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Biodiversity Integration in the Forestry Sector via FSC

case study in Portugal

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Abstract:

Biodiversity conservation and specifically in forests is one of the urgent environmental issues to address. It used to be addressed by protected areas for strict conservation purposes. This approach showed to be insufficient in attempt to halt biodiversity loss. Although Convention on Biological Diversity recognized the necessity to integrate biodiversity in the main economic stream already a while ago, it is not clear how much progress the global community achieved in this matter. The question of biodiversity mainstreaming has been addressed mainly by its practitioners in the field, while little research has been developed based on empirical knowledge. Moreover, biodiversity conservation and mainstreaming is as much important in global North as it is in global South, thus requiring to be addressed by scientific community in the developed countries as well. The integration can be realized in different ways and using a variety of instruments. These have been studied, but mostly in a restricted way. Mainstreaming however, is a complex process which aims at changing value structures of institutions and individuals. One of the more integrative ways to address it is to look at a specific tool and related social processes, and the way it integrates biodiversity at different scales. Forest Stewardship Council (FSC) is one of these tools. Therefore, the goal of this study was to contribute to existing knowledge about biodiversity mainstreaming in forest sector. The chosen framework allowed to address systemic and on-the-ground levels of integration, with its methodology based on 3 dimensions and 10 sub-dimensions. To do so, the Portugal was chosen to be the case study to answer the main research question “What is the potential of FSC as a tool to integrate biodiversity in forestry?”. The analysis showed that in such a country like Portugal, with its particular biogeographic characteristics and several challenges experienced by the forest sector, FSC has potential to integrate biodiversity in the forestry. Analysis of legal documents, existing initiatives as well as the conducted survey demonstrate, that FSC as market-driven mechanism with its philosophy of broad governance structure can mobilize support and people which at the end would help to integrate biodiversity in forest practices and globally in forest sector. Its potential is even bigger in the context of socio-ecological systems at the landscape level in such projects e.f. ecological networks. It’s not a linear process and requires strong effort from FSC stakeholders and general public. What is most important for it to succeed is the collaboration between scientific community and FSC. Only with this collaboration and partnerships can be developed solid knowledge-base which will help to achieve win-win situations both for forest producers and for biodiversity. It has to be accompanied by transdisciplinary research which through different angles will help to identify the right ways to act, further helping to assess achieved outcomes while making the actors constantly learn and adapt to changing socio-ecological systems.

Key-words: biodiversity, FSC, integrate, potential, socio-ecological systems, collaboration

Part 1: Introduction

“Mainstreaming is not a controlled experiment, but rather a social experiment in changing the value structures of institutions and individuals – with vital consequences for the natural world and the humans who rely on it. While mainstreaming may not prove amenable to rigorous testing, it does however deserve more systematic inquiry.”

(Global Environment Facility)

I. Context

Biodiversity conservation is no longer a question addressed exceptionally by natural science; it is a cross-cutting issue. For this reason, it is important to look at it through the lens both of natural and social sciences. Its inherent trait is touching upon multiple disciplines and multiple actors. Only by understanding and including peoples' beliefs, values and needs it is possible to truthfully integrate biodiversity in their lives.

It requires approaches embracing this complexity and learning to find the ways in order to pursue the main goal which is halting biodiversity loss.

Moreover, biodiversity conservation is a multi-scale challenge which comprises small scale change of practices and all the other levels upstream till the decision- and policy-making. The social aspects of the integration are part of a system which conditions their expression, but which can also help to implement and realize the goals. This system is represented by institutions. That's why mainstreaming is a process which needs to be seen at several scales starting from the largest, which is systemic level and then zooming in to the smaller ones and assessing the implementation at the local context.

These are horizontal and vertical dimensions of the integration. The further step is to find the ways or the tools to implement it. In fact, there is a plenty of instruments and some are studied more profoundly, and some are less. However, in only few cases the perspective of these analysis allows to assess this multi-dimensional integration as usually the framework of the study is mainly defined by the character of the instrument (e.g. regulatory, financial).

That's why, it's necessary to look closer at the instruments by tracing them and observing throughout the scales and throughout the disciplines. This can permit to study better the social system and the social processes behind their implementation and ultimately increase their effectiveness.

This work is about studying such an instrument, its potential and seeing how it is implemented at the national scale with the help of a case study.

II. Problem statement

Biodiversity conservation is one of the urgent socio-ecological challenges as the species extinction continues worldwide (Diaz et al., 2019). Forests are ecological systems of great importance for environmental protection, including biodiversity at different geographic scales (Scarascia-Mugnozza et al. 2000).

In view of the insufficiency of protected areas - a traditional tool of conservation strategies, the non-environmental sectors started receiving more attention. It is acknowledged that many decisions and activities in these sectors have serious implications for the environment and a separate environment ministry or department (acting alone) is not able to ensure that environmental considerations are taken into adequate account in policies and plans across sectors (Nunan et al., 2012).

Indeed, there is a lot of pressure on biodiversity in main economic and production sectors such as agriculture, forestry and fisheries which rely on sustainable use of natural resources. World forests shelter 70 to 80% of world biodiversity, which demonstrates the importance of forestry activities for conservation. Although the majority of biodiversity hotspots (Myers et al., 2000) are in the global South, forests provide biophysical structure of fundamental importance for biodiversity (and not only) and, thus, can be of great importance in

other biogeographical contexts. Therefore, it is not surprising that, forest degradation and unsustainable forestry practices are considered among the main reasons of biodiversity loss (Diaz et al., 2019).

The integration of biodiversity in the main political and economic stream (=mainstreaming), and specifically in forestry has been addressed worldwide and is not a recent issue. It can be traced back to Earth Summit in 1991, when Convention on Biological Diversity as well as nonbinding forest principles were adopted. According to CBD, the policy instruments used by each sector for addressing sustainability issues include: sectoral strategies (plans, programs), industry standards (codes, guidelines), specific ecosystem approaches and certification schemes. (UNEP.CBD, 2007). The forest policy, in particular, has been addressing this issue by means of e.g. sustainable forest management (SFM), ecosystem services (ES) assessment or forest certification schemes, REDD+, TEEB. Despite large effort, its implementation seems to fail (Diaz et al., 2019).

Even though, mentioned tools have received large attention in scientific literature and there is a substantial body of scientific literature on biodiversity conservation in forests, biodiversity mainstreaming in forest sector isn't sufficiently addressed.

It needs, however, to be studied. Effective mainstreaming can have positive impact on biodiversity, and it proved to bring important socio-economic benefits to the communities by e.g. increase in rural employment (e.g. van Wilgen et al., 2012 in Redford et al., 2015). As demonstrated by Redford et al., (2015) the mainstreaming process can begin in one sector or with one incentive and then expand to the other areas by being reinforced with adequate policy. To illustrate, it can start with the establishment of Forest Incentive Program which provides benefits to forest owners without cutting the forest down which is latter reinforced by the phasing out harmful forestry laws and developing to the policies which promote payment for ecosystem services (PES) (Redford et al., 2015). This example shows how mainstreaming can become a strategic opportunity, mobilizing resources and leading to change in forest sector benefitting socio-ecological systems¹.

Therefore, it is absolutely necessary to look at the existing tools which aim at integrating conservation objectives at several scales while understanding the horizontal integration of biodiversity both at the systemic level and at the level of stakeholders in the sector. To specify, Angelstam et al., (2013) for instance stress that the state, forest land owners and managers, as well as other stakeholders should understand the effectiveness of and contribution from each mainstreaming tool. There is also a need to collaborate and develop the level of forest composition, structure and function which maintain ecological sustainability at all scales (e.g. trees in stand, but also landscapes).

With the intention to fill up the gap, and explore how the countries can de facto include biodiversity in sectoral legislation (Whitehorn et al, 2019), the main goal of this study is to assess the forest certification scheme, particularly the Forest Stewardship Council (FSC) as a tool to integrate (or mainstream) biodiversity in the forestry sector. Certifications schemes in general represent a significant and innovative venue for standard setting (Auld, 2008) which a priori demonstrate the change of practices directly affecting components of biodiversity. It is also an innovative instrument for governance in the environmental realm which together with the first are considered to be the most advanced and thus useful to explore in forest sector when e.g. taking lessons from non-state governance of natural resources (Auld, 2008). It is more in this perspective that this work was developed where is sought to contribute to growing understanding of the potential of FSC in forestry sector as a mainstreaming tool.

The choice of certification scheme is not arbitrary. The FSC certification scheme is expected to contribute to biodiversity mainstreaming more than the other schemes. First, it is one of the two largest certification schemes around the globe. Moreover, the FSC was an initiative endorsed by non-governmental environmental organizations and unlike PEFC umbrella which drew mainly “on government-sanctioned criteria and indicator processes” (Auld, 2008), the founders of FSC turned to the International Federation of Organic Agriculture

¹ Social-ecological systems are complex, integrated systems in which humans are part of nature (Berkes & Folke 1998)

Movements (IFOAM) and the International Union for Conservation of Nature and Natural Resources (IUCN) when establishing organizational models for FSC chamber system (Elliot, 2000 in Auld, 2008).

This study aims at providing an insight into the institutional-formation effort of the FSC and its stakeholders to contribute to more sustainable forest management, particularly for biodiversity conservation. This study is expected to encourage the assessment of certification schemes in a more global view with the further participation on behalf of conservation community and research development.

The main question of this study is to assess the potential of the Forest Stewardship Council certification as a mainstreaming tool for biodiversity in the forestry sector.

III. General methodology

In this study, the adapted methodology from (Karlsson-Vinkhuyzen et al, 2017) was used in order to answer the main research question. Originally, the proposed framework was used to assess the opportunities for mainstreaming biodiversity in governance contexts via FSC. The authors suggest that it can be used for diagnostic purpose, for research, but also to advice the local actors willing to support the integration of biodiversity in economic sectors.

However, the main purpose of this study is to assess the potential of the Forest Stewardship Council certification scheme as a tool to mainstream biodiversity in forestry sector at national level, thus applying the method to a specific case in Portugal.

This particular tool was chosen as a main method for several reasons. First, it integrates a range of aspects which otherwise seem to be considered separately in different studies and thus, provide limited view. In addition to that, the field of governance research is only gaining its power and the lack of theoretical and methodological consensus make this analytical framework useful theoretical tool. (Karlsson-Vinkhuyzen et al., 2017)

The analytical framework has three main dimensions and 10 sub-dimensions. These are institutional and motivation structures, and the distribution of means, structures, interdependencies and range of alternatives. The detailed description of the methodology is provided further in the paper while the table resuming it can be found in Annex (Table 4 - Annex).

The institutional dimensions of governance include a range of formal and informal institutional structures and rules which provide information on main interactions in the chosen sector (e.g. policies, rules, organizations). In the context of governance, the types of interactions are often based on multi-stakeholder processes which represent a mix of top-down and bottom-up systems (Karlsson-Vinkhuyzen et al., 2017).

Governance-oriented analysis of mainstreaming may include important features that otherwise could be passed up. For instance, the strategies that fit into a governance model of steering the efforts by business to integrate biodiversity in their operations or the inclusion of biodiversity in voluntary standard for sustainable production in such sectors like fisheries, forestry or agriculture (Karlsson-Vinkhuyzen et al., 2017).

The governance, and specifically the new environmental governance context is the one, in which FSC was created and which is applicable to the present study. It is a mode where instead of strict rules and standards enforcement which is set out in legislation and treaties and which aims at curbing environmental degradation by a 'command&control' way, there are market-based approaches, voluntarism and other 'light-handed' policy initiatives which shift the regime away from state power hierarchy towards a network-like regime of partnerships and cooperation. That's why the research in governance and specifically on cooperation is very important. Thus, the new regime can be characterized by collaboration, integration, participation and adaptation in the context where governments, non-governmental organizations (NGOs), the private sector and civil society form many centers (formally independent of each other) of decision-making and action (Holley, 2017).

Applying this framework to a particular case may help to link the theoretical approach and understanding around the mechanism of public-private networks in practice, namely in the governance regime. Looking closer at the FSC implementation at the national level might also give an insight into the rationalities of the forestry sector in this specific context, in which biodiversity aims to be mainstreamed.

It should be noted, that the present framework is focused on the assessment of one specific tool and not the whole mainstreaming structure in Portugal, which would mean assessing the all relevant production sectors with the range of existing policy instruments for biodiversity conservation and sustainable use (regulatory approaches – command & control, economic instruments and information & voluntary approaches). On the contrary, the purpose of this study is to look close at one specific which is FSC certification scheme (information & voluntary approach)

This instrument can be considered as a tool potentially contributing to the integration of biodiversity in the context of forestry sector. The analysis will include two perspectives on integration, first how standards have incorporated aspects of biodiversity into their own practices - integration into forest certification (via analysis of standards) and then how they contribute to biodiversity mainstreaming in the forest sector - integration via forest certification (all the other dimensions).

The study is structured in a following way: Part 2 provides insights into concept of biodiversity mainstreaming, the history and short description of the Forest Stewardship Council as well as its potential role in mainstreaming biodiversity. This is followed by the literature review on biodiversity mainstreaming and FSC as an instrument which ends by the context of the case study in Portugal. Part 3 includes the state-of-art and description of applied materials and methods, data collection, results and discussion. Part 4 represents the main conclusions of the study with its limitations and perspectives.

Part 2: Generalities & the state-of-art

I. General provisions

Concept of biodiversity mainstreaming

Biological diversity is one of the key elements supporting the abundance and richness of the goods and services we obtain from nature. The basis for that is “the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part: this includes diversity within species, between species of ecosystems” (CBD, 1993) and landscapes (Keesing et al., 2010). Thus, conservation of biological diversity became an issue once it was realized how important it is for ecosystems’ functioning and for humans. For instance, stability and productivity of forests’ and agricultural ecosystems rely heavily on biodiversity (NRC, 1999).

However, there is an ongoing degradation of the natural world and of the goods and services it provides. Thus, global community made several commitments to reduce significantly the rate of biodiversity loss via numerous international agreements, one of which is Convention on Biological Diversity (Tittensor et al., 2014) e.g. in 2002 (SCBD, 2003) and later in 2010 (UNEP.CBD, 2007).

First, it is important to understand the term “mainstreaming” introduced by Convention on Biological Diversity. Although Redford et al., (2015) makes a clear distinction between mainstreaming and “integration” or “inclusion”, in this study the three terms are used as synonyms.

The mainstreaming is translated into efforts to integrate a “new” issue in sectors that usually do not address it (Karlsson-Vinkhuyzen et al., 2017), or environmental issues in non-environmental sectors (Nunan et al., 2012). It means in this case that the actions related to conservation and sustainable use of biodiversity are integrated in strategies e.g. related to specific production sectors, one of which is forestry. It seems obvious that CBD recognized the need for mainstreaming biodiversity because the conservation policies (e.g. in-situ, ex-situ conservation and limiting trade in endangered species,) will not solve totally the problem due to their limited effect (Karlsson-Vinkhuyzen et al., 2017). Therefore, in the case of forestry “mainstreaming” means first of all, a clear understanding of the relationship of forestry to conservation and sustainable use of biodiversity.

Besides that, the underlying mechanisms and the identification of win-win situations benefiting both, this particular sector and biodiversity are strictly required. (UNEP.CBD, 2007).

According to United Nations Environmental Program and Convention on Biological Diversity, (2007) environmental certification schemes including “biodiversity in their criteria can be an extremely powerful tool for mainstreaming” (UNEP.CBD, 2007). As one of the main goals of certification schemes is to establish and implement standards for sustainable forest management, while communicating this to the external world (Marx & Cuypers, 2010), consumers are presented “a choice to buy a more sustainable product” (UNEP.CBD, 2007), and are expected to choose the certified product over the non-certified one or even be willing to pay more for sustainable goods (Marx & Cuypers, 2010).

Brief historical background of FSC

Forest certification in general, can appear to be an alternative policy instrument (for mainstreaming) in the context where biodiversity objectives are hardly integrated in the forest policy. Taking as an example European Union, it's worth to note remarkable body of environmental legislation in EU (Selin & Vandever, 2015), which includes its conservation policy.

In European legal context the principle of integration makes part of primary European legislation and means that the EU should integrate the questions of environment in other policy sectors. European Environment Agency defines the mainstreaming as ‘moving environmental issues from the periphery to the center of decision-making, whereby environmental issues are reflected in the very design and substance of sectoral policies. Such calls for integration show that there is a common concern about lack of progress in solving environmental problems which are result of activities in multiple sectors.

As for forestry, recent results of research in this area, suggest that forest- related policy in the EU is an example of “fragmented field where the integration of relevant sectors and objectives has failed, despite the rhetoric of collaboration” (Johansson, 2018). This is a result of a large mosaic of forest-related policies (e.g. sectoral policies such as, environmental, agriculture and climate and energy policies) which have uncoordinated and partly contradictory goals as in case of conservation and forest policies. The fact that, responsibility for forests and their management remains exclusively with each Member State together with the lack of legally binding forest policy only reinforces its fragmentation (Edwards & Kleinschmit, 2013 in Johansson 2018) and, consequently inefficiency in its way to address biodiversity loss in forestry context. Forest certification with its three pillars, one of which is environment can help to improve forest management contributing to conservation goals.

As a baseline for assessing the effects of certification scheme, a brief discussion of its origins is required.

In forestry, several types of certification initiatives exist, including FSC, Programme for the Endorsement of Forest Certification Schemes (PEFC), the Lembaga Ekolabel Indonesia (LEI), the US Sustainable Forest Initiative SFI, the Malaysian Timber Certification Council (MTCC), the Certificación Florestal (CerFlor Brazil), and the Canadian Standard Association (CSA) (Marx & Cuypers, 2010). Their main shared goal is to ensure more sustainable use of forest resources. FSC, however, was the pioneer (established in 1993) and became operational first with the other schemes appearing and becoming operational by the end of the decade (Rametsteiner & Simula, 2003). Although PEFC is at the moment the world's largest certification scheme, counting more than 300 million hectares of forested area (equivalent to two-thirds of all certified forest around the globe) (PEFC, 2018), both PEFC and FSC are largely used around the world and in Europe, reaching hundreds of millions of hectares of certified areas (FSC, 2018) with 49% of all FSC-certified forestlands around the globe being in Europe.

FSC, however, has a system which makes it different from all the other schemes and hence, may represent stronger potential to contribute to biodiversity mainstreaming in forestry. Looking closer at the way FSC was

built in legal framework can show why as the actual FSC structure and organization is a result of long history of changes and participation on behalf of the stakeholders in forest governance (Cadman, 2011).

It is of common knowledge, that United Nations Conference on Environment and Development in 1992 in Rio (Global Summit) generated three conventions (on climate change, biodiversity and desertification) related to environmental issues, but no effective action to combat deforestation or to advance with sustainable forest management was taken. At that moment, intergovernmental discussions broke down into global South and global North, where the former were accusing the latter of undermining their sovereign right to exploit national natural resources, whereas the North was accused of not internalizing the costs of the environmental problems, which evolved because of the developed countries. (Cadman, 2011)

Thus, forest certification was partly a response to calls from social and environmental groups in the global South, which searched for assistance in saving their forests. It was also perhaps an acknowledgement of the failure of international policy to address and solve the problems of forest degradation and deforestation (Rametsteiner & Simula, 2003). In their effort to impose sustainability requirements, some NGOs pursued timber boycotts and export bans, while others tried to look at existing intergovernmental initiatives and international trade regimes. However, the lobbying of International Tropical Timber Organization (ITTO) members did not bring desired results. After ITTO Council had rejected the proposal from FoE in 1989 to develop a timber certification and labelling program, NGOs moved on with the organization of certification process on their own. Later on, actually, several developed countries will support the FSC in its role to circumvent trade rules, which otherwise would be a significant obstacle in imposing tropical timber import restrictions to control illegal and irresponsible logging (Auld, 2008).

To get back to the point, World Wide Fund for Nature (WWF) shifted its campaign focus away from intergovernmental towards non-governmental private sector initiatives. In 1991, it was actively working with businesses and industry in UK on transition of timber-consuming businesses to sustainable timber sources though, the emphases of NGOs and trade-related interests were too different and distant, which would not allow them to equally respect all three dimensions of sustainable development, and particularly, sustainable forest management (Cadman, 2011).

It is important to note that back then the existing closeness between governments' and business interests was seen as an obstacle to effective measures in forest management. At the same time, there was a distrust to the industry-sponsored certification (from environmental NGOs and civil society) (Cadman, 2011). In this context the appearance of non-governmental and non-industry sponsored certification scheme which developed independently its own principles and criteria was an alternative system of forest management and could be considered a compromise between government, industry, environmental NGOs and civil society (Kooiman in Cadman, 2011).

As a result, FSC was formed as a multi-stakeholder membership-based organization with a governance structure, where the general assembly (the highest decision-making body) consists not only of directors, an executive director, but also of its members' representatives. It's subdivided in three chambers (environmental, social, and economic), which are further split into North and South sub-chambers (FSC International). This division is intended to ensure the balance of voting between different interests without having to limit the number of FSC members. FSC is considered a largely non-governmental initiative comparing to the others due to the quality of the structural and procedural interactions within its governance system. Indeed, participation and deliberation processes are institutionally embedded in FSC to a high degree, thus ensuring strong legitimacy of the process.

The set of principles, criteria, indicators and verifiers can be used to include the SFM in policies of forest conservation and management. Thus, principles provide the base for reasoning towards established goals, while the criteria derived from the principles are regarded as conditions or process of implementation which must be achieved in SFM. Indicators are established to measure in qualitative or quantitative way if the criteria are respected and properly implemented.

On the basis of 10 principles and 54 criteria of equal importance, the FSC provides its own standard, particularly International Generic Indicators (IGI) which are used as a starting point for developing National Standards in any concerned country, and with the possibility to adopt, adapt, drop or add indicators as proper in the circumstances and relevant at the regional or national level (FSC - International Generic Indicators, 2015). The Standard containing these indicators constitute the main document of the FSC certification system. Furthermore, specific standards developed by national working groups are reviewed internationally using two-tier consultation process (Marx & Cuypers, 2010). Flexibility and adaptability of FSC to national/regional standards make it universal and applicable to a variety of forest governance contexts.

The process of development of National Standards has different stages. One of them is public consultation which makes the FSC more legitimate. The competent institutions and organizations have opportunity to shape the standards and thus, ensure that the FSC developed standards will include all relevant aspects of social, economic and environmental impact. Indeed, each country/region is different and requires specific approach, where the criteria for sustainable forest conservation and management are adapted to its geography, type of activity and forest age (O'Brien, 2016). Respecting its procedure, each [FSC National Forest Stewardship Standard](#) is developed in accordance with the above-mentioned normative document for development and maintenance of Forest Stewardship Standards. Thereby, all forest operations seeking FSC certification (for all forest types and scales, as well as production of timber and non-timber forest products) shall apply this document.

Another reason why FSC is different from the other certification schemes because it is the only multi-stakeholder third-party certification initiative, which represents an independent accredited organization that grants certificates for Sustainable Forest Management (Marx & Cuypers, 2010). This makes the FSC a more 'fair certification', as the party demanding a certificate for conformance to the standards, doesn't define them, whereas they are established by first party who also accredits an entity (a third party) performing the conformity assessment (Marx & Cuypers, 2010). Moreover, the operation of the parties is done independently of each other (Meidinger et al. 2003). The third-party certification is one of the most prominent of non-state market governance mechanisms, which together with private actors are increasingly taking up the protection of forests (Cashore, 2002; Pattberg 2005 in Marx & Cuypers, (2010).

In practice, the FSC label is used by forest logging companies and industries producing goods based on wood. The purpose of it is to show the consumer that the wood production is sustainable, hence, aspiring to "make forest management environmentally responsible, socially beneficial, and economically viable for the long term" (FSC, 2015). Forest certification recognizes different effects of logging (including the ones on biodiversity) and assesses the extent to which different impacts of forest management are mitigated by managers (de Kuijk et al., 2009).

The aspiration for sustainability in FSC certification might, however, cause some problems in its implementation. As FSC addresses issues related to three sustainability dimensions, it is legitimate to assume, that these may enter in conflict, and, therefore impede in some cases the achievement of the goals established in each dimension. For instance, the primary target of the certification is sustainable forest management when it concerns production function of the forest (for logging) and trade of raw forest materials (e.g. timber export). Thus, it can be expected that in some circumstances the tree species of high economic value will be chosen over the species of high conservation value, which represents a trade-off between environmental and economic dimensions. Besides that, if the forest is designated for protection and conservation specifically, then its management will not be a primary target for certification either (Marx & Cuypers, 2010).

In addition to this, there can be an upper limit to the forests that FSC would be able to certify because of the primary function of the forests (Marx & Cuypers, 2010). Hence, the FSC, being a market-based approach has a limited impact on the problems of forest degradation and deforestation per se (Cadman, 2011). If, for example deforestation is driven by subsistence agriculture, mining and the harvest of wood for fuel, the FSC certification potential is significantly limited, inclusively for conservation goals. On one hand, there is a strong economic

interest in one of these activities, and on the other an interest in production function for forestry, which can integrate biodiversity (Marx & Cuypers, 2010).

Moreover, such non-forestry activities like clearing for cash-crop agricultural commodities (e.g. palm oil) are often the main cause of deforestation in developing countries. In this case, the incentive for the land conversion will be mainly affected by the difference in market price for palm oil and timber. Thus, no matter how good is the forest manager and how exemplary the management of a given forest may be, the motivation for deforestation will prevail in the decision (Cadman, 2011).

There are, however, differences in major threats to forest degradation in the global South and global North. For instance, in most countries of the temperate zone, the major threats to forests nowadays are simplification characterized by structurally poor, simplified secondary stands or plantations, and fragmentation, where everything that is left from native forest are small tracts which are not connected between each other and moreover, the terrain separating them poses barrier to movement and is hostile to many species (Noss, 1999).

These examples demonstrate that needs, possibilities and resources to make use of certification may vary significantly in developed countries, countries in transition and developing countries.

Overall, it can be seen that forest certification can be a useful tool for biodiversity mainstreaming. On one hand, for example in European Union, FSC could fill up the gap in forestry policy. On the other, the MS have the competence to adopt more stringent policies at the national/regional levels where the FSC with its system could complement the existing policy in order to increment sustainable forest management. Not only FSC was created with the initiative of NGOs as a non-government certification system as its model of organization was inspired by the two organizations with the economic and conservation interests' representation, Federation of Organic Agriculture Movements (IFOAM) and International Union for Conservation of Nature (IUCN) respectively. Furthermore, it is built on three pillars - economic, social and environmental interests, where the nationally/regionally applied standards are developed with the participation of these representatives adapting to local context. Moreover, it is the only multi-stakeholder third-party certification initiative, with an independent accredited organization that grants FSC certificates and which involves several societal groups (one of the key for the success of biodiversity mainstreaming) (Karlsson-Vinkhuyzen et al, 2017).

Keeping in mind the history and the characteristics of FSC, the next section presents the review of scientific literature, showing how the subject of biodiversity integration in forestry sector as well, as the role of FSC in this matter are approached by researchers.

II. State-of-the-art

Integration of biodiversity in the forestry sector is a subject of transdisciplinary character as several disciplines (e.g. forestry, methodology, political science, law, ecology) are concerned by the present study, which explains the complex structure of the review and the study itself. In fact, biodiversity loss and conservation can be considered a 'wicked problem' as it requires creative solutions, it relies on stakeholder involvement and needs engaged, socially responsible science. In order to find solutions, it's necessary to study multiple levels of, and angles on, reality of the mentioned problem which is absolutely indispensable if we are to research biodiversity in academic context, but also outside it in order to provide practical application of the scientific inquiry. (Bernstein, 2015). This is one of the major challenges of the present study.

To start, several difficulties were encountered when synthesizing the existing scientific literature on the subject of mainstreaming.

First of all, it's important to underline that one of the challenges experienced in mainstreaming is the lack of data (Dalal-Clayton & Bass, 2009). It is even more pronounced when it concerns scientific literature on biodiversity mainstreaming.

Indeed, there are not many peer-reviewed studies published which document the nature and extent of biodiversity mainstreaming. Although some data is available, it can be found in unpublished project documents and there is still substantial undocumented knowledge in minds of practitioners (Redford et al., 2015).

Although there is a large body of literature on impacts on biodiversity in general as well as causes of its loss, the processes to integrate biodiversity in production sectors are more subject of empirical knowledge (Swiderska, 2002) rather than scientific research.

It's also to emphasize, that as biodiversity loss is a 'wicked problem', it requires transdisciplinary approach and this approach is even more needed when it comes to integration of biodiversity in a broad governance context. There is, however, a lack of such an approach in scientific literature with fragmentation and division in natural, applied, social and political sciences.

Biodiversity is part of environmental mainstreaming and this subject is in fact the one which received more attention in scientific literature (Nunan et al., 2012). However, there is also a clear bias in this area towards developing countries. One of the ways to explain it, is to look back in 1991, when along with CBD, the parties adopted Rio Declaration which had strong emphasis on development. Indeed, close attention to development issues is mirrored in the declaration, which could explain the strong biodiversity-development nexus existing world-wide and the fact that the primary focus of environmental mainstreaming in scientific literature is on poverty and development (IIED & UNEP-WCMC, 2017) which concern mainly the global South (Nunan, Campbell, & Foster, 2012).

The fact that biodiversity hotspots are predominantly in the global South and its relation to forests degradation is critical in developing countries, also creates certain bias in scientific literature towards assessment of these aspects in these countries rather than developed ones.

Furthermore, there are logistical and conceptual challenges environmental mainstreaming is facing in the context of a range of cross-cutting issues to be mainstreamed in national planning documents, e.g. poverty, gender or provision of basic services (Nunan et al, 2012), which results in conservation priorities being overshadowed by a multitude of pressing social and economic needs in developing countries (Roux et al., 2008). Therefore, one of the main directions on this subject in scientific literature is environmental mainstreaming in development.

Besides that, there is a range of funding mechanisms and projects financed in the developing countries to integrate environment in non-environmental sectors which is less present in developed world (Huntley & Redford, 2014; Nunan et al., 2012). For instance, the Global Environmental Facility (GEF) which was established on the eve of the 1992 Rio Earth Summit to help tackle our planet's most pressing environmental problems has been largely supporting countries in their projects to mainstream environment and particularly, biodiversity, funded hundreds of projects and the countries which received the largest % of the GEF funding for this purpose were in Asia (97), closely followed by Latin America and the Caribbean (92) and Africa (80) with the main focus on developing countries (Huntley & Redford, 2014). Moreover, apart from GEF which will continue to invest in mainstreaming, other big institutions like World Bank, United Nations Development Program (UNDP) or the Organization for Economic Co-operation and Development (OECD) also support projects related to mainstreaming biodiversity conservation. For instance, UNDP in October 2012 launched the Biodiversity Finance Initiative—BIOFIN (Redford et al., 2015). This project was initiated in 29 countries and aimed at helping to mainstream biodiversity into national development and sectoral planning.

This is perhaps the reason of predominance of empirical knowledge over scientific, with the former consisting mainly on project reports. Accordingly, the literature on environmental mainstreaming is limited and, mostly consisting of guidelines for mainstreaming (IIED & UNEP-WCMC, 2017) and reporting on the experience of individual countries (Swiderska, 2002; Nunan et al., 2012) or reports done by big organizations (Huntley & Redford, 2014).

Directed to its practical use, the studies about mainstreaming are usually focused on its effectiveness and the factors or conditions for it to be effective. However, there is no scientific consensus on the framework (Karlsson-Verzuijke et al., 2018) which may be another reason for lack of research in this area.

Several authors address in their studies some aspects of mainstreaming, e.g. social processes. For instance, Nunan et al., (2012) emphasizes the importance of organizational structures and processes and underlines scarcity of literature on implications of mainstreaming approach for the latter, or about which configuration of organizational structures which would increase its effectiveness.

For this reason, one of the sources to inspire the framework can be found in the guidelines provided by the CBD which is the core reference for biodiversity policy. The GEF, which is the institution established to accompany the implementation of CBD based on large experience and field data have been producing reports on mainstreaming approaches and ways to improve it. In fact, these reports are often result of several workshops which took place after the implementation of the mainstreaming projects and whose main goal is knowledge and capacity-building. The results formulated in the GEF report allowed to establish a general framework for the mainstreaming process which has proven of great practical value for its practitioners. According to this scheme, the success of mainstreaming is conditioned by the presence of all four elements (Table 3 – Annex).

However, the purpose of this study is to assess specifically the mechanism of Forest Stewardship Council which is only one example of a variety of multiple mechanisms which can be used in different economic sectors. Forasmuch as the goal of the study is to look at the FSC tool in broad governance context, to some extent it links to determinants of mainstreaming success. These are differently approached in scientific literature by the researchers where the studies usually address one element or one scale.

To illustrate, Roux et al., 2008 for instance looked at the key factors of facilitating cross-sector policy integration and cooperation related to conservation of marine biodiversity. Stokes et al., 2010 conducted interviews in order to understand planners' perspectives (directors of 17 municipal planning departments) on the factors that facilitate and impede biodiversity conservation in local planning and compared their results with the level of incorporation of biodiversity conservation in local planning (Stokes et al., 2010)

Furthermore, the studies on mainstreaming are mainly focused on the 'government' dimension, assessing mainly in their studies key national or municipal documents in view to evaluate mainstreaming effectiveness (Pasquini et al., 2015, McAfee et al., 2006; Pisupati & Prip, 2015; Sarkki et al., 2016). Pasquini et al., (2015) for instance looked at the conditions and identified the key factors which are necessary to initiate the action of mainstreaming.

There are also several studies assessing the existing tools inasmuch as there are different ways to mainstream biodiversity. One of the tools which received more attention in scientific literature and which is considered as one of the most important ones is National Biodiversity Strategy and Action Plan (NBSAP) (e.g. Pisupati & Prip, 2015; Sarkki et al., 2016; Whitehorn et al., 2019). One of the most recent studies (Whitehorn et al., 2019) actually uses NBSAPs to compare the performance of developed and developing countries at incorporating biodiversity mainstreaming into this essential policy document.

Apart from NBSAP, there are other regulatory mainstreaming tools discussed in the scientific literature, e.g. Environment Impact Assessment (EIA) which is also assessed in perspective of conditions for effective mainstreaming (Dalal-Clayton & Bass, 2009) or TEEB approach for the use of ecosystem services (Verburg et al., 2016), or a model to mainstream ecosystem services (ES) (Cowling et al., 2008). In fact, Cowling et al., (2008) developed an operational model for mainstreaming ES, which aims at embedding the latter at several levels (including stakeholders, policy and sectors) and which not only ensure the effective implementation on-the-ground (for ES management), but would also achieve resilience of the corresponding social-ecological systems in a more systemic view whereas Verburg et al., (2016) investigated how the mainstreaming tool (in this case TEEB) can be assessed at different governance scales in multi-stakeholder setting while identifying the factors of its successful implementation.

In forestry context, specifically, sustainable forest management (SFM) is recognized as a link between national forest and biodiversity programs as a means to apply the ecosystem approach in forestry activities (Convention on Biological Diversity 2004, COPVII (Decision VII/11). Furthermore, in several countries the transition from sustained yield paradigm in forestry toward SFM has been driven by the will to maintain ecological sustainability in the forests (Bush 2010 in Angelstam et al., 2013). Therefore, SFM together with the concept of forest multi-functionality received large attention in scientific literature (e.g. de Dios et al., 2006; Gil-Tena, Saura, & Brotons, 2007; Brockerhoff et al., 2017; Scarascia-Mugnozza et al., 2000; Lindenmayer et al., 2006; Gao et al., 2014). From the other mainstreaming instruments in forestry, Johansson, (2018) for instance assessed the role of National Forest Programmes (NFPs), a tool which is based on collaborative efforts and the right set up created by public administration and whose main goal is to improve sustainability.

The studies encompassing more dimensions of mainstreaming are de facto of (Karlsson-Vinkhuyzen et al., 2018) and (Karlsson-Vinkhuyzen et al., 2017), with the first one identifying the barriers and levers for biodiversity mainstreaming into the governance of economic sectors such as agriculture, forestry and fisheries, whereas the second assesses FSC and PEFC as a biodiversity mainstreaming tool in forestry.

FSC

The literature on FSC and its linkages to biodiversity includes for instance the review of the scheme and its broader effects (Auld, 2008), the comparison of the FSC standard with other indicators (Angelstam et al., 2013). The review of Auld, 2008 for instance, includes effects of the certification both on its stakeholders, but also on public policies, thus addressing several scales of FSC impacts.

There are also studies assessing specifically the ecological impact (Dias et al., 2015); Lohmus & Kraut, 2010; Elbakidze et al., 2016; Gullison, 2003; van Kuijk, 2009; Polisar et al., 2016) and assessing the non-conformities identified in the processes of forest management certification according to FSC standards (Halalisan et al., 2016). Jaung et al., 2016 for instance cites in their review several categories of studies which address the linkages of FSC certification to biodiversity. These include a broad range of studies analyzing the FSC standards, Corrective Action Requests (CARs) from certification bodies, stakeholder surveys (Moore et al., 2012) and mixed methods and reviews.

There are also studies analyzing the FSC standards at the country level. For instance Lohmus & Kraut, (2010) compared old-growth stands of non with FSC certified commercial stands in Estonia, thus seeking to assess the contribution of certification for several biodiversity indicators. Dias et al., (2015) for instance assessed the ecological impact of forest certification in Mediterranean context, particularly in southern Portugal in a sub-basin of the Tagus River.

Forest certification and particularly FSC, have received little attention as in view of mainstreaming biodiversity albeit the large interest in its social and political outcomes (Giessen et al., 2016; Auld et al., 2008, Bass et al., 2001; Cashore et al., 2003).

Yet, the studies embedded in social process which would relate and connect the political, social processes with biodiversity conservation in the multi-dimensional context are scarce. One of the exceptions is the study of Jaung et al., (2016), whose analysis provides a connection of social processes to integration of forest ecosystem services (which include biodiversity among others) in FSC. Thus, in their study, they assess different capacities of FSC stakeholders which are related to integration of FES in the certification scheme. Another important example of a broader assessment of FSC as a mainstreaming tool is a study of Rametsteiner & Simula, 2003, which aimed at assessing the role forest certification plays as a tool to promote sustainable forest management and biodiversity conservation.

As shown above, the mainstreaming tools are studied mainly in a separate way, although in reality they can be and they are used simultaneously. Moreover, many of the mentioned instruments aren't looked at in a mainstreaming perspective. On the contrary, they are assessed just with the view of their ecological impact (e.g. protected areas, EIA).

In contrast, several authors (e.g. Cowling et al., 2008) emphasize the need for combination of systemic intervention interventions (e.g. policy, planning, enforcement, institutional strengthening) with the on-the-ground activities which are capable to generate concrete benefits for the environment, thus promoting sustainability. For instance, Nunan et al. (2012) concludes that on one hand success in mainstreaming can be achieved by production of relevant strategies and planning documents with the central coordination, but on the other, the outcome and the impact which are mainly related to implementation on the ground may require more integrating effort. To put it another way, it's not enough to integrate biodiversity at systemic level and in the policy, rather to make it coherent while facilitating this integration in implementation on the ground.

This requires a more integrative approach in research. Indeed, Cowling et al., (2008) underlines the difficulty to implement socially embedded operational models for mainstreaming as it requires socially engaged, multi- and interdisciplinary research which is relatively rare.

Another exceptional study which assesses the need to link on-the-ground activities to an integrated systemic outcome is the study of (Jaung et al., 2016). In their study mainstreaming tool, namely adaptive management is analyzed with the perspective of cross-scale integration. As such, they assess the integration of principles of adaptive management in national policy (incorporated into provincial/territorial legislation and forest management policies) and then the Criteria & Indicators (C&I) framework as a tool to define and measure the progress towards the goals and objectives in order to maximize learning from the system under adaptive management of biological resources in forestry.

To conclude, literature review shows significant knowledge gaps in biodiversity mainstreaming and more specifically, regarding the concrete tools/instruments and related processes which should be the main drivers for changes. In fact, the processes behind these mechanisms have received little attention particularly if analyzing the tool in broad governance context. The report on mainstreaming biodiversity in practice underlines the need for social and governance assessments in current projects developed by Global Environmental Facility (Huntley & Redford, 2014) as these are two areas that are still poorly developed.

Although there is a clear difference between regulatory, economic and voluntary instruments as well as the difference between these and more practical aspects or tools which are expected to change behavior and turn the use of biodiversity in production sectors more sustainable, there is a knowledge gap in understanding the processes behind the links between on-the-ground practice and up-stream systemic interventions. In fact, the missing link is based on cooperation and participatory work between government officials, administration, technicians, conservationists and business. The review of Auld, (2008) also underlines the importance of the research to address the direct effects of the institutions as well as the wide range of consequences flowing from institutional-formation processes which can help to assess broader effects of problem-solving efforts particularly in forest certification system.

III. Case Study in Portugal.

As it was previously shown, biodiversity mainstreaming is mainly studied in the developing countries. Moreover, these seem to have been achieving better results in that according to the recent analysis of mainstreaming performance realized by Whitehorn et al., (2019).

It is, however, important to remind that biodiversity hotspots are also present in the global North and are as much important as the ones in the global South. Assessing FSC as a mainstreaming tool for biodiversity in forestry appears to be even more important in the context of the MS in European Union, which as it was demonstrated, has not been addressing biodiversity in forestry in a more integrated way.

Therefore, this section provides the context of the case study in Portugal, demonstrating the relevance of the study question for its particular national context.

Mainland of Portugal (further referred Portugal) is situated in the Southern-West of Europe. It is mainly surrounded by Atlantic Ocean on its Western and most of the Southern frontiers. In the South-Eastern part, it is washed by Mediterranean Sea which is connected to the Atlantic Ocean by the Strait of Gibraltar. Portugal is mainly characterized by a warm Mediterranean climate which is influenced by continental, Atlantic and Mediterranean air masses. Thus, the climate is slightly different and varies in function of altitude and sea proximity. More specifically, the Northern mountain parts of the country are mainly characterized by cooler and more humid climate than central and Southern regions.

Forest biodiversity in EU

Portugal is a MS of the European Union (EU) and thus, has to implement EU policy. The EU in fact, possess large body of legally-binding political instruments which can have strong impact on biodiversity mainstreaming process.

EU specifies the integration of biodiversity in non-environmental sectors namely in its 2020 Biodiversity strategy. Thus, European Union transposed the overall mainstreaming goal in its 2020 Biodiversity Strategy. The Target 3 clearly states the intention to “Increase the contribution of agriculture and forestry to biodiversity”. In this document, farming and forestry are referred as of major influence on biodiversity, where “both sectors combined concern almost 72% of the land in the EU and play a major role in Europe’s biodiversity”. Therefore, further the urgent need to improve the integration of biodiversity conservation into key policies for these two policy domains is emphasized (Europäische Kommission, 2011).

According to the same strategy, the situation of European forests is unfavorable for biodiversity. Commercial plantations predominate the productive forested areas, representing limited biodiversity value. The majority of forest habitats and forest species protected under the Habitats Directive have unfavorable conservation status (79% and 85% respectively), where only 1 to 3% of Europe’s forests are unmanaged or entirely natural (Europäische Kommission, 2011).

That being the case, the maintenance of biodiversity in forestlands has been one of the major concerns of forestry in the European Union (EU), with Forest Europe process being the main instrument of implementing sustainable forest management together with the EU Council 92/43 “Habitats Directive” (Mazzei et al., 2018)

Importance of forest biodiversity in Mediterranean basin

Although European policy concerns all its Member States, the forestry context varies among these.

With regards to Mediterranean forests which are characteristic for Portugal, it should be noted, that these differ significantly biodiversity-wise from the boreal and temperate forests present in Europe. First, Mediterranean region is considered one of the world’s biodiversity hotspots and moreover, it is the only European biogeographic region included in the list of biodiversity hotspots. This classification is based on the criteria of the largest species endemism² and degree of threat³ in the world (Myers et al., 2000). In fact, Mediterranean basin contains 25,000 plant species and 13,000 of these are endemic (4,3% of the world’s endemic plant species).

Speaking about the forests, forest trees represent an important element in Mediterranean basin, representing one of the largest numbers of tree species living in Europe (for instance 100 Mediterranean species vs. 30 central European species). Among these, just the genus *Quercus* alone presents more than 20 species in this region.

³ To qualify, a hotspot should have lost 70% or more of its primary vegetation, this being the form of habitat that usually contains the most species, especially endemics (Myers et al., 2000).

This is without considering a large number of tree species which survived during the glacial ages in Mediterranean refugia, from where they later recolonized the European continent and without looking at high intraspecific genetic variation in certain Mediterranean trees species (Scarascia-Mugnozza et al., 2000).

The particularities of forest systems and forest management in Mediterranean basin entail certain challenges faced by conservation community (Scarascia-Mugnozza et al., 2000). In resume, difficult socio-economic conditions with the history of over-exploitation together with harsh unpredictable climate conditions shows that it's necessary to design and implement "scientifically sound conservation strategies⁴ and locally-tailored sustainable management rules" which among others will define indicators in forest certification.

Mediterranean climate is characterized by hot and dry summers and mild wet winters. Forest ecosystems in Portugal are naturally adapted to such an environment and normally can resist to environmental hazards (e.g. heat waves or wildfires). For instance, the species of trees have various characteristics that help them to resist to the fires (e.g. the cork part of the cork oak *Quercus suber*). It should be noted, however, that despite the high genetic diversity, Mediterranean forests are especially sensitive (a transition zone between arid and humid regions of the world) to climate change with e.g. the high sensitivity of ecosystem productivity to water availability and high incidence of fire damages. As this diversity supposed to contribute to adaptation in the conditions of rapid change, it's urgent to maintain forest biodiversity at different levels, including the landscape level, which allows to restore a continuity of the forest- connecting structures and which is clearly hard to achieve in Mediterranean basin, let alone the impact of competition and parasitic organisms evolving with the climate change (Scarascia-Mugnozza et al., 2000).

To demonstrate, some of the difficulties arising from this context are related to the multiple use of natural resources in the Mediterranean forests, usually referred as Non-Timber Forest Products (NTFPs). These include food for humans and animals, dyes and medicines and cork and aromatic plants. The chestnut (*Castanea sativa*) for instance, is a traditional NTFP which makes part of Portuguese culture, but which historically has assured the survival of human populations in certain areas of Portugal (Scarascia-Mugnozza et al., 2000). Another example which is economically very important is cork, where Portugal accounts for approximately half of world production and exports of cork⁵ thus, representing a very significant source of national income. Moreover, the relevance of cork for Portugal can be demonstrated by the fact that from 150 thousand hectares of cork oak forestlands called *montado*, certified by the FSC system in Portugal, Spain and Italy, 2/3 of this area is located in Portugal. More importantly, the main Associations of Forest Producers in the area of cork oak *montado* are certified by the FSC system.

Another important service provided by forests which can sometimes exceed the value of wood production is game, which in addition to social and economic value also acquired in certain cases conservation value, particularly in careful management of the wildlife population (Scarascia-Mugnozza et al., 2000).

This diversity of products and services provided by forests ecosystems are not however, compatible with the silvicultural techniques whose only goal is wood production. Moreover, financial interest associated with the high forest productivity (which in Mediterranean forests can be very limited (Scarascia-Mugnozza et al., 2000)) and the loss of importance of some non-woody products (sometimes due to the difficulty to give monetary values to certain products or functions), result in reduced interest of the forest-owners in cultivating and maintaining forests with multiple use. As a consequence, the risk of soil erosion, land-slides and forest fires significantly increases.

In practice, the question related to NTFPs in Mediterranean context was recently discussed during the FSC Assembly in 2014. One of the raised questions was regarding the difficulties of adapting the FSC system to match the conditions of the Mediterranean forest, namely due to this multiple use. This specifically concerns the NTFPs which back then weren't covered by FSC standards although could have been certified based on the

⁵ Portuguese legislation: *Diário da República, 1.a série — N.º 24 — 4 de fevereiro de 2015*

certification bodies' own interim standards. This initiative has received support not only from FSC National Offices, but also from such Non-Governmental Organization as Greenpeace Spain.

As a matter of fact, one of the solutions proposed by the FSC to this problem was development of Small and Community Label Option which aims at connecting the consumers to the stories of small and community producers (families, cooperatives, small woodlot owners, and indigenous and traditional groups) managing their forests according to FSC standards and who face greater challenges bringing products to market, but also high pressure to convert their forests to more lucrative land uses.

Importance of forest biodiversity in Portugal

As it was shown in previous section, Mediterranean basin is the European biodiversity hotspot, with the forests representing the well of genetic diversity in tree species and Portugal is one of these countries.

Besides that, the particularities and sensitivity of the Mediterranean forests to climate change make them even more important subject for research to say nothing of the wildfires which have been devastating Portuguese forests last years. For instance, according to the Portuguese national database of forest fires (ICNF, 2017) in the period between 1st of January and 31st of October 2017, 16,981 fires were registered on the continent, which in fact corresponds to massive burnt forest area (equal to 442, 418 ha). If compared with the data from previous 10 years, number of fires slightly reduced whereas the affected area increased with 428% (compared to the mean annual value of 10 years period) (ICNF, 2017). Although the wildfires are only partly result of non-climatic effects, de Dios et al., (2007) suggest that the global warming contributed to it greatly. The main reasons, though, are the increase in the daytime temperature and relative moisture decrease which together have altered vegetation growth, fuel structure and combustibility.

In fact, these climate change effects on forests and their management have strong interconnection with conservation of forest biodiversity. To illustrate, climate change was and is expected to be one of the major challenges in forestry in Mediterranean basin since it can modify growing conditions for trees in this region. As it was previously mentioned, the forest productivity (in Mediterranean basin) is limited due to climate conditions, but what matters is that the changes in the pattern of rainfall distribution associated with climate change may have a strong effect on forest growth. Despite some adaptability to changing conditions, growth and vitality may be significantly affected by timing and duration of water stress. (de Dios et al., 2007) This adaptability is maintained by high level of genetic diversity in Mediterranean tree species.

In the context of changing climate, which has already been showing impact on forest health, and on capacity to resist to it in Mediterranean tree species e.g. *Quercus suber*, *Quercus ilex* or *Castanea sativa* Mill. (European chestnut) – the species of great socio-economic magnitude in Portugal, the importance of prioritizing biological diversity is emphasized and echoed by CBD guidelines which aim to help the foresters in their action for forest adaptation to climate change through enhancement of biodiversity. (de Dios et al., 2007)

To reinforce the climate-biodiversity nexus in Mediterranean forestry context it's worth noting that the new forest plantations which present rich diversity of species and varieties allowing them to adapt to changing environmental conditions also have strong potential for carbon stocking in biomass and soil (climate change mitigation). This opportunity of innovative forest restoration presents the nature-based solution for climate change benefiting humans in addressing in synergy climate change and biodiversity conservation. This approach is indispensable to preserve ecosystem functioning in forests and is only possible if we broaden our “views of above and belowground forest processes”, while making forest planners work together with forest researchers in order to make informed management decisions and adapt existing systems to rapidly changing forest conditions. (de Dios et al., 2007)

Biodiversity characteristic for Mediterranean climate is only part of Portuguese natural legacy as Portugal includes Autonomous Region of the Azores (an archipelago composed of nine volcanic islands in the North Atlantic Ocean) and Autonomous Region of Madeira (an archipelago situated in the North Atlantic Ocean, Southwest of Portugal). These regions represent different biogeographic as well as institutional contexts from

Mainland. Therefore, the latter is the main focus of this study, notwithstanding several examples and references to the forest governance in Azores (which has FSC certified forests).

Other arguments

Forests also play an important socio-economic role in Portugal. For instance, forestlands occupy 35% (ICNF, 2013) of the Mainland and the total annual economic value of forest production in continental Portugal is equal to 1,3 billion euros (in 2001), including negative externalities (Mendes, 2005). Together with agriculture forestry play an important role in rural employment. Indeed, (Martinho, 2016) argues that the forest sector can significantly contribute toward economic sustainability in rural zones of Portugal. There are approximately 4 million people living in rural areas, which is approximately 40 % of the total population (Martinho, 2016). Moreover, Portugal as predominantly Mediterranean country (in biogeographic view) has necessary climate conditions to develop forestry in tandem with agriculture and other activities. Therefore, promoting these activities in Portugal can bring people to the forest, and thus prevent fires. (Martinho, 2016)

Another important characteristic of Portugal as a case study is that it is the country with the largest proportion of privately-owned forests in the world. Thus, on Mainland, private and community forests represent 3,135 millions of hectares (equal to 97% of the total forestlands), which includes 5,7% of industrial forests. The forests which belong to the state represent only 3% (approximately 94,000 ha) of the total national forests, which is one of the lowest percentages not only in Europe, but in the world.⁶ Moreover, small forest owners prevail in these numbers, counting over 400,000 people, where the vast majority of them owns less than 3 ha of forested area each.

This particularity of forest governance in Portugal has implications for the forest policy implementation and overall success in achieving sustainable forest management. The recent research demonstrates a strong diversity in European forest owners' freedom to make decisions regarding their forest property (Nichiforel et al., 2018), which may affect implementation of international and EU policies, particularly in regard to their effect on privately owned forests. However, the statutory provisions can extend these limitations to the national authorities, where the national forest policy will have little or no effect on the forests which aren't owned by the state. Thus, according to geographical distribution of management rights in Portuguese jurisdiction, the forest owners have relatively high degree of freedom in decision making in regard to their property (the management index equal to 68 on a scale from 0 to 100, whereas the highest index was attributed to Bavaria in Germany with an index 84) (Nichiforel et al., 2018). Furthermore, permissible regimes and thresholds set by regulatory instruments, may not coincide with actual practice and implementation of the law which means that if there is no efficient control, the degree of freedom defined by national law may significantly vary in practice (Nichiforel et al., 2018). Indeed, law enforcement in forestry context appears to be one of the challenges for forest policy implementation (Valente et al., 2015).

As forest certification is currently one of the market requirements for forest-derived products, forest certification schemes could fill up this 'gap', since it obliges the entity to respect established standards and to assess the socio-economic and environmental impact of the forestry activities.

To conclude, Portugal is an interesting case study for the main question of this study for several reasons. On one hand, Portugal is mainly in Mediterranean basin and thus, plays an important role in Mediterranean biodiversity conservation. On the other hand, the importance of forest sector for its economy together with the exceptionally high private forest ownership present particularities which can be challenging for biodiversity mainstreaming in forest sector.

⁶ Data from Portuguese legislation: *Diário da República*, 1.a série — N.º 24 — 4 de fevereiro de 2015

As a consequence, forest certification can be seen as an opportunity to embed sustainable forest management, and particularly FSC in forestry sector which is on one hand can contribute to biodiversity conservation in forests' systems, and on the other strengthen the forest sector.

Part 3: Assessment of biodiversity mainstreaming in forestry sector via FSC in Portugal

I. Material and methods

1. State-of-art of applied methods

As stated above, the chosen framework joins dimensions which are discussed in the scientific literature in a separate way. As some authors conclude, mainstreaming is not a straightforward, purely technical exercise (formal alignment of plans and objectives and standards). It's based on several elements and arrangements. (Nunan et al., 2012)

Institutional structure

Institutional structure consists of three sub-dimensions, two of which are vertical and horizontal integration. Roux et al., (2008) defines vertical policy integration as a process which allows to reach coherence between several levels of governance e.g. regional, national and local, but also between political and operational levels (on-the-ground practices) while horizontal policy integration means harmonization across different economic sectors at any (or all) referred levels. These two processes aim at removing contradictions between and within policies in order to make them more supportive and coherent with each other.

To specify, organizational aspects of the horizontal and vertical interactions are very important for the effectiveness of the mainstreaming process (Nunan et al., 2012). For biodiversity in particular, which is a cross-cutting issue the policy implementation involves multiple hierarchies which is translated in the need of strong coherence in policy objectives across sectors and levels. These, therefore, can only be achieved if a wide range of separate ministries or agencies first incorporate and then implement them (Nunan et al., 2012).

In certain situations (with horizontal decentralization), in order to analyze organizational arrangements for environmental mainstreaming it's necessary to identify all the actors involved in the process e.g. leading organizations, other parts of the government they are working with, different kind of structures (units, coordinators, inter-ministerial working groups, committees) which are charged to facilitate the mainstreaming process, while understanding the role of the environment ministry in it. (Nunan et al., 2012)

Besides that, collaboration with other jurisdictions and relevant stakeholders was shown to be very important (Stokes et al., 2010). In a broad governance context in which FSC is functioning, the horizontal integration refers to partnerships and collaboration first among the FSC stakeholders, such as central office, certifying bodies (the entities which are accredited by a recognized accrediting body for its competence to audit and issue certification), enablers (something or someone that makes it possible for a particular thing to happen or be done) and certificate holders (the ones who have in their possession valid FSC certification). At the systemic level, the collaboration with regulatory authorities (vertical integration) is also very important for FSC, as the elected politicians are the ones allocating adequate resources and setting policy goals. The presence or lack of their support can markedly affect mainstreaming (Pasquini et al, 2015)

The third sub-dimension are norms and policies. National forest norms and policy are very important in FSC implementation and for mainstreaming conservation. The policy documents which provide overall framework (e.g. forest and biodiversity strategy, program for rural development, plans of forest management) are important documents of reference in assessing mainstreaming (Pasquini et al., 2015).

Public forest policy set by the government can serve as venues of policy deliberation to the norms available in certification schemes (Auld, 2008). In other words, the forest owners and operators who make the final call

and either choose or not to certify their forests, can use the national standards as reference. For instance, the certification uptake can be facilitated by the fact that the former already meet high standards (when these face strict government regulations) (Bass et al., 2001). That's why, an important element in this sub-dimension is comparing the FSC national standard with national forest management indicators in biodiversity-related matter.

Motivational structure

The process of mainstreaming requires motivation from the ones whose values and practices one is willing to change. In order to assess the independent and positive effect of certification on behavioral change, it's necessary to know and understand why producers certify (Auld 2008). Several factors can influence certification adoption. Some of them are of more endogenous character, e.g. people's values, while the other other ones are more exogenous, e.g. government support, NGO pressure, market and product characteristics, associational structures in the forestry sector (Auld 2008). Both types of factors, however, require initiative from the former.

This being the case, the sub-dimensions of motivational structure in this study are people's values, interests, framing and "leadership".

Ethical values are something people believe in and which influence environmental behavior (Gkargkavouzi, Halkos, & Matsiori, 2019). Indeed, the results of Stokes et al., (2010) show that land-planners from high-performing jurisdictions often considered the values in the community as the most important driver for biodiversity conservation. Pasquini et al. (2015) assessed the beliefs in their study as a key enabling factor of mainstreaming process. It is, therefore, absolutely important to look at the values of FSC stakeholders for biodiversity, as both use (here syn. to anthropocentric, instrumental) and non-use (here syn. to ecocentric, intrinsic) values are linked to less or more environmental attitudes (Gkargkavouzi, Halkos, & Matsiori, 2019).

While values can be considered as an 'inner voice' guiding someone's actions, interest acquires a bit more practical meaning in the sense of concrete tangible benefits. Even if the stakeholder believes in importance and intrinsic value of biodiversity, the lack of interest in protecting it, or better say the lack of 'added value' can be another very important factor in his decision. In case of FSC for instance, the certificate holders expect to have market advantages over the non-certified wood products' companies (Karlsson-Vinkhuyzen et al., 2018).

Another motivational aspect is framing. To demonstrate, the misconception of the term 'biodiversity' was reported to be an important factor of motivation to take measures to conserve it (Stokes et al., 2010). In effect, the lack of consensus on what the term means and how it is framed in different policies, can become an obstacle on the way to achieve the same goal. If for instance, it is only referred as to threatened and protected species and habitats in the first, while the other includes the concepts of genetic and ecosystems diversity, the spatial and temporal dimensions used for the applied measures will differ between first and second. This can demotivate the actors to take necessary action or to collaborate with the other stakeholders. In practice, the coherence in framing can be achieved by the participation of the same actors defining the framework across-sectors, for example and NGO who is a member in environmental chamber of FSC participating in the public consultation on biodiversity or forest strategies. The framing of FSC itself is another relevant factor as the way actors perceive FSC can affect their motivation to engage with certification.

'Leadership' is the for the sub-dimension of motivational structure. Leaders in fact can bring together unlikely groups of stakeholders and stimulate dialogue, thus contributing to mainstreaming. (Karlsson-Vinkhuyzen et al., 2018)

The importance of the "leadership" in the context of policy integration is often referred in scientific literature as the "championship" (e.g. Nunan et al., 2012; Pasquini et al., 2015). The so-called champions are the individuals or entities which have the will and capacity to promote certain idea while pushing for the others, thus creating a momentum for necessary change. It is, therefore, necessary to have leaders among FSC stakeholders who are motivated to introduce new concepts and ideas related to conservation in the forestry practices. Furthermore, it is also important that the FSC 'leaders' promote it as a mainstreaming tool for biodiversity conservation on more systemic level, which means in national biodiversity and forest policies.

Besides that, several studies reveal importance of senior political leadership which can drive rapid change in the context of mainstreaming (e.g. Nunan et al., 2012; Pasquini et al., 2015.).

Distribution of means, structures, interdependencies and range of alternatives.

This dimension includes first of all knowledge. The term biodiversity needs to be clear for its users in different sectors because it may affect their engagement in conservation. For instance, Stokes et al. (2010) traces interdependence between knowledge and undertaken measures for biodiversity. Thus, education showed to be one of the key factors in bringing more conservation into local planning, whereas raising the level of ecological and biodiversity literacy among the public is expected to have positive impact on community values. Overall, understanding the concepts and the key issues as well as easy access to this information are necessary to achieve successful mainstreaming (Pasquini et al., 2015).

Another sub-dimension is time. Time horizon is in fact a very important factor in the context of policy-making and policy implementation process. It is an important resource in mainstreaming inasmuch as first the actors need to be able to negotiate and integrate relevant aspects of conservation into the FSC national standards and second the implementation of the FSC relevant policies is also a time-consuming process let alone all the institutional arrangements between the concerned sectors. Different time-horizon for biodiversity and forest related policies can create incoherence in the main goals and subsequently in applied measures. Embedding biodiversity usually needs longer planning and longer action time frames within organizations than for instance the short-term livelihood horizons or the need for profit in such production sector, like forestry (Karlsson-Vinkhuyzen et al., 2017).

The individuals in key positions who can affect major decisions are also associated with specific time-frames and thus, are affected by the time available for taking action while they are in these key positions (Karlsson-Vinkhuyzen et al., 2017).

The last but definitely not the least is the sub-dimension of financial means. As FSC certification entails several costs for its users, these need either to be covered by the added value of the certified wood products (premiums) or/and by e.g. public subsidies which support the forest producers in certification adoption. The good integration, hence, means that FSC is able to mobilize financial resources for its users which at least will neutralize the investment of the landowners/managers and at most will provide additional benefits. Indeed, Stokes et al., (2010) suggested in their study the connection between funding and conservation, which was supporting by on-the-ground empirical evidence. Nunan et al., (2012) also refers to financial dimension (e.g. national finances and budgets) as one of main conditions of mainstreaming, where particularly the main environmental goals and means need to be clearly established and factored in national budgets.

Survey

Three subdimensions (values, leadership and knowledge) from all 10 described were assessed by an online survey among the key FSC stakeholders in Portugal. In fact, several authors used surveys in their studies in order to assess some of these subdimensions (e.g. Nunan et al., 2010, Stokes et al., 2010, Pasquini et al., 2015, Jaung et al., 2016; Karlsson-Vinkhuyzen et al., 2018).

In fact, Jaung et al., (2016) used this approach in their study when analyzing adaptability of FSC stakeholders to Forest Ecosystem Services as to a mainstreaming tool. The survey in this study was also designated to assess the necessary dimension in FSC stakeholders which include the FSC certificate holders, the FSC enablers and FSC certifying bodies.

First of all, the ones who hold the FSC certificate and use it in their forest properties or are managing them, are mainly concerned by this certification scheme. Their perspective is absolutely indispensable in this study, because the change in behavior and changes in forest practices in this group is the one which has direct impact on forest biodiversity. Forest owners/producer associations are also important structures which provide

assistance and facilitate the forest management. In fact, associations can play a very important role in impeding the progress of FSC certification in certain countries (Auld, 2008).

Another important group in FSC stakeholders are the ‘so-called’ enablers, which are mostly represented by Environmental Non-Governmental Organizations (here usually referred as NGOs). It’s due to the effort of ENGOs, the FSC was developed and these actors are the ones more involved and who create necessary pressure for the adoption of decisions in this matter. These showed to be the main driver in spreading forest certification among supply companies, with the NGO coordinator pushing the producers to certify (Bartley, 2007 in Auld, 2008).

The FSC certifying bodies are also very important actors in mainstreaming in view of their role in ensuring the FSC implementation on the ground by e.g. audits. These entities are accredited by the FSC scheme to grant and administer the certification (Jaung et al., 2016) and need to possess several means and motivation to ensure the positive impact of the FSC on biodiversity.

2. Description of applied methods

The survey was developed using following steps: defining the subject of the survey, the hypothesis of the survey, defining the population of respondents, developing the project of the survey, choosing the method of administration, testing it and improving it, results analysis and interpretation. Further details on data collection for the survey is provided in the following section.

II. Data collection

1. Legal and other documents analysis

Legal documents:

The full list of analyzed legal documents can be found in Table 1 (Annex). The main documents, however, were the Portuguese National Forest Strategy (*Estratégia Nacional para as Florestas*, 2015), Portuguese National Forest Law (*Lei de Bases da Política Florestal*, 1996) and Portuguese National Strategy for Nature and Biodiversity Conservation (*Estratégia Nacional para a Conservação de Natureza e de Biodiversidade*, 2018). Other legal documents mainly related to forest policy were also consulted in order to clarify the policy guidelines of the forest strategy and trace its implementation measures. The main source of the legal documents was <https://dre.pt>, which is the official website of the Portuguese legislation.

Other sources:

Given that the aim of the study was to assess the horizontal integration, and particularly with the FSC enablers, the main source of information for these were the official websites of the concerned stakeholders. The official website of FSC in Portugal was also consulted.

2. Survey structure and procedure

The canvas of the survey was built with the consultation of two experts in the areas of biodiversity conservation and forestry. The types of questions were of single and multiple choice, closed and open questions.

The main objectives of the survey were to assess if the FSC users understand biodiversity conservation (what it is, why it needs to be preserved and how it can be preserved in the forestry context), but also to identify the values they associate with biodiversity in forestry context as well as the potential for leadership among the FSC stakeholders.

The knowledge indicator was built upon three main elements:

- 1) Biodiversity as a concept and the importance of the problem
- 2) Biodiversity in forestry context (local & global)
- 3) Biodiversity in the framework of Forest Stewardship Certification (FSC)

The hypothesis in this case is that the knowledge, the values and the ‘leadership’ of these three components can be related to more effective integration of biodiversity in forestry sector by means of FSC. In other words, if the FSC stakeholders know what biodiversity means and which measures can be applied for its sustainable use and conservation in forestry, if they assign both use and non-use values to biodiversity and if they are willing to initiate changes while fostering partnership for biodiversity, the potential of FSC to mainstream biodiversity in forestry context is higher. It means, that the FSC national standards in this particular national context are developed by people who can indeed integrate the biodiversity issues/values in these standards and thus, be the driver of behavioral change which is crucial for mainstreaming and ultimately biodiversity conservation.

Several types of questions were present: closed, open and semi-open. The open are related to the values. The closed questions had options of answers with the direct association to the values (Q6, Q14, Q19). In Q14 the respondents had to show if they believe FSC contributes to more sustainable forest management and biodiversity conservation, thus attributing or not ecological value to FSC itself (Figure 4 – Annex). In the semi-open question e.g. Q13 the participants had to write 3 key words while in the open e.g. Q20 the participants were asked to describe the forest rich in biodiversity. Question 7 (Q7) had 7 boxes, where the number of checked boxes would indicate if the value is purely eco- or anthropocentric (only one type of two chosen) or slightly more eco/anthropocentric (both types are chosen, but one dominates) or equal number of both types were chosen.

The online method (Google forms) was chosen as a method of spreading the survey among the stakeholders.

The structure of the survey can be found in attachment. At the beginning a short context of the survey was provided. The participation was anonymous in order to encourage the participants to answer freely to all questions. In order to identify and cross the data obtained in the survey, at the beginning the respondents had to indicate to which group of FSC stakeholders they belong to. Although the target public of the survey were the main FSC stakeholders (listed above), there was an option for the other stakeholders as well. The surveyors also had to indicate the geographical range of their professional activity.

At the end of the survey, two open questions were added giving a possibility to the respondents to describe forests rich in biodiversity, but also an opportunity to express their views regarding the biodiversity conservation in the context of forest certification in Portugal.

The online survey (in Portuguese) was sent by email with a description of its purpose to the following groups of FSC stakeholders in Portugal:

- FSC certificate holders: all the associations of forest producers listed in National Federation of Forest Producers’ Associations (small land owners) in number of 37 (Gkargkavouzi, Halkos, & Matsiori, 2019)), but also the Navigator Company (one of the main actors in paper industry), APCOR, the owners association of cork sector, CELPA, Portuguese Association of Paper industry, which produces 100% of national paper pulp. The ones which didn’t have an email, or it wasn’t valid, were also contacted by the phone.
- FSC certificate enablers: APN/WWF Portugal, SPEA, Quercus, LPN and ZERO. The first one is the NGO under whose auspices FSC in Portugal was developed. Quercus is the largest national non-governmental organization in Portugal. National Ligue for Protection of Nature (LPN) is the oldest environmental non-governmental organization on Iberian Peninsula (was founded 1948). Portuguese Society of Birds Study (SPEA) is another big and important organization.
- FSC certifying bodies: all the certifying bodies available on the official website of FSC Portugal on the date of access (in number of 12).
- FSC main office in Portugal which is Associação para uma Gestão Florestal Responsável (AGFR), which also forwarded the survey to their members (52 national individual and collective members)

The table with the key points of answers on open question regarding the remarks and suggestions can be found in Table 2 (Annex).

III. Results and interpretation

Legal and institutional framework of forest governance in Portugal

Before analyzing the FSC certification scheme in Portugal, it's important to outline the specificity of the national context which plays huge role in forest governance and consequently in forest management.

Portugal is European country with decentralized forest governance structure composed of multiple forest actors. Until the seventies, these presented 3 main groups: private forest owners, industries and the state (as a forest owner and as a regulatory/fiscal body). Although later on, the state tried to restructure the public services entity, in nineties the forest resources development model acquired a new configuration, where its main functions became responsibility of forest associations. Thus, the State develops programs which aim at providing technical support to the associations which should ultimately promote collaboration between the forest producers as well as help them increase the quality of their production and increase the forest productivity. However, there are other non-state actors which take part in forest governance. These include the wastelands' management body organizations, hunters' and fishermen associations, associations which represent interests of various industrial ranks and environmental non-government organizations.

Thus, the authorities have legal power to intervene by a range of means. Its power is relevant in municipal land-planning activities including the ones against wildfires, firemen, tax and permit-related issues, technical support, the wastelands' administration, management of municipal forests and the municipal hunters' council. However, state doesn't have direct control over privately managed forests (Lopes, 2018). It is also important to remind that although Portugal possesses large forested areas, more than 95% of these are in private property.

The need to integrate biodiversity question in different sectors and policy is acknowledged by the latest National Report on implementation of Convention on Biological Diversity, where one of priorities is incrementing private sector involvement.

FSC in Portugal

According to the data of FSC, 2017 the certified area per species as a function of total forestland is distributed in following way: 25,12% are eucalypt plantations, 16,47% are cork oaks, 12,01% is maritime pine and 4,34% is holm oak. It's worth noting that not all the eucalypt plantation in Portugal are certified. If to be precise, CELPA, the biggest paper industry association in Portugal counts around 19% of total eucalypt plantations in Portugal which are de facto certified by FSC and PEFC, where the total area of companies associated to CELPA, cover 56% of all FSC certified and 78% of forested areas in Portugal (Quercus, 2017).

Top 10 regions of certified area (in %) in the country are Lisbon, Benavente, Sousel, Alpiarça, Chamusca, Crato, Nisa, Almerim, Avis and Salvaterra de Magos with higher concentration of certified area in the central area of the country (Figure 1- Annex). If considered in absolute values (in hecatres) the 'champion' counties are Chamusca, Coruche, Nisa and Benavente.

In terms of total certified area, on 31st of October 2018, Portugal represented 421.406 certified hectares, equivalent to 12,03% of all national forested area on Mainland (7,64% of certified area on Azores) whereas the main 'competition' of FSC in Portugal, accounts 277,356 ha with 1,718 land owners involved (PEFC, 2019).

Conservation area/ certified protection and High Conservation Values in Framework of FSC certified area correspond to 21,3% and 2,6%, respectively. In regard to nationally classified areas, there are 47 protected areas (with different protection status) on Mainland which are the priority in terms of biodiversity conservation, where only 22% of total land area make part of Natura 2000 EU conservation program.

Looking at the evolution of FSC certified area in Portugal, it is important to mention that between 2005 and 2008 almost all the certified area represented plantations. In the period between 2008 and 2012 certification was adopted largely by the groups of Cork Montado. If to be more precise, between 2012 and 2014 around half of the FSC certified area constitutes areas from Cork Montado groups. Smallholders, on the contrary represent very little percentage from certified area, which appears on graph around 2011 and slightly grows until 2014.

Institutional structure

1) Horizontal interactions

In horizontal interaction, several axes have been assessed. These include: the horizontal interactions at the systemic level, involving mainly forest and environment sectors, which have implications for forest management and particularly FSC and the horizontal interactions of FSC stakeholders.

At the systemic level, there are several important aspects in National Biodiversity⁷ (further referred as NBS) and National Forest Strategy⁸ (further referred as NFS) in Portugal which create opportunities for FSC.

Last year the state adopted new National Strategy for Biodiversity (Estratégia Nacional de Conservação da Natureza e Biodiversidade para 2030 (ENCNB 2030)). Among range of measures the first one to distinguish is formation of intersectoral forum for biodiversity. It integrates representatives with competence in biodiversity conservation from several national public entities and sectors. The department of agriculture and forestry, however, is not in the list. Although this list is not closed, and if necessary other entities may be invited, the agriculture and forestry represent one of the sectors of major importance for biodiversity, something that is acknowledged in the strategy itself.

This forum should ensure necessary institutional cooperation and political articulation between different levels of territorial governance (vertical integration), but also engagement of different sectors. It's expected to increase participation and coherence in implementation of biodiversity strategy, namely through plans and programs and policy of these sectors. For instance, ICNF⁹ (the national authority of conservation of nature and biodiversity in Portugal) will elaborate the Plan of Action for Nature and Biodiversity which will define sources and size of financial support for the implementation of NBS.

Horizontal integration of biodiversity is explicitly supported by this strategy which can be seen by a range of instruments and measures proposed for agriculture, forestry, for marine resources and biodiversity. The strategy emphasizes the need to increase the articulation of objectives, means and instruments with the forestry to have more and better results of biodiversity conservation in forestlands.

It's also worth mentioning that other cross-sectoral tools for biodiversity conservation are present in this document, e.g. green infrastructure, ecosystem and specifically forest services.

There is no certification or FSC mentioning in the strategy in relation to sustainable use of forest resources or in any other context. There is, however, a clear idea of costs that biodiversity conservation entails for society and the state assumes to mitigate these with the help of certain attributed benefits which are firstly translated into direct public support, but more and more into search of positive externalities¹⁰ produced by biodiversity while engaging other actors and partners (e.g. counties, NGOs, universities, representatives of economic sectors).

Notwithstanding the absence of representatives for forest and agriculture in the intersectoral forum created by NBS, there is an Interministerial Commission for Forestry Issues¹¹ which integrates a representative of the

⁷ Portuguese legislation: Diário da República, 1.ª série—N.º 87—7 de maio de 2018

⁸ Portuguese legislation: Diário da República, 1.ª série — N.º 24 — 4 de fevereiro de 2015

⁹ Portuguese Institute for Nature and Forests Conservation (ICNF) - the main forest public authority implementing forestry and biodiversity strategies

¹⁰ Positive externality is the benefit that affects a party who did not choose to incur this benefit.

¹¹ Comissão interministerial para os assuntos da floresta in Portuguese (created by National Forest Law, Lei nº 33/96 de 17-08-1996)

Ministry of the Environment and thus, suppose to assure effective articulation and coherence in forestry and biodiversity policy.

Moreover, in regard to public forestlands, FSC is present in several areas, e.g. Monsanto Forest Park in Lisbon, Parks of Sintra, public areas in the municipalities of Figueiró dos Vinhos, Alcobça, Vila Nova de Poiares, Lousada, Coruche, as well as the areas managed by the Azores Regional Directorate of Forest Resources. (FSC, private communication)

The FSC office role in mainstreaming is very important, both in fostering collaboration and partnership with public authorities, but of course mainly with the certificate holders and other FSC stakeholders let alone all the activities which aim at raising awareness among municipalities, schools and other partners about the importance of knowing the origin of forest products, and FSC role in this matter.

The first and probably the main example of strong horizontal interaction with the FSC stakeholders, and particularly with the ones representing the environment in FSC process are WWF, LPN, Quercus and SPEA, which are members of FSC Portugal and which took part in the development of the standard. The recent update to the standard was done last year in 2018 (FSC, 2018).

The above-mentioned FSC enablers in Portugal are 4 environmental non-governmental organizations (APN/WWF, LPN, SPEA, and Quercus). These organizations either include or work closely with the biodiversity experts, and who, are the interested parties in promoting biodiversity in forestry through FSC system. Since they are enablers, they are expected to be the main actors to both promote FSC as a mainstreaming tool (namely by means of more sustainable forest management), in forestry and biodiversity conservation inside the FSC standards, thus demonstrating their leadership in this matter.

The main enablers have been showing initiative in promoting FSC certification scheme in different ways, but mostly through projects.

For instance, LPN have been organizing several activities either related to FSC formation or to more general subject of more sustainable forest management. LPN also takes part in campaigns like [“It’s all connected”](#) which joins a range of initiatives and projects which aim at informing, raising awareness and encourage active and conscious participation in forest recovery and conservation, and to which FSC is a partner (LPN, 2018). The money raised by the campaign at the auction is to be used in forest conservation and restoration in Portugal. Moreover, the campaign was recognized by the Ministry of Environment of Portugal with the ‘Green stamp’ (Sê-Lo Verde), which is a national program supporting (financially) adoption of good environmental practices with innovative and important social, economic and environmental impact during large-scale events ([Environmental Fund, 2019](#)).

Apart from this project, LPN signed commitment to responsible forest management with FSC by adhering to the program Trademark Service Provider which basically accompanies all the agents who use or promote FSC products (LPN, 2018). The organization also develops different formation activities, e.g. course about use of FSC trademark or about FSC tools for identification and impact assessment for Ecosystem Services (FSC-PRO-30-006) (LPN, 2019) with the agents who among others have expertise in ecology and biodiversity management in agriculture, forestry and protected areas (and who work in partnership with FSC Portugal).

This initiative for Ecosystem Services (ES) was launched on 22nd of May 2018 (with implementation from 21st of August 2018) and its goal is to incentivize preservation of forest ecosystem services (one of which is also conservation of biodiversity). “This new procedure offers additional economic support by providing forest landowners, smallholders and communities with the tools to verify and derive value from their positive impacts on ecosystem services.” (FSC, 2018). This project illustrates how FSC fosters horizontal and vertical interactions. The main goal of this initiative is to mobilize financial support (from private and public sector) for FSC certified forests/products by measuring more specific impact of this certification scheme on conservation and restoration of ecosystem services. Thus, for instance, the major brands can “invest” in positive impacts on biodiversity in the forests which provide them the raw materials for their products.

Another very important enabler for FSC is WWF, which is represented by WWF Mediterranean in the region, and by APN/WWF in Portugal and which developed several activities in partnership with FSC. In fact, WWF is one of the organizations which initiated the development of FSC standard internationally and in Portugal. (WWF, no date). One of the outstanding projects demonstrating WWF commitment to FSC is the initiative [“Green Heart of Cork”](#) (GHoC) which was developed by WWF Mediterranean in Portugal to promote Payment for Ecosystem Services on voluntary market (to FSC holders) for the world’s largest area of cork oak woodland over the largest Iberian aquifer and which received an award from European Commission ‘CAP Communication Awards 2013’ in category ‘Communication to stakeholders’(WWF, 2013). Moreover, WWF is also supporting the forest producer association by monitoring on annual basis their High Conservation Value Areas and by helping it to improve the forest management plans of the producers.

Another FSC enabler is SPEA whose main work consists in studying and preserving birds and their habitats. This includes protecting and giving value to Portuguese forests, its birds and biodiversity in general. The organization is involved in promotion of montado and cork, but also development of FSC standard in Portugal. In forests’ context specifically, SPEA realize annual monitoring of biodiversity in the Portuguese forests with the help of Common Bird Census (CAC) and Common Forest Bird Index, fights for sustainable game management and defends investment in silvo-environmental measures in framework of Rural Development Program. In the recent interview in June 2019, SPEA confirmed that by their involvement with FSC they intend to defend environmental sustainability in forestry sector. According to the plan of activities for 2018, SPEA intended to participate in the work of the association AGFR as well as accompany the FSC certification particularly by taking part in a project of assessment of FSC certification scheme in Portugal (SPEA - Plano Anual de Atividades 2018, 2017).

Apart from projects, SPEA demonstrates evident support for FSC. For example, in the recent interview (FSC, 2019) SPEA it listed several certification benefits (from FSC) both for people and environment: multifunctionality in forestry practices, promotion of autochthonous tree species, biodiversity, but also socio-economic value for the local population.

FSC itself develops various initiatives to raise awareness both for general public and for forest producers and technicians (FSC, personal communication), including Good Practice Days (FSC, 2017), ecosystem services (with LNO), High Conservation Values, Certification Impacts, so that people increasingly understand the importance of certification. In this context we work with forest producers associations and companies (which are Certification Group Management Entities), which work together with these sector agents.

To demonstrate, one of the recent project developed in the South of Portugal is “TerraSeixe” which aimed at developing a model of environmental stewardship in a logic of social-ecological systems and ecological networks. Not only this project involves a range of stakeholders (including The Navigator Company), but also considering FSC an important local player. (Rosario Oliveira, personal communication).

2) Vertical interactions

Going from top-down, it’s important first to look at National Forestry Strategy. The most recent NFS dates since 2015. This document provides the general framework for forest policy, establishes priorities goals and defines the tools to achieve these. Thus, since 1999 the basic tools to achieve sustainable development goals in forestry are Regional Forest Plans (PROF) and the Forest Management Plans (PGF), fiscal and financial incentives (financial forest fund and other financial resources). Permanent Forest Fund for instance, was created to finance investment and management and compensate forest owners for positive externalities.

According to NBS, the instruments of forestry planning like PROF and especially, PGF are fundamental for conservation and sustainable use of biodiversity resources. However, according to NFS, development and implementation of PGF represents one of the major challenges for substantial forested area in Portugal. Another challenge is to recover abandoned forest ecosystems, particularly in the classified areas.

Apart from PROF and PGF, biodiversity strategy relies on instruments of Environmental Impact Assessment which are Strategic Environment Assessment of plans and programs and Environment Impact Assessment of projects, both applied to forestry practices in specific conditions. The strategy gives value to these generic instruments of environmental protection, which apply precautionary and prevention principles while assessing ecological impacts. Moreover, agro-silvo-pastoral practices are acknowledged to play an important role in conservation of species, habitats and ecosystems while promoting economic viability of agricultural and forestry activities.

This subdivision (for PROF and PGF) is part of decentralisation process. According to NFS the latter in Portugal is seen by the fact that the regional and local authorities have been gaining more importance in forestry sector. Several types of interventions can be realized at the level of these public institutions e.g. guiding municipal plans used for land-planning, municipal plans for wildfire prevention in the forests, municipal taxes, technical forestry entities, administration of community-based forests (baldios), management of forestry property belonging to authorities.

It should be noted that the state explicitly recognizes the role of NGOs in policy definition and implementation both in forestry and environment domains, where the former are leading projects related to conservation of species and habitats. Their ability as enablers fostering horizontal social processes (such as involvement of stakeholders) is also emphasized. Moreover, their role in initiating and starting the process of forestry certification is mentioned as well.

On the contrary to NBS, the NFS gives a lot of attention to forest certification as an instrument for more sustainable forest management. The state has been assuming its importance in promoting forest certification and definition of the strategy which would support the implementation of the SFM systems. In fact, the state explicitly recognizes the importance of certification of forestry activities. To exemplify, in the context of wood production, NFS underlines the increasing costs for forest owners with the insufficient increase in quantity and quality of produced wood, inducing that forest certification process would be able to promote more appropriate silvicultural techniques helping to solve this problem.

Another suggestion from the NFS is that the forest certification could improve market conditions for forestry products. According to the strategy, competitive ability could be improved by increasing the viability of forestry production which in its turn would be results of low prices of raw materials but sufficient level of profits. This is related to more efficient ways of production and appropriate management models, which according to NFS can be achieved through certification schemes. This is also expected to contribute to higher forest productivity.

The forest certification schemes are briefly described in the strategy and assumed to be a mandatory market requirement. The state is assuming its role in helping in implementation of sustainable forest management systems which facilitate the certification, as planned in PDR 2020. Thus, in its strategic lines, one of its goals for the period of 2014-2020 (in terms of financial support) was to support forest certification.

To illustrate, one of the operational objectives (D1.1) is to support certification of Sustainable Forest Management (SFM). There are indicators and goals to measure the implementation, as well as the policy instrument used and the entities responsible for this process (Table 1. Adopted from the NFS).

Table 1 - Example of Operational objective for SFM. Adopted from ENF, 2015

Operational objectives	Implementation indicators	Objectives	Instrument	Responsible entity
D1.1 To support certification of SFM	Measurable support for the certification of SFM	Until 2020: 500.000 ha of certified forested area	FEADER FFP ¹²	ICNF, I.P, GPP Forest owners/managers and their organizations,

¹² FFP is Permanent Forest Fund (Fundo Florestal Permanente)

	Forested are which was certified with the support of financial instruments	Until 2030: 1.000.000 ha of certifies forested area		including managing entities of ZIF or joint areas and administration bodies of baldios
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Curiously, in the same strategy, forest certification received even more attention in Autonomous Region of Azores, where the former is not only part of the strategy, but it is also explicitly included in the Goal 1 and further in the proposed measures.

Contrary to the Mainland strategy, it should be noted that Azorean Government intended to expand the forest management certification in all its public properties, but also to support forest management certification for privately owned forests, particularly by providing background studies needed to streamline the forest management certification process in the private sector, thus contributing to the qualification, enhancement and diversification of the products and services generated by these forestlands. Another measure is to incentivize development of Forest Management Plan (PGF), where the government intended to support the forest owners in this matter, as one of the advantages of having it would be to fulfil a pre-requisite and apply for forest certification program. This support is not surprising if to consider that the land-planning policy in the region has been directed toward more multifunctional model.

In regard to National Forest law in Portugal (Lei de Base de Política Florestal)¹³, it's important to note that the state is trying to address the problem of fragmentation of forestlands on Mainland. Thus, the recent update of juridical regime (2017) of Forest Management Entity (PGF) states that EGF which are recognized by the state have 5 years to initiate the certification process (FSC or PEFC), where the certification should be obtained by the end of the 6th year of entity recognition. Moreover, there are incentives and support for the these organizations, which will be discussed in Section Financial Resources.

In fact, the main goal of the FME is to promote and facilitate joint management of the forestlands (strengthening sustainable model), preferentially in the organization called minifúndio in Portugal, which would allow to add value to the forests while making turning the production more rentable. These entities are obliged to provide the confirmation of the obtained certification (annually) and also keep the registry of all the elements which are required for the certification to be obtained and be valid.

FSC Portugal itself created a model which tries to address this sectoral challenge by facilitating the certification process for the units of Small- and Low- Intensity Managed Forest (SLIMF). In this case the management unit is considered small if the area is smaller than 500 ha and of low intensity when the “areas where the rate of harvesting is less than 20 per cent of the mean annual increment (MAI) and the annual harvest is less than 5,000 m³”. Although, as previously stated, there is a large number of small forest owners (3 ha). Moreover, if the main production is non-timber forest products (NTFPs) it is also considered low intensity SLIMF. The members of the group have simplified assessment procedures.

As a matter of fact, forest fragmentation is one of the main challenges for FSC implementation. The development of certified area in Portugal explains it. There is a slow increase in FSC uptake last years although in the beginning of FSC establishment in Portugal, the growth of the FSC uptake is exponential as all the big forested areas were uptaking the certification. Last years, on the contrary, the main focus of FSC is on small forest owners and communities and which is advancing relatively slowly. FSC Portugal emphasizes the need of sustained growth of FSC as it is a complex process, requiring adaptation and changes in management. (FSC, private communication)

13 Portuguese legislation: *Diário da República n.º 190/1996, Série I-A de 1996-08-17*

Furthermore, certification of smallholding is one of the priorities of FSC international, which is currently developing several initiatives in framework of its project 'New Approaches' whose main goal to improve access and uptake of the FSC system by small forest owners and communities (Santos, 2019).

Going down on the implementation chain, the PROF as a result of decentralization of national forest system have become one of the most important legal documents for forest policy implementation¹⁴. The PROF is sectoral policy instrument for land management (provisioned in National Forest Law¹⁵), which establishes specific norms of use and exploration of forestlands with the aim to guarantee sustainable production of forests' goods and services, setting the guidelines for downstream forest planning levels.

The PROFs themselves are to undergo Strategic Environmental Assessment before they are adopted as it is required by European (Directive 2001/42/EC) and transposed National legislation.

This assessment among other impacts includes the ones on biodiversity. The guidelines provided by European Commission for this assessment propose several types of tools for its MS and in regards forestry, there is an indication that "responsibly sourced (certified) wood has a generally lower impact on biodiversity than un-certified wood". The main legislation regarding PROF, however, don't have any mentioning of forest certification or FSC.

On the other hand, ICNF, I.P as in its role of National Forest and Biodiversity Authority and the body which is in direct contact with the stakeholders is the key actor in public sector to integrate FSC certification more explicitly in forestry policy. Indeed, the duties of the Institute include among others such as support in policy-making for conservation of nature and biodiversity as well as national forest policy-making and policy implementation, ensuring the achievement of established goals in forestry production. Moreover, another important responsibility of ICNF is to articulate the conservation and forest policy with other policy instruments (land use) and to cooperate with other services and bodies in this areas. After all, ICNF also is to foster the productive potential of forest stands and the certification of their management, so as to ensure the development of the forestry sector, within a framework of sustainability of the national forest management and related to it resources, to support the production of forest reproduction materials and ensure its control and certification.

In regard to forest certification, last twenty years two complementary approaches for forest certification have been pursued at the national systemic level: national standard of certification and the adaptation of the PEFC to Portuguese conditions.

3) Norms and policies

Before looking at the norms and policies specifically in forestry sector, it should be noted that there are several mechanisms of biodiversity conservation in forestlands originating from the Environment sector which can have implications for forest owners and producers.

European Union recognizes forest certification as one of the instruments of SFM in framework of its conservation policy (N2000). In fact, conservation measures adopted in conformity with the Habitat Directive can include different types of tools including certification of the management practices where the latter are necessary in order to maintain existent habitats and species. The FSC certificate holder will more likely need to check if his management plan complies with other plans (e.g. measures indicated in fact sheets of the sites of Plano Sectorial da Rede Natura 2000) as well as main "conservation legislation and instruments" since the standards have more generic description and, thus, are not adapted to the specific context of the protected site⁸.

The National Forest Law in its turn provides the model for forest exploration which includes three points: program for wood production management, program for non-wood resource and other related to its services use, and the BMP as described above.

¹⁴ Portuguese legislation: *Diário da República n.º 172/2018, Série I de 2018-09-06*

¹⁵ Portuguese legislation: *Lei n.º 33/96, de 17 de agosto*

The norms of silviculture are identified by PROF. This policy instrument identifies general model of silviculture and management of appropriate resources and define the specific norms of silviculture and of sustainable use of resources applied to these forested areas.

The second level of this system is represented by Forest Management Plans (PGF), which are tools used for forest management at the unit/holding level (defined in the respective forest regional plan). These are local support structures which together with the code of good forest practice, were created to support, guide and provide information to forest managers in order to integrate biodiversity in forestry. Although the level of detail in this guide is quite high, its character is more technical (for silviculture), with very few references to biodiversity and all its components. Indeed, the guide was developed by technical experts from several forestry entities with the technical assistance from agriculture and economy agents. Moreover, this guide is not legally binding and serves only as a reference.

The PGFs are developed according to special Technical Norms¹⁶ and integrate biodiversity mainly by the Program for Biodiversity Management which is mandatory only for classified areas. Only here the author of the plan is required to provide a program of the silvicultural measures which ensure the perennity of the protected habitats and species and always, when possible improve its conservation state. For the ‘ordinary’ biodiversity, on the contrary it is only required to describe the existing ecological state of the flora and fauna. There are no measures or indicators which should guarantee its sustainable use or the impact of silviculture on biodiversity components (except when it’s for game purposes). The PGF is mandatory for all publicly owned forests as well as all for community-based forestlands (or a plan for the utilization of community lands), where it is prepared by the public administration.

Privately owned forests, on the contrary, only need PGF (prepared by the management entity and approved by the national forest authority) when they meet the area conditions of their respective PROF (e.g. from 20 ha in PROF Alto Douro, 2019), integrate Forest Intervention Zone (ZIF) or are granted public financial support for the purposes of forest management or afforestation (since 2014 projects with areas above the ones defined in their PROF).

PROF regulation doesn’t contain any reference to forest certification but indicates that the plan must contain information on identified biodiversity which is different from Biodiversity Management Program mandatory for sites N2000.

It should be noted, that there is no mentioning of FSC or forest certification in PGF¹⁷ or Technical Norms for PGF development. In Azores Autonomous Region, on the contrary, the PGF must promote among others biodiversity conservation.

Furthermore, some of the oldest examples of inclusion of FSC demonstrate that for instance the decentralization and the responsibilities the state has given to the regional authorities and municipalities. Thus, the actors themselves (Interprofessional Forest Organizations, OIF) are encouraged to contribute to certification of forest products and management¹⁸. The more recent updates of the forest entities in fact indicate that one of the pre-requisites of recognition of FME is the possession of forest certification or the entities which are going to have it under certain conditions provisioned by the law¹⁹.

Even though, forest certification is largely present in Portuguese legislation, assessing its ecological impact represents another challenge as the actual information about state of habitat and species conservation in the entire country is expert-based and there are no systemic and perennial instruments of biodiversity monitoring at the national level, which of course represents a strong shortcoming especially if the goal is to improve biodiversity state. This also plays an important role for the available information and knowledge development of FSC stakeholders whose one of the goals is to have positive ecological impact through the application of the

¹⁶ Portuguese legislation : Artigo 15.º do Decreto-Lei n.º 16/2009, de 14 de janeiro

¹⁷ Portuguese legislation: *Os princípios orientadores da política florestal consagrados na Lei n.º 33/96, de 17 de Agosto, Lei de Bases da Política Florestal*

¹⁸ Portuguese legislation: *LEI N.º 158/99, DE 14 DE SETEMBRO LEI DE BASES DAS ORGANIZAÇÕES INTERPROFISSIONAIS DA FILEIRA FLORESTAL*

¹⁹ Portuguese legislation: *DECRETO-LEI N.º 66/2017, DE 12 DE JUNHO RECONHECIMENTO DAS ENTIDADES DE GESTÃO FLORESTAL*

FSC certification (ENCNB 2030). Thus, one of the goals of the updated biodiversity strategy is to develop a coherent system as well as monitoring and accompany of biodiversity.

In regard to the norm for SFM in Portugal, the national standard for sustainable forest management was developed by the technical commission (TC145) designated by Portuguese Institute for Quality and managed by ICNF, which deals with, among others criteria and indicators at forest management unit level. This is closely related to international standard ISO 14.001, although is not its official adaptation.

Recently a normalization process have taken place. In 2009 there was a revision of the Portuguese Norms for Sustainable Forest Management in the view of normalization of the latter with PEFC and FSC. In 2013 the norm was revised again which resulted in adoption of “Portuguese Norm for Systems of Sustainable Forest Management, application Pan-European criteria for SFM” (NP4406:2013), which is in force at the moment.

FSC in fact took active part in this process (FSC, personal communication). Upon the request of its members, stakeholders and certificate holders, the Direction of FSC in Portugal made big effort for the NP4406 to be developed within TC145. Thus, the revision of internal regulation of TC145 allowed to incorporate the additional requirements of FSC. As a result, since January 2015 all the activities related to the development of the NP4406 are bolstered within this commission. Adherence to TC 145 has enriched the process of FSC Forest Management Standard implementation by including more stakeholders, by fostering interactions with regulatory entities and facilitating access to technical experts when necessary. To emphasize, FSC together with LPN, Quercus and its several other stakeholders are the members of the TC145.

Results of analysis of FSC national standard’ indicators in Portugal:

Biodiversity in FSC standard is present and addressed in several P&C and thus, several indicators. In some cases, it is addressed through the ecosystem services. Overall, the FSC National standards’ indicators in Portugal have high level of detail regarding biodiversity. Despite the fact that the indicators are of procedural character, the precision of ‘prescriptions’ at several levels is relatively high. The whole process is accompanied by mandatory records. Several indicators and the respective P&C have implications and can contribute to conservation of biodiversity e.g. 5, 6, 7, 8, 10. The example of the indicators and their contribution to conservation objectives are provided in the table which can be found in the Annex (Table 5 - Annex).

To start, the definition of biodiversity and related elements such as environmental values, high conservation values, connectivity, ecosystem services are defined in vocabulary. Moreover, the definition of biological diversity corresponds to the one in CBD, thus including genes, species and ecosystems. The standard also includes habitats, communities and landscape.

The baseline ecological data is defined as environmental values and in fact includes so-called ‘ordinary’ biodiversity, which is far more than consideration of the endangered/protected species and habitats usually present in forestry policy. Thus, both ‘ordinary’ and exceptional biological diversity are included in the standard.

One of the very important aspects related to the state and impact on biodiversity is the availability of relevant scientific data. Many indicators for example rely on existing data and must use best available information²⁰ on biodiversity in the area. Thus, for instance, the focus on protected species/habitats at the national level can be reflected in lack of the necessary information which makes difficult to see the ‘big picture’ of forest biodiversity. As it is indicated in the biodiversity strategy, for protected species and habitats there are indicators and monitoring, but for the ordinary the information is fragmented and often too specific (Lia Leporta, personal communication).

Multifunctionality of forest services is also included. Thus, the appropriate management should ensure the sustainable use of the NTFPs. Moreover, the organization shall demonstrate that effective measures are in place

²⁰ Best Available Information - Data, facts, documents, expert opinions, and results of field surveys or consultations with stakeholders.

to manage and control hunting, fishing, trapping and collecting (Criterion 6.6), thus including game and relevant aspects in standards.

The provisions of the recently adopted FSC ecosystem services procedure are included in the standard although not included “in the ability of organizations to make FSC-related promotional claims about the maintenance of the ecosystem services (Indicator 5.1.3 and Annex C)”.

The precision of prescriptions can be illustrated by identification of impact on concrete elements of biological diversity. Threats, strategies and actions must be identified and developed and later checked.

The impact on biodiversity is considered throughout the whole cycle of usual procedure of impact assessment. The impacts of silvicultural methods must be assessed, documented and mitigated. Alien species are also included in the management plan with the adverse impacts associated with alien species within and outside the management unit. Monitoring must be carried out in order to ensure that appropriate measures were undertaken, and that the management plan is up to date (e.g. Indicator 8.2.1). Moreover, the cycle must be closed by the application of adaptive management which should include the results of monitoring in management plan and adjust it accordingly. Frequency of measurement is also included and must be appropriate.

Furthermore, indicators related to Principle 10 must demonstrate results of effective management and monitoring which are prescribed to be done in an iterative way (with the help of adaptive management). The process can also be accompanied and even include participation of stakeholders.

The means of verification are also specified and must include records of everything, management plan (according to the indicators very detailed), interviews with forest management agents, stakeholder consultation, fields inspection.

Nevertheless, quantitative indicators (measuring species richness or abundance) are absent. The FSC certificate holder and the auditing agents need to use expert judgements and available data. Perhaps, that is one of the strongest disadvantages of the standard. For instance, for the indicator “10.11.3 Sufficient amounts of dead and decaying biomass and forest structure are retained to conserve environmental values”, there is no indication of what is sufficient, which implies that the auditing body needs to have a reference for that. The source for the latter is not specified.

One aspect which is not directly related to biodiversity but plays an important role in the integration of certification is transparency and participation. Many indicators and criteria include consultation of experts. Moreover, as it was shown, the means of verification may also include consultation of those or concerned stakeholders. In normal procedure, there are consequences of non-compliance which can result in suspension of certification. Additionally, anticorruption criteria are also present with the respective indicators.

Comparing the biodiversity-related indicators with the ones applied to public forests which are represented by the “Criteria and Indicators of SFM at the level of MU”, several differences can be identified.

Biodiversity here is fully addressed in terms of the levels (genes, species, ecosystem and landscape). All the relevant elements are also included as in FSC standard e.g. invasive alien species, multifunctionality.

The character of the prescriptions here is different from the one in FSC standard. These criteria have a structure of guidelines (non-exhaustive) in a form of a ‘package’ of separate elements. Although different levels of biodiversity are referred to in introduction, the indicators themselves do not address the connection between those. It has more measurable goals with very concrete prescriptions about how to apply them. The prescriptions are even more specific than the ones in FSC. For instance, the dead biomass is present in FSC as well as in the state indicators, but in state document there is a concrete goal of keeping at least 0,5-1 m³ of dead wood per ha; the method/measure advised is in a parcel of >5.000 m² with 1 assessment for the entire management unit, frequency at least 2 times during short rotations (<15 years) and 4 times in long rotations. In FSC, on the contrary there are no such specifications.

The authors admit the guiding character of this document, where the forest manager takes the ultimate responsibility of interpreting the indicators while adapting them to the conditions and particular necessities in his FMP and complementing them with the other relevant indicators.

Another relevant aspect here is if the respect of these criteria is a legal obligation and how it is verified, while in FSC there are three parts involved. Furthermore, NGOs as well as regulatory authorities or concerned stakeholders can have access to the information.

Motivational structure

1) Values

As it was previously said, values are something people believe in and something that can significantly help to change their behavior and the current practices.

At the institutional level both biodiversity and especially forest strategy, when refer to biodiversity, appeal to more instrumental values (e.g. economic values of biodiversity, values for development) which demonstrate the usefulness of biodiversity for people's well-being and prosperity. However, the biodiversity strategy embraces protection of its intrinsic values along with social and economic values. Moreover, the information available to the public about intrinsic values (ecocentric) of biodiversity together with its importance for environmental services production (anthropocentric, instrumental) is claimed to be matter of first importance. In forestry strategy these are referred to in more specific way as values of indirect use.

The integration of biodiversity values and conservation objectives in forestry through FSC means that the FSC stakeholders acknowledge both ecological and socio-economic value. Provided that, the presence of both is indispensable for motivation to preserve forest biodiversity, it was expected that FSC certificate holders and certifying bodies have enough knowledge about biodiversity in the forestry context, and associate the right values with it, which means not only instrumental, but intrinsic or ecocentric. Several questions of the conducted survey concern biodiversity values (Q6, Q7, Q13, Q14, Q19, Q20).

The results of the survey demonstrate that all 30 respondents (100%) associate ecological value with the biodiversity, while only 6 of these also believe it has financial values. The answers on Q6 show that 21 of the respondents (70%) believe that the forest is important for the functioning of biological systems, thus demonstrating more eco-centric value (Figure 2 - Annex). However, even stronger ecocentrism can be shown by the option two which states that forest is important by itself, only chosen by two respondents (from these two one is NGO, and another is a forest owner holding the FSC certificate). The group of respondents giving more instrumental value to biodiversity represents 23% (7 people).

On the Graph of Q7 it can be seen, that certificate holders tend to assign more anthropocentric values, whereas certificate enablers and associations – more mixed values ecocentric/anthropocentric (Figure 3 – Annex). Curiously the forest owners also tend to assign more mixed values unlike certificate holders in general. Accordingly, certificate holders with more anthropocentric views regarding biodiversity associate FSC more with financial values. Only two of all forest owners see in FSC financial value, while 4 see ecological and 2 moral (Table 6 - Annex). All respondents checked the box of ecologic value for biodiversity, but only 6 checked the financial.

Almost unanimously, the survey participants think that FSC contributes to more sustainable use of forest resources, including all the certificate enablers and almost all associations (except 1)

2) Interests

Interest in conserving biodiversity through FSC is a very important part of motivational structure because the right values people attribute to forests and biodiversity may not be enough to make them change their practices. There must be strong interest in engaging in forest practices and interest to certify it.

In FSC, for instance, post-certification annual costs can be very high in some cases (up to €3,71 per m³/year of certified output or €4,16 per ha/year of certified forest) and are mainly associated with environmental/social impact monitoring & mitigation (37%), HCV management (4%) but also with benefits to workers (20%).

(Breukink et al, 2015). This indicates the strong necessity to complete the ecological values of FSC certified forests with the economic interests of certificate holders.

In Portugal specifically, The Navigator company, for instance pays premium prices to certified wood, which increases interest in planting eucalypt which are the main wood supplied for the production in The Navigator Company. According to the company, the premiums supposed to cover the costs of the certification process.

Although the interest in this case is strongly related to financial resources, there are several economy-related aspects that can be identified and seen separately. For instance, the interests in case of FSC can be related to economic aspect which in reality is the profit and access to the market of the certified wood or can be translated more in instrumental values associated with nature, e.g. some types of ecosystem services related to biodiversity.

Although FSC-related promotional claims about the maintenance of the ecosystem services are not applied in Portugal and it represents certain limitations and disadvantages to the forest owners willing to obtain certification, it should be noted that in Portuguese context, specifically, the Ecosystem Services Mapping in forest and agriculture land is a process just recently started in Portugal. Thus, the Ministry of Environment, Land Planning and Energy (was changed since then) with the help of IUCN and a team of researchers carried a pilot project of mapping and assessing ecosystems in Alentejo region, which gave origin to a study presented by a member of this team Lia Laporta on 30th of July during the EEF congress in Lisbon, Portugal. According to the speaker the Ministry intends to expand this project for the entire country in the future, which would generate useful database on ES which can be considered for the next update of the FSC standard.

National Forest Strategy for instance has its own attribution of values to different types of forest activities. Thus, there are three types of use of forestlands in Portugal: area of wood production, area of multifunctional management and area of transversal type of use (the coast and classified areas). Biodiversity conservation is included in values associated with the second and third types, although the last one is covered by more specific regulation and isn't the focus of this study. Therefore, the integration of biodiversity in forestry practices in production context is better reflected by the multifunctional management which in its turn includes further values and function: other non-wood products (e.g. cork, fruits, seeds), pasture (sylvo-pastoral systems), game and fishing in inland waters and conservation of the soil and hydric regime protection.

The area of wood production is also subject to the sustainability standards; however, its main purpose is wood production which is directly related to the quantity and quality of the produced wood. This area corresponds to the region where the Portuguese climate is mainly influenced by Atlantic air masses (in the so called Cantabro-Atlantic province), which is in the Northern part of the country (with dominance of small forest owners). The main species used for this purpose are *Pinus pinaster* (for production of lumber, panels, furniture, paper and resin derivatives), the maritime pine and the species of genus *Eucalyptus* (mostly for paper industry), whose productivity levels are above 6m³/ha/year and 10m³/ha/year, respectively. Other resinous and noble wood species are also very important for this economic dimension and yet, whose full potential has not been explored.

The multifunctional management areas are associated with the low (wood) productivity levels while represent direct use values by non-wood products such as cork, resin, fruits (chestnut, the fruit of strawberry tree *Arbutus unedo* and of the carob tree (*Ceratonia siliqua*)), but also pasture, game and leisure. This type of areas also represent important values (definition in the strategy) of indirect use, such as soils and water regime.

Multifunctional use of forestlands is part of long-lasting tradition which has been ensuring the landscape and biodiversity conservation. One of most prominent examples in Portugal is its main traditional agroforestry system *montado*, characterized by low density trees (mainly cork oak, *Quercus suber* L and holm oak, *Quercus rotundifolia* L) combined with agriculture or pastoral activities. According to the last Forest Inventory, cork oak and holm oak forest area, occupied 736,775 ha and 331,179 ha respectively. A range of management variations of the understory from forest (e.g. cork oak) to agro-sylvo-pastoral systems (cork, sweet acorns, animal and/or crop production together) allow to maintain characteristic landscape and mosaic of habitats together, favouring biodiversity.

The rich structural mosaic of montado systems can be found mainly in the South of Portugal, but also and in few areas in the North. Thus, 36% of the Portuguese forest areas are in the Alentejo region are mainly composed

of the montado system, where the cork oak and holmoak are combined with agriculture and grazing activities (Coelho 2002, 2003 in Valente et al., 2015), whereas 29% and 18% occupy central and Northern regions, respectively. The latter are mainly composed of conifers like *Pinus pinaster* and by introduced fast-growing eucalyptus species.

Considering the importance of cork montado systems, it's worth noting that only the Upper Alentejo region "avoided" strong economic pressure from cellulose industry and maintained characteristic primitive cork forested areas. However, one region Serra da Ossa has lost thousands of hectares of montado areas to eucalyptus monocultures for pulp production (Domingos Patacho, Quercus).

As it has been shown, montado systems are of high importance for biodiversity conservation. For instance, Iberian lynx (*Lynx pardinus*), the protected species (and as mentioned before, the one who is one of the national conservation priorities) is a species which benefits from the heterogeneity of montado ecosystems. In fact, there is currently an ongoing LIFE Project in Portugal and Spain, namely LIFE-Montado-adapt (LIFE, 2019) which aims at "Introducing innovative adaptation technologies in Portuguese and Spanish Montado and Dehesa (M/D) landscapes and communities, through demonstration of sustainable and profitable Integrated Land Use (ILU) systems" which among others provide structural complexity in montado systems matching habitat requirements for the Iberian lynx. This is reflected by the national regulation, which protects cork and holm oaks²¹

Apart from being a tradition, cork production in Portugal is a very important economic activity. According to National Forest Strategy, on average, the value of exports in the sector corresponds to six times the value of imports, reaching approximately 900 millions euros a year (Domingos Patacho, Quercus) reflecting Portugal's dominance in the world market.

Despite the importance and large potential of Portuguese forests, its forestry economics is under question. According to available information, forestry as a sector in Portugal is already experiencing several challenges such as rural flight (rural exodus) or high level of fragmentation of forested land in the country (NFS). The fact that people abandon agriculture and forestry leads to degradation of natural capital (NBS). Although up to date information on premium for FSC certified cork was not found, according to Society CERTIS, there is currently no price differentiation from uncertified cork, however, there is a growing increase in demand for certified cork over the other.

The state emphasizes the urgency to stop the rural exodus by creating better conditions in economically deprived areas and by promoting economic activities which foster conservation e.g. of species and habitats depending on specific agro-silvo-pastoral practices. Thus, there are several initiatives to encourage people to stay in these areas. One of these is a recently adopted Project of Young Rural Businessman (Jovem Empresário Rural (JER))²².

It is not surprising, that the National Forest Strategy itself is providing examples payment for ecosystem services in the WWF Project sponsored by Coca Cola (for details, see the previous chapter). In this context, the State is referring to a payment for products and services provided by forests which may be and may be not sponsored by state.

On the other hand, management of corks in montado systems together with cork production can create good profit to the communities at local and regional level in more interior part of Portugal, thus representing an important socio-economic factor for local employment and balance in rural development. This in combination with several traditional (non-intensive) agricultural practices of meat and milk products, apiculture, eatable mushrooms and game activities together rural tourism represent a range of opportunities from which could benefit local communities while contributing to biodiversity conservation. The businesses also recognize the importance of montado and for instance Portuguese Cork Association (APCOR) promotes FSC as tool to foster sustainable forest management and biodiversity conservation in montado systems. In fact, it is more Cork

²¹ Portuguese legislation: *Decreto-Lei n.º 155/2004, de 30 de junho*

²² Portuguese legislation :*Decreto-Lei n.º 9/2019, de 18 de janeiro*

Montado groups which have been showing the increase in certified forested areas in the overall % of FSC certified in Portugal between 2011-2014.

As there are several threats (pests, disease, wildfire risk exacerbated by climate change, urbanism) to these important socio-ecological systems, Quercus organization alleges that “However, the clear focus on the use of natural cork stoppers in quality wines, associated with the promotion of sustainable forest management certification through the recognition of worldwide certification systems, such as FSC, brings new hopes for the maintenance of cork oak forests.” (Domingos Patacho, Quercus).

The biodiversity strategy emphasizes the importance of these activities which would provide opportunity to more diversified forest services which would be economically interesting for the local communities. As demonstrated in previous section, FSC integrates this context specific characteristics and includes multifunctionality in its standard.

3) Framing

Framing can be understood as a process by which issues, decisions or events acquire different meanings from various perspectives and they provide strong and generic storylines that guide both analysis and action in practical situations (Schön and Rein, 1994 in Karlsson-Vinkhuyzen et al., 2017)

FSC itself is framed more in view of SFM in forest policy and despite all its support is negatively perceived by the general public (as shown by the survey), and not recognized as a tool to preserve biodiversity in the forests.

Framing of biodiversity conservation was expected to be the same or very similar for FSC standard, National Forest and Biodiversity Strategies. Moreover, the participation of the same actors would provide evidence of coherence in the existing frameworks. The one in FSC standard has been shown in the section of Institutional structure. Biodiversity strategy addresses biodiversity in all its complexity, as defined in CBD thus, including diversity of genes, species, communities, but also ecosystems and biodiversity at landscape level and not limiting biodiversity to conservation in areas of exceptional value (NBS). Forests are recognized in this strategy as for their structural function providing habitat for a range of species. FSC framing corresponds to the latter. Although in forest strategy, biodiversity is mainly addressed as species and habitats, the importance of genetic diversity (in forestry in terms of vegetation) but also communities, ecosystems is acknowledged. The landscape scale is, however, referred to separately from biodiversity even though the connectivity at the landscape level (in terms of structure and composition) is included.

The most important difference, which has implications for the national forest policy and FSC implementation is the lack of vision of connectivity and ecological networks (in this case in forestlands) at more global scale in forest strategy. Anyhow, this vision may be present in the PROFs.

On the other hand, Quercus and WWF, which are the members of environmental chamber of FSC along with the other environmental associations took part in the public consultation on update of NBS before it was adopted.

This, on the contrary exists in biodiversity strategy along with such concepts as green infrastructure for example. Even though, the dimensions of management units are not comparable with the dimension of the national ecological network, FSC standard includes several provisions on landscape while identifying its connection to smaller scales.

4) Leadership

The last but not least of the motivational sub-dimensions is the leadership. It is perhaps the most important sub-dimension to assess among FSC enablers and associations, as these are the ones working more in the area of public relationship and fostering partnerships and collaboration. The initiatives and activities of FSC enablers

described in the horizontal interactions already provide an idea of the role they play in integrating FSC in forestry and integrating biodiversity through FSC.

Nevertheless, the survey included 3 questions on leadership which were addressed to all groups of FSC stakeholders. As expected, all enablers answered positively on the three questions related to leadership: Q16, Q17 and Q18.

On the other hand, the FSC certificate holders themselves could also take the initiative to encourage other forest owners and producers to acquire certification. What is even more important is that they could play also a very important role in integrating FSC with the consumers, while demonstrating the added ecological value of FSC to forest products. The transformation of wood and other forest products along the industrial chain drive away the forest practices on-the-ground from the consumers benefiting from these.

With this intention, the leadership of forest owners and FSC certificate holders was assessed by the survey. The results show, that the FSC certificate holders themselves would like to improve forestry production in relation to biodiversity conservation (with the exception of one), where 7 out of 9 forest owners answered positively to this question.

As to associations of forest owners and producers, these can also play an important role in leading the integration of biodiversity in FSC or promoting FSC among their members. The answers on Q16 show that all except one stakeholder (who associates FSC with financial value) from association group are willing to turn their production in forestry better for biodiversity conservation. Another stakeholder from association group which on the contrary, would like to improve forestry production for biodiversity, doesn't show interest in collaborating with the other actors (Q17) or to promote biodiversity conservation in forestry through FSC (Q18), thus being the only participant from all 30 answering negatively on these two questions.

On the other hand, there are three stakeholders from associations who would like to promote conservation of biodiversity in forestry sector through FSC (Q18), but don't know how to do it, something to reflect on in the strategy of FSC implementation.

What to the forest owners, 8 out of 9 (except the stakeholders mentioned above) who hold or not the FSC certification, are willing to use FSC as a biodiversity mainstreaming tool in forestry sector (Q18) as well as foster partnerships and collaboration with public authorities, scientific community and NGOs (Q17).

Distribution of means, structures, interdependencies and range of alternatives

1) Knowledge

The importance of knowledge about national natural capital and ecosystem services is emphasized in National Biodiversity Strategy, where one of the planned implementation measures is creation and application of a system of formation and sensibilization of actors in public sector but also forest producers, where NGO are to intervene along with the sectoral organizations and companies. Furthermore, the education of forest producers is specified.

That being said, knowledge is the sub-dimension more relevant for FSC certificate holders and FSC certifying bodies. The first ones are to apply FSC in practice while the second are to verify the compliance to the standard. The FSC enablers a priori, have experts or at least employees competent in this matter, and who works specifically with the FSC. Moreover, FSC enablers, one of which is LPN organize activities which aim at involving more people in FSC certification process and improving the knowledge of forest owners or technical experts, consultants about FSC and its system.

The results of the survey show that 30% of respondents are certificate holders, but only 9 are forest owners. Although all respondents acknowledge the importance to preserve biodiversity, 12 of them answered that biodiversity means only species diversity. Five out of 9 FSC certificate holders associate biodiversity only with diversity of species, whereas for instance all respondents from certifying bodies encompassed other elements of biological diversity.

The respondents from the associations demonstrated the least score for this question, where 5 out of 7 people identify only species diversity.

Regarding the % of world biodiversity sheltered by forests, less than a half of respondents (13) checked the right answer (70-80%). Moreover, only 3 out of 9 certificate holders know that the forests shelter 70-80% of world's biodiversity (Q10 – Figure 6 – Annex), whereas half of the respondents from certifying entities answered on this question correctly.

In regard to the local species contributing to biodiversity in Portuguese context (Q9), 83.3% (25) of respondents identified the symbolical Iberian lynx, whereas only 66.7% (20) checked the box of the booted eagle which is another protected species in Portugal. Curiously, while nobody checked the boxes of the two of the most renown invasive species in Portugal (Mimosa and the red swamp crawfish), 3 of all respondents consider that all existing species contribute to biodiversity. Regarding the bird species richness and abundance (Q12) in the forest, 27 out of 30 respondents chose the right answer, which is mature forest.

Although 43% (13) of the respondents chose the right answer, more than a half underestimates the importance of the forest for biodiversity. (Q10 – Figure 5 - Annex). The certificate holders seemed to be the ones more aware of the benefits of biodiversity conservation for the forest, where 6 out of 9 checked all three correct boxes (Q11 – Figure 7 - Annex).

2) Time

Time perhaps is one of the most important limitations in the process in both biodiversity integration in FSC and FSC integration in forestry sector.

FSC in Portugal was established in 2007 by the creation of Association of Responsible Forest Management (AGFR) and the first standard was effective only 6 years after, in 2013. The second standard was approved in March 2016 with the effective date in May 2018 and validity period of 5 years starting from the effective date. Biodiversity strategy in its turn in fact took 17 years to update. However, the most recent version is more complete and includes a range of measures to implement which will also have a long-time frame. In fact, the recently updated biodiversity strategy established goals to achieve for 2030, thus indicating the time horizon of the policy implementation.

The forest strategy was updated in 2015 which means it doesn't include the recent development regarding biodiversity. It doesn't preclude though for the responsible ministry to adopt other types of legislation corresponding to the needs of the sector. The question is how soon FSC could integrate the necessary changes in the standard. As it was shown in previous sections, the FSC Procedure for Ecosystem Services was not adopted in the last update, whereas the recent policy developments in this matter are advancing at the systemic level. However, since the projects involving the assessment and payment for ecosystem services can take decades, FSC can still keep up to the updates in the relevant policy and decisions.

On the other hand, the time horizon necessary to drive change among the forest owners and managers themselves is also long. Transforming people's views and their system of values with the further change of behavior is something that requires time and conditions for that. Portugal with its high fragmentation of forest properties is perhaps the biggest hurdle in this matter.

3) Financial resources

Support provided by the state

There are several examples of state support to more sustainable forest management and particularly to forest certification.

First of all, the main conservation policy based on Natura 2000 doesn't exclude forestry activities. And although the main financial support for classified areas is directed to implementation of conservation measures

(e.g. for Iberian lynx and Iberian wolf), forest owners and producers can still benefit from this program under certain circumstances. The financial support is mainly done in a perspective of multifunctionality and traditional agro-silvo-pastoral activities in agriculture and forestry.

For instance, the Rural Development Program (PDR 2020) established such financial instruments which included Natura 2000 payments in forest lands, support to non-productive investments, forest-environmental payments, support to restoring forestry potential and introducing of prevention measures.

In fact subsidies in framework of Common Agriculture Policy and Natura2000 by PDR 2020 and by direct compensations specifically in classified areas are both to ensure the pursue of goals in agri- and forestry management in protected areas (N2000). This goal is based on the assumption that CAP support ensures sustainability of agri and forestry investments, while promoting multifunctionality in the sector and cooperative and innovative spirit and at the same time fomenting structural and functional quality of ecosystems and services they provide. Indeed, according to the Institute of Agricultural and Fisheries Financing, several types of support have already been provided to foster biodiversity in forestlands.

One of the main economic policy instruments for biodiversity conservation in forestry according to NBS strategy is Permanent Forest Fund (FFP)²³ which aims at supporting sustainable forest management in compliance with the National Forest Law and NFS.

As a matter of fact, both legal references include provisions on forest certification and support for it. To illustrate, NFS when adopted in 2015 defined as one of its main goals for the financing period 2014-2015 to support forest certification (Operational objective D1.1). For this purpose, the indicators of results would be support provided to SFM and certified forest area. The state intended to reach 500.000 ha of certified forest area until 2020 and 1.000.000 ha until 2030.

Portuguese legislation has provisions for supporting FSC for several organizations and structures²⁴. These include e.g. Forest Intervention Zones (ZIFs) (premiums attribution) according to the achieved goals and the attainment of forest management certification, joint forest management and in smallholding (organized in Forest Management Entity, EGF), in Portuguese called *minifúndio*²⁵. Through recognition, these entities are able to access targeted public support as well as to obtain tax and tax incentives. Moreover, FlorestGal project was developed by the Government, a public company that aims to promote good management of the public forest and the aggregation of small plots in order to subject abandoned forest areas to good management rules.(one of the goal to attract investors from private sector) (PDR 2014-2020, 2018)

Despite all this substantial body of legislation which demonstrates support to forest certification, [ANP/WWF](#) in Portugal not only stressed the importance of responsible forest management and forest certification, but also stressed the need to amplify concrete financial support measures namely by Permanent Forestry and Environmental Funds, while promoting the joint management like in ZIF. The need of effective mechanisms for payment for ecosystem services (voluntary and regulated) was also stressed in the report, while fostering participation of the concerned stakeholders and strengthening the synergies in the forest management. (Em 2017, a ANP|WWF).

The state also assumes to support the process of transformative industries in order to increase their efficiency which will help to reconvert the eucalypt plantations (with the area between 25 and 45 thousand hectares (NFS) replacing them by species which are better adapted to local edaphoclimatic conditions.

For instance, according to the transposition of the EU Regulation1307/2013 one of the implementation measures adopted in framework of PDR2020 which aims to increase the economic value and competitiveness of woody and non-woody forest products supports among others certification of SFM. The support is slightly bigger for the less developed regions. It should be noted however, species exploited with rotations below 20 years also benefit from this measure.

²³ Portuguese legislation:..Decreto-Lei n.o 63/2004, de 22 de março

²⁴ Portuguese legislation:..DECRETO-LEI N.o 127/2005, DE 5 DE AGOSTO1 ZONAS DE INTERVENÇÃO FLORESTAL

²⁵ Portuguese legislation:..DECRETO-LEI N.o 66/2017, DE 12 DE JUNHO

An interesting example is of the law adopted just last year, *Diário da República*, 1.a série—N.º 2—3 de janeiro de 2018 which aimed at supporting municipalities of Pinhal Interior after heavy fires which devastated the area the year before. Certification is included in several measures and moreover, at the beginning of the document it is specified – FSC and PEFC (as opportunities for appreciation of existing forest capital). The measures proposed for example indicate to include specific species in SFM certification (e.g. strawberry tree) or to include extraction of resin and different sub-products which would create conditions for a financial reward for an increase in forest (certified) multifunctionality. The Program mobilized so far 1 million euros.

All these policy support and measures are directed to support SFM in forestry, without any explicit mentioning of biodiversity. This, however, may have implications for the added value for conservation efforts in framework of SFM, which in fact require substantial financial investments on behalf of forest managers.

One recently adopted decision may help to address this institutional gap, the decision of the Portuguese government which demonstrates the recognition of importance to protect and preserve natural capital. This is the Resolution of Council of Ministers n.º 121/2019 which approves the first phase of program of remuneration for Ecosystem Services in Rural Areas (including forestlands), supported by Environmental Fund (created by the Decreto-Lei n.º 42-A/2016, de 12 de Agosto). According to this decision in next years between 2019 and 2038 Environmental Fund is to undertake the expenditure in the amount up to € 3 737 705,00 for the 1st Phase of this Program, launching a pilot project of payment for ecosystem services in two protected areas. This Project aims at developing a model of payment for ecosystem services to the owners of the property in the defined geographical area which will be realized through the adoption of the measures which restore, add value and protect biodiversity in these areas.

This is a large step forward in implementation of biodiversity strategy for 2030, where one of the goals is to ensure an integrated support system for EU community funds but also payments for forestry practices which are beneficial for climate and environment (NGO) and can encourage first of all more forestry activity in the areas of rural exodus and second, encourage the forest owners/ producers to search for a more sustainable production and explore existing opportunities for that, one of which is FSC certification.

Other sources of support for FSC mobilized at the national level

Several initiatives are developed by FSC and its stakeholders. One of them, which FSC procedure for Ecosystem Services includes a range of financial opportunities e.g. so-called “Impact investment” which is translated into the development of partnerships of FSC with financial sector with the aim “to explore how integrating FSC certification and FSC-verified ecosystem services impacts into strategies used by impact funds can bolster the case for private sector investments in conservation.”

Other sources of support include for example projects which take place in Portugal. Some of the examples have been given in previous sections e.g. The LIFE Project adapt for instance is co-financed by European Union and mobilized or project “Green Heart of Cork” (GHoC) of WWF where Coca-Cola paid 17€/ha to the APFC forest landowners, in the 600 ha identified and classified as HCV, located in sensitive areas for water recharge of aquifer T3 and certified by FSC.

Another example demonstrating EU support of FSC, is Forest-In Project co-funded by Erasmus+ Programme of the European Union, where FSC is one of the main partners. This project is about “INovative and Educational INformation for the Sustainable FOREST Management by Smallholders” whose main goal is international strategic partnership for forest education. It is designated for the countries (Portugal inclusively) where there is “predominance of private forest property with very small areas and mostly under the management of owners without technical training, leads to the proliferation of practices that sometimes threaten forest integrity and productivity, while hindering overall ecosystem services”.

IV. Discussion

Institutional structure demonstrates that several initiatives exist at the highest political levels and which aim at integrating either environmental or specifically biodiversity objectives in non-environmental sectors. However, forest certification is not acknowledged in biodiversity strategy as a tool contributing to more sustainable use of forest resources. Biodiversity in its turn in forestry strategy is mainly referred to as protected species and habitats while the conservation of ‘ordinary’ biodiversity in regular forest practices is not underlined.

Inside forestry sector, there are however several legal documents referring to and considering the importance of FSC, while promoting it and supporting certification activities especially in joint types of management of forest properties.

Although the evidence corroborates the vertical integration of FSC in forest sector, which among others indicates political commitment, and as result resources and support, horizontal approach of environment representation in forestry “might have greater chance of infusing mainstreaming with technical and analytical expertise” (Nunan et al, 2012).

Although both strategies include previous consultation of relevant stakeholders, Valente et al., (2015) emphasizes that their participation is neither frequent nor promoted by government. Limited stakeholder participation in forest policy-making in Portugal is reflected in a poor implementation of forest policies. Their results, however, show that people are willing to join discussions in forest policy-making and work together in their local future, thus emphasizing the need for innovative participatory methodologies which would increase collaboration among all concerned stakeholders. (Valente et al.2015).

FSC in this context is one of the possible initiatives, as it has three chambers with representatives of environmental, social and economic interests. Moreover, the FSC standard in Portugal includes indicators which include consultation of relevant stakeholders together with the possibility of experts’ consulting (e.g. for ecological data) or providing information regarding several aspects of forest management to concerned stakeholders. Yet, several FSC stakeholders stressed in the survey the lack of participation in FSC process.

Nevertheless, the involvement of FSC enablers in fostering partnerships and promoting the certification is demonstrated by several projects and activities they develop. FSC itself tends to foster its collaboration with public authorities which is demonstrated by its involvement in TC145. Moreover, it develops various initiatives to raise awareness both of civil society and forest producers and technicians.

Several stakeholders however, stressed in the survey that the general public is still unaware of forest certification and especially the differences existing between e.g. FSC and PEFC or other labels. Moreover, the certificate holders expressed the need of broader public (NGOs, scientists). In certain cases, certification showed to be a useful tool to foster interactions between government, academic and corporate efforts in order to define sustainable forest management, offering experimental approaches in this matter together with monitoring (Bass et al., 2001). The importance of involvement on behalf of scientific community in the assessment and monitoring process of the forest management are also underlined by Noss, (1999)

As all participants demonstrated ‘leadership’ to foster partnerships and cooperation with the other actors, the horizontal integration would be more effective in the bottom-up perspective, from the FSC stakeholders who locally present. Indeed, the flow and the quality of information as well as the actors relying on it will more likely to be bolstered in denser social networks rather through impersonal contact (Pasquini et al., 2015).

In regard to the standard itself FSC standard in Portugal it’s to note that overall it encompasses all relevant levels of biodiversity together with some crucial aspects like invasive alien species or the inclusion of ‘ordinary’ biodiversity, which is not common for the documents in forestry sector in general (assessed in this study). Multifunctionality which is characteristic for Portuguese forestry context is also included and although

ecosystem services procedure (involving financial claims) is not applied in Portugal for the moment, it is present in the standard. The ecosystem services is in effect a subject entailing several developments in Portugal which may help to add value for biodiversity conservation in FSC.

The Portuguese general indicators on the level of management unit, represent this type of specific indicators including the exact ways and frequency to measure it, with the numeric norms for it. Speaking of the national indicators, despite of these being quantifiable, they are not structured in a coherent and connected way. This document is non-exhaustive and doesn't provide the big picture of the whole forest management system in the unit with the biodiversity components and connections between them.

Perhaps, the most prominent shortcoming in the standard is the lack of biodiversity indicators measuring species richness or abundance, and overall performance targets, which was also observed in other studies (e.g. Angelstam et al. 2013). These, however are rarely used in certification schemes in general as they are costly and time-consuming to measure, and high variation hampers interpretation (van Kuijk, 2009) and managers cannot measure everything of potential interest (e.g. 'ordinary' biodiversity) in the forest (Noss, 1999). The best available data and expert consultations are used instead. Moreover, it's important to keep in mind that if the standard is too strict, the industry will be less motivated to submit themselves to certification (Rametsteiner & Simula, 2003).

Globally, it's important to note that the standard includes provisions on management objectives, measures, assessment and monitoring of biodiversity and impact of silvicultural practices on its state, where for instance the goal-setting is essential for further measures, impact, while creating entire context and sense of purpose for assessment and monitoring (Noss, 1999). Noss, (1999) underlines the importance of assessments which "provide a snapshot of a forest at a single point in time", helping to identify the progress of the managers towards established objectives and the feed-back they provide to the forest planning. This is included in FSC standards in adaptive management framework. However, again, assessment and monitoring are to be in continual interplay with the research which in Portugal is still insufficient for forests.

Curiously, biodiversity indicators for Mediterranean region have not been receiving due attention despite the specificities of Mediterranean forests.

Regarding the values, the results of the survey show that in general FSC stakeholders assign the non-use together with the use values to biodiversity. As much as NBS strategy underlines the importance of intrinsic values, and its acknowledgement, the NFS refers to it as non-use values.

Thus 70 % of the participants believe that the forest is important for the functioning of biological systems, thus demonstrating more eco-central value whereas the other majority relies on forests as a supporting system. Forest owners in general assign more mixed values while the certificate holders tend to search more for use values. According to Noss, (1999) different conservation goals established in framework of the Forest Management Plan (FMP) derive from values, thus suggesting that value judgement about need and importance of biodiversity and ecological integrity could be better traced by the conservation goals established in FMP. This together with the fact that all survey participants think FSC contributes to more sustainable use of forest resources suggests, that certificate holders see the potential in biodiversity conservation as an added value for certified forests.

On the other hand, answers on open questions demonstrate the acute need for an added value for conservation effort in framework of FSC to be recognized by the general public and the conservation community, either in form of PES or through public subsidies mobilized for forest biodiversity conservation (e.g. it is possible in N2000 sites). The forest owners specifically stress the need for the general public to recognize the positive externalities as the forest owners cannot be the only ones investing in biodiversity. Moreover, the changes require time in order to be done properly keeping patience for the owners to stay in the process while changing their practices. Public pilot projects concerning Ecosystem Services also require time in order to produce changes in relevant public policy.

Regarding the costs, indeed the heaviness of the bureaucratic process and all the requirements to comply to FSC standards require investments for proper technical assistance and necessary works. Moreover, the conservation measures are the ones requiring even more financial effort.

Thus, producers in some value chains, like for example in forestry would expect premiums for certified wood which can strengthen the attraction to certification (Karlsson-Vinkhuyzen et al., 2018) and increase both interest in having positive ecological impact and in certifying their forests. Available data, however, only indicates premiums provided by one company (a very economically important actor), focused on paper production.

This with the fact that the short rotation trees require less time and financial effort to manage, and the subsidies which also partly support it are the incentives to plant fast growing species. This, however, is not viable if not integrated in a system with long-rotation and traditional agro-silvicultural practices which in combination can provide opportunities for biodiversity conservation and for production. Indeed, as the results show, forestry in Portugal does have weight in national economy which can be fortified by long-lasting tradition of interactions of people with the environment, e.g. for cork. Moreover, the market for noble woods according to NFS is not fully explored and thus also presents important potential.

Assessment of ecosystem services, which started to be explored by public sector demonstrates potential way of adding value to biodiversity in framework of FSC certification, which first already showed to be present in conservation projects and second has necessary provisions which (if approved by the board) will be applied in Portugal in the next update of FSC standard in Portugal.

On the other hand, several challenges experienced by the forest sector in Portugal can present serious hurdles to FSC uptake, such as fragmentation of forest properties. Public and FSC initiatives are currently trying to address these issues, but this process is time-consuming.

In this context for instance, landscape level planning is something crucial for conservation, especially when some species require large areas of contiguous biophysical structure providing habitat as well as appropriate placement of core protected areas versus productive plantations which are rarely contained within one property or parcel. That's why, FSC as a tool to address biodiversity can be limited which highlights the importance of complementarity of private initiatives with public ones (Auld, 2008), presenting at the same time opportunity and challenge for future research which is critical in this area.

In Portugal, certification is framed as an instrument for SFM in forestry, but with no framing in biodiversity strategy, on the contrary to the results of (Karlsson-Vinkhuyzen et al., 2017). The negative frame around forest certification is present in Portugal, which is stressed by the stakeholders in the survey, as well as by some officials of ICNF (ICNF, personal communication). As individuals' and institutions' frames are dynamic and can be actively influenced, it is worth noting the consultation on NBS which took place last year, and where WWF and Quercus took active part. This type of interactions can contribute to deliberate fusion or connection of frames.

Leadership was assessed in the survey and showed that the large majority of stakeholders are willing to promote FSC and to use FSC as a biodiversity mainstreaming tool in forestry sector as well as foster partnerships and collaboration with public authorities, scientific community and NGOs, the real activities and projects. These include both forest owners and certificate holders' groups. More importantly, FSC enablers, demonstrate not only their leadership potential in the survey, they do demonstrate it in practice. The partnerships they foster are good examples of how FSC can contribute to biodiversity conservation in different contexts with benefits this can bring to FSC certificate holders. This is coherent with the results of (Karlsson-Vinkhuyzen et al., 2018), which demonstrate the influence that the leadership of NGOs and companies can have on mainstreaming. They also underline the potential leadership of researchers, which showed the economic values of more sustainable forms of production while collaborating in co-management structures with producers.

The latter, however, can be important leaders in this process by seeking opportunities with FSC to take active part in communication and activities raising awareness. These are more likely to have higher impact on local scales (Pasquini et al., 2015). On local scale, however, the role of public authorities is also essential for

mainstreaming. The study of Pasquini et al., (2015) shows that the leadership of administrative champions was crucial to bolster proactive behavior of the municipality. Moreover, it was the department of environmental resource management who led the process (responsible for the formulation and implementation of strategies and programs for environmental sustainability).

In case of Portugal, ICNF is the national public authority responsible for forest and biodiversity policy implementation, and who is legally obliged to strengthen implementation of forest certification in the country. It is though may not be sufficient as for instance senior political leadership may be of much higher importance as a leader for driving change in the context of mainstreaming (Pasquini et al., 2015).

Moreover, the actual role of ICNF in it is unclear. For instance, in its article from 2018, Quercus stresses necessity to increase transparency of the ICNF work. This claim is related to the fact that the Institute certified plant nurseries, which can generate more than 35 thousand hectares of eucalypt but without making available the information regarding the placement and legality of the authorized eucalypt plantations. And indeed, some answers from the survey do stress the need for the state to show initiative by certifying its own forests. According to FSC (FSC, personal communication), although large area of public forestlands is not certified, there already several examples.

In regard to the knowledge, the overall results of the survey demonstrate that certificate holders and participants from the associations tend to associate biodiversity only with the diversity of species, whereas for instance all respondents from certifying bodies referred to other elements of biological diversity. And although all stakeholders acknowledge the importance to preserve biodiversity, less than a half (with only one third of all certificate holders) is aware of the fact that forests shelter 70-80% of global biodiversity. The answer on open question regarding the view of biodiversity rich forests, certificate holders demonstrated knowledge of significance of forest habitats, several ecosystem services and concept of biological systems. This shows that FSC stakeholders, and particularly the certificate holders still lack broader knowledge about biodiversity, something that may affect the performance of forest management in certified areas.

The need of knowledge development among forest producers is emphasized by NBS, and not only FSC develops activities in order to improve it, it was able to engage in a larger scale formation project supported by European Union which demonstrates its potential in mobilizing financial resources for good forest practices aiming at sustaining forest integrity and productivity, as well as ecosystem services provision.

On the other hand, several participants (certificate holders, enablers and others) stress the lack of knowledge about FSC among the general public and scientific community which creates negative frame for it in public opinion. This is related to the lack of insufficiency of horizontal interactions. The system of knowledge regarding forest biodiversity and the FSC' conservation value are thus still to develop not only among forest owners, but also among general public and consumers. All this requires a lot of effort (FSC, personal communication) and is time-consuming.

The overall knowledge base can indeed play a huge role in the mainstreaming process (Karlsson-Vinkhuyzen et al., 2018). For instance, Pasquini et al., (2015) demonstrated that the progress on mainstreaming is related to the presence of strong knowledge base in the city which includes involvement of academics from universities and colleges who can provide necessary information.

Conversely, continued trust in the labels among consumers can be compromised by the weak knowledge base, while increasing a mistrust of NGOs which perceive market-based mechanisms in a negative way (Karlsson-Vinkhuyzen et al., 2018), which seems to be the case in Portugal.

All these processes related to changes of people values' systems are slow. Moreover, the time horizon of national policy implementation as well as the time necessary to adjust and adapt certain aspects of forest and biodiversity policy, which in case of Portugal show strong discrepancy. FSC, however, with its time frames can still have opportunity to integrate necessary changes, like in case of ecosystem services procedure if the developments in this area show strong progress during following years.

Apart from already mentioned financial resources mobilized for forest certification and for biodiversity conservation in FSC framework, the results demonstrate that there are many initiatives at the systemic level (mainly from EU funds) to endorse and support forest certification as a tool for Sustainable Forest Management (SFM). Although it is mainly perceived in a frame of SFM, it may create opportunities for large scale conservation initiatives involving different actors in the field. The socio-ecological approach is required to assess each case separately. As there is an initiative of national ecological network, further work would be to design the ecological networks existing already and identifying large habitat corridors, conservation nodes and the production areas (Samways et al., 2010) including agriculture and even eucalypt plantations. Despite its strong negative ecological impact per se, eucalypt and paper industry are an important part of Portuguese economy and as such, cannot be entirely excluded from it. What's important here, is that more of these plantations need to be certified and moreover, be integrated in landscape conservation projects which will permit to create win-win situations both for biodiversity and for producers, while ensuring that the overall management helps to reinforce forest resilience to fires. In order to achieve this, strong collaboration and cooperation are required from all stakeholders and actors in the field.

One of the priorities identified in NFS is to recover abandoned forest ecosystems, particularly in the classified areas. That's an example of opportunity for FSC potential. The decentralized system of forest governance in Portugal together with the strong fragmentation of forest property reinforces the potential of FSC for locally targeted projects, especially considering the fact of several types of support that can be mobilized for joint forest management. For instance, some studies showed that strong integration of social and ecological systems in EU's Natura 2000 network of protected areas requires academic research integrative across fields of study which involves both nature protection agencies (such as FSC enablers in this case) and academia collaborating with each other, while producing place-based knowledge and strengthening constant iterative learning, and integrating stakeholders in concrete landscape and regions (Popescu et al. 2014 *in* Elbakidze et al., 2016).

Although the results of (Karlsson-Vinkhuyzen et al., 2018), show that one of the major barriers of the expansion of the certification regimes are limited financial resources in certain cases, this is not the case for Portugal, as there are many financial instruments at the European level which aim at supporting rural development as well as biodiversity in agricultural and forestry context and EU recognizes the forest certification value.

It is though important to keep in mind, that the tool for SFM doesn't not explicitly specific biodiversity conservation, which is more encompassed by forest policy in framework of protected and classified areas. N2000 policy with the help of PDR 2020 provided several opportunities for forest producers in concerned areas and such projects like TerraSeixe demonstrates how conservation objectives of N2000 can be embraced in a complex multi-stakeholder landscape, which among others include forest producers and particularly certified forest production. Indeed, strong Integration of social and ecological systems in EU's Natura 2000 network of protected areas requires academic research integrative across fields of study which involves both nature protection agencies (such as FSC enablers in this case) and academia collaborating with each other, while producing place-based knowledge and strengthening constant iterative learning, while integrating stakeholders in concrete landscape and regions (Popescu et al. 2014 *in* Elbakidze et al., 2016).

Indeed, FSC seems to be a potential tool in more so-called landscape governance (specifically in view of addressing forests conservation), as a process of spatial decision-making taking in consideration socio-ecological boundaries which can be characterized by multi-stakeholder dialogue and negotiation, aiming at achieving all environmental and socio-economic goals (van Oosten et al., 2018)

Part 4: Conclusions

I. Summary/synthesis and answer to the problem statement

Biodiversity conservation is one of the urgent environmental issues society currently needs to address. The initial vision for fully protected areas showed its insufficiency and made everybody realize that, biodiversity needs to be integrated in mainstream of the economy, which are the production sectors. In reality, all of them are extremely important, but the aim of this study was to assess the integration in forestry. Biodiversity mainstreaming showed to be something that is done by people around the globe and with the help of Global Environment Facility, but also something that is still hardly addressed in scientific literature. While keeping in mind that the mainstreaming goes through the whole policy implementation cycle including the impact on biodiversity, which is its ultimate goal, studying it implies assessing social systems and processes which are essential for biodiversity integration. As one of the keys of mainstreaming is changing values' systems of individuals and institutions, it practically means seeking for ways and instruments which realize these changes.

One of these instruments in forestry is forest certification. Regardless the possible controversy this tool entails, it's worth looking at its potential, while searching for the most optimal ways to implement it. It's even more justified when assessing the Forest Stewardship Council (FSC), which with its three-party system, multi-stakeholder governance and the whole original initiative has been applied worldwide.

That having been said, the main goal of this study was to assess the potential of Forest Stewardship Council (FSC) as a mainstreaming tool for biodiversity in forestry. Portugal, being one of the countries of Mediterranean region (considered a biodiversity hotspot) was chosen for the case study. Its particularities regarding forest governance, long-lasting agri-silvo-pastoral traditions, biodiversity context and endless fires, made it an interesting opportunity to explore FSC potential for biodiversity.

The applied methodology with its multiples dimensions allowed to understand the potential for biodiversity integration within horizontal and vertical axes, while looking at the values which lie at the heart of the institutional and individuals' systems for biodiversity conservation in forests.

Despite all the difficulties forest sector experiences in Portugal, the main conclusion of this study is that FSC does have potential for biodiversity integration in forest sector. The fact that very little part of Portuguese forests is certified is one of the aspects, but what really matters, is that the whole process that leads to certification is socially, economically and environmentally relevant. As all of these are the pillars of FSC, they can define the processes of integration. The NGOs, which are FSC enablers demonstrate strong leadership in integrating FSC taking in account the available resources. The projects they are involved in, bring benefits to producers and to environment and biodiversity. By increase of communication, transparence and by improving the knowledge base, the general public together with scientific community could be mobilized in order to make part of the FSC process. Moreover, the state recognizes the value of forest certification and demonstrates support for it, as well as European Union.

The other question is how to use the existing potential in the most optimal way. As within Portuguese context, with its decentralized centers of power, its perhaps worth looking at the local opportunities, where local FSC stakeholders can take initiative to help to implement FSC, e.g. in case of environmental stewardship or ecological networks. The existing projects inside and outside Portugal can provide inspiration for further initiatives.

To conclude, in order to adapt to constantly changing socio-ecological systems, more iterative learning is required. This could be strengthened by transdisciplinary research in this area.

II. Research limitations

A deeper analysis of legal documents is required, which could provide even better insight into the institutional framework.

Another limitation is the fact, that public authorities were not interviewed in this study, although they play a very important role.

In regard to the survey, little number of participants and especially of certificate holders took part in the survey. It helped, however, to interpret the results of the survey in combination with the other obtained data. Moreover, surveys in paper and presential are required for deeper assessments of concerned stakeholders, and particularly forest owners.

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<https://dre.pt/application/file/a/123578803>
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Annex

Table 1 - Portuguese Legislation consulted for assessment

Diário da República, 1.a série — N.o 24 — 4 de fevereiro de 2015
Diário da República, 1.a série—N.o 87—7 de maio de 2018
Comissão interministerial para os assuntos da floresta in Portuguese (created by National Forest Law, Lei n.º 33/96 de 17-08-1996)
Diário da República n.º 190/1996, Série I-A de 1996-08-17
Diário da República n.º 172/2018, Série I de 2018-09-06
... aprovada pela Lei n.o 33/96, de 17 de agosto
Decreto-Lei n.o 142/2008, de 24 de julho
Artigo 15.º do Decreto-Lei n.º 16/2009, de 14 de janeiro
Os princípios orientadores da política florestal consagrados na Lei n.o 33/96, de 17 de Agosto, Lei de Bases da Política Florestal
Avaliação Ambiental Estratégica (SEA) n.o 1 do artigo 3.o do Decreto-Lei n.o 232/2007, de 15 de junho
Avaliação de Impacte Ambiental (AIA) artigo 18º da Lei de Bases do Ambiente (lei n.º 19/2014, de 14 de abril)
LEI N.o 158/99, DE 14 DE SETEMBRO LEI DE BASES DAS ORGANIZAÇÕES INTERPROFISSIONAIS DA FILEIRA FLORESTAL
DECRETO-LEI N.o 66/2017, DE 12 DE JUNHO1 RECONHECIMENTO DAS ENTIDADES DE GESTÃO FLORESTAL
Decreto-Lei n.º 9/2019, de 18 de janeiro
Resolution of Council of Ministers n.º 121/2019
Decreto-Lei n.o 63/2004, de 22 de março
DECRETO-LEI N.o 127/2005, DE 5 DE AGOSTO1 ZONAS DE INTERVENÇÃO FLORESTAL
DECRETO-LEI N.o 66/2017, DE 12 DE JUNHO

Table 2 - Main points from the open questions of the survey

Stakeholder category	Main points of their answers
FSC enablers	<ul style="list-style-type: none"> - Need for public recognition, support from the government, medium and long-term supply (procurement) policies, valuation of forest ecosystem services - Conflict in FSC certified monocultural plantations, especially eucalyptus and pines, with the conservation of biodiversity especially the creation of ecological corridors. - Lack of stakeholder participation in FSC certification processes, poor access to the public, FSC certification of the forest management of monocultures which has discredited the FSC process itself - The general public is still unaware of these certifications, so product labels say little - There is also confusion with certifications / stamps in general, as there is also PEFC.

	<ul style="list-style-type: none"> - The prices of these products are generally more expensive, which may discourage consumer to choose it, which means, there is a lack of communication. Other aspects of conservation - monoculture, notably pine and eucalyptus (and used plant protection products) do not favor biodiversity and is a danger when it comes to fires.
FSC certificate holders	<ul style="list-style-type: none"> - Appreciation by Society <p>Opportunities:</p> <ul style="list-style-type: none"> - A strategic awareness-raising program on this subject should be considered that touches especially on education but also on the media etc. - It's imperative that the Portuguese State set an example in the national forestry areas. - A registration and parceling program must be implemented. - The services provided by the forest must be paid to the owners. <p>Obstacles: reduced land structure makes profitable management impossible (especially if responsible); Services offered by the most biodiverse areas are not paid for and costly to owners (> risk of fire); The most important forests (cork, cork, eucalyptus pulp and paper, and wild pine sawmills) are authentic monopolies and oligopolies that cause the prices of products in productive areas to be bought at insulting prices, ie the margin or the surplus of profits is not enough for owners to worry about the most biodiverse areas. It is even known that many of these areas as e.g. riparian galleries with alders, oaks and willows are often cut at the same time as productive areas eg. of confining eucalyptus, to monetize something else through the wood obtained.</p> <ul style="list-style-type: none"> - Opportunities - Improving forest management in terms of quality and science and capacity building - Obstacles - Difficulties in implementing small area systems - Certification is a good tool for influencing the management of our forest in an attempt to make it more sustainable. However, some exaggerations that may compromise and discredit the process should be avoided. Overly conservative (for conservation) and bureaucratic vision and measures that undermine the financial viability of the forest. If there is hurry and exaggeration in conservation demands the process falls apart. We must not forget that 98% of our forest is private, it is legitimate that its owners also want some financial income from it. There must be balance and patience for owners to maintain interest in the process.) Scientists, NGOs and public institutions should study / justify and publicize the forms of management they consider most appropriate to maintain / enhance biodiversity but without forgetting the owner of this forest and the need to also monetize it. We cannot aim for only the forest owners to pay the conservation bill. - If we want to enforce rules on forest management that enhance biodiversity and ensure ecosystem services that are in everyone's interest then we must all be paying and not just the forest owner. - Economic value
FSC certifying bodies	<ul style="list-style-type: none"> - Opportunities - empower the entities that truly defend biodiversity within the FSC system. - Obstacles - the power of some industrial groups within the FSC system that impedes the true defense of biodiversity, using FSC to consolidate its power in the

	<p>market, and its image and communication, ultimately disrupting and discrediting FSC as a sustainable system, and some good management that is done in the country.</p> <ul style="list-style-type: none"> - The whole idea of certifying and conserving is good, but not viable; The Portuguese forest is almost entirely private, and there must be a monetary incentive for the owners to invest in the environmental aspect. Other than eucalyptus wood, no other product has any added value for being certified. The certified product must have added value, otherwise none of this is feasible.
Other stakeholders (including associations and consultants)	<ul style="list-style-type: none"> - Obstacle: Economic vision in everything - Dimension of properties in Portugal - Warning for the spread of the eucalyptus monoculture that is plaguing our country. - FSC é greenwashing - Fires are one of the major obstacles - Need of less bureaucracy associated to the whole management of the system

Table 3 - Key components of mainstreaming process. Adapted from Huntley and Redford, (2014)

Key components	Description	Examples
Prerequisites	conditions necessary for mainstreaming to happen	good governance, spatial biophysical and socio-economic knowledge, strong institutions
Stimuli	internal and external elements which increase awareness of the need for mainstreaming or offer unexpected opportunities	change in governments, natural disasters
Mechanisms	the actual activities that seek to affect mainstreaming	enabling legislation, strengthened institutions, tax incentives, product certification
Outcomes	the measurable indicators of mainstreaming effectiveness	area of land that is under improved management systems, habitats that are sustainably managed for threatened species, effective incentives through certification resulting in biodiversity gains

Table 4 - Description of analytical framework adapted from (Karlsson-Vinkhuyzen, Kok, Visseren-Hamakers, & Termeer, 2017b)

Governance dimension	Sub-dimension	Description	Method

Institutional structure	Horizontal interactions	These include interactions within and between public-private, hybrid or multi-stakeholder partnerships or among largely independent international sectoral regimes, where there is no institutional hierarchy.	Identifying this type of interactions (positive e.g. partnerships and negative e.g. inter-institutional and policy-conflicts) by understanding how FSC is implemented in forestry sector in Portugal.
	Vertical interactions	This sub-dimension encompasses interactions across multiple levels, including, but also beyond hierarchical settings.	Identifying mismatches of biodiversity integration between the levels (FSC hierarchy), where the actors have authority and capacity to form partnerships.
	Norms and policies	The norms in this case are referred as standards for appropriate behavior, while policy could be referred as a course of action or a plan.	Identifying the policies and norms developed by both public and private actors; analyzing the compliance of FSC national standards with biodiversity strategy and indicators used in national legal documentation.
Motivation structure	Interests	As the actors' interests are an important driver of their behavior, it is essential to identify the motivations of the main FSC actors.	Identifying local (FSC) actors who have linked interests and whose interests are linked to the environmental issue (in this case biodiversity).
	Values	Here, the values are confined to the things that are essentially good by the FSC actors.	Identification of utilitarianism, expanded values and eco-centrism among the FSC actors in regard to biodiversity in Portugal.
	Framing	Framing in this case is perceived as a "process by which issues, decisions or events acquire different meanings from various perspectives".	Identification of the relevant frames for biodiversity in forestry context relevant for FSC actors in Portugal (e.g. is there any fusion or connection between these, interaction between experts and other actors contributing to uniformity

			of the biodiversity framework). >>> the way biodiversity is framed in FSC, in national forestry policy and in national bd policy
	"Leadership"	In this study, leadership is perceived as ability "to initiate the kind of change mainstreaming needs". It implies a range of capabilities and involves different functions.	Identifying the ability and motivation of local FSC actors to perform functions supporting innovations required for mainstreaming biodiversity in FSC. Capability to collaborate for a common goal (BD MS), ability to share responsibility among all participants etc.
Distribution of means, structures, interdependencies and range of alternatives	Knowledge	In this study, both scientific and experience knowledge of biodiversity conservation is considered relevant for the purpose of BD mainstreaming in FSC.	Identifying the knowledge of the local FSC actors in regard to biodiversity conservation, particularly their activities contributing to BD conservation or loss, as well as their knowledge of necessary action such as collaboration or innovation.
	Time	In this case, the timeframe is an aspect referring to time-horizon of the major FSC actors in the forestry sector and the time dynamics around the FSC certification process.	Identifying the time-horizon of national FSC standard development and relevant biodiversity developments in national politics. Identifying the presence of individuals in key positions fostering necessary horizontal collaborations.

	Financial resources	Financial resources present the available monetary sources which are crucial in influencing incentives and possibilities for action.	Identifying the sectoral (forestry) mobilization (sectoral resource mobilization) with the help of FSC implementation. Identifying the sources of funding for FSC and biodiversity conservation via FSC. Identifying also the dedicated support to BD under a distinguished budgetary heading.
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Table 5 - Examples of biodiversity relevant indicators and their contribution to conservation. Adapted from FSC Standard Portugal, 2018

Principle	Indicator	Contribution of the indicator to biodiversity
PRINCIPLE 5: BENEFITS FROM THE FOREST	<p>5.1.3 When the organization makes FSC-related promotional claims regarding the maintenance and/or enhancement of ecosystem services, Annex C is followed in relation to additional requirements²⁶</p> <p>5.2.1 Timber harvesting levels are based on an analysis of the best information currently available on growth and yield, an inventory of the forest, mortality rates, and the maintenance of ecosystem functions. In Portugal, some forest products (e.g. pine cones, forest fruit (<i>Arbutus unedo</i>, etc.) might be commercialized based on estimated yield/quantities.</p> <p>5.3.1 Costs related to the prevention, mitigation, or compensation of negative social and environment impacts of management activities are quantified and documented in the management plan.</p>	<ul style="list-style-type: none"> - More detailed information on forest services if FSC ecosystems services procedure is applied - the harvesting levels are chosen carefully considering various factors, including maintenance of ecosystem functions. - Multifunctionality of forest services is considered - demonstration of costs associated to measures contributing to conservation
PRINCIPLE 6: ENVIRONMENTAL VALUES AND IMPACTS	6.1.2 Assessments of environmental values are carried out at a level of detail and frequency such that:	Identification of baseline biodiversity and impacts on it. It concerns primarily ordinary biodiversity.

²⁶ Is not applied in Portugal for the moment

	<p>1) impacts of management activities on the identified environmental values can be assessed as per Criterion 6.2;</p> <p>2) the conservation measures required to protect these values can be identified as per Criterion 6.3; and,</p> <p>3) monitoring of impacts or environmental changes can be conducted as per Principle 8.</p> <p>6.2.1 An environmental impact assessment identifies potential present and future impacts of management activities on environmental values, from the stand level to the landscape level.</p> <p>6.6.2 Management activities maintain, enhance, or restore habitat features associated with native ecosystems, to support the diversity of naturally occurring species and their genetic diversity.</p> <p>6.5.4 The size of representative sample areas and/or restoration areas is proportionate to the conservation status and value of the ecosystems at landscape level, the size of the management unit and the intensity of forest management.</p> <p>6.6.1 Management activities maintain the plant communities and habitat features found within native ecosystems where the management unit is located.</p> <p>6.8.1 A varying mosaic of species, sizes, ages, spatial scales, and regeneration cycles is maintained that is appropriate to the landscape.</p>	<ul style="list-style-type: none"> - detail and frequency of assessment must be appropriate (impacts, conservation measures, monitoring) - all relevant scales are considered - contribution of management activities at different levels of BD: genes, species, habitats, ecosystems, landscape - appropriate sample areas for restoration and conservation - heterogeneity of the elements with their specification - habitat features that should be considered include: diversity, composition and structure; maintenance of old or dead trees, standing or fallen; riparian zones, clearings, rotation, and connectivity.
<p>PRINCIPLE 7: MANAGEMENT PLANNING</p>	<p>7.1.2 Specific, operational management objectives that address the requirements of this standard</p> <p>7.2.1 The management plan includes management actions, procedures, strategies, and measures to achieve the management objectives.</p> <p>7.3.1. Verifiable targets and the frequency with which they are assessed are established for monitoring progress towards each management objective and used as the basis for monitoring in Principle 8.</p>	<p>Principle promoting adaptive management. Obligation to implement established management plan and obligation to keep it up to date based on monitoring information.</p> <ul style="list-style-type: none"> - operational objectives are defined and must be proportionate to scale, intensity and risk of its management activities, set policies (visions and values)

	<p>Guidance note: Examples of verifiable targets to be established include:</p> <ul style="list-style-type: none"> - site productivity, yield of all products harvested; - growth rates, regeneration and condition of the vegetation; - composition and observed changes in the flora and fauna; ... <p>7.5.1 A summary of the management plan in a format comprehensible to stakeholders, including maps but excluding confidential information, is made available to stakeholders at no cost.</p> <p>7.5.2 Relevant components of the management plan, excluding confidential information, are available to affected stakeholders²⁷ on request at the actual costs of reproduction and handling.</p>	<p>and objectives for management</p> <ul style="list-style-type: none"> - the ways the management objectives are achieved are included - transparency of the certification process is a mandatory condition -
<p>PRINCIPLE 8: MONITORING AND ASSESSMENT</p>	<p>8.1.1 The organization document and implements a monitoring plan.</p> <p>8.2.1 Monitoring is sufficient to characterize the environmental impacts of management activities, including: ...vii. The impacts (when assessed as significant) of infrastructural development, transport activities, and silviculture on rare and threatened species, habitats, ecosystems, and landscape values in relation to water and soil (Criterion 10.10)</p> <p>8.3.1 Adaptive management procedures are implemented so that monitoring results feed into periodic updates to the management plan. 8.4.1 A summary of the monitoring results, including those listed in criteria 8.1 and 8.2, is made publicly available at no cost in a format comprehensible to stakeholders, including maps and excluding confidential information. Guidance note: The entire results of any monitoring can be</p>	<p>Implementation of policies and management objectives; achievement of verifiable targets; deviations from planned FM activities; changes to the conditions of the MU, with and without interventions; the types of impacts are specified; mandatory Monitoring Plan</p> <ul style="list-style-type: none"> - adaptive management is explicit and mandatory; the definition is provided by FSC: Adaptive management - A systematic process of continually improving management policies and practices by learning from the outcomes of existing measures. - transparency of monitoring process

²⁷ Affected stakeholder - Any person, group of persons or entity that is or is likely to be subject to the effects of the activities of a Management Unit. Examples include but are not restricted to (for example in the case of downstream landowners), persons, groups of persons or entities located in the neighbourhood of the Management Unit. (Based on FSC 2011). The following are examples of affected stakeholders: local communities; indigenous peoples; workers; forest dwellers; neighbours.

	provided if this reduces the administration burden.	
PRINCIPLE 9: HIGH CONSERVATION VALUES	<p>9.1.1 An assessment is completed using the best available information, including:</p> <ul style="list-style-type: none"> - the location and status of high conservation value categories 1–6, as defined in Criterion 9.1; and - the high conservation value areas they rely upon, and their condition. <p>9.4.1 A programme of periodic monitoring assesses:</p> <ol style="list-style-type: none"> 1) Implementation of strategies; 2) The status of high conservation values, including the high conservation value areas on which they depend; and 3) The effectiveness of management strategies and actions for the protection of high conservation values to ensure that they are fully maintained and/or enhanced. 	<p>Indicators concern threatened, endangered or protected species and habitats.</p> <ul style="list-style-type: none"> - the types of sources for this information are specified (surveys, databases and maps; consultation with relevant local and regional experts; review of the results by knowledgeable expert(s) independent of the organization) - the object of monitoring is specified - the effectiveness of applied FM is assessed
PRINCIPLE 10: IMPLEMENTATION OF MANAGEMENT ACTIVITIES	<p>10.5.1 Genetically modified organisms are not used.</p> <p>10.10.6 Forest workers are aware of the significant impacts of their activities, and the way these can be prevented or mitigated.</p> <p>10.11.3 Sufficient amounts of dead and decaying biomass and forest structure are retained to conserve environmental values.</p>	<ul style="list-style-type: none"> - relevant structural elements identified and must be guaranteed - “naturalness” of management techniques - knowledge of impacts and necessary measures

Table 6 - Table representing answers on Q7 and Q19 for Forest owners and FSC certificate holders

Forest owners		Certificate holders	
Answers on Q7		Answers on Q19	
Ecocentric	Ecological	Ecocentric	Ecological
More anthropocentric	Financial	More anthropocentric	Financial
More ecocentric	Moral	More anthropocentric	Financial
Ecocentric/anthropocentric	Ecological	Ecocentric/anthropocentric	Financial
Ecocentric/anthropocentric	Financial	More ecocentric	Moral
Ecocentric/anthropocentric	Moral	More ecocentric	Ecological
Ecocentric/anthropocentric	None	More anthropocentric	Moral
Ecocentric/anthropocentric	Ecological	More anthropocentric	Ecological
More anthropocentric	Ecological	More anthropocentric	Financial

Figure 1 - Map of Portuguese Districts and Map of Portugal central area and Madeira/Azores Islands (source: Google maps).

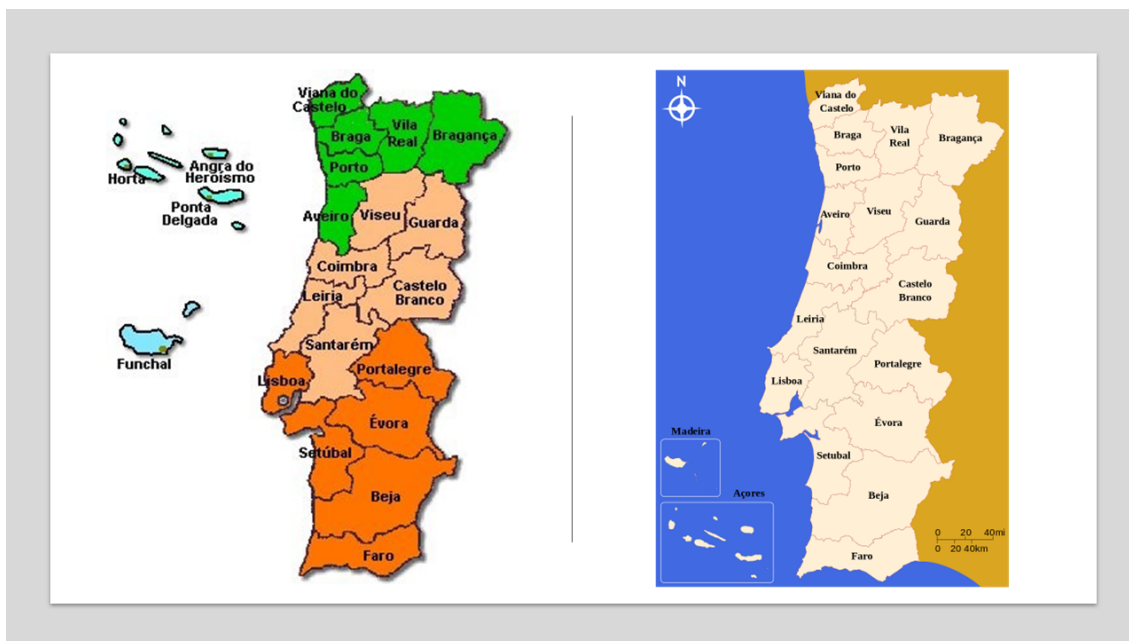


Figure 2 - Why it is important to preserve biological diversity?

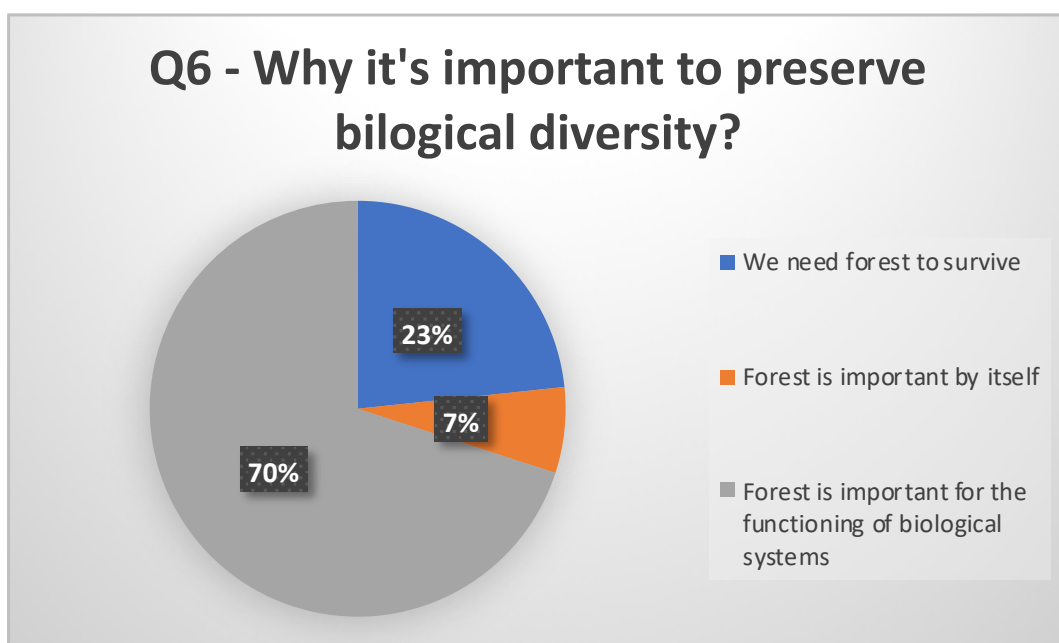


Figure 3 - Values associated to biodiversity and its components

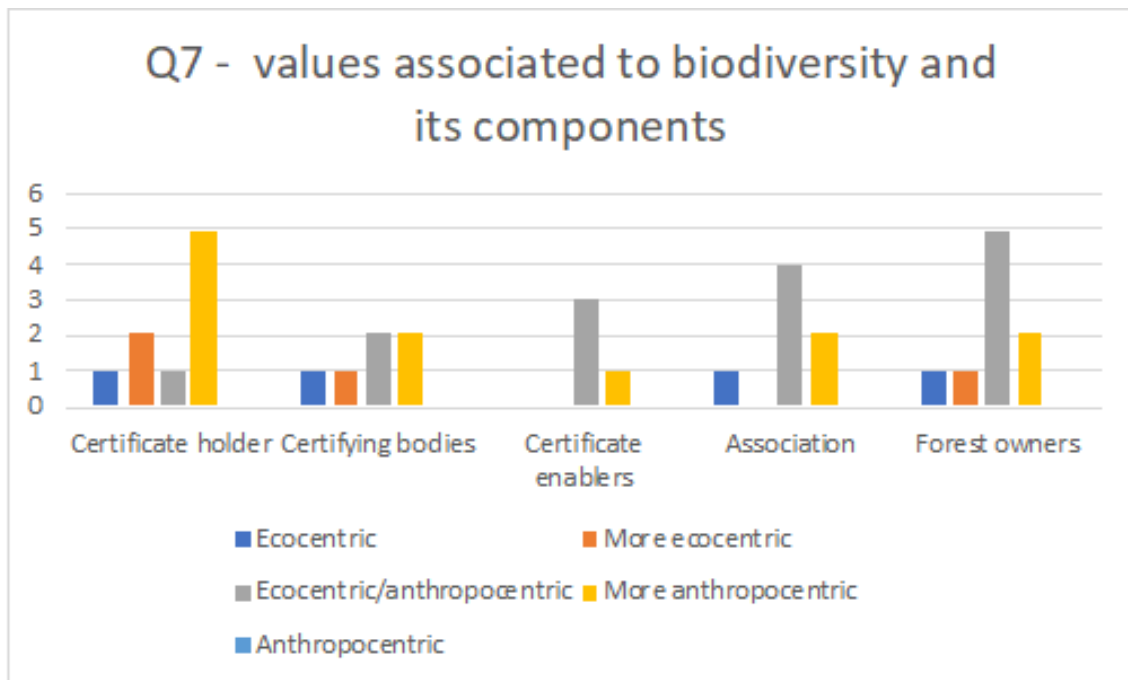


Figure 4 - Do you think FSC contributes to more sustainable use of forest resources?

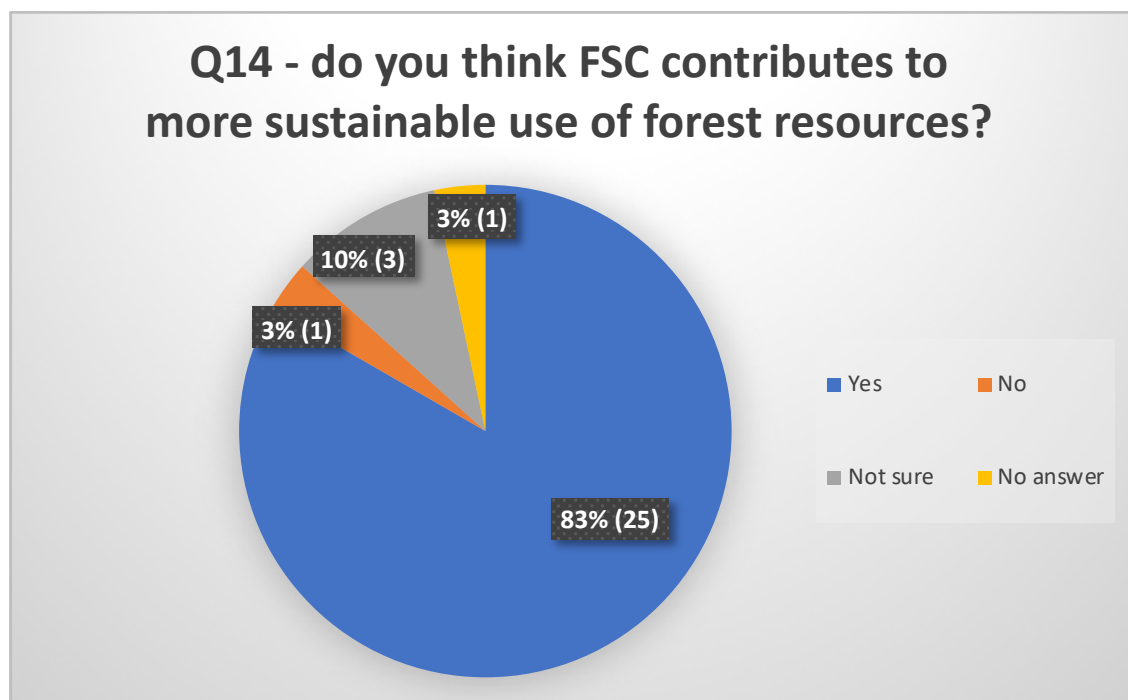


Figure 5 - Percentage of world's biodiversity sheltered by forest

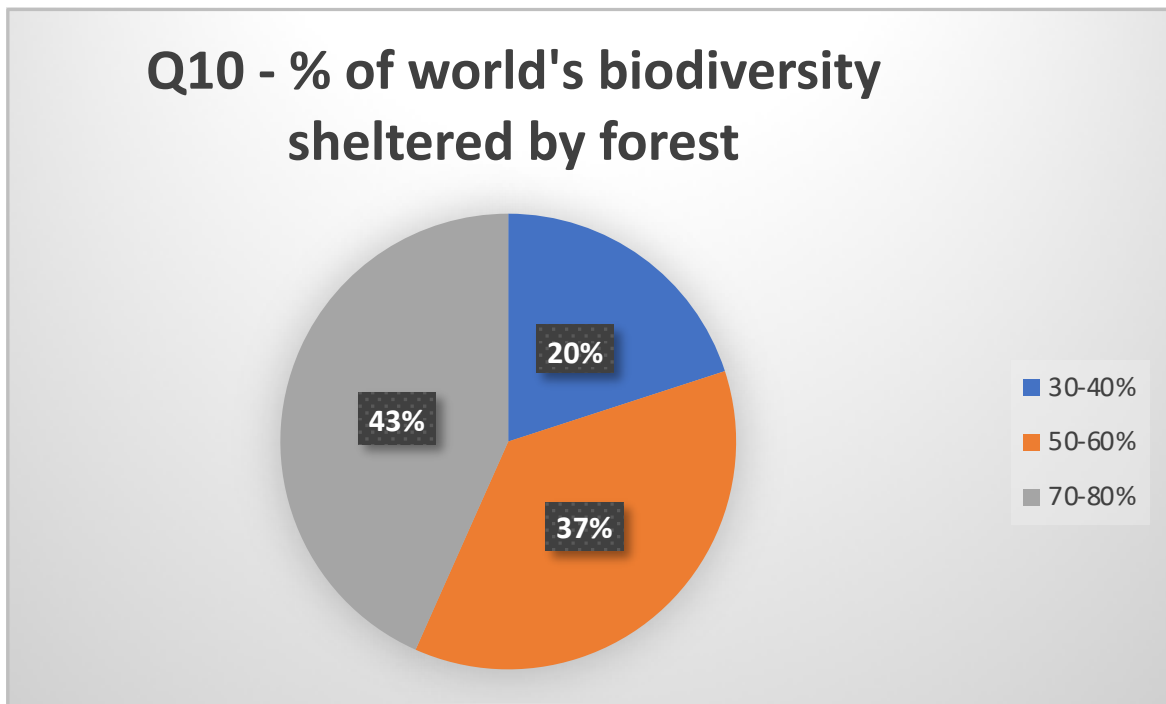


Figure 6 - Percentage of world's biodiversity sheltered by forest per group of Stakeholder

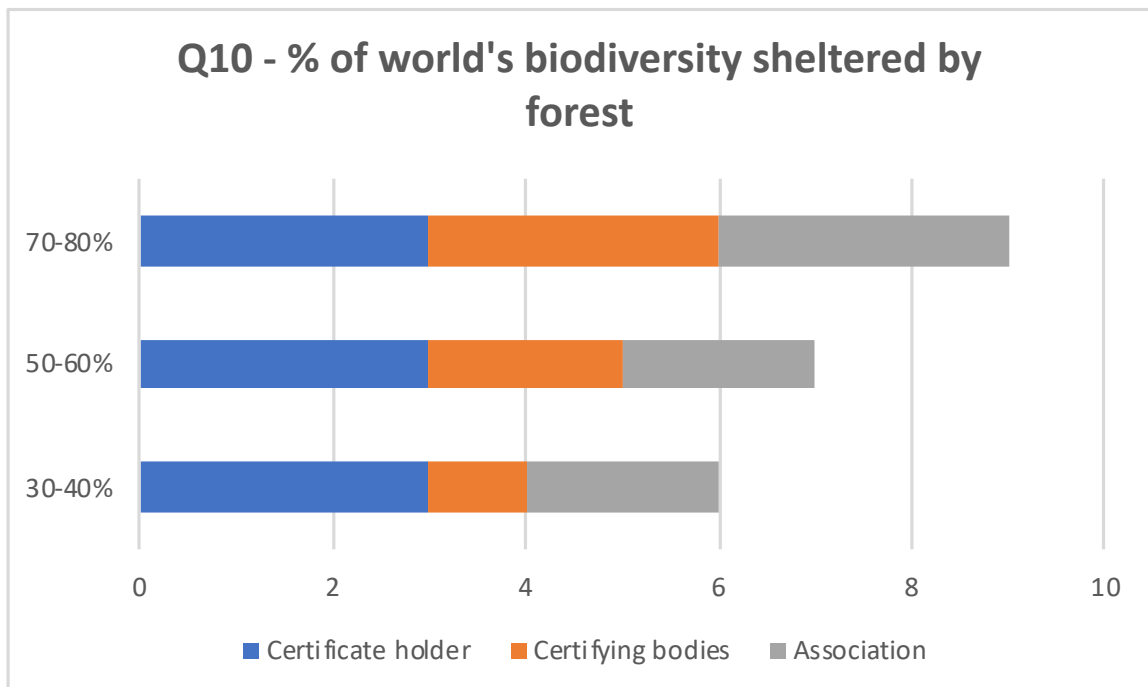


Figure 7 - Which of these are the benefits of biodiversity conservation for forest?

