmes (strategies, plans), answers to which can be seen on Figure 1.

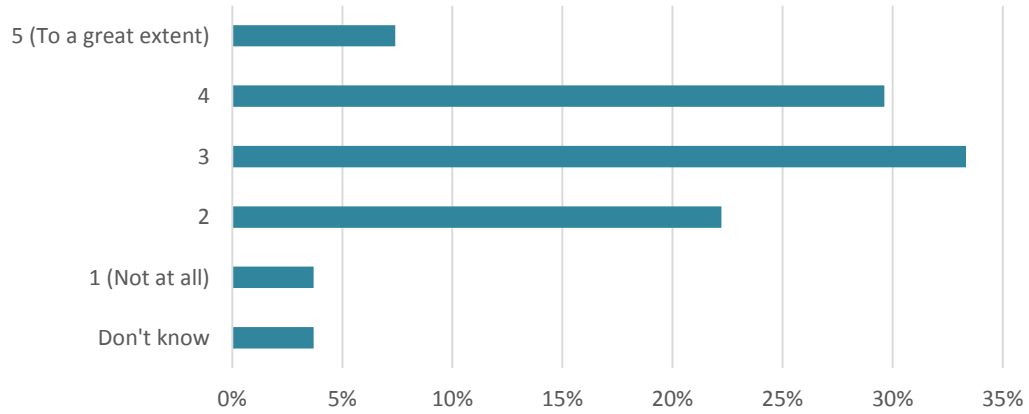

Figure 1. Influence of the EU Forest Strategy on the design or implementation of NFP

The responses in Figure 1 are centred on the middle of the scale, indicating an average level of influence from the EU Forest Strategy on the implementation of National Forest Programmes (NFPs). As seen on Figure 2, the respondents consider that the EU Forest Strategy has had a moderate effect on the way the public funding is used for forest-related activities in their country.

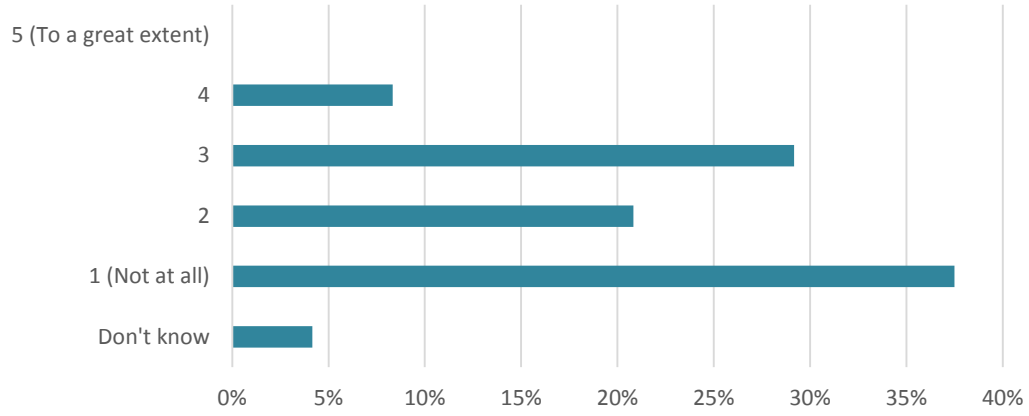

Figure 2. Extent to which the EU Forest Strategy changed the way in which public funding was used for forest-related activities

Although majority of responses are close to the middle of the scale, there are numerous responses in the bottom edge of it. Countries of respondents that have stated that EUFS had no effect on the way public funding is used in forestry are Austria, Belgium, Croatia, Italy, Cyprus, Romania and Netherlands. Countries in which it had a large (response category 4) effect are Spain and Hungary. The respondents were also asked to elaborate their opinions and give examples. The main messages were that the EUFS has had a moderate effect on the way the public funds are used within the domain of forestry, but that it had strategic effect of strengthening the coordination of relevant national actors, that it has helped to create new budget lines related to different topics, that it has strengthened the role of forestry in the climate-change related issues, and that it had a synergic effect with the spending related to implementation of strategic documents from other sectors, such as the biodiversity strategy. Respondents in the Member States questionnaire were asked would the same results be achieved in the absence of the EU Forest Strategy; the responses to which are presented by Figure 3.

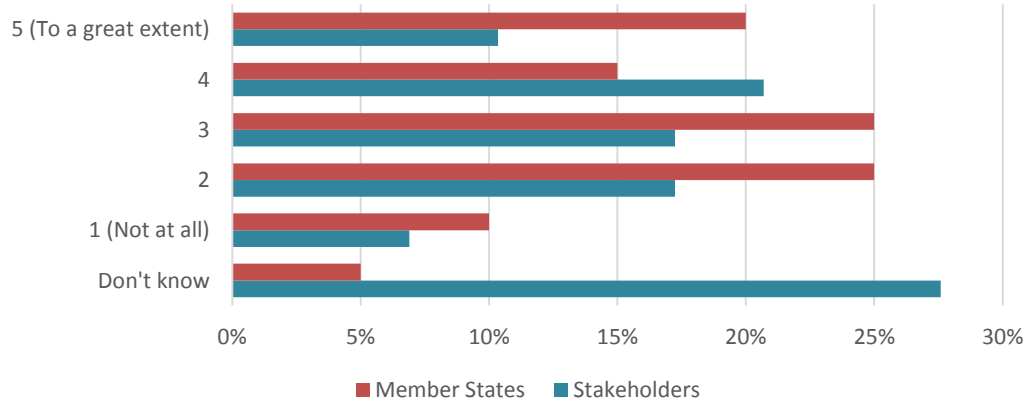

Figure 3. Would the same results have been achieved in the absence of the EU Forest Strategy?

Majority of Member States responses are located in the central categories of the scale. Those who stated 1 (not at all) are coming from Italy, while those who stated 5 (To a great extent) are coming from Bulgaria, Cyprus, Romania and Germany. Responses from the stakeholder are more negative towards the effects of the EU Forest Strategy, where the median (central response when they are scaled from smallest to largest) and mode (response with highest

frequency) values are at point 4 of the response scale. In the qualitative part of the question, the stakeholders have stated that the strategy had a moderate effect, and that more could have been implemented. Respondents also acknowledge the multitude of policies that affect the forest sector, lack of coordination from the side of EU and a need for coordinated response from Member States to the Strategy. The comments from the side of Member States in similar vein acknowledge the contribution of the EU Forest Strategy towards raising the prominence of the forest sector in the national policy arena, but also stipulate lack of coordination with policies from other sectors. Respondents in both questionnaires were asked on the contribution towards 2020 Forests Objectives on national level, where their responses are presented in Figures 4 to 7.

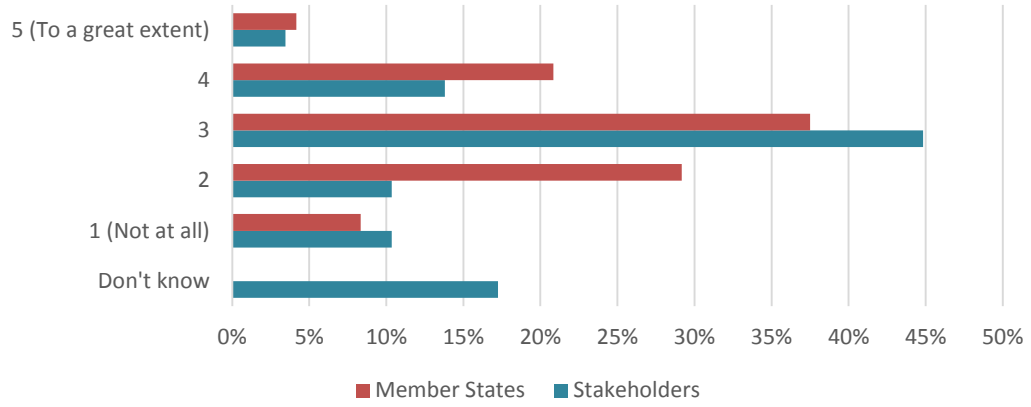

Figure 4. Contribution of the Strategy towards 2020 Forest Objectives (To ensure and demonstrate that all forests in the EU are managed according to sustainable forest management principles)

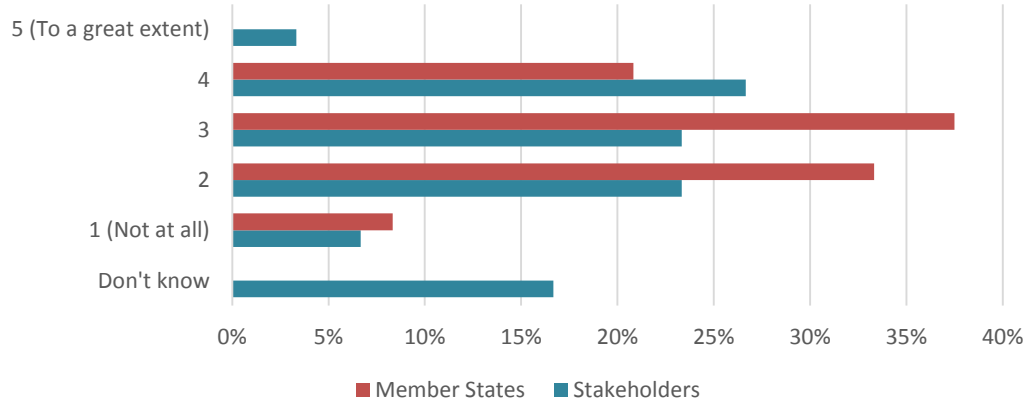

Figure 5. Contribution of the Strategy towards 2020 Forest Objectives (To strengthen EUs contribution to promoting sustainable forest management and reducing deforestation at global level)

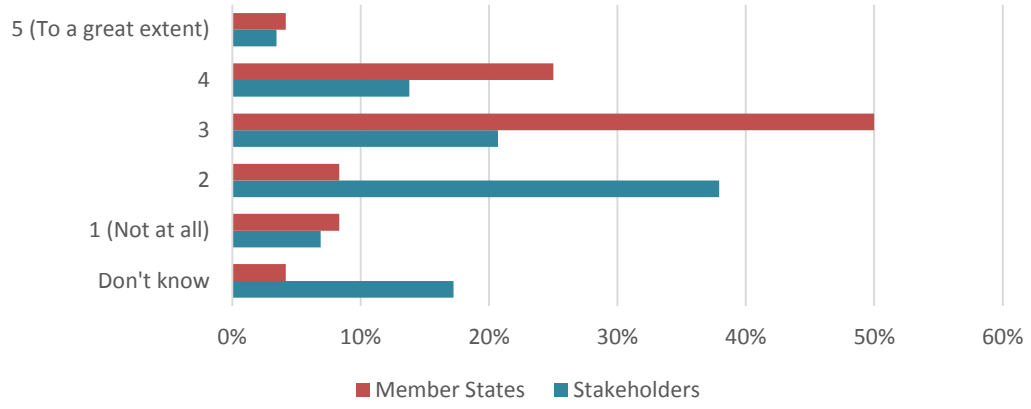

Figure 6. Contribution of the Strategy towards 2020 Forest Objectives (Contributing to balancing various forest functions, meeting demands, and delivering vital ecosystem services)

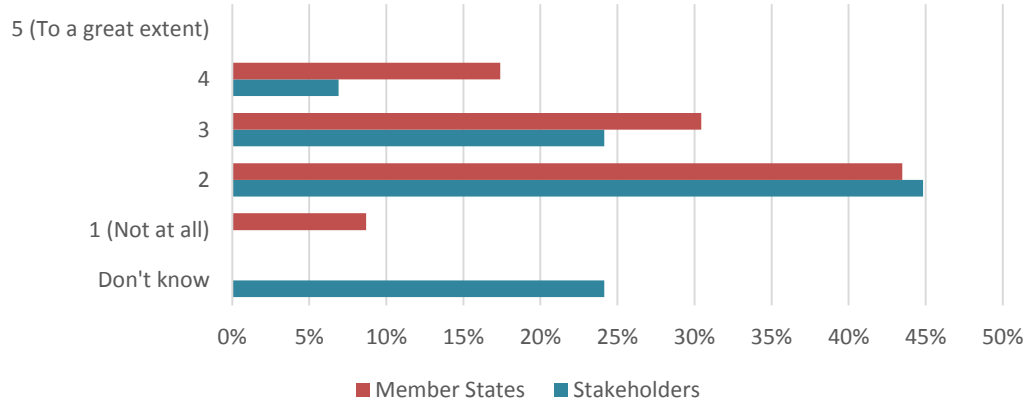

Figure 7. Contribution of the Strategy towards 2020 Forest Objectives (Providing a basis for forestry and the whole forest-based value chain to be competitive and viable contributors to the bio-based economy).

It can be seen on Figures 4 to 7 that both of the groups of respondents have stated that there is an intermediary level of EU Forest Strategy's contribution towards 2020 Forest Objectives; but also that the Member States-respondents have consistently assigned one-point higher EU Forest Strategy contribution to 2020 Forest Objectives than stakeholders did. Another finding is that sizable portion of stakeholders cannot assess the relation between these two elements.

A chapter of the questionnaire sent to representatives of Member States responsible for forestry was devoted to activities that were carried out in relation to the implementation of the EU Forest Strategy. The distribution of activities by status and country is presented by Figure 8.

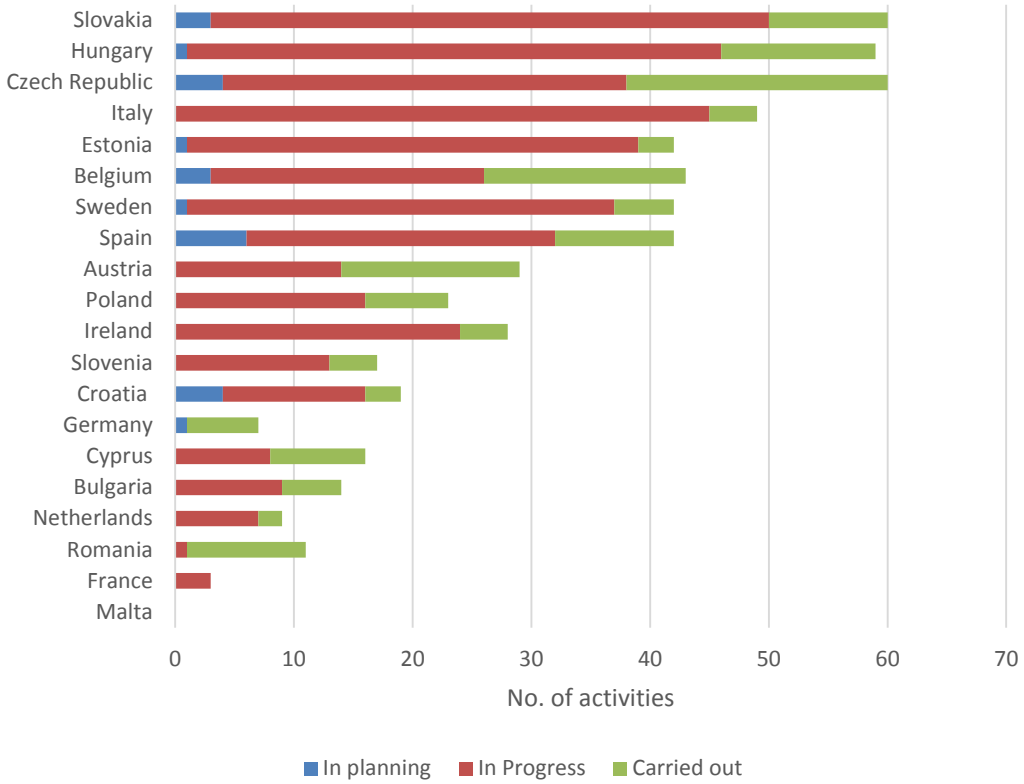

Figure 8. Number of activities by status and country.

A total of 622 activities has been reported, with the average of 31 activity per country, the highest number of activities is reported in Slovakia (61), Hungary (60) and Czech Republic (60), while the lowest number of activities was reported in Malta (2 – not seen in the figure as their status is not reported), France (3) and Romania (11). The Figure 9 also shows that only small portion (4 per cent) of activities are in planning, some (26 per cent) have been carried out, while that vast majority (70 per cent) is in progress.

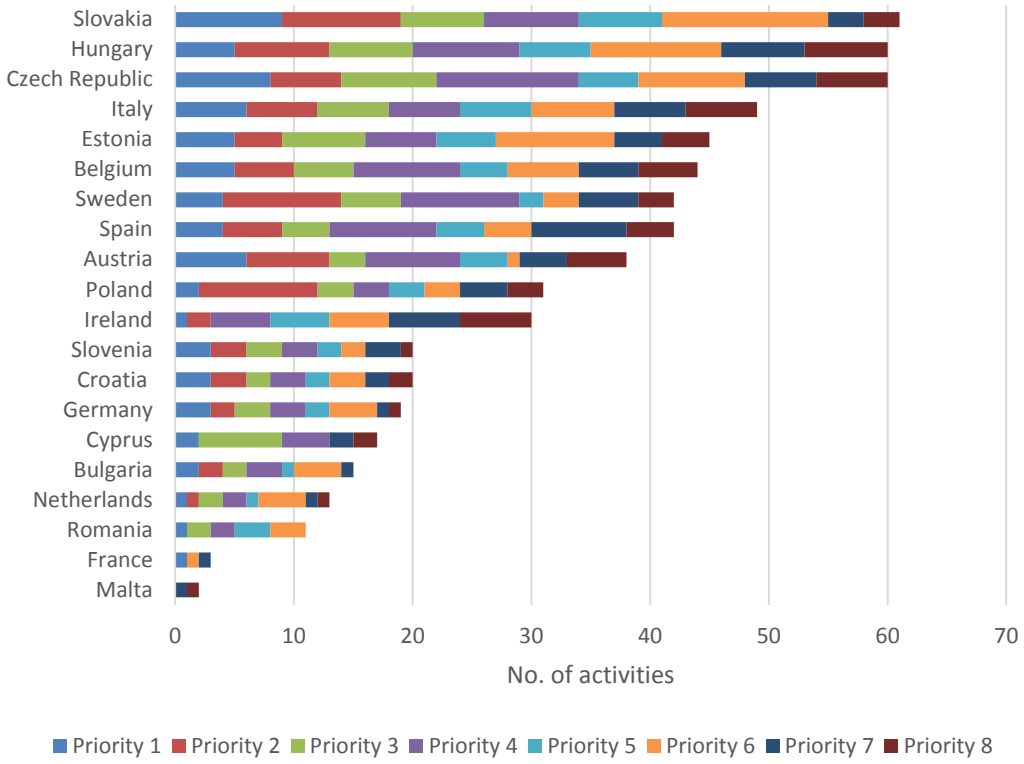

Figure 9. Number of activities by priority and country.

When the activities are broken-down by country and Priority Areas (Figure 9), it can be seen that the activities by country are proportionally distributed across Priority Areas. However, activities are not proportionally distributed across Strategic Orientations contained within the eight Priority Areas. The average number of reported activities by Strategic Orientation is 11, while it is smallest for the following Strategic Orientations:

- Work together with other relevant COM committees depending on subject (e.g., Civil Dialogue on Forestry and Cork, F-BI Expert Group and the Expert Group on Natura 2000) – 2 reported activities, within Priority Area 7
- Develop good-practice guidance for sustainable wood mobilization and for the "cascade" principle, as well as on resource and energy-efficient manufacturing processes – 3 reported activities, within Priority Area 2
- Support to producer countries for FLEGT implementation – 3 reported activities, within Priority Area 8

On the other side of the scale, there are several Strategic Orientations within which many activities have been reported on, most notably:

- Ensuring that results and good practices are disseminated – 33 reported activities, within Priority Area 6
- Supporting prevention and preparedness actions related to forest fires (Civil Protection Mechanism) – 23 reported activities, within Priority Area 3
- Explore and promote the use of wood as a sustainable, renewable, climate and environment-friendly raw material – 22 reported activities, within Priority Area 2

Respondents were also asked not just to classify their activities, but to describe them as well. The summary of these descriptions of activities by each Strategic Orientation within each Priority Area is displayed in the table below.

Table 1. Summary of activities undertaken by Member States in relation to the implementation of the EU Forest Strategy

Priority Area 1: Supporting rural and urban communities
1.1.1.1. Use of rural development funds to improve competitiveness and promote the diversification of economic activity and quality-of-life Countries reporting activities: AT BE BG CZ DE EE HR HU IT NL SI SK Many countries and regions are in the course of implementing the Rural Development Program 2014-2020. This RDP contains a number of measures that are relevant to the forest sector. In the EUFS survey, some countries referred to the specific RDP measures while others didn't. The most relevant forest-related RDP measures are M08 and its various sub-measures (Investments in forest area development and improvement of the viability of forests), M15 (Forest-environmental and climate services and forest conservation) and M12 (Natura 2000 and Water Framework Directive payments). Other measures that were selected by some Member States include M01, M02, M04, M07, M09, M10 and M16. The responses to this question are sometimes incomplete and overlap **Reported activities – carried out**: This Strategic Orientation has been translated by some countries in support to both private and public forest owners (DE). Some countries invested in technological improvements in the forest sector by supporting the purchase of machinery and by stimulating the processing and marketing of forest products (CZ, HU). RDP measures have also been used to support private investments in woodworking, joinery, wood products for energy use, as well as for the creation and maintenance of forest fires and prevention and protection against forest fires (CZ). **Reported activities – in progress**: Many RDP measures are still in progress as the program covers the time span of 2014-2020. Also here there is a focus on wood mobilization (HU), forest technology and the bioeconomy (HR). Producers are supported by organizing cooperative structures (SI). There are ongoing efforts in order to increase the resilience of forests and to manage natural risks and hazards such as storms and fires (BG, HR, IT, SI). Forest-related tourism is supported (BE(WA)) as is farm business development (SI). The activities can be in line with an existing national forest strategy (AT, SK).
1.1.1.2. Use of rural development funds to deliver specific environmental public goods Countries reporting activities: AT BE(VL/WA) BG CZ DE EE ES IE PL SE SI **Reported activities – carried out**: This Strategic Orientation has been used to map the forest areas and to assess ecosystem services (BG) and in water management (CZ) and the increased resilience of forest, by species substitution and risk management (CZ). **Reported activities – in progress**: There are ongoing efforts to develop, in a participatory way, woodland amenities on sites close to centers of population (IE) and demonstrations sites of sustainable forest management (CZ). Also the actions under SO 1.2 are in line with some existing national forest programs (AT, EE). There are some investments in afforestation (BE(VL), PL) and agro-forestry (BE(WA)). Also under this SO, activities to increase the resilience of forests in the light of climate change are reported (ES).
1.1.1.3. Use of rural development funds to promote the social functions of Sustainable Forest Management Countries reporting activities: ES HR IT SI SE **Reported activities – carried out**: A number of countries reported a regular assessment of their national forest measures. **Reported activities – in progress**: Idem.
1.1.1.4. Assess and improve the effect of forestry measures under rural development policy Countries reporting activities: AT BE(VL) CZ ES HR IT SE SI **Reported activities – carried out**: Some countries have an operational program on advisory systems for forest owners and forest managers (BE(VL), CZ) but the link to RDP is not always clear (BE-VL). Some countries organize seminars (ES) and stakeholder dialogues (AT) **Reported activities – in progress**: In some countries the development of advisory groups for forest owners and managers is in progress (HR). Other plan to increase the state forest extension services through digitalization (SE).
1.1.1.5. Support Forest Advisory Systems for awareness raising; training; and communication between local forest holders and authorities Countries reporting activities: AT CY CZ EE HU PL RO SE SI SK **Reported activities – carried out**: This has been used to raise awareness about forest resilience and risks

(CZ), invest in better management plans (RO) to improve sustainable forest management in urbanised regions (SI).

Reported activities – in progress: There are ongoing plans to enhance the recreation value of forests and to bring people in contact with the forest (CY, PL, SE).

1.1.1.6. Improve the valuing of the benefits that forests give to society and, through sustainable forest management, find the right balance between delivering the various goods and services

Countries reporting activities: AT BE(VL) EE HU SK

Reported activities – carried out: /

Reported activities – in progress: Countries refer to their respective RDPs.

1.1.1.7. Prepare forestry-related recommendation for the post 2020 Rural Development Policy

Countries reporting activities: AT CY IT SK

Reported activities – carried out: In comparison to the previous RDP (2003-2013) forestry measures have already been improved in the current one (CY, SK)

Reported activities – in progress: Ex-post evaluation of the current RDP (AT, SK).

1.1.1.8. Prepare forestry-related recommendation for post 2020 State aid guidelines

Countries reporting activities: CZ EE FR HU IT SK

Reported activities – carried out: Planning forest advisory services provided in the form of subsidized services or expert advice to small owners (CZ).

Reported activities – in progress: Under this activity forester trainings (HU) and efforts to increase the awareness of the public for forest use were reported (FR, SK).

Priority Area 2. Fostering the competitiveness and sustainability of forest-based industries, bioenergy and the wider green economy

1.1.1.9. Explore and promote the use of wood as a sustainable, renewable, climate and environment-friendly raw material

Countries reporting activities: AT BE(VL/WA) BG CZ DE EE ES HR HU PL SE SI SK

Reported activities – carried out: Enhancing the wood and timber industry and promoting the use of wood (also in construction) as an environment-friendly choice (AT, DE, SE).

Reported activities – in progress: Promoting wood as a renewable energy source (BG, EE, SK) and innovative wood-based products (SK). Adding value to wood by cascading use and selecting high quality timber for special purposes (BE(VL) and generally improving the utilisation of the whole wood value chain (BE(WA), CZ, ES, HR, PL, SI) with a special focus on wood construction (PL, SI, SE).

1.1.1.10. Assess the climate benefits of material and energy substitution by forest biomass and harvested wood products and the effect of incentives for using forest biomass

Countries reporting activities: AT BE(WA) BG EE HR HU IT NL SE SK

Reported activities – carried out: Some countries focus on bioenergy and the coordination between different sectors and departments (BG, SE, SK).

Reported activities – in progress: Many countries focus on the use of bioenergy and its potential to mitigate climate change (EE, HU, SI) or the mitigation potential of the forest sector as a whole (AT, SE). Coordinating and grouping forest owners (BE(WA)) was also reported.

1.1.1.11. Develop objective, ambitious and demonstrable EU sustainable forest management criteria that can be applied in different policy contexts regardless of the end use of forest biomass

Countries reporting activities: AT BE(VL) EE HU PL SK

Reported activities – carried out: Countries reported having national criteria for SFM (SK, BE(VL) and updated internal forest policies (AT, PL). Participation in SFC meetings was also mentioned (SK).

Reported activities – in progress: /

1.1.1.12. Assess potential wood supply and facilitating increased sustainable wood mobilisation

Countries reporting activities: EE HU IE SE

Reported activities – carried out: Two countries finished long-term wood mobilisation forecasts (IE, SE).

Reported activities – in progress: Updating NFPs and NFIs (EE, HU, SE)

1.1.1.13. Develop good-practice guidance for sustainable wood mobilisation and for the "cascade" principle, as well as on resource and energy-efficient manufacturing processes

Countries reporting activities: AT IT SK

Reported activities – carried out: /

Reported activities – in progress: Updating NFP (AT), technological advances on woodworking machines (SK).

1.1.1.14. Stimulate market growth and internationalisation of EU Forest-based Industry products and improve sectorial knowledge

Countries reporting activities: CZ ES PL

Reported activities – carried out: Technological advancements in regards to bioenergy production (PL), national plans to stimulate the wood-based sector (ES, PL)

Reported activities – in progress: Establishing a marketing fund for forest-base products (CZ)

1.1.1.15. Stimulate favourable investment conditions in construction

Countries reporting activities: AT CZ ES PL

Reported activities – carried out: Promotion of and education on wood constructions (ES, PL).

Reported activities – in progress: Promoting wooden houses as energy-efficient alternatives (PL)

1.1.1.16. Support the Forest-based Sector Technology Platform and encourage new initiatives

Countries reporting activities: AT CZ HU IE IT SE SI SK

Reported activities – carried out: /

Reported activities – in progress: Many countries are implementing strategies to enhance the use of wood throughout the whole value chain by valorising lesser quality and developing new technologies, new products and production methods (CZ, HU, SI, SK). Developing decision tools for forest owners (IE).

1.1.1.17. Identify needs and provisions for education, training and skills development in the forest-based sector

Countries reporting activities: AT BE(WA) CZ ES HR HU PL SE SI SK

Reported activities – carried out: /

Reported activities – in progress: Organising trainings, investing in and promoting wood construction (BE(WA), CZ) and financially supporting them (HU, SK). Investing in new regional or national education programs (ES, HR, SK) and extension services (SE).

Priority Area 3: Forests in a changing climate

1.1.1.18. Increasing the forests' mitigation potential through increased removals and reduced emissions, including by cascading use of wood

Countries reporting activities: AT BE(VL) CZ DE EE ES IT NL PL RO SE SI SK

Reported activities – carried out: Afforestation (CZ, RO) and forest stand conversion and management for carbon sequestration (CZ, PL, SE, SI)

Reported activities – in progress: This activity is largely covered by regional and national RDP measures (BE(VL), CZ, EE, ES, SK). Promoting the use of wood (AT).

1.1.1.19. Promote and support forest management practices that limit emissions or increase net biological productivity

Countries reporting activities: BG BE(VL) CY CZ EE HU SE SK

Reported activities – carried out: /

Reported activities – in progress: Forest expansion through afforestation (RDP measures) or through natural expansion (BG, HU). Managing forests for fire risk reduction (CY). National climate action programs (BE(VL), SE). Network of demonstration sites for SFM (CZ).

1.1.1.20. Studying the effectiveness, costs and standards of forest nature-based solutions to cost-effectively contribute to climate change mitigation and natural risk reduction

Countries reporting activities: AT BG CY CZ EE HU IT SK

Reported activities – carried out: /

Reported activities – in progress: This activity is largely covered by RDP support for restoration of forests damaged by natural disasters (CY, CZ, EE, HU, IT, SK). Some countries organize additional training for

forest and civil protection services (CY, HU).

1.1.1.21. Supporting prevention and preparedness actions related to forest fires (Civil Protection Mechanism)

Countries reporting activities: CY CZ DE EE ES HR HU IT PL SE SK

Reported activities – carried out: Financial support to private and public forest owners in improving the tree species mixture and climate change resilience (DE, AT).

Reported activities – in progress: This activity is largely covered by RDP support for restoration of forests damaged by natural disasters (CY, CZ, EE, HU, IT, SK) or for the building and maintenance of forest fire prevention infrastructure (HR, ES, PL). Guidance and (online) advice for resilient management, native species admixture or natural regeneration (EE, SK, HU, CY

1.1.1.22. Enhancing the forests' adaptive capacities and resilience

Countries reporting activities: BE(WA) CZ DE ES HR IT NL SK PL RO SE SI

Reported activities – carried out: National/RDP support for tree species composition change (CZ), developing models for adaptive forest management (SE).

Reported activities – in progress: National or regional guidelines for close-to-nature silviculture (BE(WA), PL, RO, SI).

Priority Area 4: Protecting forests and enhancing ecosystem services

1.1.1.23. Develop a conceptual framework for valuing ecosystem services, promoting their integration in accounting systems at EU and national levels by 2020

Countries reporting activities: AT BG CZ DE ES HU IT SE SK

Reported activities – carried out: RDP SUPPORT, participation in INTEGRATE network (CZ)

Reported activities – in progress: Working out methodologies for valuing ecosystem services (BG, CZ, ES, SE, SK); implementation of the EU Water Framework Directive (SE)

1.1.1.24. Integration of sustainable forest management practices in the Program of Measures of River Basin Management Plans

Countries reporting activities: AT BE(VL) BG IE ES SK

Reported activities – carried out: /

Reported activities – in progress: Different activities related to regional or national RBM plans by managing run-off after forest operations and restoring new or existing riparian ecosystems (IE, BG, SK, ES, AT).

1.1.1.25. Integration of sustainable forest management practices in the Rural Development Programs

Countries reporting activities: AT BE(VL) CZ EE ES HR IT SK

Reported activities – carried out: Binding SFM plans for financial support (BE(VL), CZ).

Reported activities – in progress: A number of activities relateD to national forest strategies or RDP measures (CZ, EE, HR, ES).

1.1.1.26. Achieve a significant and measurable improvement in the conservation status of forest species and habitats by fully implementing EU nature legislation

Countries reporting activities: BE(WA) CY CZ EE ES HU IE NL RO SE SK

Reported activities – carried out: Management plans for all forests in Natura 2000 zone (CY)

Reported activities – in progress: Special focus on SACs and Natura 2000 areas; protection of species from the Birds and the Habitats Directive (BE(WA), CZ, HU, ES, NL, IE), sometimes involving mandatory management plans in these areas (SK). Identification of virgin forests (RO).

1.1.1.27. Ensure that national forest plans contribute to the adequate management of the Natura 2000 network by 2020

Countries reporting activities: AT BE(VL) CY CZ EE IE HR HU PL RO SE SI SK

Reported activities – carried out: Improved monitoring system (CY, HU), special focus on Natura 2000 sites (SI).

Reported activities – in progress: Increased import controls (IE). Implementing the actions mentioned in the national/regional forest/Natura 2000 strategies (BE(VL), CZ, EE, HR, RO, PL, SI) and EU legislation (CZ, IE)

1.1.1.28. Strengthen the mechanisms for protecting forests against pests and invasive alien

species

Countries reporting activities: BE(VL/WA) CZ EE ES HR IT PL SE SI

Reported activities – carried out: Regional list of recommended provenances (BE(VL)), observatories on forest health and invasive species (BE(WA)), HR) or tree genetics (CZ)

Reported activities – in progress: Setting up expert committees and online tools on pests and diseases (ES, SI, SE).

1.1.1.29. Guidance on Green Infrastructure and restoration

Countries reporting activities: BG CY CZ ES HU IT SE SK

Reported activities – carried out: Many activities here are covered by the RDPs (CY, CZ, HU, SK). Technical guidelines on restoration of burned areas (ES)

Reported activities – in progress: Ongoing RDP measures. Provincial plans for Green Infrastructure (SE).

1.1.1.30. Implementation of the Strategic Plan for Biodiversity 2011-2020

Countries reporting activities: AT BE(VL) EE IT SE

Reported activities – carried out: /

Reported activities – in progress: These activities generally overlap with those under 4_4 and 4_5, related to the Birds and Habitats Directives (BE(VL), SE).

1.1.1.31. Strengthen forest genetic resources conservation

Countries reporting activities: AT BE(WA) CY CZ DE EE ES HU IE PL SE SK

Reported activities – carried out: National Programme for the conservation and reproduction of forest genetic (CZ), installation of seed banks (BE(WA), CY, PL).

Reported activities – in progress: Some countries have genetic diversity in their NFP (EE), some installed working groups (IE) or are part of international networks like EUFORGEN (SE). Genetic diversity can be related to RDP measures (ES, HU, SK).

1.1.1.32. Applying the International Standard for Phytosanitary Measures nº15 on wood packaging materials

Countries reporting activities: AT ES IE SE SK

Reported activities – carried out: Several countries have already implemented this legislation (AT, ES, SE, SK)

Reported activities – in progress: Implementation is still ongoing (IE).

1.1.1.33. Provide relevant information and data to the Parties to the UN Convention to Combat Desertification to support the implementation of their Plans of action

Countries reporting activities: DE ES NL SE

Reported activities – carried out: /

Reported activities – in progress: National studies to provide relevant information for the new reporting system (ES); coordinating implementation of UNCCD decisions (SE).

Priority Area 5: What forests do we have and how are they changing?

1.1.1.34. Setting up of the Forest Information System of Europe

Countries reporting activities: AT DE EE IE HU IT SK

Reported activities – carried out: National forest information systems (EE, SK)

Reported activities – in progress: Contribution to international platforms like JRC (HU)

1.1.1.35. Collecting harmonized Europe-wide information on the multifunctional role of forests and forest resources

Countries reporting activities: AT CZ EE HU HR PL RO SK

Reported activities – carried out: Many countries have a National Forest Inventory (PL, RO)

Reported activities – in progress: Contributing to international databases like EFFIS, EFDAC or ENFIN and participating in local and global level (EU, FAO, UNECE, FOREST EUROPE) discussions (AT, HR, HU).

1.1.1.36. Integrating diverse information systems (e.g. EFFIS) and data platforms (e.g. EFDAC) into a dynamic modular system that combines data and models into applications

Countries reporting activities: BG CZ DE EE HU IE IT SK

Reported activities – carried out: Improved national information systems and NFIs (BG, CZ, DE, HU

Reported activities – in progress: Participation in e project for JRC data collection (IE), continously monitoring and updating NFI (EE, CZ, HU).

1.1.1.37. Aligning EU forest information so that it is primarily based on data collected by Member States with EU data architecture requirements

Countries reporting activities: AT EE IE IT NL RO SK

Reported activities – carried out: /

Reported activities – in progress: Ongoing efforts to harmonize data collection and NFIs, contribution to international organisations, networks and platforms like JRC, EUFORGEN, ENFIN, EUFGIS (EE, IE, RO, SK).

1.1.1.38. Promoting the further development of the EU database of forest reproductive material, including hyperlinks to national registers and maps

Countries reporting activities: BE(WA) CZ EE HU IE RO SI SK

Reported activities – carried out: Improved forest acts and NFIs (HU, IE, SI)

Reported activities – in progress: Continuously updating NFI (CZ, EE, SK), contributing through FOREMATIS, EUFORGEN or different COST action plans (CZ, RO, SI) or national seed bank (BE(WA)).

1.1.1.39. Improving, making comparable and sharing forest information and monitoring

Countries reporting activities: AT BE(FL) CZ ES HR IT PL SE

Reported activities – carried out: Digital national forest fire register (HR), third NFI (CZ).

Reported activities – in progress: Ongoing efforts to harmonize data collection and NFIs (BE(VL), ES, SE). Contribution to international organisations, networks and platforms like FOREMATIS (IE).

Priority Area 6: New and innovative forestry and added-value products

1.1.1.40. Transferring technological and scientific knowledge to forest practice and the market

Countries reporting activities: BE(WA) CZ DE EE ES HR HU IT PL RO SK

Reported activities – carried out: National program declarations in the Seventh EU Framework Programme for science and research (SK), continuous knowledge transfer from public to private sector (RO).

Reported activities – in progress: National research institutes and research programs (BE(WA), CZ, PL, SI) knowledge transfer (EE, ES, SI) and international cooperation in eg. Life+ projects (HU, SK

1.1.1.41. Active engagement in ongoing ERA-NETs, like FORESTERRA, SUMFOREST and WoodWisdomNet+

Countries reporting activities: AT BE CZ EE HU IE SK

Reported activities – carried out: /

Reported activities – in progress: Coordination of FOREST EUROPE process (SK), involvement in European Innovation Partnership grant scheme (IE), ERA-NET (CZ, IE, NL), WoodWisdomNet+ and SUMFOREST (SK) and FORESTERRA (BG).

1.1.1.42. Using the Standing Committee on Agricultural Research (SCAR) to strengthen coordination of research and innovation work between the EU, Member States and stakeholders

Countries reporting activities: BE(WA) EE HR HU IE SE SK

Reported activities – carried out:

Reported activities – in progress: The SCAR is used to exchange of information and coordination on regional and European scale (BE(WA), EE, HR, HU, IE, SE, SK)

1.1.1.43. Supporting the development of new products with higher added-value

Countries reporting activities: BE(VL) CZ EE ES IE NL HU SI SE

Reported activities – carried out:

Reported activities – in progress: Program TREESEARCH on new materials and speciality chemicals from forest raw material (SE) and other national programs (SI, BE(VL)); regional cooperation on innovative research like BIOEAST (HU)

1.1.1.44. Cooperating with the Commission on advanced research and modelling tools to fill data and knowledge gaps

Countries reporting activities: BG CZ EE HU IE IT NL RO SK

Reported activities – carried out: Participation in and organisation of surveys on European (Eurobarometer) and national level (HU, CZ, EE, SK).

Reported activities – in progress: Providing information through ERA-NET (IE, CZ).

1.1.1.45. Ensuring that results and good practices are disseminated

Countries reporting activities: BE(VL/WA) BG CZ DE EE FR HR HU IE IT NL PL RO SK

Reported activities – carried out: Forest owner consultations (DE) and information campaigns (BG, HU, BE(WA)). Training on national criteria for SFM (HU, SK).

Reported activities – in progress: Organizing regular trainings and seminars about SFM for forest professionals (BG, HR, HU, SK) and awareness-raising of the general public (HR) on a national level. Participation in ENFIN and the INTEGRATE network (CZ, HU) H2020 and JRC projects (IE). Continuing consultation of stakeholders for the development of new national forest and wood (research) programs (FR, BE(VL), PL, EE).

Priority Area 7: Working together to coherently manage and better understand our forests

1.1.1.46. Ensure that the Standing Forestry Committee's work builds on other EU policies relevant for forests and the forest sector

Countries reporting activities: AT CY CZ EE HU IE IT MT SE SI SK

Reported activities – carried out: Implementation of EU Timber Regulation (HU, SK, CY)

Reported activities – in progress: Cooperation in expert groups on FLEGT, EUTR and international fora such as UNFF and COFO (IE). Active involvement in the SFC (SE, AT).

1.1.1.47. Improve coordination and policy coherence for EU policies relevant for forests and the forest sector

Countries reporting activities: AT CY EE ES HR HU IE IT NL

Reported activities – carried out: Implementation of FLEGT (HU, NL, IE)

Reported activities – in progress: Implementation and national coordination of EU policies (ES, HR, HU, IE, IT).

1.1.1.48. Ensure that managing EU forests remains multifunctional

Countries reporting activities: AT IE SE SK

Reported activities – carried out: /

Reported activities – in progress: Translation of Forest Europe principles on multifunctionality for SFM into national legislation (SK, SE).

1.1.1.49. Work together with other relevant COM committees depending on subject (e.g., Civil Dialogue on Forestry and Cork, F-BI Expert Group and the Expert Group on Natura 2000)

Countries reporting activities: AT SE

Reported activities – carried out: /

Reported activities – in progress: Active participation in the SFC an stakeholder consultations with e.g. forest owners, forest industries, the union, and eNGOs (SE).

1.1.1.50. Enhance the role of the Standing Forestry Committee (SFC)

Countries reporting activities: CZ IE IT HR HU SE

Reported activities – carried out: /

Reported activities – in progress: Supporting stronger and more dynamic exchange with the SFC (HR, SE)

1.1.1.51. Assessing public perception of forests

Countries reporting activities: BE(VL) CZ ES IE IT HU SI

Reported activities – carried out: /

Reported activities – in progress: ERA-NET study on future general perception monitoring (BE(VL)), ongoing survey (CZ), communication related to management plan preparations (SK), development of an integral communication forest plan (ES).

1.1.1.52. Develop harmonised criteria and methods for EU-wide reporting on National Forest Inventories (NFI) information

Countries reporting activities: BE(WA) CZ DE EE ES IE HU SK

Reported activities – carried out:

Reported activities – in progress: International cooperation and coordination on global level: UN - UNFF, FAO, Forest Europe, COST, IUFRO, UNFCCC, OECD, , ICP Forests, , COFO… (IE, CZ, HU, SK) on a European level: EFI, EUFORGEN, INTEGRATE, EEA, DIABOLO projects (CZ, HU, SK, ES, FR) and on a regional level: Carpathian Convention (HU).

1.1.1.53. Events and information campaigns to raise awareness, knowledge and visibility of sub-sectoral issues having impact along the forest-based value chain

Countries reporting activities: BE(WA) BG CZ ES IE IT PL SI

Reported activities – carried out: Different communication and learning programs (BE(WA), PL), cooperation with NGOs (CZ).

Reported activities – in progress: Establishment of Forest and Forest-based Industries Marketing Fund (CZ). Specific campaigns on wood promotion (SK) or forest fire prevention (ES).

Priority Area 8: Forests from a global perspective

1.1.1.54. Active involvement in relevant international forest-related multilateral fora at the global and regional level

Countries reporting activities: AT BE(WA) CZ EE ES HR HU IE IT MT PL SE SK

Reported activities – carried out: /

Reported activities – in progress: Active participation in work of Forest Europe and various international fora like UNFCC, UNECE/FAO, FLEGT (CZ, IE, SK, ES, SE). Coordination on regional or national level (BE(WA)) and INTEGRATE network (CZ, PL).

1.1.1.55. Ensuring consistency between EU and Member State policies and commitments on forest-related issues at international level

Countries reporting activities: AT CY CZ EE IE IT NL SE

Reported activities – carried out: Adoption of new legislation in accordance with EU FLEGT and EUTR Regulations (CY, CZ, IE).

Reported activities – in progress: Implementation of EU FLEGT and EUTR Regulations (CY, CZ, IE).

1.1.1.56. Support for global efforts to fight illegal logging through the FLEGT action Plan

Countries reporting activities: AT IE HR IT SI SK

Reported activities – carried out: /

Reported activities – in progress: Ongoing implementation (HR, IE, SI).

1.1.1.57. Support to producer countries for FLEGT implementation

Countries reporting activities: BE(VL) ES

Reported activities – carried out: Green public procurement, dissemination and outreach activities about the implementation of EUTR and FLEGT (SE)

Reported activities – in progress: Very limited. Could receive more attention (BE(VL)).

1.1.1.58. Support developing countries in their efforts to improve forest policies and regulations, strengthen forest governance, value and monitor forest ecosystems

Countries reporting activities: AT BE(VL) CZ HU IE IT

Reported activities – carried out: /

Reported activities – in progress: Bilateral cooperation with non-EU countries (CZ, IE, HU), support for specific multilateral projects like the great Green Wall in the Sahel and Flemish Tropical Forest Fund (BE(VL).

1.1.1.59. Addressing the drivers of deforestation and forest degradation through REDD+

Countries reporting activities: AT BE(VL) CZ DE EE ES HU IE SK

Reported activities – carried out: Donors in the UN REDD Program 2015 (ES)

Reported activities – in progress: Participation in REDD+ programs (IE, HU).

1.1.1.60. Strategic Orientations

The Member States respondents were also asked to state the three best implemented Strategic Orientations of the EU Forest Strategy, and they are:

- Studying the effectiveness, costs and standards of forest nature-based solutions to cost-effectively contribute to climate change mitigation and natural risk reduction (Priority Area 3)
- Use of rural development funds to improve competitiveness and promote the diversification of economic activity and quality-of-life (Priority Area 1)
- Increasing the forests' mitigation potential through increased removals and reduced emissions, including by cascading use of wood (Priority Area 3)

The Member States respondents were asked also to identify three most relevant gaps in the implementation of the Strategic Orientations of the EU Forest Strategy. These are:

- Lack of cooperation between relevant authorities and stakeholders on one side and policy coherence between forest-focused and forest-related policies on another
- Lack of prominence of the forest sector in the national and EU-level of policy making
- Production of added value and increasing of the forest sector competiveness

The stakeholders were also asked to identify the most relevant gaps in the implementation of the EU Forest Strategy. The most important gaps are (in descending order of relevance); (I) Lack of recognition of the forest sector when designing forest-related policies; (II) Lack of policy coherence at EU level; Weak reference to the EU Forest Strategy in national policies; Low stakeholder involvement; Lack of coordination among national policies and Low knowledge on the Strategy with low implementation capacity. Less than third (e.g., 27 per cent) of stake-holding organizations have produced position papers, statements, reports or other materials regarding the implementation of the EU Forest Strategy.

The respondents were asked were there some additional activities in their countries that have contributed towards objectives of the EU Forest Strategy. The main messages in these open-ended responses were that the NFP and similar documents have played in crucial role in the national contributions to reaching the objectives of the EU Forest Strategy. They have also stated positive role of research projects, especially of the INTEGRATE project, and that in general any long-term strategic activity in this context requires a broad participation of and coordination with wide array of stakeholders, especially with the industry and its representatives. The respondents were also asked do they know of activities initiated by other authorities (e.g. regional, local) or national stakeholders that contributed to the implementation of the EU Forest Strategy in their country. The main messages where that a large portion of national implementation of the EU Forest Strategy actually occurred on the regional level, with strong cooperation with regional governments. This type of cooperation was related to NFP, climate policy-related activities, LULCF, wood sector and in general to implementation of sustainable forest management

1.1.1.61. Progress in implementing the EU Forest Strategy at EU level

As seen on Figure 10, the stakeholders consider that the EU Forest Strategy had an average level of implementation, where almost half of the responses have been designated to the average level (3) of implementation.

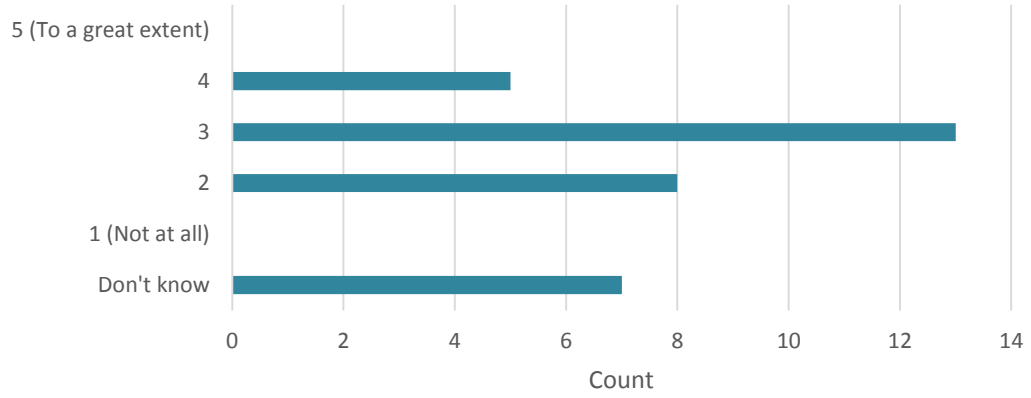

Figure 10. Extent to which the EU Forest Strategy been effectively implemented.

The absence of responses in the extreme points of the scale indicates low variability of answers. Respondents were also asked to further elaborate their opinions. The prevailing comments are that (I) it cannot be really known what the implementation status in individual EU member countries is, that (II) it is difficult to evaluate its impact; that (III) more emphasis is put on social and less on the implementation of its environmental elements, that (IV) agroforestry-related topics are not implemented enough and (V) that research projects are an appropriate mechanism for securing of the long-term implementation of the EU Forest Strategy. In a similar vein, the respondents in the questionnaire designated to Member States were asked to state the level of implementation of the EU Forest Strategy's various Strategic Orientations for the 2013-2018 period. The answers to this question are displayed in Figure 11, and show great propensity for the mid-scale answers that again indicate to average level of EU Forest Strategy implementation.

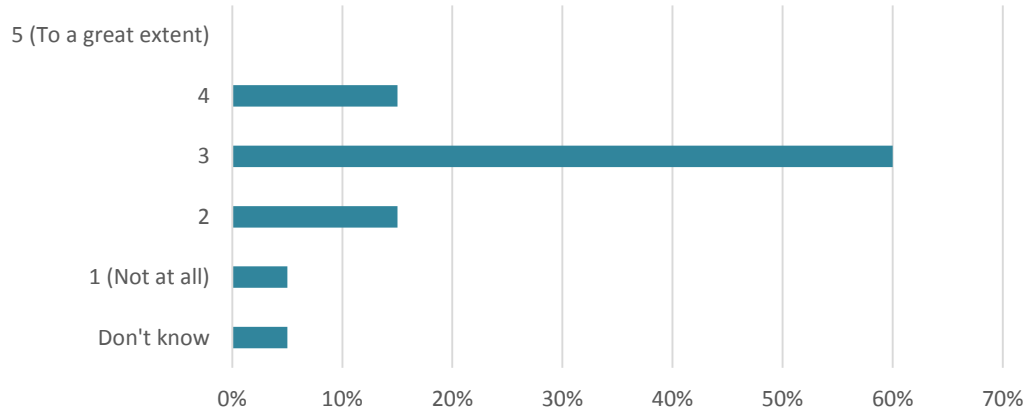

Figure 11. Implementation level of EU Forest Strategy's various Strategic Orientations (2013-2018).

On a more detailed note, the respondents to both questionnaires were asked to further assess the level of EU Forest Strategy implementation by each of its Priority Areas. The answers to these questions are displayed in Figures 12-19.

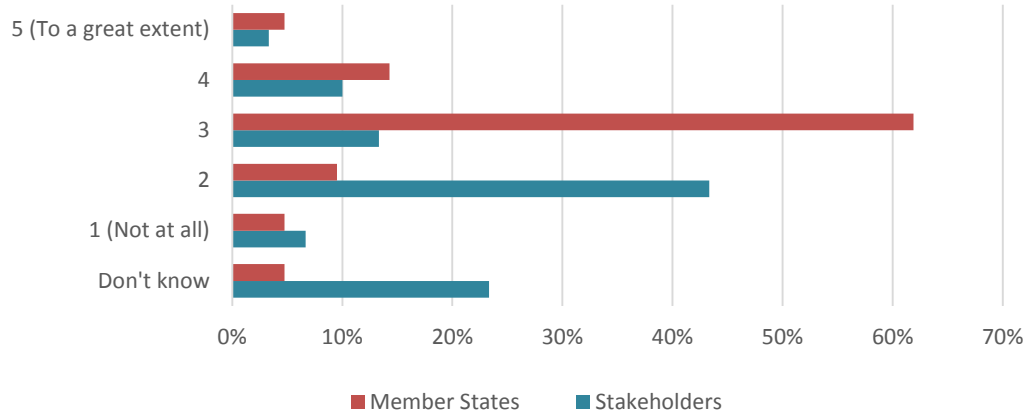

Figure 12. Implementation of Priority Area 1 (Supporting rural and urban communities).

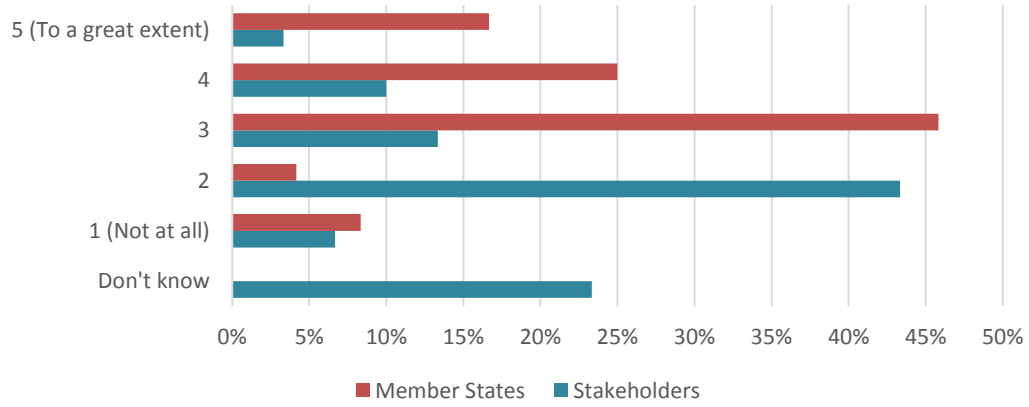

Figure 13. Implementation of Priority Area 2 (Fostering the competitiveness and sustainability of forest-based industries, bioenergy and the wider green economy).

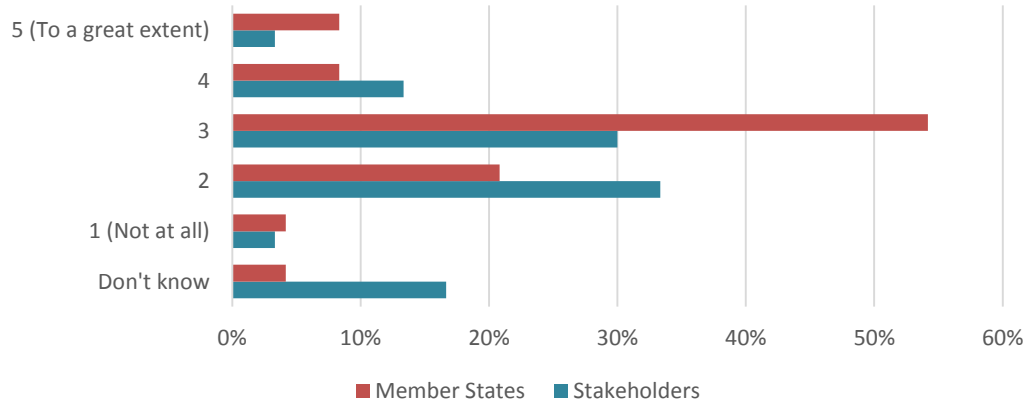

Figure 14. Implementation of Priority Area 3 (Forests in a changing climate).

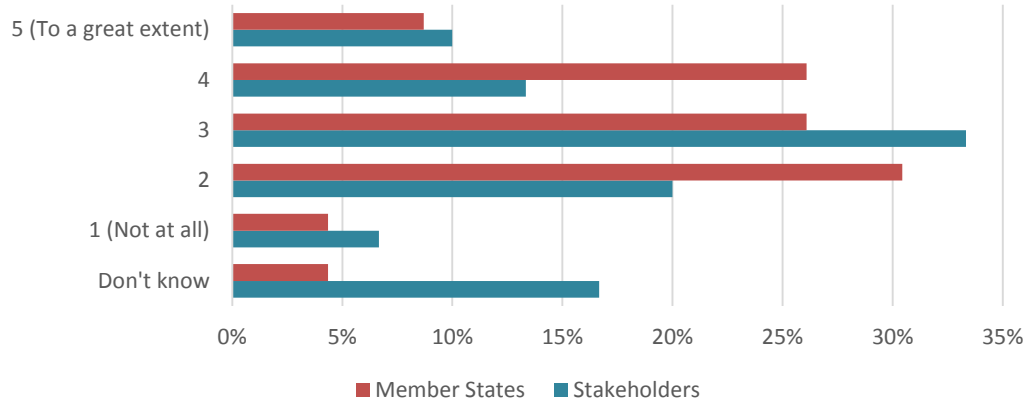

Figure 15. Implementation of Priority Area 4 (Protecting forests and enhancing ecosystem services).

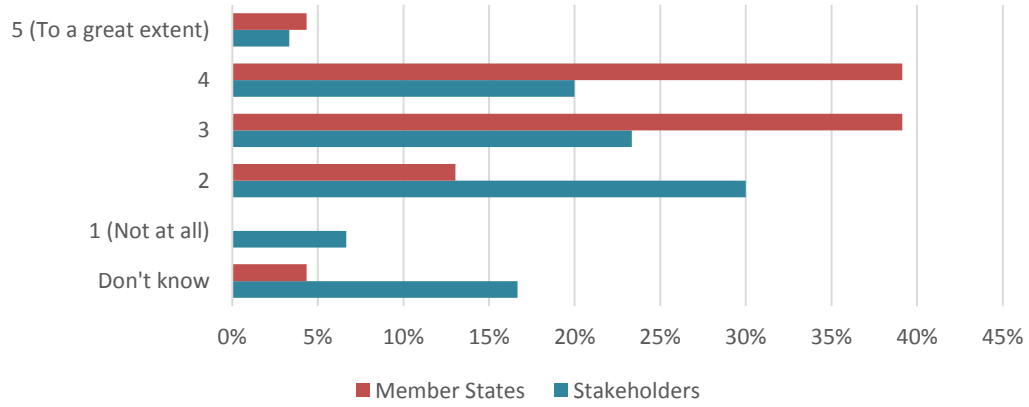

Figure 16. Implementation of Priority Area 5 (Forest information and monitoring).

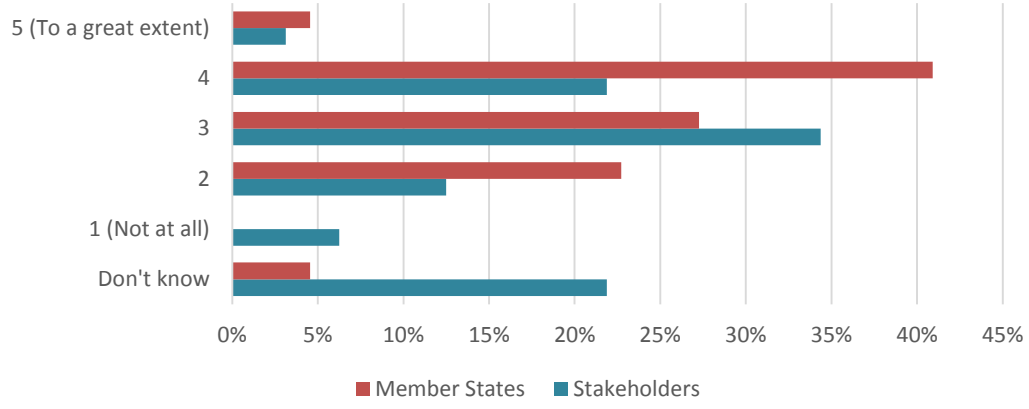

Figure 17. Implementation of Priority Area 6 (Research and innovation).

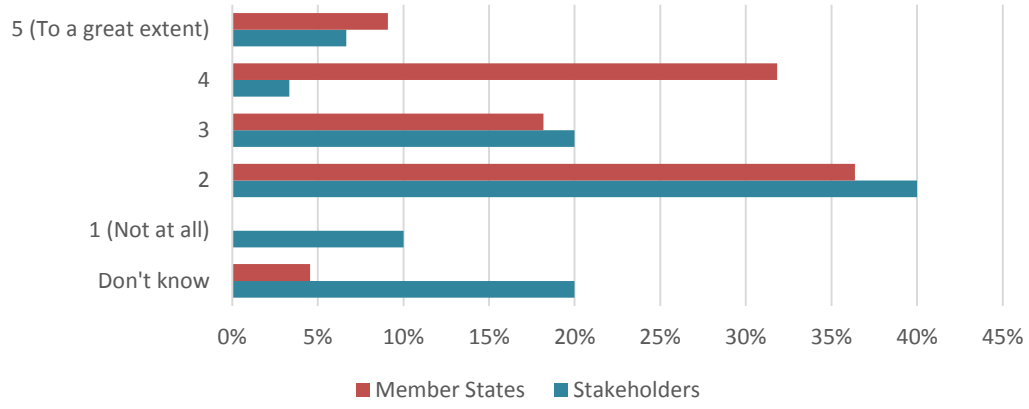

Figure 18. Implementation of Priority Area 7 (Working together).

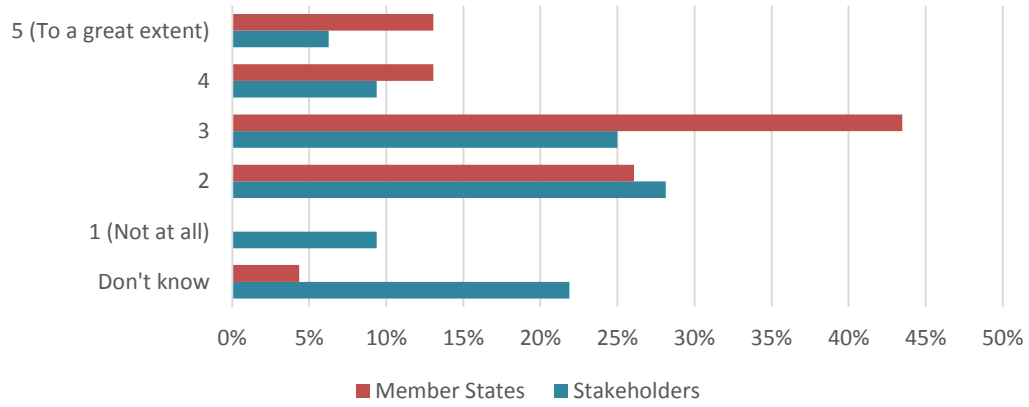

Figure 19. Implementation of Priority Area 8 (Forests from a global perspective).

Similar to contribution of EU Forest Strategy to 2020 Forest Objectives, there is an average level of implementation of the individual Priority Areas of the EU Forest Strategy. This is indicated by the fact that both the median and mode response are on the central (3) point of the response scale. It can again be seen that Member States have systematically described higher level of EU Forest Strategy Priority Areas than the stakeholders did, and that there is a substantial share of respondents that cannot assess the level of individual Priority Areas of the EU Forest Strategy. If the responses for top-two (values 4 and 5) and the bottom-two (1 and 2) categories are summed-up, level of implementation by individual Priority Area can be ranked. By these criterions, the Priority Areas with highest level of implementation are no. 6 (Research and innovation – 34 per cent in top response categories) and no. 5 (Forest information and monitoring – 33 per cent in top response categories), while the Priority Areas with lowest level of implementation are no. 7 (Working together – 44 per cent in bottom response categories) and no. 1 (Supporting rural and urban communities -35 per cent in bottom response categories).

Respondents in both questionnaires were also asked to comment on which extent did the Forest MAP contribute to the implementation of the Strategic Orientations contained within the EU Forest Strategy set out for the Commission Services for the 2015-2017 period. The responses to these questions are displayed in Figures 20-27.

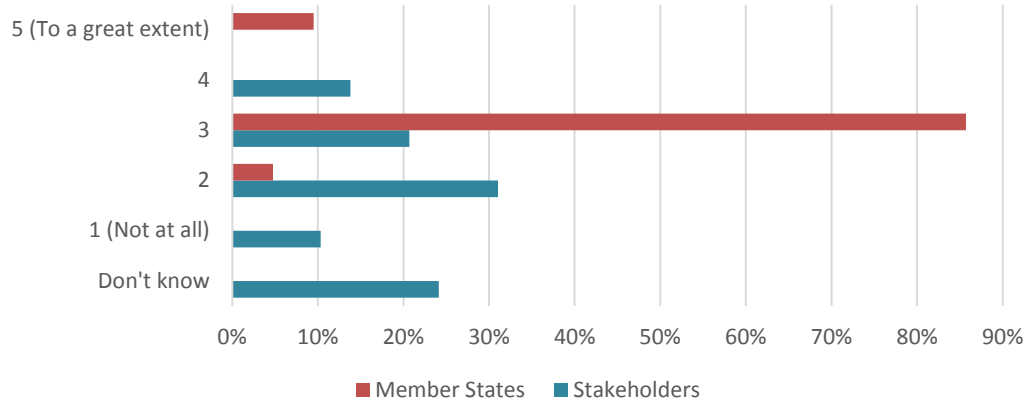

Figure 20. Forest MAP contribution to implementation of specific priorities by Commission Services (Coordinating, cooperating and communicating to enhance policy coherence and consistency).

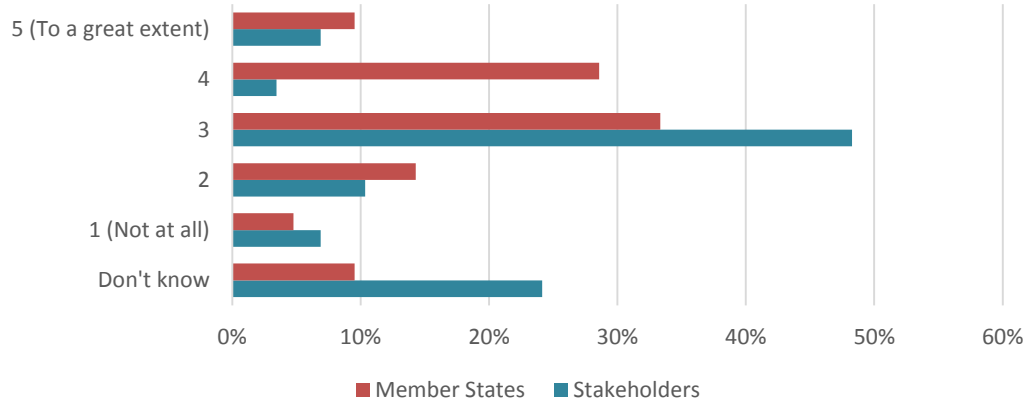

Figure 21. Forest MAP contribution to implementation of specific priorities by Commission Services priorities (Using the FOREST EUROPE set of criteria and indicators for Sustainable Forest Management to review how to demonstrate the sustainable management of forests in the EU).

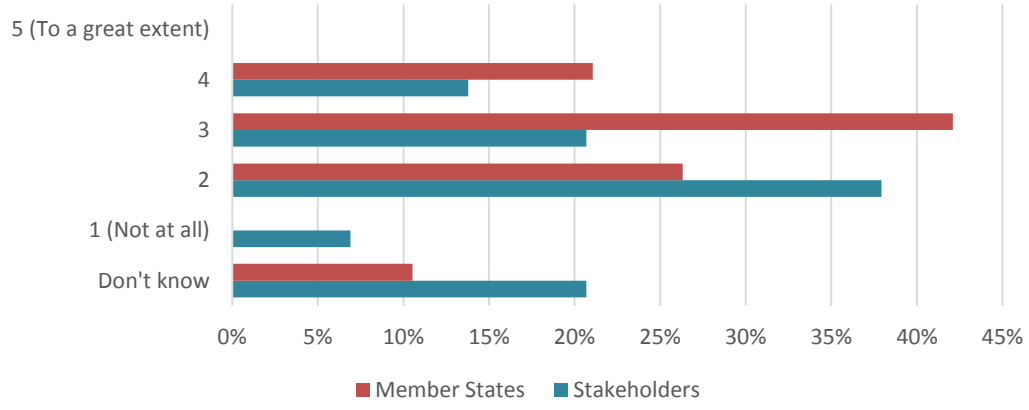

Figure 22. Forest MAP contribution to implementation of specific priorities by Commission Services (Enhancing the competitiveness of the forest-based sector).

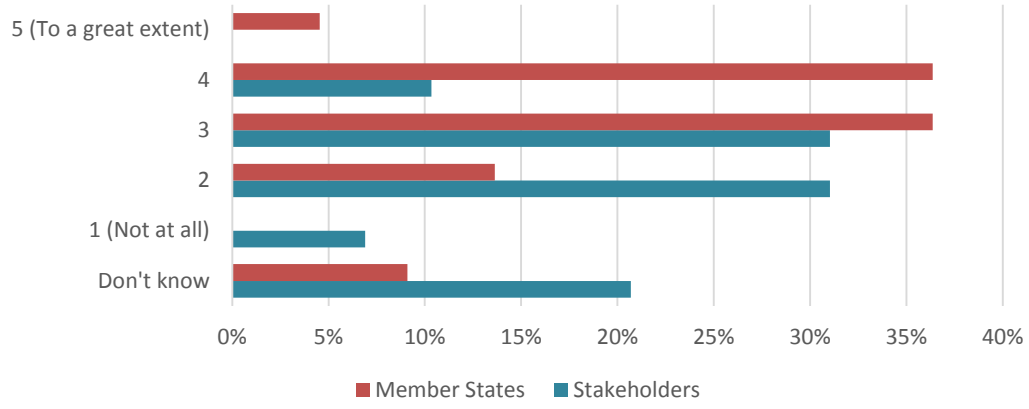

Figure 23. Forest MAP contribution to implementation of specific priorities by Commission Services (Assessing and enhancing the contribution of sustainably managed forests to rural development).

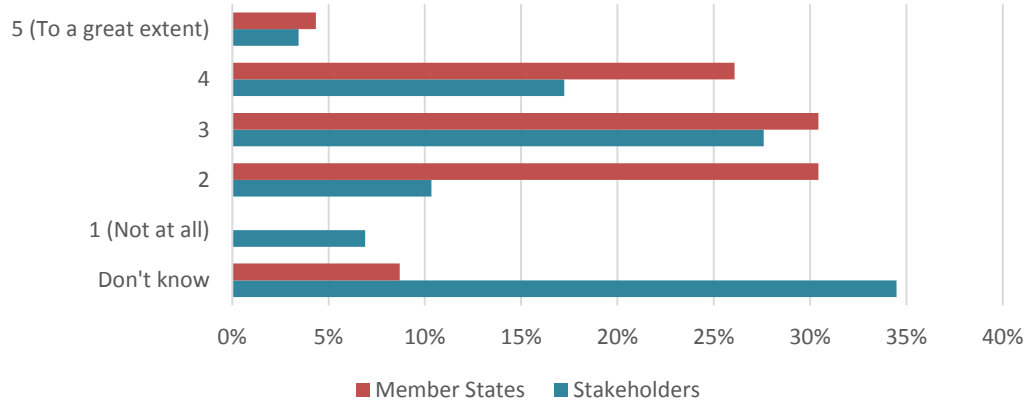

Figure 24. Forest MAP contribution to implementation of specific priorities by Commission Services (Strengthening the Forest Information System).

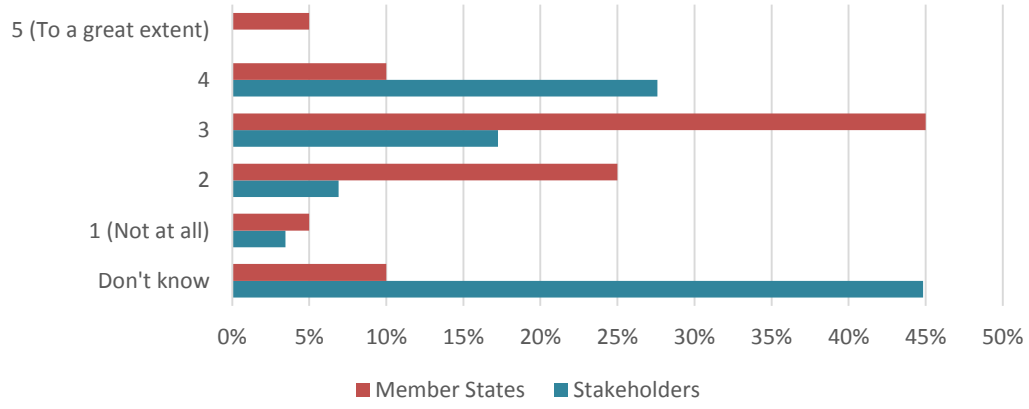

Figure 25. Forest MAP contribution to implementation of specific priorities by Commission Services (Coordinating and integrating diverse information systems and data platforms).

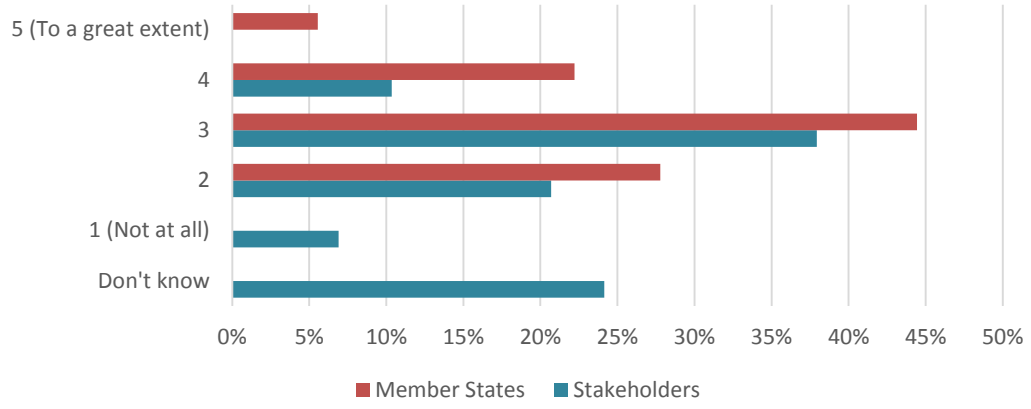

Figure 26. Forest MAP contribution to implementation of specific priorities by Commission Services (Supporting a sustainable bio economy and the forest-based industries with coherent information).

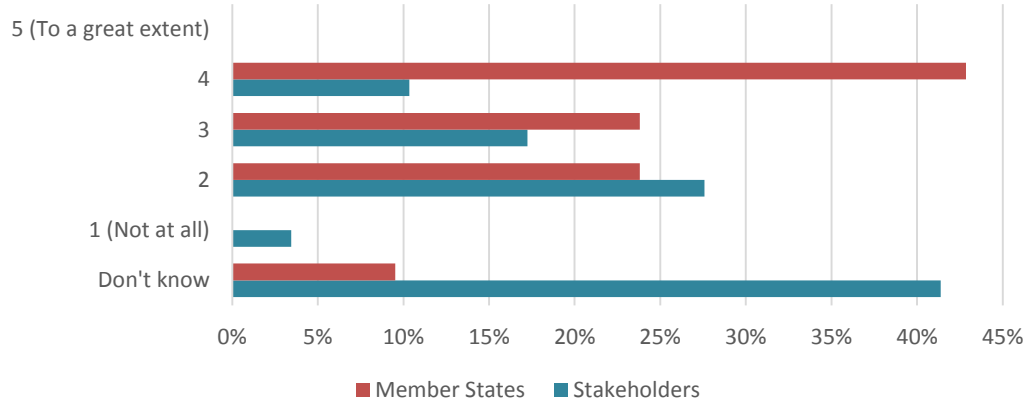

Figure 27. Forest MAP contribution to implementation of specific priorities by Commission Services (In the context of Natura 2000 Biogeographical Process, sharing experiences, building knowledge and promoting cooperative actions involving all interested stakeholders to maximise the contribution of the Natura 2000 network).

Both group of respondents have stated that there is an average (median and mode at the response category 3) level of contribution of Forest MAP to specific priorities set out for the Commission Services for the 2015-2017 period - for all actions set by the Forest MAP. If the bottom and top two responses are summed-up, then it can be stated that the action 'Strengthening the Forest Information System' has the highest level of implementation (25 per cent responses in top categories) and that the action 'Enhancing the competitiveness of the forest-based had the lowest level of implementation sector' (38 per cent responses in bottom categories). It can again be seen that the respondents to the Member States questionnaire have systematically scored one response category higher than the stakeholders did, and that the large portion of stakeholders cannot assess the relation between the variables in question. The general feedback from the stakeholders is that they have a low level of access to the relevant data and information on these topics, and that the level of their involvement is low, especially in Natura 2000 related topics.

1.1.1.62. Coordination and communication of the EU Forest Strategy

The respondents to both of the questionnaires were asked to comment on how effective is the organizational setup of the Expert Group on Forest-based Industries and Sectorally Related issues and of the Civil Dialogue Group on Forestry and Cork in supporting of the EU Forest Strategy implementation; the responses to which can be seen in Figure 28.

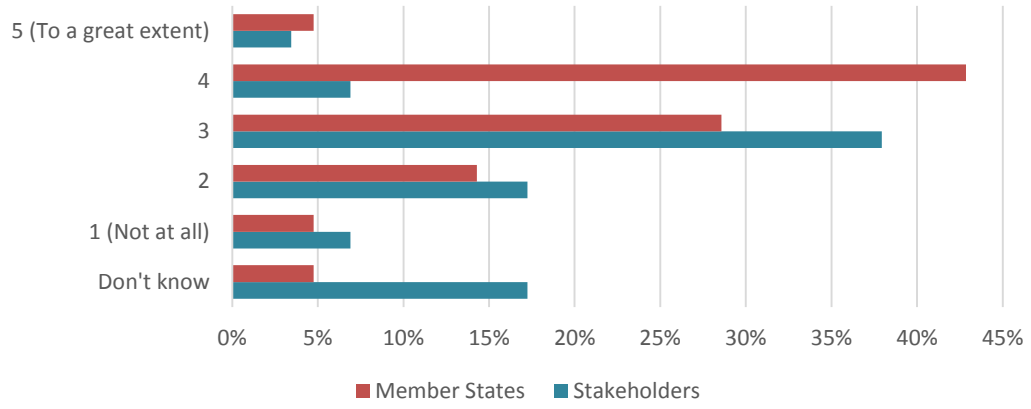

Figure 28. In your opinion, does this organizational setup effectively support the implementation of the EU Forest Strategy?

The Member States have on average (median and mode at 4) described the current organizational setup as moderately-to-highly effective in supporting the implementation of the EU Forest Strategy. On the other hand, the stakeholders have described that the current organizational setting is only moderately (median and mode at 3) effective in supporting the implementation of the EU Forest Strategy. The Member States respondents were also asked to provide examples of good practices in coordination at EU level during the 2013-2018 period. They have stated early engagement of Standing Forestry Committee in the policy processes, good cooperation between DGs, INTEGRATE project, LULUCF negotiations and developing SFM criteria as good examples. For the same question, the stakeholders have stated: The ad-hoc group on biomass sustainability criteria; The joint meetings of the ENVI, ITRE and AGRI committees of the European Parliament, National consultation groups to address issues and elaborate county sectoral positions or contributions; The ad-hoc group on sustainable forest management criteria; EIP groups; Civil Dialogue Group on Forestry and Cork and Expert Group on Forest-based Industries and Sectorally Related issues.

When Member States were asked for the examples of shortcomings in coordination at EU level, they have stipulated late and inadequate information sharing, weak role of Standing Forestry Committee in the policy formulation process, and LULCF negotiations related to forestry. For the same question, the stakeholders have stated: Lack of systematic and timely information to stakeholders on the initiatives related to the EU Forest Strategy; More frequent and more meaningful participation and lack of knowledge on political priorities. In general, the respondents see the Standing Forestry Committee as partially successful in ensuring coordination and coherence on forest related items, but look unfavourably on how relevant information (especially background documents) are circulated, and criticize it for just having an advisory role and thus nor having strong role in decision making. They have also identified several measures through which its role could be improved, most notably by (I) having more resources, (II) being more systematic in its activities, (III) have better coordination and more collaboration with relevant actors, (IV) launch more timely responses to developments in

other policy areas, (V) having an early circulation of background document and (VI) by having more responsibilities'.

The questionnaire aimed to Member States also had a question has the has the EU Forest Strategy succeeded in improving the coordination between the EU and Member States; and from Figure 29 it can be seen the EU Forest Strategy has been moderately successful in this regard.

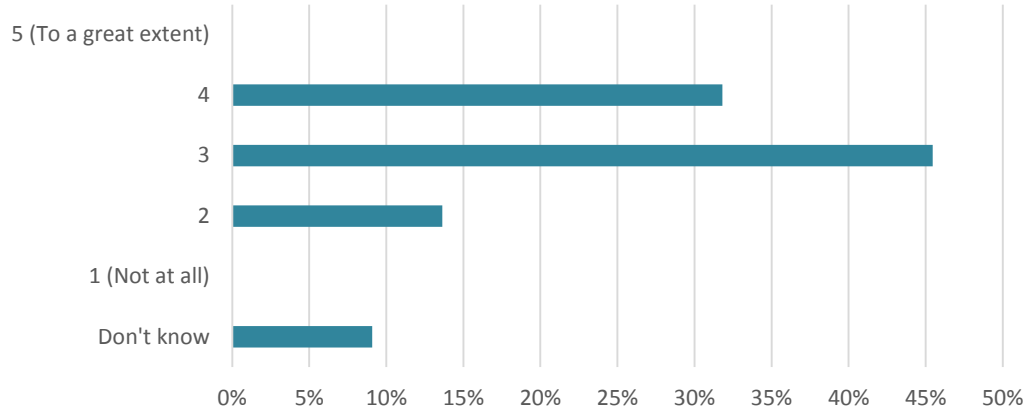

Figure 29. Success of EU Forest Strategy in improving the coordination between the EU and Member States.

When asked how this coordination could be improved, respondents have identified the following actions: (I) coordination on climate-related issues and bio economy across sectors has to be especially strengthened, (II) that there is a general need for the forestry actors to recognize that the sector has to operate in a fragmented EU policy landscape and to stop trying to control the sector on its own, (III) that the background documents need to be circulated on time. Stakeholders were asked an equivalent question, such as to what extent did the EU Forest Strategy had an effect on improving the coordination between the EU and the stakeholders (Figure 30).

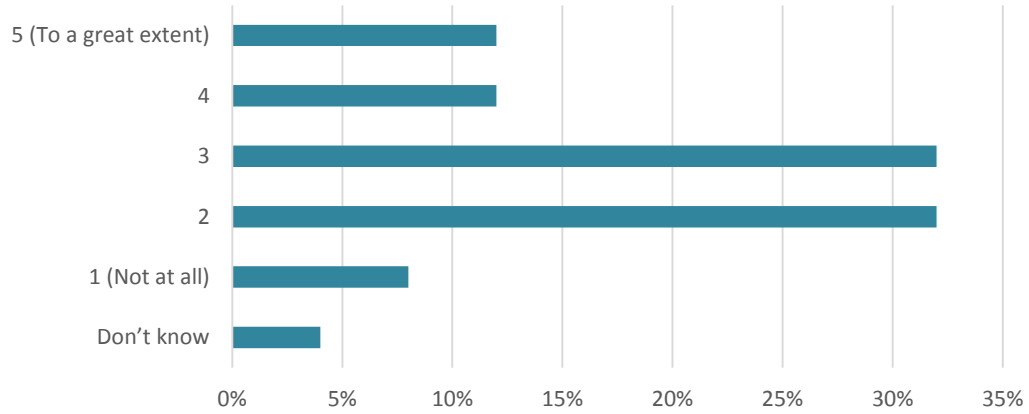

Figure 30. Success of EU Forest Strategy in improving the coordination between the EU and stakeholders

Although the median response again falls within the central response category 3, the range of responses now encompasses the entire scale, indicating greater diversity of views on the role of EU Forest Strategy in the coordination of relations between EU and stakeholders. In the

qualitative part of the same question, the stakeholders have stated that there is a lack of leadership when designing forest-focused policies on EU level; that the EU Forest Strategy has made a contribution in the direction of coordination between EU and stakeholders but more could be done and that more information and wider inclusion of stakeholders is needed.

Respondents in both questionnaires were also asked to assess to which extent have the stakeholders been involved in the implementation of the EU Forest Strategy, the answers to which can be seen in Figure 31.

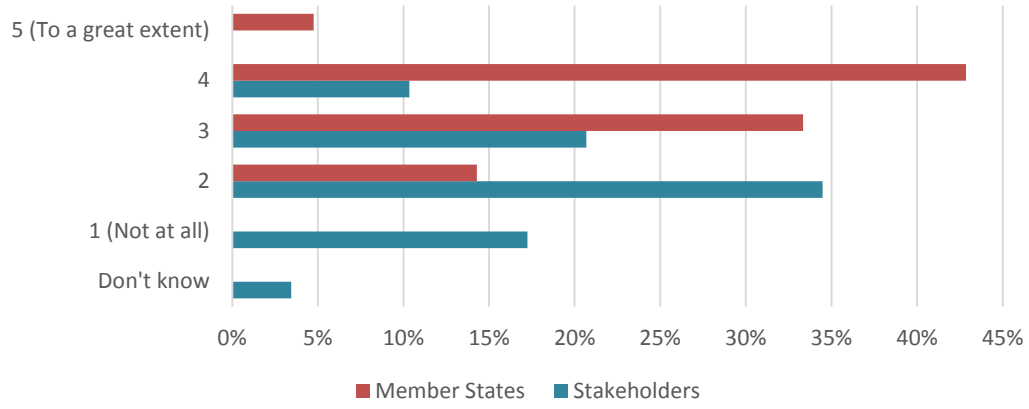

Figure 31. Involvement of stakeholders in the implementation of the EU Forest Strategy at EU level.

Respondents to the Member States questionnaire have stated that the involvement of stakeholders in the implementation of the EU Forest Strategy has been moderate-to-high (median and mode at response category 4), while the stakeholders themselves have characterized their involvement on more moderately (median and mode at response category 3). When asked to elaborate their answers, the respondents have stated that there is an involvement of only a limited number of forestry stakeholders, and that this participation is limited only to 'traditional players' (e.g., low involvement of actors such as eNGOs). When stakeholders were asked how and in which areas their participation could be improved, they have stated: (I) A need for more ad-hoc working groups, in order to get the stakeholders' opinions early in the process of policy formulation; (II) more regular meetings and (III) more workshops where new information is shared and discussed. For the thematic areas of their inclusion, they have stipulated () Agroforestry; (II) Mediterranean forestry; (III) Wood supply and (IV) in general need for more involvement of forest owners.

In the Member States questionnaire, the respondents were asked on the extent to which the EU Forest Strategy has contributed towards improving national governance and coordination of forest-related issues. The answers to this question can be seen on Figure 32.

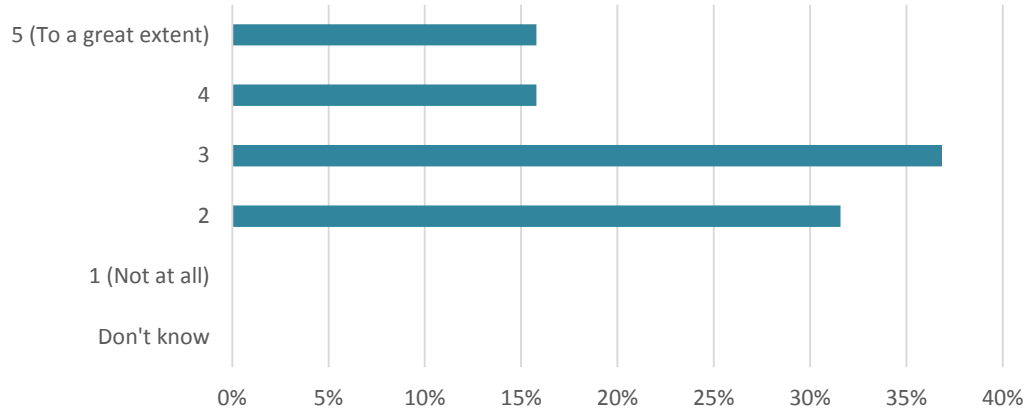

Figure 32. Contribution of EU Forest Strategy towards improving national governance and coordination of forest-related issues.

Although the median and the mode are on the response category (indicating moderate effect of EU Forest Strategy on the national governance and coordination), there are no responses in the category 1 and total of 32 per cent are in response categories 4 and 5. In the qualitative part of the questions, the respondents have stated that (I) the EU Forest Strategy has helped in EUTR and climate change related policies, but not much in other areas; (II) that similar level of coordination would exist without it and (III) that it is too early to make judgments on this issue.

1.1.1.63. Evolving priorities and emerging trends and final comments

The stakeholders were asked are there any gaps in carrying-out the actions of the EU Forest Strategy, in the light of new policy context. The responses focused on (I) the problem of trade-offs between different actions and goals; (II) a need for coordination (possibly from the side of DG Agri); and (III) need for integration with bio economy and climate change policies. On the same question, the respondents in the Member States questionnaire have stipulated (I) that EU consumption impact on deforestation at global level requires urgent actions; (II) that greater flexibility in the implementation of the strategy is needed; (III) that fragmentation of forest-related policies is a challenge to the implementation of the strategy and (IV) that links with land-use planning are missing.

As from the final comments, the stakeholders have stated that EU Forest Strategy is an important document but a follow-up in its implementation is still needed, and that broader stakeholder engagement is also needed. The final comments in the Member States questionnaire were (I) that public storage (e.g., dissemination) of good practice examples is needed; (II) that more action is needed in cross-sectorial coordination; (III) that it is difficult to react to quickly changing societal demands and (IV) that strategic relevance of EUFS should be strengthened.

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