# Deliverable 4.1 –
# Report on actors driving forest management in selected European countries

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# Contents





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# List of Tables and Figures





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# Abbreviations used

AFVS - Vale do Sousa Forest Owners' Association
CAB- Country Administrative Board
CSA – Case Study Area
DGSF – Directorate General of State Forests
ENF - National Forest Strategy
ENGO – Environmental Non-Governmental Organization
ES – Ecosystem Service
EU – European Union
FMM- Forest Management Model
FOA - Forest Owners Association
FPM – Freshwater Pearl Mussel
FSC – Forest Stewardship Council
GS- The Swedish union of forestry, wood and graphical workers
GTF - Municipal Forest Technical Offices
ICNF - Institute for the Nature Conservation and Forests
JSC – Joint Stock Company
LRF Skogsägarna - Federation of Farmers Forestry Division
MSG – Management Support Group
NHA – Natural Heritage Area
NFI – National Forest Inventory
NGO – Non-Governmental Organisation
NP – National Park
PA – Project Administrator
PEIF - Specific Plans for Forest Intervention
PGF - Forest Management Plan
PMDFCI - Municipal Plans for Forest Fire Protection
PNDFCI - National Plan for Forest Fire Protection
PROF - Forest Management Regional Plan
PC – Project Coordinator
RP – Regional Park
SAC - Special Area of Conservation
SC – Scientific Coordinator
SC – State Company
SC – Stock Company
SEPA- Swedish Environmental Protection Agency
SFA- Swedish Forest Agency
SFE – State Forest Enterprise
SFM – Sustainable Forest Management
SPA – Special Protection Area
SR – Slovak Republic
SSNC- The Swedish Society for Nature Conservation
WFP - Wild Forest Products
WP – Work Package
WPLs – Work Package Leader(s)
WWF- World Wide Fond
ZIF – Forest Intervention Zone



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# Summary

This report presents the results of the actor analysis in ALTERFOR. Actors were characterized in terms of interests and power resources to act in forest management. Interests are understood in this report as being "based on action orientation, adhered to by individuals or groups, and they designate the benefits the individual or group can receive from a certain object, such as a forest" (Krott 2005). The assessment of interests is based the actor's forest use and advocated positions up to present. In the context of this study, power is defined as "capability of an actor to influence other actors" (Krott et al. 2014). Based on the actor-centered power approach (Krott et al. 2014) the assessment of power is based on the ability of actors to apply the mechanisms coercion, incentives, and dominant information. The report is based on empirical data from Germany, Ireland, Italy, Lithuania, the Netherlands, Portugal, Slovakia, Sweden, and Turkey. These countries were selected to represent different bio-geographical and socio-economic backgrounds in Europe. This report is based on a triangulation of qualitative data (qualitative interviews, participatory observations, document analysis) in all ten cases. The data for each case has been compiled by researchers working in the corresponding countries and knowledge of the local language and local circumstances. In all countries, except the Netherlands, a CSA has been defined to analyze the applied forest management practices and the power relations between actors at a regional level. The researchers of UGOE trained field researchers from other countries' project partners in the method of actor analysis during a joint seminar in Göttingen, Germany from the 26th -30th of September 2016 to ensure that same standards were applied within all case studies for the actor analysis (→ ALTERFOR Milestone 16). In the following, the findings of the actor analysis are summarized shortly.

In **Germany**, there is a broad agreement in forest politics that the dominating concept of multi-functional, integrative forestry (timber production, nature conservation, and recreation at the same area) would be most reasonable for the conditions within Germany. Furthermore, almost all actors preferred mixed forests (coniferous and deciduous trees) with mixed age structure, managed by selective thinning to fulfill the different ecosystem services of forests and to have resilient forests. However, conflicts between different actors exist based on varying priorities between different forest ecosystem services and about how to exactly implement multi-functional forestry. Most important current conflicts about silvicultural management of forests in Germany are: if set-asides of forest shares without any management are reasonable, if non-indigenous tree species should be planted, densities of wild game, amount of deadwoods shares, and the share of coniferous trees in forests. The actor landscape within forest politics in Germany became more diverse in recent years. Traditional forestry actors still play the most important role in forest politics. Due to their close relations to agricultural ministries and forestry administrations, forestry is in a powerful position to influence forest policy. Furthermore, due to the direct access and decision-making authority over forests based on ownership, traditional forestry actors can be considered key actors for forest management. However, due to changes in nature conservation legislations, nature conservation authorities and nature conservation lobby groups became increasingly important in forest politics and have substantial influence on forest management. Actors from timber industries impact forest management by increasingly lobby in favor of higher shares of coniferous trees and influence forest management by market forces. Actors representing hunting can be also considered as indirectly influential because of the importance of wild game densities for forest management. Furthermore, actors from the renewable energy sector became increasingly important for forest management because of the construction of



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wind turbines within forests and the increased demand for timber due to energetic use. Actors representing employment in forests have very little influence on forest policy processes. Actors with recreational interests are almost meaningless for forest policies at the national level.

Within the **case study Bavaria (West Augsburg)** the general conflicts about silvicultural concepts within German forest politics are also relevant. The case study area has a high share of Spruce (*Picea abies*), thus bark beetle infestations constitute a major problem. It is intensively discussed how forests can be adapted to expected changes in climatic conditions and how alternative silvicultural concepts with reduced share of Spruce (*Picea abies*) could be implemented. Several local state-actors from forestry and actors from nature conservation preferred increasing the share of White fir (*Abies alba*) and Beech (*Fagus sylvatica*) to increase the resilience of forest and to improve the value of forests as habitats. However, most small-scale forest owner in the case study area are currently not willing to reduce the share of Spruce because of its financial return. Douglas fir (*Pseudotsuga menziesii*) is preferred by several forestry actors as alternative to Spruce but nature conservationists disagree to plant non-native species. The reduction of coniferous trees would require reduction of wild game densities which is in conflict with the interests of local hunters. The case study area has very good growing conditions and wood provision is considered as most important forest function by private and public forest owners. Several companies from timber industries are located in the area and demand mainly coniferous wood. The local population has a high demand for wood (beech) for domestic heating purposes. The case study area is important for the provision of drinking water, thus the impacts on water quality and water quantity of silvicultural concepts need to be considered. Furthermore, the CSA is intensively used for recreational purposes because of the relatively high population density in the area. Recreational users (e.g. fishing, hiking, biking, mushroom and berry picking) sometimes feel disturbed by intensive harvesting measures. Furthermore, large parts of the local population expect from the state forest service to apply silvicultural concepts that produce nice sceneries and diverse landscapes and do not interfere with recreation. Landscape protection is an important issue in the CSA. Some local actors suggest to increase the share of traditional forest use concepts (e.g. pastoral forest, coppice) to contribute to conservation of the cultural value of these traditional concepts. Actors from forestry are powerful actors in Bavaria in general and within the case study area. Large-scale forest owners and the lobby groups of forestry and agriculture have close relations to the Bavarian government. Furthermore, due to their private property rights on forests, public and private forest owner are key actors for forest management. Actors from nature and environmental conservation are increasingly powerful in Bavarian forest politics but less influential than in other parts of Germany. Hunters have a strong lobby in Bavaria and impact forest management directly by their hunting strategies and the resulting amount of wild game. Due to the importance of water provision in the CSA water associations have influence of forest management practices. Recreational interests are supported by the "Nature park association" which is influential at the local level and recreationalists enforce their interests directly by accessing and using forests. Actors from timber industries have strong influence of forest management strategies by setting market incentives for coniferous trees, specifically Spruce. The identified actor landscape and the interests of actors are widely typical for rural German forests in the vicinity of larger cities with high population densities.

The **case study Brandenburg (Lieberose/Schlaupetal)** offers socio-economic conditions typical for remote areas within Germany in need of economic development. The case study area is dominated



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by Pine (*Pinus sylvestris*), managed by selective thinning with highly mechanized harvesting technology. A former military site within the case study has a high value for biodiversity and many rare species occur in the area. A share of the area of the former military site is taken out of management to allow natural forest ecosystem development. In terms of bio-geophysical conditions the case study areas consists of two parts: the Lieberose area with very poor growing conditions and the Schlaupetal which offers site conditions suitable for several tree species and management strategies. Due to the climatic site conditions the adaptation to climate change is seen as more urgent than in other parts of Germany. Droughts became more common in recent years. The danger of forest fires, how to organize fire monitoring, and how larger fire outbreaks can be avoided constitutes a major challenge. Due to increasing long periods without rain in spring, forests are under stress and the tree growth is negatively impacted. In the last years, the case study area experienced major insect calamities. The Pine-tree lappet (*Dendrolimus pini*) is one of the major pest problems, other insects cause problems as well. Due to the high share of Pine the resilience against insects' outbreaks is low. The forest management in Brandenburg suffers from very high wild game densities, causing severe browsing damages. There is ongoing discussion in Brandenburg how to legally regulate hunting best to reduce the wild game. The transition towards forests with higher shares of deciduous trees is limited due to high browsing damages. Two major preferences for forest management by actors exist in the case study: On the one hand a preference for very extensive forest management with focus on cultural and ecologic ecosystem services. At the other hand a preference for forest management focused on the provision of timber. Powerful actors in the case study Brandenburg are the state-owned forest enterprise, nature conservation authorities, the Brandenburg Wilderness Foundation, Birdlife Brandenburg, large-scale forest owners, e.g. the monastery foundation Neuzelle, sawmills, and actors form the touristic sector.

Historically, most of **Ireland** was under forest cover, but due to anthropogenic influences this fluctuated and reduced to less than 1% in the early 1900s (Forest Service 2008). To establish a viable forest industry in Ireland, the government started a large afforestation project, utilising fast-growing exotic softwoods Sitka spruce (*Picea sitchensis* (Bong.) Carr.) and lodgepole pine (*Pinus contorta* Douglas). The main purposes of these forests were to produce timber and create jobs in rural areas with high unemployment. Since the early 1980s, government afforestation has ceased and focus has shifted to encouraging private landowners to afforest their agricultural land in exchange for economic incentives (Forest Service 2015c). In 2012, the forest cover had increased to 10.5% (Forest Service 2013) and the ambition is to bring the forest cover to 17% by 2030 (Forest Service 2000). Around the turn of the last millennia, social and environmental forest values gained more recognition and legislative protection by the implementation of Sustainable Forest Management (SFM) and EU Habitats and Birds Directives (DAFF 1996, Forest Service 2015b). Many of the land-use conflicts in Irish forestry relate to stakeholders having different opinions on how the three pillars of SFM (economic, social and environmental) should be balanced. The main conflicts are between using forests for timber production and using forests for enhancing and protecting habitats and biodiversity. A lot of biodiversity conflicts focus on how forestry operations impact water quality and freshwater pearl mussel (FPM) habitats and one of the FPM populations that is deemed to have the best chance of surviving in the future is present in the case study area (CSA). There are social conflicts around farmer's unwillingness to avail of afforestation grants, even if it is financially more beneficial, since they think it threatens and diminishes their culture and heritage as farmers. Many actors from government and civil society have expressed that they were not against forestry but didn't like the fact that extensive



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areas of blanket peat had been planted and that the two most common species in Irish forestry were non-native. Actors from government are the most powerful since they are implementing legislation and thus have a strong coercion backing. The strongest actor, the Forest service, approve all afforestation grants, felling licenses and fertilisation applications and thus derive a lot of their power from this. The Forest service pay out afforestation grants and road construction grants, this alongside government actors that work to protect the environment give them a strong incentive power. The Forest service is responsible for the national forest inventory and other government actors record species and habitat status, and keep records of protected features (natural and cultural) which makes them very strong in providing dominant information. Market actors are almost as powerful as government actors but must abide by the law and require approval from the Forest Service in order to get afforestation grants and felling licenses. Over half the forest estate is owned by Coillte (the Irish State forest company), the rest is privately owned, thus land ownership and control of the timber resource is the main source of coercion power for market actors. There are private forest companies that offer forest management services and advice to private forest owners, resulting in substantial incentives and a lot of dominant information. Some market actors (other than Coillte, forest management companies, wood processing industries and private forest owners) are lobby organisations that influence politicians and advocate their interests (Irish Farmers Association, Irish Forestry and Forest Products Association, Irish Timber Grower's Association, Wood Marketing Federation, Irish Timber Council). Civil society actors are relatively weak, but many of them are interested in protecting the environment so their interest coincide with many government actors. Their desire to enhance and protect species, the natural environment, and Irish cultural heritage is their main incentive since it appeals to morals. Many civil society actors tend to engage large parts of the population, resulting in large networks that can identify and report on issues related to habitat degradation due to forestry operations. They also provide knowledge about species protection, biodiversity and how to enhance the environment. Their engagement with the public can make them very influential in rallying the population around causes when they believe that too drastic policy changes are being made.

**Italy** has experienced a radical change in forest cover that doubled in the last 50 years, in the social demands for forest products and services and in the structure of the wood-working industry, but its institutional organizations, mode of forest governance and the political- legal frameworks have only changed slightly. The objectives and contents of Italian forest policy have slowly evolved over time, but most of the Italian formal institutions connected with the forest sector, at all levels, have been unable to reform and adapt themselves to the new challenges posed by the changing environmental, social, economic and political scenarios. Although the concept of multifunctional forestry is quite traditional and well established in Italian forestry, the momentum recently gained by ecosystem services is creating conflicts between different actors based on varying priorities between different forest ecosystem services and how to exactly implement multi-functional forestry. This is emphasized by traditional conflicts between State (i.e. central) and Regional Authorities, poor vertical and horizontal integration in forest policies and responsibilities, and the more recent conflicts between non-traditional (e.g. environmentalists) and traditional actors. Recent budget cuts and institutional rearrangements due to the spending review have also contributed to exacerbating conflicts.

The conflicts and the main problematic issues discussed include:

- proactive forest management vs. abandonment of marginal areas (e.g. in mountainous areas),



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- forest ownership fragmentation and consequent limitations (abandonment, lack of profitability…) and needs to favor networking/association of smallholders,
- increasing gap between the primary sector (forests and forest management) and the industrial sector (wood and paper),
- industrial vs. energy use of wood,
- the role and valorization of non wood forest products and services often with a public-good nature (natural capital accounting and mechanisms for establishing payments for ecosystem services),
- non-traditional (civil society and private sector) vs. traditional public actors and ways to facilitate dialogue and cooperation among them (e.g. innovative private-public partnerships),
- visibility of the forest sector and knowledge/perception by the general public.

Traditional (public) forestry actors still maintain a central/strong role and a powerful position to influence forest policy. Government authorities at both national and meso-levels are still the most powerful actors in forest management and stakeholders. The State Forest Service (CFS) -though recently reformed and merged with a military police corps- is probably the most well-known entity in the forest sector by the general public. Although some exceptions exist, the role and influence of other actors, including non-public ones, at the national level are much more limited and can mostly be perceived at a lower scale (sub-regional, local). Even when non-public actors might have enough power to influence forest policies, they often have no strong interest in doing so. This is the case for example of the main wood and paper companies that largely depend on wood imports. One of the most dynamic segments within the forest sector is the one related to bioenergy, although conflicts exist both within the segment itself (e.g. medium-small scale plants vs. big plants, heating/combined heating and power generation vs. power generation, etc.) and with other actors/segments (e.g. industrial vs. energy use of wood). Private forest owners are almost voiceless because there are not national wide associations of forest owners, moreover Italy has no representative in either of the two most important associations of private forest owners in Europe. Public forest owners are loosing power (due, among other issues, to budget cuts) and they lack adequate representativeness and coordination at both national and international level. Forest enterprises suffer similar conditions, although a new organization to give them a common representation at national scale has been recently created and is gaining visibility. Environmental NGOs are quite active but have a marginal role in forest policy and forest management at the national scale. Finally organizations dealing with products different from wood are gaining relevance but still they are more active at sub-national (and sometimes very local) level. This is the case for example of wild forest products production and trade, as well as for organizations dealing with services delivered by forests (e.g. carbon sequestration, tourism and recreation, mountain therapy, etc.). Although a growing number of initiatives are emerging, in most of cases they are still at a preliminary stage and poorly coordinated. Best practices and models exist, but they often remain isolated and with limited capacity to influence policy and decision-making.

The **case study area -in the North East of Veneto Region**, Northern Italy- represents an interesting example of living "laboratory" for this new issues and initiatives and for testing innovative forest management solutions. It consists of lowland forests close to urban areas (north of Venice), with no prevalent productive function but with huge potentialities in terms of other functions and services:



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wild forest products production (mostly truffles and pine seeds), biodiversity conservation, carbon sequestration and, above all, cultural services (tourism and recreation). The area is visited every summer by about 3 millions of tourists and, starting from 35 years ago, has been subject to a large afforestation program. Forests are owned by local Municipalities, while management activities are carried out through various forms: direct management by Municipalities, management agreement with private companies or not-for profit entities, rent to private, etc. Forest owners and managers are supported by the Lowland Forest Association (*Associazione Forestale di Pianura*, AFP), a unique case of private-public cooperation in lowland forest management in Italy. AFP has been established to help active forest management in the area, encourage positive impacts for locals and enhance the dialogue with multiple stakeholders. The area has recently been FSC certified, being the first case in Veneto, where PEFC certification is traditionally supported by Regional Public Forest Authorities. Management operations are not just financed through Municipal budget, but also through funds raised by the Lowland Forest Association via other sources, such as the Rural Development Program and private investors that are increasingly interested in investing in forest projects to offset their carbon emissions, mitigate their environmental impacts, improve their image, etc. Ongoing and planned investments aim to increase the capacity of the forests to deliver ecosystem services, including cultural ones: all these services are taken into account into the newly developed and approved forest management plan for the area. Innovative management solutions however have to face traditional and/or emerging actors. These include both public actors (Regional Authorities, Forest Service) and private ones. Although management remains challenging, new models and arrangements are being developed. This includes for example the appointment of a representative of local environmentalist into the Board of the Association and the recent agreement with the local Hunting Association for the management of a forest area and the prevention of poaching activities. Hotel managers and the tourism industry are also being involved as the managed area increases. Due to proximity to urban areas and the large number of visitors, as well as to the specific ecological (and socio-economic) features of local forest resources (forest remnants, new plantations, periurban parks, etc.) management operations are not standardised and are mostly oriented to facilitate the evolution towards more natural and stable forest ecosystems. This also leaves managers the opportunity to decide future operations based on the progress of development processes and to decide the type and intensity of management operations according to specific conditions. From a purely technical point of view there is not a fixed management model to replicate and much is left to case-by-case decisions made by the forest manager(s) within the framework of a broader strategy set-up through the management plan, and based on coordination with relevant stakeholders. In the short to medium term, selective systems appear as the only viable forest management solutions. Nonetheless it is worthwhile underlining that new agreements and arrangements (both formal and informal) and networking/cooperation among different actors are part of these new management models and likely represent the most relevant and challenging component of future decision making for the management and development of the area.

Current **Lithuanian** forestry can be described as a struggle between the traditional silvicultural focus on maximizing sustainable timber production and increasing attention on environmental and social values. After the restoration of independence and turning towards market economy, timber was considered one of the few domestically available raw materials. This, also the modernization of forestry technologies, the liberalization of international trade and privatization, including forestland restitution to pre-war landowners and their heirs doubled the forest harvesting. Simultaneously, the



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acceptance of international environmental standards, joining the EU led to "greening" of society together with introducing or increasing environmental regulations, implemented through segregation management and integrative measures. So, the major forest policy conflicts and problems both at the national and case study area levels are due to struggle between maintaining stern regulation versus increasing the decision freedom for forest owners and managers in practically all forestry aspects.

Forest policy arena is strongly dominated by state forest institutions, including the forest management requirements which are identical to state and private forest owners, disregarding totally different management conditions and owners' needs. Prevailing public opinion on forests and forestry is in principle negative, as the involvement of public in taking forest management decisions is also low. State forest management via 42 state forest enterprises, simultaneously being legally self-subsistent and economically independent entities but fulfilling the requirements to provide conservation, recreational, social services, if far from being efficient and is pending for reforms. Private foresters are predominantly very fragmented, sometimes rather weak, however aiming diverse management objectives, ranging from strongly economic to purely conservational. Timber trade is strongly influenced by third parties and non-transparent round timber auctioning and interests on local timber industries. Implementation of nature protection measures has also introduced some hesitations on the economic and ecologic effectiveness of solutions. Afforestation, especially on abandoned agricultural lands is promoted, however it is reaching the margins. Research and education in forestry is characterised by limited resources and still unbalanced research personnel and institutions.

Development of legal competences and instruments in Lithuanian forestry was relatively stagnant during last years. However, new Government plans to improve legal forestry environment, and the management models of state and private forests, to support timber industries and to solve some environmental problems. Even though the new Government has been in power just for several months, some steps on fulfilling its program are already evident, e.g. the plans for restructuring state forest management and reduce the number of state forest enterprises have already been announced.

At the national scale, the differences between the interests in ecosystem services are clearly seen if governmental and non-governmental actors' groups are compared. The governmental actors are usually interested in diversity of ecosystem services while the non-governmental actors tend to be more concentrated on a specific ecosystem services. The actors interested in timber provision and environmental conservation are most powerful in forest policy processes at the national level, much due to the fact, that they are represented not only by civil society and market actors, but also by the governmental actors. Medium power resources belong to the actors interested in the provision of renewable energy, timber processing, hunting and certification. The weakest in this context are the actors interested in recreation, water provision, and employment in forests. The governmental actors exercise power primarily through coercion due to their executive power. Power of civil society actors is mainly based on unverified information which is spread within lobbying processes, in public relations, contribution to research projects and general participation in the public discourse. Market actors mainly apply some material incentives by regulating timber demands and prices. It should be noted that strong state influence and powerful forest legislation doesn't allocate much power of the non-traditional forest actors.



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Similarly to the national level, the strongest actors at the **case study level** are interested in forest management, recreation and nature conservation. **Telšiai** state forest enterprise is the actor with the biggest power among the actors with the interest in forest management, although it is also strongly controlled by the state authorities. The governmental actors have the strongest power resources in the case study and the market actors have the medium influence – this fits the findings at the national level. Nevertheless, the power of civil society actors at local level is somewhat higher the one at national scale. Actors with interests in wood provision, supporting and cultural ecosystem services have the strongest power resources to impact forest management in the case study. The environmental NGOs in the case study area have less influence, if any, on the forest policy than on the national level.

In **the Netherlands** forest management can be characterized by efforts to achieve a balanced combination of different forest functions, avoid risks and increase forest stability, use natural processes, and limit investments. Forest owners have the right to use, open up and manage their property according their own visions; the government can only commit (private) forest owners to engage in a certain management of their forest and to open up their property for visitors when a forest owner receives financial support from the government (such as the Subsidy scheme for landscape and nature management, and the Estate Act). Forest policy in a classical, sectorial sense does not exist anymore in The Netherlands, the regulatory discourse has now shifted towards 'forest and nature governance'.

In the Netherlands, the multifunctional character of forests and forest management is reflected in a diversity of stakeholders involved in forest management. The key actors in Dutch forest management and nature conservation are the central state, the provinces, the municipalities, the (semi-public and private) organizations that manage nature and forest areas (particularly the Dutch National Forest Service, *Natuurmonumenten* and the *Landschappen*), private owners (incl. the umbrella organisations representing private owners), and the forestry actors (employers and employees; particularly the former *Bosschap*, Union of Forest Associations, and VVNH).

The diversity of stakeholders involved represents a range of interests. The Dutch government focuses strongly on the multiple-use of forests, combining especially wood provision, biodiversity and nature, and recreation. This is reflected in the management by the Dutch National Forest Service, who combines wood provision, with biodiversity and recreation. In comparision, Natuurmonumenten and the Provincial Landscapes focus less on wood provision, and more on the supporting services. Private forest owners focus again more on wood provision, and less on habitats. The eNGOs and the timber industry have a more limited interest; eNGOs focus mainly on the regulating services, and the timber industry on wood provision.

State actors – central government, provinces and municipalities – hold the strongest power resources to regulate and influence the Dutch forest sector. In contrast, both market actors and civil society actors 'only' have medium power in the sector. But jointly, they may outnumber state power (like in the design and choice of specific forest management models or regarding forest certification schemes). State actors particularly use coercion and incentives as power resources, whereas non-state actors particularly use dominant information sources. The following forest ecosystem services are most relevant in the Netherlands: wood and game (provision), biodiversity and habitats (support), water quality (regulation) and recreation and tourism (cultural services).



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In **Portugal**, there is a general consensus among political decision makers about the need to improve forest policy in order to cope with the problems affecting the forest sector, but there are different opinions about the priorities that should be given to the different problems and policy instruments. The general consensus about the need for policy changes is reflected in the unanimity of the decisions made at the National Parliament concerning Forest Policies. Most of the Portuguese forests are primarily intended for provisioning ecosystem services, e.g. roundwood, pulp and paper and other non-wood forest products. Furthermore, actors such as forest owners and timber industries prefer high harvesting intensities, high shares of eucalypt stands and low amounts of shrubs in forest because of wildfire risk. However, conflicts between different actors exist based on varying priorities between different forest ecosystem services and about how to exactly implement multi-functional forestry. Most important current conflicts about management of forests in Portugal are associated with the following issues:

- Landscape integrated management goals vs. small-scale private property rights;
- Central vs. local policy making;
- Role of the public administration vs. role of forest owners' associations;
- Payment of non-market ecosystem services;
- Preventive vs. suppression fire policy measures;
- Use of non-native tree species;
- Use of timber for traditional uses vs. use of timber for bioenergy;
- Plantation vs. other types of forest;
- Outdoor recreation activities vs. property rights;
- Wildfire risk mitigation management vs. close-to-nature management.

The collective action and the representation of actors within the forest sector have been improving in general and within the case study area, but not up to the point of being very influential in the forest policy making process. Due to property rights, private forest owners are key actors for forest management.

Actors from timber industries impact forest management through their role in managing their landbase (owned or rented) and by lobbying in favor of higher shares of eucalypt and cork oak. They further influence forest management by market incentives. Furthermore, actors from the renewable energy sector became increasingly important for forest management because of the increased demand of timber for bioenergy. Actors from nature and environmental conservation non-governmental organizations have some power at national level, mostly through information and moral incentives, but they are less influential in Vale do Sousa, at the local level. Actors representing employment in forests have very little influence on forest policy processes.

Actors with recreational interests are almost meaningless for forest policies at the national level. However, recreational interests are supported by significant nature activities promoted by several



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entities and may thus be influential at the local level; recreationalists enforce their interests directly by accessing and using forests.

The actor landscape within forest politics in **Slovakia** become more diverse since early 1990s. More precisely, the transformation from planned to market economy has been accompanied by many institutional changes. Among others, not only new formal institutions such as legally binding laws or soft instruments are introduced or renewed, but also actor landscape is transformed. In this respect, the main institutional upheaval in forestry is related to the changes in forest ownership structure. Specifically, the forest ownerships rights of non-state forest owners are restored. However, the restitution process is still ongoing due to various reasons. Additionally, new actors such as environmental governmental or non-governmental organizations, privately owned business and various associations are formed. In summary, nowadays forest arena consists not only of forestry related actors but also of actors from outside the forestry network (e.g., nature protection, water, energy from renewable resources, agriculture, and various businesses)

Traditional forestry related actors (governmental and non-governmental) still play the most important role in the forest management. Due to their direct access and decision-making authority over forests based on ownership structure, traditional forestry actors can be considered as key actors for forest management. Actors interested in hunting can be also considered as indirectly influential because of the importance of wild game densities for forest management. Due to changes in formal institutions related to nature protection and conservation, the governmental but especially non-governmental actors become gradually powerful (e.g., media, lobby, public discourse) in respect to forest management. Additionally, actors from timber processing industries impact forest management via increased lobby in favor of higher felling volumes, higher shares of coniferous species, or influence forest management by market forces. In contrast, actors from the renewable energy sector had become increasingly important for forest management because of increased demand for timber due to energetic use.

Generally, the power concerning forest politics at national level is split among actors from and outside forestry arena. Governmental actors mainly interested in forestry and nature have the highest impact on forest politics. From outside the forestry arena, the forest politics is also strongly formally or informally influenced by an agriculture related actors. Furthermore, the governmental actors and even in some cases also (environmental) non-governmental actors are influenced by businesses rather than politics. The power is increasingly being taken by businesses, which either formally (e.g., associations, non-governmental organizations) or informally influence forest politics. Actors at national level interested in forestry and recreation/tourism represented via various associations and organizations have rather low impact on forest politics. For instance, although associations of non-state forest owners try to have effect (e.g., participating in forest policy formulation processes), their negotiation position is weak. In contrast, actors representing nature via various (environmental) non-governmental organizations exercise medium power in forest politics in Slovakia. Actors interested in timber processing, water and production of energy from renewable resources associated in various associations or organizations have also medium impact on forest politics.

At the level of **CSA Podpoľanie** the power of various actors concerning forest politics is relatively low. Thus, the results need be interpreted with caution and power characteristics need to be distinguished between forest politics and forest management.



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In **Sweden** the forest sector has been, and still is, a sector of big economic importance, contributing with 11 % of the export value and being an important source of employment. Forest management is oriented towards producing conifer timber and pulpwood for domestic industrial use. Since the 1950s clear cutting has been the totally dominant FMM.

The current forest policy orientation was established in 1993, after a major revision of the forest act. It stipulates that production goals and environmental goals are equally important and policy implementation is characterised by soft policy tools rather than strict regulation. The policy shift in 1993 implied that the government lost their possibility to enforce production-oriented forest management ideals through coercion. Simultaneously, the stronger emphasis on environmental issues has increased the power resources of governmental actors in nature conservation. In short, the national forest policy is characterised by the balancing act between different forest functions, where wood production and nature conservation are most important. The SFA and CAB are the governmental agencies in charge of implementing these policies. Overall, they have medium power resources.

Market actors interested in wood production constitutes the most dominant interest group at both national and case study level. The current forest policy characterised by the principle "Freedom with responsibility" enable them to utilise their power resources to promote production-oriented ideals upon forest owners in the local setting. The internal composition of this group deviates between different regions. In **Kronoberg County**, the industrialised forest owner organisation Södra constitutes the most important market actor.

Civil society actors can overall be regarded as the weakest actor group. They often lack the power resources to influence forest management in the local setting where forest management is conducted in practice. Instead they are mainly confined to the national level where they try to promote their interests in the policy making process. However, there are large differences between different interest groups. Environmental NGOs are powerful at the national level and have been successful in their efforts to protect areas of high conservation value in the case study area. Most conflicts in the Swedish forest sector are results of wood production interests that collide with other interests.

Hunting has long tradition in the Swedish culture, and is especially popular among private forest owners and professional foresters. However, especially in southern Sweden the high populations of ungulates is problematic for forest management, causing large damages and making forest owners reluctant to reforest with the preferred forage species.

Forest management philosophy in **Turkey** has moved towards the ecosystem based multiple use management concept, accounting for ecological, economic and socio-cultural values in an integrated and sustainable basis since 2008. The necessary regulations for the new approach were also prepared accordingly and are in operational across the country. Almost all actors acknowledged the approach that considers the harmonization of both the conservation and production of ecosystem services. However, conflicts between different actors exist in setting priorities for different forest ecosystem services and about how to exactly implement ecosystem based multiple use forest management concept on the ground.

Most important current conflicts about forest management planning in Turkey are:

1. Stratification of forest lands and/or forest ecosystems to various forest uses



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2. Being conservative in determining the annual allowable cut levels in various forest use areas particularly in timber oriented forest use areas
3. Determining management interventions without any decision making techniques
4. Ultimate power of state, less room for the structured participation of other stakeholders

Most important current conflicts about silvicultural management of forests in Turkey are:

1. Unknown or undefined silvicultural models for each forest use/function area, aside from timber production
2. Continuous cover forest model vs even-aged management vs uneven-aged management
3. Industrial plantations vs natural regeneration
4. Optimal stand structure for each forest value or objective
5. Amount of deadwoods shares
6. Thinning intensities for each forest use areas
7. Modeling the development of various stand types (no growth and yield models exist for understocked stands, empirical yield tables exits for only pure and fully stocked stands)

The actors in Turkey have recently started to pronounce their interests and power in the management of forest landscape. State forest actors still play the dominant/key role in forest policies. As the forests are owned and managed by the state, the state actors are the primary decision making authority with a direct relationship with the ministry of forest and water works. In the meantime, however, nature conservation actors in association with the state nature conservation authority have become increasingly important players in forest policies and have certain influence on forest management over the last couple of decades. Actors from private timber industries have certain impact on forest management by increasing lobby activities in favor of timber oriented forest management by market as well as indirect political forces from the government. Actors representing recreation and hunting have little indirect influence related to the initial forest land allocation to the appropriate forest uses in management planning. Furthermore, actors from the water supply and renewable energy sector became increasingly important for forest management because of the construction of dams for both energy and water supply in forest watersheds and the construction of wind turbines within forests. Actors representing employment (e.g., villagers and cooperatives) in forests have certain influence on forest policy processes as they have certain legislative rights on forestry workforces (e.g., Forest law articles 30 and 31). Actors with the interests of non-wood forest products are currently almost uninfluential in the formulation of forest policies at the national level.

As far as silvicultural management is concerned, the **case study area Gölcük** has very good growing conditions and wood provision is considered as the most important forest value by the private industries and the state forest industries. One big company and few other small wood processing establishments from timber industries are located in the area and demand mainly wood. The big timber company has high demand of wood that the case study area cannot even supply. Thus intensive silvicultural management model is requested from the case study area to provide as much wood as possible, instead of being conservative, a regular policy of state forest industries. The case study area is important for the provision of drinking water, thus the impacts of silvicultural prescriptions/models on water quality and water quantity need to be considered. Furthermore, the area is quite attractive for recreation and aesthetic values with currently operational 30 small sized promenade areas, because of the close proximity to the industrial area and large metropole (e.g., İstanbul,



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Adapazarı and Bursa). Protecting forests from insect, illegal cutting and forest fires is also an important issue (yet not the primary issue) in the case study area. Chestnut and mushroom are two important non wood forest products within the study area and the associated actors have limited influence in the management of forests.

The conflicts within the case study area are almost similar to the condition at national level due mainly to the ownership structure. Actors from forestry sector are not quite powerful in the government and within the case study area due to a little contribution (0,8%) of forest sector to GDP (Anonymous, 2014). It is quite obvious that the public sectors are the key actors for forest management both in the country and the case study area. Actors from nature conservation are increasingly powerful in forest policies. While water provision in the case study area is gradually increasing, the private water companies have currently weak influence of forest management practices. Actors from timber industries have still strong influence of forest management strategies by setting regulations and market conditions. Cooperatives and villagers are the influential local actors in forest management operations due to their legislative rights on the forest workforce, yet have limited influence in forest management design and planning.

## Objective of the deliverable

This deliverable presents which actors are driving forest management in the ten case studies of ALTERFOR. Based on the RIU Model, forest relevant actors and their networks are identified and their actions in the case study areas are analysed. The analysis focuses on actors' interests and power to act in forest management. The interests of the actors will be empirically investigated primarily by assessing forest use up to the present. The basis of power of actors is identified by observing the means of coercion, incentives, and dominant information.



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# Introduction

Europe's forest resources face multiple challenges at the beginning of the 21st century. Amongst other ecosystem services, forests are expected to provide timber and biomass, to contribute to climate change mitigation by sequestering carbon within stands, maintain biodiversity, supply habitats for multiple species, and to allow outdoor recreation and tourism.

Ecosystem services are defined as benefits people obtain from ecosystems (MEA 2005). Not all forest ecosystem services can be generated unlimited without impacting the generation of other ecosystem services. Trade-offs exist between some ecosystem services (Bennet et al. 2009; Kandziora et al. 2013; Wang and Fu 2013). For example, an increase of timber provision is often associated with negative impacts on carbon sequestration within forest ecosystems (Fares et al. 2015). Forest management practices impact the generated basket of ecosystem services by forests; the provision of some ecosystem services is supported by human intervention, resulting in a reduction of availability of other ecosystem services (Kandziora et al. 2013). The general interests in ecosystem services of forests by various actors are similar in all European countries. However, applied forest management models and the implemented deliberation between forest ecosystems services differ widely between European countries. In some countries forest management is strongly focused on timber provision. In contrast, in other countries biodiversity protection, non-wood products and recreation are important aims of forest management.

Forest use practices are based on the actions of actors. The actions of actors are steered by the legal framework of forest management in each case study and the decisions and actions of other actors. Of course, existing bio-geophysical conditions of each case study impacts the provision of ecosystem services. However, the ecosystem service basket generated by Europe's forests is mainly the result of forest management. Therefore, this report examines which actors are driving forest management in the ten case studies of ALTERFOR. Specifically, three questions are addressed in this actor analysis:

1) Who are the actors interested in ecosystem services provided by forests in the ten ALTERFOR case studies (national level and CSA) and which interests do these actors have?
2) Which power resources do the identified actors have to impact forest management?
3) How are the power relations between governmental, market, and civil society actors that are driving forest management in the ten ALTERFOR case studies?

The assessment of the actor's power to impact forest management is based on the actor-centered power approach (Krott et al. 2014). The actor-centered power approach is presented in section 2. Next, the applied methods are presented in section 3. In section 4, the results of the actors analysis in all ten case studies is presented. The interests of actors in the case studies and their power resources need to be taken into account for developing strategies to implement alternative forest management models.



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# Analytical framework

The analysis in this report focuses on actors' interests and power to act in forest management.

Interests are understood as being *"based on action orientation, adhered to by individuals or groups, and they designate the benefits the individual or group can receive from a certain object, such as a forest"* (Krott 2005). The assessment of interests is based the actor's forest use and advocated positions up to present.

In the context of this study, power is defined as *"capability of an actor to influence other actors"* (Krott et al. 2014). Based on the actor-centered power approach (Krott et al. 2014) the assessment of power is based on the ability of actors to apply the mechanisms coercion, incentives, and dominant information (Table 1).

*Table 1. Power indicators based on the actor-centered power framework*

| **Definition** | **Power mechanism** | |
|---|---|---|
| Altering behavior with force | Coercion | Applying real force |
| | | Threating with force |
| | | Bluffing about force |
| | | Non-compliance with rules |
| Altering behavior with advantages or disadvantages | Incentives/ Disincentives | Material |
| | | Immaterial |
| Altering behavior by supplying unverified information | Dominant information | Ideology |
| | | Expert knowledge |

## Coercion

Coercion can be based on real force as well the threat of force and even bluffing about force that does not really exist. Avoiding control by other actors is coercion too (e.g. illegal harvesting). Coercion must always influence other actors. Therefore cutting or planting a tree is no coercion because it influences nature directly.

Examples for power based on coercion:

- Implementation of forest law
- Implementation of nature conservation law
- Fencing a forest to stop recreationalists to enter the forests
- Climbing over a fence to enter the forest
- Illegal timber harvesting for domestic heating purposes
- Picking berries without control
- Shooting a deer without control
- Displacing barrels with old oil in the forest without control
- Deciding on a legally-binding forest management plan



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## Incentives

Material and immaterial (dis-)incentives can be distinguished. Material incentives are money and also all technical sources, e.g. machines, plants, food or support in labor. Immaterial incentives offer social or psychological advantages. In practice incentives are often combined with coercion. A binding fine is coercion but the amount of the fine is a disincentive.

Examples for power based on material (dis-)incentives:

- Subsidies for certain forest management practices
- Providing free extension services by state forest service to private forest owners
- Certification schemes
- Buying timber
- Paying for the tenure of forests for certain activities (e.g. hunting, construction of a wind turbine, constructing a mountain bike dirt place, …)
- Providing tree seedlings to a reduced price to forest owners

Examples for power based on immaterial (dis-)incentives:

- Appealing to social conventions
- Appealing to moral (e.g. not to extinct a species)
- Appealing to the welfare of future generations

## Dominant information

Dominant information can be based on ideologies or based on superior expert knowledge. Dominant information can relate to knowledge about bio-geophysical processes and knowledge about decision-making processes. Dominant information means that the subordinate cannot check the quality of the information and therefore cannot make his/her own rational judgement. Dominant information like expert knowledge can be advantage or a disadvantage for the subordinate.

Examples for dominant information sources which become dominant information if the subordinate is not able to check the content independently:

- Information provided to small-scale forest owners by extension services of the public forest administration
- Recommendations of forest management provided by the Forest Owner Association to forest owners
- Information about forests provided by Greenpeace to the general public
- Information provided by water associations about the impacts of certain forest management practices on water quality



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# Methods

This report is based on empirical data from ten case studies in Germany, Ireland, Italy, Lithuania, Netherlands, Portugal, Slovakia, Sweden, and Turkey. These countries were selected to represent different bio-geographical and socio-economic backgrounds in Europe. This report is based on a triangulation of qualitative data (qualitative interviews, participatory observations, document analysis) in all ten cases. The data for each case has been compiled by researchers working in the corresponding countries and knowledge of the local language and local circumstances in each case study. In all countries, except the Netherlands, a CSA has been defined to analyze the applied forest management practices and the power relations between actors at a regional level. These CSAs are:

- Bavaria (West Augsburg) in Germany
- Brandenburg (Lieberose/Schlaubetal) in Germany
- Barony of Moycullen, County Galway in Ireland
- Veneto in Italy
- Telšiai in Lithuania
- Vale do Sousa in Portugal
- Podpoľanie in Slovakia
- Kronoberg County in Sweden
- Gölcük in Turkey

The researchers of UGOE trained field researchers from other countries' project partners in the method of actor analysis during a joint seminar in Göttingen, Germany from the 26th -30th of September 2016 to ensure that same standards were applied within all case studies for the actor analysis (→ ALTERFOR Milestone 16).



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# Actors driving forest management in the case studies

In the following sections, the results of the actor analysis of all ten case studies are presented.

## Germany- Case Study Bavaria (West Augsburg)

Nataly Juerges

*Summary*

There is a broad agreement in German forest politics that the dominating concept of multi-functional, integrative forestry (timber production, nature conservation, and recreation at the same area) would be most reasonable for the conditions within Germany. Furthermore, almost all actors preferred mixed forests (coniferous and deciduous trees) with mixed age structure, managed by selective thinning to fulfill the different ecosystem services of forests and to have resilient forests. However, conflicts between different actors exist based on varying priorities between different forest ecosystem services and about how to exactly implement multi-functional forestry. Most important current conflicts about silvicultural management of forests in Germany are:

- if set-asides of forest shares without any management for nature conservation purposes are reasonable,
- if non-indigenous tree species should be planted,
- densities of wild game,
- amount of deadwoods shares, and
- the share of coniferous trees in forests.

The actor landscape within forest politics in Germany became more diverse in recent years. Traditional forestry actors still play the most important role in forest politics. Due to their close relations to agricultural ministries and forestry administrations, forestry is in a powerful position to influence forest policy. Furthermore, due to the direct access and decision-making authority over forests based on ownership, traditional forestry actors can be considered key actors for forest management. However, due to changes in nature conservation legislations, nature conservation authorities and nature conservation lobby groups became increasingly important in forest politics and have substantial influence on forest management. Actors from timber industries impact forest management by increasingly lobby in favor of higher shares of coniferous trees and influence forest management by market forces. Actors representing hunting can be also considered as indirectly influential because of the importance of wild game densities for forest management. Furthermore, actors from the renewable energy sector became increasingly important for forest management because of the construction of wind turbines within forests and the increased demand for timber due to energetic use. Actors representing employment in forests have very little influence on forest policy processes. Actors with recreational interests are almost meaningless for forest policies at the national level.



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Within the case study area Bavaria (West Augsburg) the general conflicts about silvicultural concepts within German forest politics are also relevant. The case study area has a high share of Spruce, thus bark beetle infestations constitute a major problem. It is intensively discussed how forests can be adapted to expected changes in climatic conditions and how alternative silvicultural concepts with reduced share of Spruce could be implemented. Several local state-actors from forestry and actors from nature conservation preferred increasing the share of Fir and Beech to increase the resilience of forest and to improve the value of forests as habitats. However, most small-scale forest owner in the case study area are currently not willing to reduce the share of Spruce because of its financial return. Douglas fir is preferred by several forestry actors as alternative to Spruce but nature conservationists disagree to plant non-native species. The reduction of coniferous trees would require reduction of wild game densities which is in conflict with the interests of local hunters. The case study area has very good growing conditions and wood provision is considered as most important forest function by private and public forest owners. Several companies from timber industries are located in the area and demand mainly coniferous wood. The local population has a high demand for wood (beech) for domestic heating purposes. The case study area is important for the provision of drinking water, thus the impacts on water quality and water quantity of silvicultural concepts need to be considered. Furthermore, the case study area is intensively used for recreational purposes because of the relatively high population density in the area. Recreational users (e.g. fishing, hiking, biking, mushroom and berry picking) sometimes feel disturbed by intensive harvesting measures. Furthermore, large parts of the local population expect from the state forest service to apply silvicultural concepts that produce nice sceneries and diverse landscapes and do not interfere with recreation. Landscape protection is an important issue in the case study area. Some local actors suggest to increase the share of traditional forest use concepts (e.g. pastoral forest, coppice) to contribute to conservation of the cultural value of these traditional concepts.

Actors from forestry are powerful actors in Bavaria in general and within the case study area. Large-scale forest owners and the lobby groups of forestry and agriculture have close relations to the Bavarian government. Furthermore, due to their private property rights on forests, public and private forest owner are key actors for forest management. Actors from nature and environmental conservation are increasingly powerful in Bavarian forest politics but less influential than in other parts of Germany. Hunters have a strong lobby in Bavaria and impact forest management directly by their hunting strategies and the resulting amount of wild game. Due to the importance of water provision in the case study area water associations have influence of forest management practices. Recreational interests are supported by the “Nature park association” which is influential at the local level and recreationalists enforce their interests directly by accessing and using forests. Actors from timber industries have strong influence of forest management strategies by setting market incentives for coniferous trees, specifically Spruce.

The identified actor landscape and the interests of actors are widely typical for rural German forests in the vicinity of larger cities with high population densities.



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# 1. General country information Germany

Around one third of Germany's surface is covered by forests; in total, Germany has around 11 million ha of forest cover (BWI 3, 2012). The share of forest cover has been slightly increasing in the last ten years by around 50,000 ha (BWI 3, 2012). Forests are unevenly distributed in Germany. Schleswig-Holstein, the state with the lowest forest share, has only a forest cover of 11%, the forest richest states (Rhineland-Palatinate, Hesse) have a forest cover share of 43% of the surface (BWI 3, 2012).

Forests in Germany consist of about 57% conifers and 43% deciduous trees (BWI 3, 2012). The assumed natural forest vegetation are forests dominated by Fagus sylvatica but due to forest management over centuries the current forest ecosystems differ from natural ecosystem conditions. Based on the high demand for coniferous trees by timber industries, coniferous trees have high shares of forest vegetation.

The so-called "backwash theory" [Kielwassertheorie] (Rupf, 1961), a forest management paradigm describing the priority of wood production which allows additional social and ecological benefits as byproducts of wood production (in the backwash of economic forest use), dominated forest politics for decades. Nowadays, dominant silvicultural paradigm is the so-called "multi-functional or integrative forestry", meaning that different economic, ecologic, and social forest functions are realized at the same area. However, different forest-related actors do not agree about the implied forest management measures of the concept and its concrete implications for forest management. Some actors from nature and environmental protection even argue that the so-called multi-functional forestry would be nothing more than a new term for the "backwash theory" (Source: Interviews N4; N2).

In Germany, recreationists have the right of way in forests, private forest owners are not allowed to exclude recreationists from the forest. Furthermore, public and private forest owners are obliged to ensure the safety of recreationists on the forests path (e.g. from falling dead wood).

Almost half of German forests are privately owned. Large-scale forest owners own 66% of privately owned forest area, small-scale forest owners (forests < 5ha) contribute to 44% of privately owned forest area. The states own around a third of forest area, around a fifth of forest area is owned by municipalities and the church (BWI 3, 2012).

At the beginning of the millennium the state forest administrations became transferred into publicly owned companies to increase the efficiency of state forestry. These re-structuring processes of state-owned forestry constituted a major change in the organization of forestry and still faces a lot of criticism by state foresters. The privatized forest administrations still offer far-reaching consulting services for private and municipal forest owners but due to legal reasons a reduction of these services has to be expected in the future (Source: Interviews N1; N10; N9).

## 1.1 Current forest policy conflicts and problems

There is a broad agreement in German forest politics that the dominating concept of multi-functional, integrative forestry with selective thinning is most reasonable for the conditions within Germany.



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Furthermore, almost all actors within forest politics agree that mixed forests with mixed age classes are most reasonable to fulfill the different ecosystem services of forests and to have resilient forests. However, conflicts between different actors exist based on varying priorities between different forest ecosystem services about how to exactly implement multi-functional forestry. Most important current conflicts about silvicultural management of forests in Germany are:

- if set-asides of forest shares without any management, independently from the specific ecosystem and specific side conditions, are reasonable, and
- if non-indigenous tree species should be planted (e.g. *Pseudotsuga menziesii, Quercus rubra, Abies grandis*),
- densities of wild game,
- deadwood shares,
- the share of coniferous trees in forests,
- if chemical pest control should be applied within forests.

(Source: Interviews at the national level, N1-N9; Participatory observations Na-Nc).

Traditionally, German forest politics has been characterized by conflicts between ecologic and economic interests (Hellström and Welp, 1996; Mann, 1998; Winkel and Sotirow, 2011). In recent forest policy research seven conflict groups have been identified characterizing current German forest politics: (1) Conflicts related to nature conservation, (2) Conflict related to (renewable) energy, (3) Conflicts related to climate change, (4) Conflicts related to recreational forest use, (5) Conflicts related to hunting, (6) Conflicts related to employment in forests, and (7) Conflicts related to general guidelines and priorities of forest use (Table 2).

*Table 2. Overview of current conflicts in German forest politics*

| ***Conflict category*** | ***Conflict*** |
|---|---|
| **General guidelines** | Multifunctional forest use vs. segregation |
| | Deliberation between conservation, economic, and recreational interests/meaning of "sustainable forestry" |
| | FSC vs. PEFC |
| | Owner vs. Society: Who should decide? |
| **Nature conservation** | Non-use to allow natural development of forests vs. sustainable harvesting |
| | Implementation of Natura-2000 |
| | Non-native tree species |
| | Genetic modified tree species |
| | Forest conversion towards more natural ecosystem types versus plantation of economically most beneficial tree species |
| | Introduction of legally binding „Best practice" recommendations |
| | Deadwood share |
| | Protection of old growth beech forests |
| **Energy transition** | Material vs. energetic wood use |
| | Subsidization of energetically used timber |
| | Intensification of harvesting measures versus nature conservation |



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| | |
|---|---|
| | Wind energy projects in forests vs. recreation and conservation |
| | Expansion of power grids above forests |
| | Gas pipeline construction through forests |
| **Climate change** | Most effective climate mitigation measures in silviculture |
| | Financial compensation for owner for climate change mitigation services of forests |
| | Reduction of game densities to allow natural climate adaptation |
| | Best climate adaptation strategy |
| **Recreation** | Increased/changed interests of recreational users vs. conservation and use |
| | Scenery and landscapes vs. economic interests |
| | Motor cross vs. economic and other recreational interests |
| | Horse riding vs. hunting and other recreational interests |
| | Mountain biking vs. other recreational interests |
| | Geocaching off-road vs. economic interests of forest owners |
| | Costs of obligation of forest owners to safeguard forests for hazards of recreational users |
| **Hunting** | Browsing damages versus economic and ecological interests |
| | Unlimited rambling of red deer |
| | Lead-free ammunition |
| | Hunting technique/trap hunting |
| | Hunting management plans |
| | Interests of forest owner and minimum periods for hunting tenures vs. interests of hunters and their autonomy |
| | Discussed changes in state and federal hunting laws |
| | Horse riders vs. hunters |
| **Work in forests** | Dead wood vs. job safety of forest workers |
| | Work in forestry versus non-use for conservational purposes |
| | Minimum wages for forest workers |

Source: adapted from Jürges 2016

## 1.2 Instruments and legal competences in German forest politics

In 1975 West Germany enacted a national forest law (Table 3). Previously, all legal competences for forestry were allocated at the state level ("Bundesländer"). Traditionally, forests were seen as a regional issue because of the side specifity of forest ecosystems (Köpf 2002). Even though some decision-making authority over forests has been shifted towards the national level, the main competences for forests have remained at the state level in Germany (Juerges and Newig 2015a).

Since the 1980s, a change in forest policy in Germany took place based on a re-framing of forests in the public discourse towards a stronger consideration of ecological and social benefits of forests (Hellström and Welp 1996; Mann 1998; Weber et al. 2000). This re-framing process caused changes in the institutional assignments of forests, environmental ministries and authorities received partially decision-making authority over forests. Next to traditional forestry and hunting laws, other policies became increasingly important for the regulation of forests, such as nature conservation law, soil and water protection laws, and climate and energy policies. Additionally, forest and nature conservation



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policy processes at European and international levels impacted forest politics in Germany (Juerges and Newig 2015a).

*Table 3. Overview of legally-binding law and soft instruments in Germany*

| | |
|---|---|
| **Germany – National** | **Legally-binding law**<br>• Federal Nature Conservation Act (1976, replaced Nature Conservation Act of 1935)<br>• Federal Hunting Law (1953)<br>• Federal Water Act (1957)<br>• Town and Country Planning Code (1960)<br>• Federal Forest Act (1975)<br>• Federal Regional Planning Act (1998)<br>• Federal Soil Protection Act (1999)<br>• Forest Reproductive Material Act (2002)<br>**Soft instruments**<br>• National Forest Program (1999-2006)<br>• Forest Strategy 2020 (2008-2011)<br>• Forest Climate Fund (2012) |
| **Joint task of the Federal government and the states** | • Germany's Joint Task for the Improvement of Agricultural Structures and Coastal Protection (German abbreviation: GAK) (1969) |
| **Germany –State** | **Legally-binding law**<br>• Federal States Forest Acts<br>• Federal States Regional Planning Acts<br>• Federal States Hunting Laws<br>• Federal States Water Laws<br>• Federal States Town and Country Planning Codes<br>• Federal States Development Plans<br>**Soft instruments**<br>• Position Papers and declarations of Forest Summits<br>• Federal State Nature Conservation Strategies<br>• European Agricultural Fund for Rural Development (EAFRD)<br>• Extension of state forest service to private forest owner |
| **Germany – Regional / Local** | **Legally-binding law**<br>• Regional Development Plans<br>• Regional Planning Programs<br>• District/Land Development Plans<br>**Soft instruments**<br>• Regional/ Local Strategy Paper |

Source: adapted from Juerges and Newig 2015a



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# 2 Actor analysis: Germany, national level

There is a variety of interests in forests in German forest politics. The interest group landscape within German forest politics representing this diversity of interests consist out of a broad range of organizations with a diversity of goals, strategies, structure and available resources. Interest groups have an important function in representing citizens, the largest environmental and nature conservation groups have more members than the biggest political parties in Germany (Juerges and Newig 2015a).

Forest-related governmental, market, and civil society actors were identified as relevant at the national level in forest governance based on previous studies on the German forest sector (Hellström and Welp, 1996; Mann 1998; Memmler and Schraml, 2008; Jürges, 2016).

## 2.1 Interest of actors: Germany, national level

Interests are understood as being *"based on action orientation, adhered to by individuals or groups, and they designate the benefits the individual or group can receive from a certain object, such as a forest"* (Krott 2005). The assessment of interests is based the actor's forest use and advocated positions up to present. As information sources to identify actor's forest use and advocated positions qualitative data from website and document analysis, participatory observations, and interviews with key actors are triangulated.

The non-governmental actors in German forest politics at the national level can be categorized in actors representing mainly interests in provisioning forest ecosystem services, actors representing mainly interests in cultural ecosystem services, actors representing mainly interests in supporting ecosystem services, and actors representing mainly interests in regulating ecosystem services. However, there are also some actors who are interested in all or several forest ecosystem services and aim to find a balance between the different forest ecosystem services.

Actors mainly interested in the provisioning ecosystem service of timber are usually economically directly or indirectly economically dependent on forests. Most actors interested in provisioning ecosystem services of timber prefer high harvesting intensities and a tree species selection based on the demand of timber industries. A conflict exists between actors interested in maximizing timber output and actors interested in high wild game densities because of browsing damages caused by game. Actors interested in the supporting and regulating forest ecosystem services are mainly nature conservation and environmental groups who aim to protect forest resources. However, some actors interested in regulating forest ecosystem services are also driven by economic interests, for example water companies. Actors interested in the protection of supporting and regulating forest ecosystem services often had a preference for forest management models with high nature conservation standards, set asides, high deadwood shares, and mixed forests (in species and age structure). Because of this different ideas of optimal forest management actors representing nature conservation and environmental protection were in in conflict with actors representing forestry. Actors mainly interested in cultural ecosystem services favored forest management models that produce nice sceneries and



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landscapes. This interest aligns with the interest of nature conservation groups to apply forest management models with mixed forest systems and without clear-cutting. The preference for mixed forests caused conflicts with the interest of some actors from forestry and timber industries, which prefer a high share of coniferous trees and planting of non-native tree species.

Corresponding to the market and civil society actors, the governmental actors at the national level can be distinguished in actors mainly interested in provisioning forest ecosystem services and actors mainly interested in the protection of supporting and regulating forest ecosystem services. These actors were in conflict about the priorities of forest managements and the deliberation between ecologic and economic interests in forests. There are no governmental actors with strong interests in cultural forest ecosystem services (Table 4).

*Table 4. Interests in ecosystem services of selected actor groups (Germany, national level)*

| | **Forest management** (e.g. public and private forest owner organizations) | **Timber Industries** (e.g. sawmills, papermills) | **NGOs representing employment in forests** (e.g. labor unions) | **Outdoor recreation NGOs** (e.g. hiking and mountain biking groups) | **Hunting NGOs** | **Water associations + companies** | **Nature + environment conservation NGOs** |
|---|---|---|---|---|---|---|---|
| *Provisioning ES* | | | | | | | |
| Wood provision | +++ | +++ | ++ | - | - | - | + |
| Game provision | -- | --- | - | ++ | +++ | 0 | -- |
| Mushrooms | 0 | 0 | 0 | +++ | 0 | 0 | +++ |
| Berries | 0 | - | 0 | +++ | + | 0 | + |
| Medical plants | 0 | 0 | 0 | + | 0 | 0 | + |
| *Supporting ES* | | | | | | | |
| Biodiversity | -- | --- | - | ++ | + | + | +++ |
| Habitats | -- | --- | - | ++ | + | + | +++ |
| *Regulating ES* | | | | | | | |
| Carbon sequestration | -- | --- | - | 0 | 0 | 0 | +++ |
| Climate regulation | 0 | 0 | 0 | 0 | 0 | 0 | +++ |
| Water quality | 0 | - | - | - | - | +++ | +++ |
| Pest control | +++ | +++ | + | + | 0 | + | +++ |
| *Cultural ES* | | | | | | | |
| Outdoor recreation | - | - | - | +++ | - | - | 0 |
| Aesthetics | 0 | - | 0 | +++ | + | - | + |
| Tourism | + | - | 0 | +++ | - | - | - |



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## 2.2 Power of actors: Germany, national level

Power is defined as *"capability of an actor to influence other actors"* (Krott et al. 2014, p.35) Based on the actor-centered power approach (Krott et al. 2014) the assessment of power is based on the criteria coercion, incentives, and dominant information sources.

Coercion is defined as altering behavior with force, including the threat of force and even bluffing about force that does not really exist.

Incentives are defined as altering behavior with advantages or disadvantages. Material and immaterial (dis-)incentives can be distinguished. Material incentives are money and also all technical sources, e.g. machines, plants, food or support in labor. Immaterial incentives offer social or psychological advantages, e.g. social conventions, morals.

Dominant information sources are defined as altering behavior by supplying unverified information trusted by the subordinate, e.g. within ideologies or based on superior expert knowledge.

The analysis of the power resources of actors at national level showed that actors interested in timber provision and biodiversity are most powerful in forest policy processes. Furthermore, actors interested in the provision of renewable energy, timber processing, and certification have some power resources. Actors interested in recreation, hunting, water provision, and employment in forests have only marginal power resources to impact forest policy processes at the national level.

The main power resource of governmental actors at the national level is coercion based on executive power of legislations by the ministries and subordinated federal agencies. Furthermore, governmental actors contribute to spreading of unverified information by supporting arguments on market actors and civil society organizations. The Federal Ministry for the Environment and its subordinated agencies set immaterial incentives by appealing to morals and values when demanding higher nature protection standards.

Following the actor-centered power approach, for each actor group it has been evaluated if power resources have a strong impact (+++), a medium impact (++), or a low impact (+) on forest management (Hubo and Krott 2015). At the national level, actors interested in forest management and environmental, nature, and landscape conservation have the highest impact on forest management. Actors interested in timber industries, water provision, certification, and renewable energy regeneration have medium impact on forest management. Actors interested in employment in forests, recreation, and hunting have only low impact on forest management in national forest policy processes (Table 5).



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*Table 5. Overview of power resources of different interests (Germany, national level)*

| **Actor's interests** | **Power resources** | | | |
|---|---|---|---|---|
| | **Means of coercion** | **Incentives** | **Dominant information** | **Power resources of the interest** |
| Forest management | **+++** | **++** | **+++** | **Strong** |
| Timber processing | **+** | **++** | **++** | **Medium** |
| Employment in forests | **+** | **+** | **+** | **Low** |
| Renewable energy regeneration | **+** | **++** | **++** | **Medium** |
| Recreation | **+** | **+** | **+** | **Low** |
| Hunting | **+** | **+** | **+** | **Low** |
| Certification | **+** | **+++** | **+++** | **Medium** |
| Water provision | **++** | **+** | **+** | **Low** |
| Environmental, nature, and land-scape conservation | **+++** | **+++** | **+++** | **Strong** |

At the national level, most powerful are actors with interests in timber provision and actors interested in the supporting ecosystem functions biodiversity and habitats for species (Table 6). Actors interested in regulating forest ecosystem services have medium power resources to impact forest management at the national level. Actors interested in cultural ecosystem services have low power resources and only marginal impact on forest policy processes.

*Table 6. Overview of power resources of interests in different ecosystem services (Germany, national level)*

| **Interest in** | **Overall power resources** | **Means of coercion** | **Incentives** | **Dominant information** |
|---|---|---|---|---|
| ***Provisioning services*** | | | | |
| Wood | **Strong** | **+++** | **+++** | **+++** |
| Mushrooms | **Low** | **+** | **+** | **+** |
| Berries | **Low** | **+** | **+** | **+** |
| Game | **Low** | **+** | **+** | **+** |
| Medical plants | **Low** | **+** | **+** | **+** |
| Other(s): | | | | |
| Fish | **Low** | **+** | **+** | **+** |
| Wind energy | **Medium** | **+** | **+++** | **++** |



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| | | | | |
|---|---|---|---|---|
| ***Supporting services*** | | | | |
| Biodiversity | **Strong** | **+++** | **++** | **+++** |
| Habitat for species | **Strong** | **+++** | **++** | **+++** |
| ***Regulating services*** | | | | |
| Carbon sequestration | **Medium** | **++** | **++** | **+++** |
| Climate regulation | **Medium** | **++** | **++** | **+++** |
| Water quality | **Medium** | **++** | **++** | **++** |
| Pest control | **Medium** | **++** | **+** | **++** |
| ***Cultural services*** | | | | |
| Outdoor recreation | **Low** | **+** | **+** | **+** |
| Aesthetic values | **Low** | **+** | **+** | **+** |
| Tourism | **Low** | **+** | **+** | **+** |

At the national level, market actors and governmental actors each have medium power resources to impact forest management. Civil society actors have low power resources to impact forest management (Table 7). Governmental actors at the national level in Germany are relatively weak in forest policy because most decision-making authority is allocated in the responsibility of the states. Power of market and civil society actors in forest policy at the national level is mainly based on unverified information which is spread within lobbying processes, in public relations, contribution to research projects and general participation in the public discourse. Furthermore, most civil society actors and some market actors appeal to moral and norms in their arguments by justifying their preferences for forest management referring to democratic rights or the general welfare.

*Table 7. Overview of power resources of different actor types (Germany, national level)*

| | **Means of coercion** | **Incentives** | **Dominant information** | |
|---|---|---|---|---|
| **Market actors** | **+** | **++** | **+++** | **Medium** |
| **Civil society actors** | **+** | **+** | **++** | **Low** |
| **Governmental actors** | **++** | **+** | **+++** | **Medium** |



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## 2.3 Power of non-traditional forest actors to impact forest management

Interest groups from representing forest owners and timber industries dominated German forest politics until the 1980s. Interest groups representing forest owners' interests are still most powerful in German forest politics because of their access to forests based on private property rights and their close relations to the Ministries for Agriculture at state and federal level and the state forest services.

From beginning of the 1980s forest dieback and destruction of rainforests lead to an increased involvement of nature conservation and environmental interests within forest policy (Hellström and Welp, 1996; Humphreys, 2004; Mann, 1998; Weber et al., 2000). However, the interest groups representing nature conservation and environmental interests within forest policy differ in their goals and interests and are not homogeneous. Some interest groups from nature and environmental conservation have a more confrontative approach by campaigning against public and private forest owners or taking the state forest service to court; others have a more cooperative approach by seeking close exchange and discussions with actors from forestry (Juerges and Newig 2015a). Environmental and nature conservation groups and organizations became powerful actors in forest politics in Germany because they were so successful in recent years to impact forest management with nature conservation legislations, especially supported by European legislations strengthening the protection of species and ecosystems. Furthermore, the general public often perceives actors form nature and environmental conservation as advocates of the general welfare of society and the environment because their arguments appeal also to morals and norms. Therefore, the actions and involvement of actors from nature and environmental conservation in forest politics is supported by large groups of the general populations, especially more urban populations without personal relation to agricultural production and forestry.

The hunting lobby is quite powerful in forest politics because of relatively high financial resources and often close personal relations to decision-makers. However, the hunting lobby could be much more influential if they would act more strategically and apply more modern lobbying strategies. The hunting lobby missed to target the general public in their political actions and therefore suffers from a negative perception of hunting of large parts of the population. Arguments of animal protection and animal rights groups were increasingly considered in the legal regulation of hunting.

Previous studies on German forest politics stated that interest groups representing recreational interests in forests are weakly integrating in forest policy networks (Hofmann et al. 2000). This argument was also supported by the analysis in the context of ALTERFOR. Some organizations representing recreational interests (e.g. hiking, horse riding, mountain biking) were participating in forest policy round table meetings but are almost meaningless in forest policy processes.

Actors from timber industries are increasingly important in forest politics, specifically related to issues of tree species selection and the share of coniferous trees in forest.

Due to new societal challenges such as climate change and the transition towards renewable energies new actors become increasingly important within forest politics, for example organizations representing the interests of the renewable energy sector or climate protection organizations. Climate change and energy transition modify the established conflict line because new conflicts related to climate mitigation, climate adaptation, and renewable energies have blurred the clear opposition



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between environmental and economic interest (Jürges 2016). In some regions of Germany wind energy companies realizing wind energy projects within forests became important actors in forest politics and forest management (Juerges and Newig 2015b). Due to the increased energetic use of timber, companies producing wood pellets impacted local timber markets and caused an increase of timber prices. Furthermore, the increased demand for timber based on energetic timber use conflicted with nature conservation interests and preferences for low management intensities.

Thus, summing up, forest politics in Germany became more diverse in the last years. Traditional forestry actors play still an important role in forest politics and due to their close relations to agricultural ministries and administrations, the traditional forestry actors are still in a powerful position to influence forest policy decision-making. Furthermore, due to the direct access and decision-making authority over forests based on ownership traditional forestry actors can be considered a key actors for forest management. However, due to changes in nature conservation legislations, nature conservation authorities became increasingly important in forest politics and have substantial influence on forest management. Furthermore, actors from the renewable energy sector became increasingly important for forest management because of the construction of wind turbines within forests and the increased demand for timber due to energetic use. Actors from timber industries impact forest management by increasingly lobby in favor of higher shares of coniferous trees and their non-strategical market forces. Actors representing hunting can be also considered as indirectly influential because of the importance of wild game densities for forest management. Actors representing employment in forests have very little influence on forest policy processes. Actors with recreational interests are almost meaningless for forest policies at the national level.

## 3. General case study information: Bavaria (West Augsburg)

The state of Bavaria is located in the Southeast of Germany, bordering with Czech Republic, Austria, and Switzerland. By covering 70.500 km2 of land surface it is the biggest German state in area and the second biggest state in population with 12.7 million inhabitants (online: de.statista.com, accessed 10/2016). Bavaria covers around 19% of the surface of Germany (online: de.statista.com, accessed 10/2016), thus Bavaria is larger than several European countries. The state of Bavaria has a strong economy and is considered as a rich state within Germany. Bavaria has a very low unemployment rate of less than 4%. Several international companies have their headquarters in Bavaria. Important economic sectors are automobile industries, defense industries, the IT-sector, and tourism (online: stmwi.bayern.de, accessed 10/2016). The state of Bavaria can be considered as conservative state, a majority of the population is member of the Roman-catholic church. The “Christian Social Union in Bavaria“, a conservative and Christian democratic party, has been governing party non-stop in Bavaria since 1957 (online: csu.de, accessed 10/2016).

The case study area West Augsburg is located in the south-west of Bavaria, and covers approximately an area of 122,488 hectares (online: naturpark-augsburg.de, accessed 10/2016). Most of the area of the case study area is located in the district of Augsburg, the case study area also extends to the edge of the districts of Unterallgäu, Günzburg, and Dillingen (online: naturpark-augsburg.de, accessed 10/2016). The case study area is identical with the Augsburg-Western Woods Nature Park (German:



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Naturpark Augsburg-Westliche Wälder). The landscape category "Nature Park" is an area type protected by the Federal Nature Conservation Law in Germany. Nature parks are defined as large scale areas which need to be developed and protected as landscapes or nature conservation areas, which have a high biodiversity in species and habitats, and which landscapes are managed in diverse, environmentally-sound land use systems. Nature parks aim at enabling a permanent environmentally-sound land use system to allow recreation and sustainable tourism (online: naturpark-augsburg.de, accessed 10/2016).

The nature park is bordered by the rivers Danube, Wertach, Schmutter, Flossach and Mindel. The landscape of the case study area is hilly and characterized by forestry and agricultural production which contribute to 82% of land use (online: naturpark-augsburg.de, accessed 10/2016). 43% of the case study area is covered by forests (online: augsburg.de/freizeit/ausflugsziele/naturpark-westliche-waelder, accessed 10/2016). Due to preferable bio-geophysical conditions, the case study area has a very high productivity, the timber growth rates are among the highest of all over Germany (Interview Ba5). Within the case study area coniferous trees have a high share of forests ecosystems. A few hectares are managed in ways to sustain specific ecosystems, e.g. alluvial forests, heath lands, and coppice forest (Interviews Ba5; Ba8). Some parts of the case study area have a very high value for nature conservation and rare species occur in the area (e.g. wild cats, several butterflies and insects such as the woodland brown, rare orchids) (Interview Ba11). Some archeological monuments are located in the forests of the case study area, such as monolithic tombs (Interviews Ba1; Ba12). The ownership structure of the forest in the case study area is a combination of state, municipal and private forests.

## 3.1 Current forest policy conflicts and problems in Bavaria

The implementation of the Natura-2000 network was an important current policy issue in Bavaria because 17% of forest areas are located within Natura-2000 areas (online: stmelf.bayern.de/wald/waldfunktionen/biologische-vielfalt, accessed 10/2016). Furthermore, set-asides of forest areas without any silvicultural management and the establishment of National parks without any management were important issues in forest policy Bavaria (Interview Ba2; Ba3). However, conflicts between nature conservation and forestry were described as having a low intensity within the case study area. Foresters described nature conservationists in the case study area as rural people who would have understanding for agricultural production and forestry. Therefore, it would be possible to discuss issues in a constructive way and to work together. Actors from the case study area shared the perspective that forest policy conflicts existed often only at the state level between different interests groups and politicians. In contrast, at a local level people with conflicting interests could often work together and find compromises (Interviews Ba5; Ba1; Ba11). The analysis of the case study confirmed that no violent conflict escalations occurred in the area, however, many conflicts of interests occurred in the area.

Climate change is as important issue in the case study area (Interviews Ba1-Ba12). Due to the high shares of Spruce (*Picea abies*) climate adaptation towards mixed forests with higher shares of deciduous trees (*Fagus sylvatica and Quercus rubra*), Douglas fir (*Pseudotsuga menziesii*) and White fir



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(*Abies alba*) was advocated by the state forest service (Ba1; Ba4; Ba5). However, private forest owners were often not willing to invest in climate adaption measures and to reduce the share of Spruce within their forests (Interviews Ba5; Ba9). Bark beetles infestations were a major problem in Bavaria, especially in forests with high share of Spruce (Interviews Ba3; Ba4; Ba5; Ba7).

Conflicts existed between hunters and forest owners, specifically between the state forest service and hunters about best hunting strategies and the desired amount of wild game densities (Interviews Ba1; Ba5). The state forest service preferred a reduction of game intensities to allow climate adaption towards higher shares of deciduous trees. The state forest service faces high costs because of browsing damages by wild game and protection measures against browsing damages (Interview Ba5).

The case study area is important for the exploitation of water, several wells for tap water sources are located in the case study area. Therefore, large parts of the case study area are specified as water protection zones (Interviews Ba1; Ba4; Ba5). The state forest service considers water protection and impact on water quality explicitly in their forest management decision-making (Interviews Ba1; Ba4; Ba5). Water management associations were relevant actors for forest management in the case study area (Ba12).

The case study area is located a region with a high population density, resulting in intense recreational uses of the forests within the case study. Around 200 km of hiking path and 100 km biking path are maintained in the case study area (Interview Ba5). The recreational users within the case study were demanding about recreational opportunities within the forests. If paths were not in a good condition or unusable because of harvesting activities recreational users would start immediately complaining at the state forest service. In the vicinity of commercial horse riding facilities paths often required more intense maintaining because of the use by horse riders. In the past, these damages caused conflicts between the horse riding facilities and the state forest service because the horse riding facilities were asked to contribute financially to the repairing of path damages caused by horses. This request caused strong opposition of horse riders and the general public, therefore, the state forest service decided to accept the use of horse riders as acceptable use which does not require financial contribution to path maintenance. Problems were caused by mountain bikers who established illegal mountain biking trails within forests. A member of the state forest service stated that these trails are a problem because of the security of the mountain bikers but that the forest service could not do anything about it. Mountain bikers would just start a new trail a few meters further if they were asked not the use trail anymore. As more serious problem were described motorcross bikes and off-road vehicles that were used illegally within the forests. However, usually the drivers were not identified because these vehicles do not have plates and were too fast to be stopped by foresters or forest workers (Interviews Ba4; Ba5).

Illegal dumpsters within forests caused problems for public and private forest owners, amongst others, old heating systems, parts of cars and motorcycles, and green wastes were displaced within the forests. The offender were very rarely identified, thus forest owners had additional costs of removing illegal dumpsters (Interview Ba4; Ba5).



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## 3.2 Instruments and legal competences in Bavarian forest politics

The Bavarian ministry for nutrition, agriculture, and forestry and its subordinated agencies have the legal competence for forests within the state. The Bavarian Forest administration has been reformed in 2005 towards less public service and more according to free market principles (Wagner 2006). This reform caused severe resistance from private and municipal forestry and is heavily criticized until today by many actors (Interviews Ba2; Ba3; Ba4 Ba6; Ba12). The Bavarian ministry for the environment and consumer protection and its subordinated agencies have indirectly partially legal competences for forests due to their legal competences for biodiversity, water and soil protection. Bavarian state laws specify the more general guidelines of the federal laws (Table 8).

*Table 8. Legally-binding law and soft instruments in Bavaria, Germany*

| | |
|---|---|
| **Bavaria** | **Legally-binding law**<br>• Bavarian Forest Act<br>• Bavarian Regional Planning Act<br>• Bavarian Hunting Law<br>• Bavarian Water Law<br>• Bavarian Town and Country Planning Code<br>• Bavarian Land Development Plan<br><br>**Soft instruments**<br>• Bavarian Forest Days<br>• Bavarian Nature Conservation Funds<br>• European Agricultural Fund for Rural Development (EAFRD)<br>• Extension of state forest service to private forest owner |
| **Bavaria –**<br>**Regional/ Local** | **Legally-binding law**<br>• Regional Development Plans<br>• Regional Planning Programs<br>• District/Land Development Plans<br><br>**Soft instruments**<br>• Regional/ Local Strategy Paper |

Source: adapted from Juerges and Newig 2015a

# 4. Actor analysis: Case study Bavaria (West Augsburg)

Forest-related governmental, civil society and market actors were identified based on previous studies on the Bavarian forest sector, a web search and interviews with local key actors who were asked to identify further actors relevant for forest use and management in the case study area. Important



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actors in the case study area are forest and nature conservation authorities, the state forest service, forest owning municipalities, small-scale forest owners, a few large-scale forest owners (often members of nobility), water associations, activists of local subchapters of the Friends of the Earth and Birdlife and some individual nature conservationists, landscape protection organizations, recreationists who use forests for biking or hiking, hunters, and several companies from timber industries.

Most of the state forest area is in the responsibility of the state-owned forest [Forstbetrieb] Zusmarshausen, some parts belong to the state-owned forest [Forstbetrieb] Ottobeuren. The city of Augsburg owns huge forest areas, some other municipalities within the case study area own forests too. Many farmers own small-scale forests, often these small-scale forest owners are organized in forest management associations but there is also a share of small-scale forest owners who do not live in the area anymore and who do not actively manage their forest. There are owners who are are sometimes not even aware that they own a forest. Some descendants of the noble Fugger family own larger-scale forests within the case study area. A large forest area belongs to the Fugger Foundation which supports social projects with the financial return of the forest. The private forest owner within the case study area differ in their priorities of forest management, most private forest owner focus on timber production in forest management but there are also some forest owner who prefer forest management concepts with a priority on biodiversity protection, or who do not actively manage their forest at all. Due to the importance of water provision water associations (often municipality owned) impact forest management and also own some hectares of forest within water protection zones (Interviews Ba1; Ba4; Ba5; Ba12).

Nature conservation is advocated by the local chapters of Friends of the Earth and Birdlife. Furthermore, a local nature conservation network, the nature conservation alliance, advocates the consideration of non-economic interests in forest. Most of the local nature conservationists have a preference for cooperative activism by actively seeking contact and cooperation with the state foresters. More extreme and confrontative organizations (e.g. Greenpeace, Robin Wood) are politically not relevant within the case study area (Interviews Ba3, Ba4; Ba5; N4). Landscape protection organizations advocate the maintenance of traditional forest management systems, such as shrubbery or coppice because of their cultural and ecological value (Interview Ba8).

As described above, the case study area is intensively used for different recreational activities. The interests of recreationalists are advocate by the nature park association [Naturparkverein] and a local recreation organization (Interview Ba10).

There are a lot of hunters in the case study area. A majority of hunters has a very traditional understanding of hunting and no interest in ecologically-sound hunting systems. The ecological hunting association is very weak in the area (Interview Ba6).

The Cluster of forestry and timber ("Cluster Forst und Holz") in Bavaria has been funded in 2006 in the context of a Bavarian policy initiative. The cluster aims to strengthen the network of forestry and timber industries in Bavaria and to improve the cooperation of science and practice in forestry (online: cluster-forstholzbayern.de, accessed 10/2016). The cluster has around 500 members. Within the case study area several timber industries companies are located, e.g. UPM (paper), Ilim, and Peifer (sawmills) (Interviews Ba4; N8).



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## 4.1 Interest of actors: Case study Bavaria (West Augsburg)

Interests are understood as being *"based on action orientation, adhered to by individuals or groups, and they designate the benefits the individual or group can receive from a certain object, such as a forest"* (Krott 2005). The assessment of interests is based the actor's forest use and advocated positions up to present. As information sources to identify actor's forest use and advocated positions within the case study area qualitative data from document analysis, participatory observations, and interviews with key actors are triangulated.

The interests of individual and collective actors within the case study correspond to the general interests within German forest politics (Table 9). Actors from forestry and timber industries prefer high harvesting intensities, high shares of coniferous trees, low amounts of deadwood, and advocate increased shares of Pseudotsuga menziesii to make forests more resilient. Most actors from forestry argue against set-asides of forest areas without any management and suggest multi-functional forest management at the whole area with a priority on timber production (Interviews Ba1; Ba2; Ba4; Ba5; Ba7; Ba9). Actors with nature conservation interests prefer a forest management concept including large-scale set-asides without any management, high deadwood shares, high shares of deciduous trees, low harvesting intensities, a diversity of ecosystems within the forest, abandonment of non-indigenous trees, and a revitalization of alluvial forests, bogs, and fens (Interviews Ba3; Ba6; Ba8; Ba11). Actors from forestry and nature conservation agree that a reduction of wild game densities would be desirable to allow natural regeneration and increased shares of Fagus sylvatica. This interest is in conflict with the interests of most hunters who prefer high wild game densities. Recreational forest users have no specific ideas about preferred forest management concepts but demand a well maintained forest paths and nice sceneries and landscapes within forest (Ba4; Ba10).

*Table 9. Interests in ecosystem services of selected actor groups (Bavaria, Germany)*

| | **Forest management** (e.g. local public and private forest owners) | **Timber Industries** (e.g. local sawmills, papermills) | **Employment in forests** (e.g. labor unions, local contractors, forestry experts) | **Outdoor recreationists** (e.g. hikers, mountain bikers) | **Hunters** | **Water associations + companies** | **Nature + environment conservation NGOs** |
|---|---|---|---|---|---|---|---|
| *Provisioning ES* | | | | | | | |
| Wood provision | +++ | +++ | ++ | - | - | - | + |
| Game provision | -- | --- | - | ++ | +++ | 0 | -- |
| Mushrooms | 0 | 0 | 0 | +++ | 0 | 0 | +++ |
| Berries | 0 | - | 0 | +++ | + | 0 | + |
| Medical plants | 0 | 0 | 0 | + | 0 | 0 | + |
| *Supporting ES* | | | | | | | |
| Biodiversity | -- | --- | - | ++ | + | + | +++ |
| Habitats | -- | --- | - | ++ | + | + | +++ |
| *Regulating ES* | | | | | | | |
| Carbon | -- | --- | - | 0 | 0 | 0 | +++ |



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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| sequestration | | | | | | | |
| Climate regulation | ++ | 0 | 0 | 0 | 0 | + | +++ |
| Water quality | 0 | - | - | - | - | +++ | +++ |
| Pest control | +++ | +++ | + | + | 0 | + | +++ |
| *Cultural ES* | | | | | | | |
| Outdoor recreation | - | - | - | +++ | - | - | 0 |
| Aesthetics | 0 | - | 0 | +++ | + | - | + |
| Tourism | + | - | 0 | + | - | - | - |

## 4.2 Power of actors: Case study Bavaria (West Augsburg)

Power is defined as *"capability of an actor to influence other actors"* (Krott et al. 2014, p.35) Based on the actor-centered power approach (Krott et al. 2014) the assessment of power is based on the criteria coercion, incentives, and dominant information.

Following the actor-centered power approach, for each actor type and each interest in ecosystem services and forest functions it is evaluated if power resources have a strong impact (+++), a medium impact (++), or a low impact (+) on forest management (Hubo and Krott 2015).

*Table 10. Overview about power resources of actors with different interests (Bavaria, Germany)*

| **Interest in** | **Power resources** | | | |
|---|---|---|---|---|
| | **Means of coercion** | **Incentives** | **Dominant information** | |
| Forest management | +++ | + | +++ | **Strong** |
| Buying and processing timber | + | +++ | ++ | **Medium** |
| Employment in forests | ++ | + | + | **Low** |
| Renewable energy regeneration | + | +++ | ++ | **Medium** |
| Recreation | ++ | + | ++ | **Medium** |
| Hunting | ++ | ++ | + | **Medium** |
| Certification | + | +++ | ++ | **Medium** |
| Water provision | ++ | ++ | + | **Medium** |
| Environmental, nature, and land-scape conservation | ++ | ++ | +++ | **Medium** |

Actors interested in forest management (e.g. public and private forest owners, forest administration) are most powerful to impact forest management within the case study area based on their private property rights on forests and the legal competence of forestry authorities to council forest manage-



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ment of private forest owners. Nature conservation authorities have some legal competence for forests, specifically in relation to the implementation of the Natura-2000 network. Civil society actors interested in nature conservation are influential by appealing to the moral obligation to protect nature and their high reputation and credibility by the general public. Actors interested in buying and processing timber set financial incentives based on (mainly) non-strategic market forces as renewable energy companies interested in the regeneration of renewable energies do. Actors interested in hunting, recreation, and actors working in forests impact forest management by their actual physical actions within the forest when realizing their interests. Governmental, market, and civil society actors interested in the provision of clean drinking water impact forest management by prohibiting and advocating certain forest management measures (Table 10).

Market actors have the strongest power resources to impact forest management in the case study Bavaria (West Augsburg). However, governmental actors are powerful to impact forest management. Civil society actors are medium powerful to impact on forest management in the case study (Table 11).

*Table 11. Overview about power resources of different actor types in the case study Bavaria, Germany*

| | **Means of coercion** | **Incentives** | **Dominant information** | |
|---|---|---|---|---|
| **Market actors** | **+++** | **+++** | **+++** | **Strong** |
| **Civil society actors** | **+** | **++** | **+++** | **Medium** |
| **Governmental actors** | **+++** | **++** | **++** | **Strong** |

In the case study, actors with interests in wood provision and supporting ecosystem services have the strongest power resources to impact forest management (Table 12).

*Table 12. Overview about power resources of different interests in ecosystem services (Bavaria, Germany)*

| **Interest in** | | **Means of coercion** | **Incentives** | **Dominant information** |
|---|---|---|---|---|
| ***Provisioning services*** | | | | |
| Wood | **Strong** | **+++** | **+++** | **+++** |
| Mushrooms | **Low** | **+** | **+** | **+** |
| Berries | **Low** | **+** | **+** | **+** |
| Game | **Medium** | **++** | **++** | **+** |
| Medical plants | **Low** | **+** | **+** | **+** |
| Other(s): | | | | |
| Fish | **Low** | **+** | **+** | **+** |
| Wind energy | **Medium** | **+** | **+++** | **++** |
| ***Supporting services*** | | | | |
| Biodiversity | **Strong** | **++** | **++** | **+++** |



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| | | | | |
|---|---|---|---|---|
| Habitat for species | **Strong** | **++** | **++** | **+++** |
| ***Regulating services*** | | | | |
| Carbon sequestration | **Medium** | **+** | **+** | **+++** |
| Climate regulation | **Medium** | **+** | **+** | **+++** |
| Water quality | **Medium** | **++** | **++** | **++** |
| Pest control | **Medium** | **++** | **+** | **++** |
| ***Cultural services*** | | | | |
| Outdoor recreation | **Medium** | **++** | **+** | **+++** |
| Aesthetic values | **Medium** | **++** | **+** | **+++** |
| Tourism | **Low** | **+** | **+** | **+** |

## 4.3 Power of non-traditional forest actors to impact forest management

Governmental actors with legal responsibility for nature conservation received some legal decision-making authority in Bavaria in recent years but are less influential than nature conservation at the federal level and in most other states of Germany. Environmental NGOs impact discourses about forest management. At a local level, nature conservationists realize small-scale nature conservation projects, often in cooperation with the state forest service. However, the power of nature conservation to impact forest management within the case study is limited.

Hunters impact forest management due to their direct impact on wild game densities within the forest. Other recreational users impact forest management by physically accessing forests and realizing their interests (e.g. mountain biking off-road, berry picking). These activities impact the natural regeneration of forests and the growing rates of trees. Furthermore, the state forest service needs to maintain forest paths in a good condition to avoid conflicts with the local population. Water associations impact forest management within the case study by requiring certain standards to sustain water quality within the case study (e.g. limiting the size of clear cuts). Timber industry companies' impact indirectly forest management by setting market incentives for coniferous trees, high harvesting intensities, and relatively young harvesting ages of trees. Renewable energy companies set financial incentives for increasing harvesting of woody biomass (e.g. crown material) and the realization of wind energy projects within forests. However, the power of these actors to impact forest management within the case study is limited and affects only specific aspects of forest management but not the general concepts of forest management.

Thus, corresponding to the situation at the national level, traditional forestry actors are most powerful to impact forest management within the case study. Other actors have some but quite limited impact on forest management within the case study. In contrast to the situation at the national level, hunters, recreational users, and water associations impact forest management locally.



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## 5. Conclusions case study Germany, Bavaria

The identified actor landscape and the interests of actors are widely typical for rural German forests in the vicinity of larger cities with high population densities. Within the case study area public and private forest owners are powerful actors. Actors interested in nature conservation are relevant in the case study area but less powerful than actors interested in forest management and timber provision. Furthermore, timber industry companies, hunters, water associations, and recreationalists impact forest management in the case study area. These actors have different preferences for forest management practices, favouring various ecosystem functions.

Conflicts exist between actors interested in the provision of timber and actors interested in the sustainment of the supporting ecosystem services biodiversity and habitats for species. Furthermore, conflicts exists between actors interested in the provision of wood and game because of browsing damages caused by deer. The interests of actors interested in cultural ecosystem services partially conflict with the interests of actors preferring timber provision. Based on the identified interests, different future forest management approaches are thinkable favouring different ecosystem services. Some interests in ecosystem services can be combined but others require a deliberation of priorities of forest management.



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## Germany- Case Study Brandenburg (Lieberose/Schlaubetal)

Nataly Juerges

*Summary*

The case study Brandenburg (Lieberose/Schlaupetal) offers socio-economic conditions typical for remote areas within Germany in need of economic development. The case study area is dominated by Pine (*Pinus sylvestris*), managed by selective thinning with highly mechanized harvesting technology. A former military site within the case study has a high value for biodiversity and many rare species occur in the area. A share of the area of the former military site is taken out of management to allow natural forest ecosystem development. In terms of bio-geophysical conditions the case study area consists of two parts: the Lieberose area with very poor growing conditions and the Schlaupetal which offers site conditions suitable for several tree species and management strategies.

Due to the climatic site conditions the adaptation to climate change is seen as more urgent than in other parts of Germany. Droughts became more common in recent years. The danger of forest fires, how to organize fire monitoring, and how larger fire outbreaks can be avoided constitutes a major challenge. Due to increasing long periods without rain in spring, forests are under stress and the tree growth is negatively impacted. In the last years, the case study area experienced major insect infestations. The Pine-tree lappet (*Dendrolimus pini*) is one of the major pest problems, other insects cause problems as well. Due to the high share of Pine the resilience against insects' outbreaks is low. The forest management in Brandenburg suffers from very high wild game densities, causing severe browsing damages. There is ongoing discussion in Brandenburg how to organize hunting best to reduce the wild game (and if this is desirable). The transition towards forests with higher shares of deciduous trees is limited due to high browsing damages.

Two major preferences for forest management by actors exist in the case study: On the one hand a preference for very extensive forest management with focus on cultural and ecologic ecosystem services. At the other hand a preference for forest management focused on the provision of timber. Powerful actors in the case study Brandenburg are the state-owned forest enterprise, nature conservation authorities, the Brandenburg Wilderness Foundation, Birdlife Brandenburg, large-scale forest owners, e.g. the monastery foundation Neuzelle, sawmills, and actors form the touristic sector.



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## 6. General case study information: Brandenburg (Lieberose/Schlaupetal)

Brandenburg is located in the East of Germany, surrounding the German capital Berlin and bordering with Poland. The case study area is located in the South-East of Brandenburg in two districts: the Spreewald-Dahme district and the Oder-Spree district. Brandenburg has been funded as a state of Germany in 1990 after the German reunification. The state of Brandenburg covers an area of 29,654 16 km². With an area of 1,106,916 ha around 37% of Brandenburg is covered by forests (MIL 2011a; MLUL 2015). After the German reunification pre-war forests owners received their forests back. Additionally, many forests were sold to low prices to new forest owners. 61% of forest are privately owned in Brandenburg (MLUL 2015). In total, there are around 100,000 forest owners in Brandenburg (MIL 2011a). Most private owned forests are smaller than 20 ha (MLUL 2015). 26% of forests are owned by the state of Brandenburg, 7% are owned by municipalities or foundations, and 6% are owned by the federal state of Germany (MLUL 2015). 4.5% of forests still administered by the "Treuhandanstalt" which organizes the re-privatisation of former property of the East German National People's Army (MLUL 2015).

Around 35% of forests are certified according to FSC or PEFC standards (MIL 2011a). State-wide forest inventories are conducted in Brandenburg to evaluate the development and structure of forests in Brandenburg (MIL 2011a; MLUL 2015).

Brandenburg suffered from severe economic decline after the reunification of Germany because many industries were closed down. In the more rural parts of the state the population is decreasing because many young people move to cities. However, in the vicinity of Berlin population numbers are increasing because of the commuting distance to the city (Berlin Institut 2007). The state of Brandenburg has 2,484,826 inhabitants. Most habitants of Brandenburg live in the surrounding of the German capital Berlin. The more remote areas of Brandenburg, such as the case study area, have a very low population density with less than 25 habitants/km$^2$. The average population density of Brandenburg is 84 habitants/km².

The state of Brandenburg has coal and copper deposits, thus mining is an important land use, causing land conversion of large areas. Furthermore, Brandenburg has crude oil occurrences (Potsdamer Neue Nachrichten 2011). Additionally, Brandenburg is an important producer of fossil and renewable area. Larger shares of land are used of wind energy farms and large-scale solar panels facilities (MLUL 2007).

The unemployment rate in Brandenburg is in average 7.5%, which is relatively high compared to other areas in Germany (Bundesagentur für Arbeit 2016). Agriculture, forestry, and timber industries are important economic sectors for Brandenburg (MIL 2011a). Around 10% (9,000 companies) of all enterprises in the state of Brandenburg belong to the sector forestry and timber industries (MLUL 2015). Around 33,000 employees (3% of all employees) work in the sectors forestry and timber industries (MLUL 2015). Tourism is an important economic sector in rural areas of Brandenburg as well. Ecotourism is increasing popular and touristic development is supported by several programs. The tourists coming to Brandenburg aim to experience nature and a feeling of being in the wilderness. Furthermore, hunting trips are a popular type of tourism in Brandenburg (Sources: Br7; Br14).



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The climate in Brandenburg is drier than in other parts of Germany with precipitation rates 500-600 mm/year (LBV 2010). The soils in Brandenburg are sandy and nutrient poor, thus only slow growing rates are reached (MIL 2011b). The growing rates in the case study area are very low due to the poor soil conditions. Most important tree species covering around 80% of forests in the case study area is Pine (*Pinus sylvestris*). Furthermore, Oak and Birch have shares in forest stands (Sources: Br5; Br7; Br9; Br10; Br13; Br14).

Within the case study area, a former military site is located, the Lieberoser Heide, covering an area of around 25,000 ha. This area has a high value for biodiversity because it is not cut by urban settlements or infrastructure and many rare species occur in the area. Around 3,000 ha of the former military site are managed by the Brandenburg Wilderness Foundation which received former Soviet military sites in Brandenburg to designate them as nature reserves. 65% of the area owned by the Wilderness Foundation is managed without any interventions (Stiftung Naturlandschaften Brandenburg 2016). The other parts of the former military site is managed by the state forest administration. A larger share of the forest area in the case study is owned by the Foundation of the monastery Neuzelle. The income of forestry is used to finance social project (Sources: Br3; Br14). Another important forest owners in the case study is the municipality Lieberose. Furthermore, several small-scale forest owner own forests in the area.

## 6.1 Current forest policy conflicts and problems

The general conflicts about forest management in the case study Brandenburg (Lieberose/Schlaupetal) are similar to the situation in other parts of Germany. The most important conflict exists between actors interested in nature conservation and actors interested in timber production. For example, in Brandenburg the high density of forests path for forest machinery is criticized by nature conservation organizations. In contrast, timber industries argue in favour of increasing the density of forests paths (Source: Br2). Furthermore, there are different understandings to which extend forest owners should be obliged to support regulating and supporting ecosystem services of forests without any financial compensation. However, due to the specific site conditions of the case study area, the current forest policy conflicts and problems have some particularities compared to other areas within Germany.

Due to the climatic site conditions the adaptation to climate change is seen as more urgent than in other parts of Germany (Sources: Br5; Br9; Br10; Br13; Br14). Droughts became more common in recent years. A desertification in the long-term is feared by experts. Furthermore, the danger of forest fires, how to organize fire monitoring, and how larger fire outbreaks can be avoided constitutes a major challenge (Source: Br6). Due to increasing long periods without rain in spring, forests are under stress and the tree growth is negatively impacted. In the last years, the case study area experienced major insect calamities. The Pine-tree lappet (*Dendrolimus pini*) is one of the major pest problems, other insects cause problems as well. Due to the high share of Pine the resilience against insects' outbreaks is low (Sources: Br5-Br14). However, due to the sandy soils and low precipitation, there is under current conditions no comparable economically-sound alternative to Pine trees. Nature conservation organizations, especially Birdlife Germany, criticize the application of chemical pest



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control to fight against insect infestations. Furthermore, a conflict exists between the state of Brandenburg and the Federal Environmental Ministry about the legal responsibility to regulate the application of chemical pest control in cases of insect outbreaks in the forest.

The state forest administration aims to increase the share of birch trees and oaks to increase the resilience of forest stands (MIL 2011a; MIL 2011b). Birch (*Betula pendula*) is sold to local households for domestic heating purposes (Source: Br10). Disagreement between different actor groups exists about the future role of non-indigenous tree species, such as Douglas fir (*Pseudotsuga menziesii*). Non-native trees are often planted by privately owned-forests (Sources: Br4; Br13; Br14). Actors interested in economically-sound forest management argue that in the less dry areas of the Schlaupetal Douglas fir could increase the resilience of forests. Within the Lieberose area growing conditions are assumed to be too dry for Douglas fir. Disagreements exists in the Lieberose area if oaks or birch shares should be more increased. The White Fir (*Abies alba*) has been suggested as another alternative tree species in the Schlaubeptal. The advocated forest transition towards higher shares of deciduous trees is against the interests of timber industries, who demand mainly timber from coniferous trees.

Conflict exists about the desirable amount of timber stocks within forests. Nature conservation organizations criticise that timber stocks are too low in the forests in Brandenburg. Forests in the state of Brandenburg have an average timber stock of 287m$^3$/ha which is the lowest timber stock in forests compared to all other German states (MLUL 2015). Members of the forest administration and private forestry argue that lower stocks would be desirable to allow better development of single trees and natural regeneration of stands. However, timber stocks have been increasing in the last decade in Brandenburg's forests (MLUL 2015).

In this context, it is also criticized by nature conservation organizations that too much forest biomass is used for energetic purposes. In Brandenburg, 23 combined heat and power stations (cogeneration-plants) and 16 heating stations are running based on biomass (MLUL 2015). Additionally, many private households have timber-based heating systems.

In Brandenburg, large battles took place at the end of World War II, within forests a lot of munition is still lying in the ground, causing a threat to foresters and forest workers (Source: Br6). Within the case study area is a former military site located. At the military site some parts are still not cleared from munitions in the ground, thus any type of soil conversion is not allowed for safety reasons. Therefore, trees cannot be replanted and can only regenerate naturally (Source: Br10). Some parts of the former military site has been transformed to a nature reserve without any active forest management, other parts are managed by the Brandenburg state forest service. A conflict exists between different nature conservation organizations who want to transform the whole former military site area into a nature reserve and actors from forestry and timber industries who prefer multi-functional forest management for the area.

Migrating from Poland, several wolves found a new habitat in Brandenburg. Wolves protected under nature conservation law and are not allowed to be shot. Farmers receive compensation for cattle killed by wolves. However, the protection of wolves receives a lot of criticism and larger parts of the rural population would prefer to have no protection status for wolves (Source: Br5). Furthermore, elks and beaver are invasive species in the CSA, impacting forest management (Source: Br12).



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The forest management in Brandenburg suffers from very high wild game densities, causing severe browsing damages (MLUL 2015). There is ongoing discussion in Brandenburg how to legally regulate hunting best to reduce the wild game. The transition towards forests with higher shares of deciduous trees is limited due to high browsing damages (Sources: Br5; Br8; Br9). Wild boar population is increasing due to warmer winters and high shares of corn production within agricultural land. Hunters oppose a change in hunting strategies to substantially reduce wild game densities. Increasing wolf population requires adaptation of hunting strategies of deer. The natural regeneration of trees is negatively impacted because of high wild game densities (MLUL 2015).

Brandenburg has a strong sawmill industry. Due to new technical opportunities and new wood composites, timber industry is mainly demanding small dimensioned wood. High grade wood became only a niche market. This market development is disadvantageous for the Brandenburg state forest service because of the focus on high grade wood production for the last decade (Sources: Br2; Br5).

Wood is sold to local population who harvest timber by themselves for domestic heating services. Within very remote areas this type of direct timber marketing is of limits because it is difficult to find people who are willing to harvest their timber there and transport it to their homes (Source: Br10). Some timber is sold to professional wood companies from Poland who harvest the timber by themselves. Within the case study area the infrastructure is very good, around 80% of wood is harvested by harvesters, only 20% with motor saws (Source: Br10). Nature conservation organizations argue in favor of reducing harvesting measures with heavy machinery and suggest taking timber out of forests by horse-pulling. Actors from timber industries argue that this would not be possible due to the costs of horse-pulling (Br2).

Harvester cause damages at forest paths which are criticized by the local population. However, in ccomparison to other parts of Germany, conflicts related to recreational use of forests are of relatively low importance, due to the low population density in the area (Sources: Br5; Br10; Br13).

Due to the very bad growing conditions in the case study area, actors from the energy sector argue that forests should be better deforested and the areas should be used for large-scale solar and wind farms. Within the last years, the forest area got slightly reduced and land shares used for energy production were increased (Source: Br5). The bad growing conditions and low productivity of stands is also used as an argument of nature conservation and tourism in favor of extensive forestry with a focus on nature conservation and tourism (Source: Br3).

## 6.2 Instruments and legal competences in Brandenburg's forest politics

The Brandenburg Ministry for Rural Development, Environment and Agriculture and its subordinated agencies have the legal competence for forests within the state. The Brandenburg forest administration is currently is a process of restructuring and the number of employees will be continuously reduced until 2020. This reform caused severe resistance from private and municipal forestry and is heavily criticized by many actors (Sources: Br2-Br13). Brandenburg state laws specify the more general guidelines of the federal laws (Table 13).



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*Table 13: Legally-binding law and soft instruments in Brandenburg, Germany*

| | |
|---|---|
| **Brandenburg** | **Legally-binding law**<br>• Brandenburg Forest Act<br>• Brandenburg Regional Planning Act<br>• Brandenburg Hunting Law<br>• Brandenburg Water Law<br>• Brandenburg Town and Country Planning Code<br>• Brandenburg Land Development Plan<br><br>**Soft instruments**<br>• Brandenburg Forest Days<br>• Brandenburg Nature Conservation Funds<br>• European Agricultural Fund for Rural Development (EAFRD)<br>• Extension of state forest service to private forest owner |
| **Brandenburg – Regional/ Local** | **Legally-binding law**<br>• Regional Development Plans<br>• Regional Planning Programs<br>• District/Land Development Plans<br><br>**Soft instruments**<br>• Regional/ Local Strategy Paper |

Source: adapted from Juerges and Newig 2015a

## 7. Actor analysis: Case study Brandenburg (Lieberose/Schlaupetal)

Forest-related governmental, civil society and market actors were identified based on previous studies on the forest sector in Brandenburg, a web search and interviews with local key actors who were asked to identify further actors relevant for forest use and management in the case study area.

Important actors in the case study area are the state-owned forest enterprise Brandenburg, the Foundation of the monastery Neuzelle, the Foundation Wilderness Reserves Brandenburg, private small-scale and large-scale forest owners, the municipal forest Lieberose, and several sawmills, timber companies and paper mills (e.g. Zellstoff Stendal, Klenk Holz AG, Robeta), and actors from tourism and regional development. The small-scale forest owners started a new association because they did not feel represented by the Brandenburg Forest Owner Association. “Forum Natur” is an umbrella organization in which different land user groups (forestry, fisheries, and agriculture) have organized to have together a better standing in forest politics in competition the nature conservation organizations. Forum Natur became active in forest policy processes in Brandenburg. Furthermore, companies from the renewable energy sector are important competitors for land because of their interest in deforestation to establish large-scale solar and wind turbine farms.



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## 7.1 Interests of actors: Case study Brandenburg (Lieberose/Schlaupetal)

Interests are understood as being *"based on action orientation, adhered to by individuals or groups, and they designate the benefits the individual or group can receive from a certain object, such as a forest"* (Krott 2005). The assessment of interests is based the actor's forest use and advocated positions up to present. As information sources to identify actor's forest use and advocated positions within the case study area qualitative data from document analysis, participatory observations, and interviews with key actors are triangulated.

The interests of individual and collective actors within the case study correspond to the general interests within German forest politics (Table 14). Two major conflict lines could be identified:

1. Actors interested in timber production and processing vs. Actors interested in biodiversity and landscapes conservation. Related to these conflicting interests is also the conflict about applying chemical pest control against insect infestations. Furthermore, there is ongoing discussion, if it is reasonable to take out large forest areas of active forest management as it is done in Brandenburg. Some actors criticize the high public expenditures to subsidize nature conservation.

2. Actors interested in high wild game densities vs. Actors interested in substantially reduced wild game densities. Due to the browsing damages, natural regeneration of trees is limited and it is difficult to increase the share of deciduous trees. However, many (non-local) small-scale forest owners bought their forests mainly for hunting purposes when they come to visit occasionally. Therefore, these forest owners prefer high wild game densities.



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*Table 14: Interests in ecosystem services of selected actor groups (Brandenburg, Germany)*

| | **Forest Owners-Economically-oriented** | **Forest Owners Environmen-tally-oriented** | **Employment in forests** (e.g. labor un-ions, local contractors, forestry experts) | **Timber Industries** (e.g. local sawmills, papermills) | **Hunters** | **(Eco)tourism** | **Nature + environment conservation NGOs** |
|---|---|---|---|---|---|---|---|
| *Provisioning ES* | | | | | | | |
| Wood provision | +++ | + | +++ | +++ | -- | -- | + |
| Game provision | --- | - | -- | --- | +++ | +++ | - |
| Mushrooms | - | + | 0 | 0 | 0 | ++ | + |
| Berries | 0 | + | 0 | 0 | 0 | ++ | + |
| Medical plants | - | 0 | 0 | 0 | - | + | + |
| *Supporting ES* | | | | | | | |
| Biodiversity | --- | ++ | - | -- | ++ | +++ | +++ |
| Habitats | --- | ++ | - | -- | ++ | +++ | +++ |
| *Regulating ES* | | | | | | | |
| Carbon sequestration | -- | ++ | - | -- | 0 | + | +++ |
| Climate regulation | - | ++ | - | - | 0 | + | ++ |
| Water quality | - | ++ | - | - | 0 | + | ++ |
| Pest control | ++ | ++ | - | + | 0 | + | ++ |
| *Cultural ES* | | | | | | | |
| Outdoor recreation | - | 0 | - | - | -- | +++ | + |
| Aesthetics | - | + | - | -- | ++ | +++ | ++ |
| Tourism | - | + | - | - | - | +++ | + |

## 7.2 Power of actors: Case study Brandenburg (Lieberose/Schlaupetal)

Power is defined as "capability of an actor to influence other actors" (Krott et al. 2014, p.35) Based on the actor-centered power approach (Krott et al. 2014) the assessment of power is based on the criteria coercion, incentives, and dominant information.

Following the actor-centered power approach, for each actor type and each interest in ecosystem services and forest functions it is evaluated if power resources have a strong impact (+++), a medium impact (++), or a low impact (+) on forest management (Hubo and Krott 2015).

Public and private forest owner, especially the state-owned forest enterprise Brandenburg, are powerful actors in the case study area, based on their property rights in forests. Furthermore, actors representing traditional forestry dominate the perceptions of sustainable forestry in the public discourse. However, actors preferring environmental, nature, and landscape conservation manage



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large-scale wilderness reserves in the area. Most important is the Brandenburg Wilderness Foundation which is a powerful actor in the case study area. Some nature conservation organizations, especially Birdlife Brandenburg, get involved in conflicts about forest management, for example the use of chemical pest control to defeat insect infestations.

In the case study a strong timber industry exists which sets strong economic incentives for the provision of timber. Companies that are developing large-scale solar and wind turbine farms (e.g. juwi) are important land use competitors for forestry and agriculture in the area. Due to the high financial returns of renewable energy farms this actors can set strong finical incentives for conversion of forest land. Actors from the touristic sector set economic incentives for close-to-nature forest management and dominate discussions about future economic development in the area. The hunting associations impact forest management by allowing high wild game densities against the forest management interests of public and private forest owners. Many local politicians and members of local administrations are also members of hunting associations, resulting in a powerful position of the interests of hunters at a local level. Actors representing employment in forests have only low power resources to impact forest management (Table 15).

*Table 15. Overview about power resources of actors with different interests (Brandenburg, Germany)*

| **Interest in** | **Power resources** | | | |
|---|---|---|---|---|
| | **Means of coercion** | **Incentives** | **Dominant information** | |
| Forest management | **+++** | **+** | **+++** | **Strong** |
| Buying and processing timber | **+** | **+++** | **+** | **Medium** |
| Employment in forests | **+** | **+** | **+** | **Low** |
| Solar and wind energy generation | **+** | **++** | **++** | **Medium** |
| Tourism | **+** | **++** | **++** | **Medium** |
| Hunting | **++** | **++** | **++** | **Medium** |
| Environmental, nature, and landscape conservation | **+++** | **++** | **+++** | **Strong** |

Governmental actors from forest administration and nature conservation are powerful actors in the case study. Furthermore, private forest owners, renewable energy companies, the touristic sector, and timber industries are powerful actors based on private property rights in forests and financial incentives. Actors from civil society also have property rights in forests. Due to the low economic value of forests in the case study area the realization of interests in cultural and ecologic values are supported (Table 16).



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*Table 16. Overview about power resources of different actor types (Brandenburg, Germany)*

| | Means of coercion | Incentives | Dominant information | |
|---|---|---|---|---|
| **Market actors** | **+++** | **+++** | **+++** | **Strong** |
| **Civil society actors** | **++** | **++** | **+++** | **Medium** |
| **Governmental actors** | **+++** | **++** | **+++** | **Strong** |

Actors with interests in wood provision, biodiversity, and habitats for species are most powerful in the case study. Actors interested in regulating ecosystem services, game provision, and aesthetic values have medium power resources to act in forest management. Actors interested in berries, mushrooms, medical plants, or outdoor recreation have low power resources to impact forest management (Table 17).

*Table 17. Overview about power resources of different interests in ecosystem services (Brandenburg, Germany)*

| Interest in | | Means of coercion | Incentives | Dominant information |
|---|---|---|---|---|
| ***Provisioning services*** | | | | |
| Wood | **Strong** | **+++** | **++** | **+++** |
| Mushrooms | **Low** | **++** | **+** | **+** |
| Berries | **Low** | **++** | **+** | **+** |
| Game | **Medium** | **++** | **++** | **++** |
| Medical plants | **Low** | **+** | **+** | **+** |
| ***Supporting services*** | | | | |
| Biodiversity | **Strong** | **+++** | **++** | **+++** |
| Habitat for species | **Strong** | **+++** | **++** | **+++** |
| ***Regulating services*** | | | | |
| Carbon sequestration | **Medium** | **++** | **++** | **++** |
| Climate regulation | **Medium** | **++** | **++** | **++** |
| Water quality | **Medium** | **++** | **++** | **++** |
| Pest control | **Medium** | **++** | **++** | **++** |
| ***Cultural services*** | | | | |
| Outdoor recreation | **Low** | **+** | **+** | **+** |
| Aesthetic values | **Medium** | **+** | **++** | **++** |
| Tourism | **Medium** | **++** | **+++** | **++** |



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## 8. Conclusions case study Germany, Brandenburg (Lieberose/Schlaubetal)

The case study Brandenburg (Lieberose/Schlaupetal) offers socio-economic conditions typical for remote areas within Germany in need of economic development. The case study area is dominated by Pine (*Pinus sylvestris*), managed by selective thinning with highly mechanized harvesting technology. A former military site within the case study has a high value for biodiversity and many rare species occur in the area. In terms of bio-geophysical conditions the case study areas consists of two parts: the Lieberose area with very poor growing conditions and the Schlaupetal which offers site conditions suitable for several tree species and management strategies. Two major preferences for forest management by actors exist in the case study: On the one hand a preference for very extensive forest management with focus on cultural and ecologic ecosystem services. On the other hand a preference for forest management focused on the provision of timber. Powerful actors in the case study Brandenburg are the state-owned forest enterprise, nature conservation authorities, the Brandenburg Wilderness Foundation, Birdlife Brandenburg, large-scale forest owners, e.g. the monastery foundation Neuzelle, and actors from the touristic sector.



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# Ireland – Case Study Barony of Moycullen, County Galway

Anders Lundholm, Edwin Corrigan

*Summary*

Historically, most of Ireland was under forest cover, but due to anthropogenic influences this fluctuated and reduced to less than 1% in the early 1900s (Forest Service 2008). To establish a viable forest industry in Ireland, the government started a large afforestation project, utilising fast-growing exotic softwoods Sitka spruce (*Picea sitchensis* (Bong.) Carr.) and lodgepole pine (*Pinus contorta* Douglas). The main purposes of these forests were to produce timber and create jobs in rural areas with high unemployment. Since the early 1980s, government afforestation has ceased and focus has shifted to encouraging private landowners to afforest their agricultural land in exchange for economic incentives (Forest Service 2015c). In 2012, the forest cover had increased to 10.5% (Forest Service 2013) and the ambition is to bring the forest cover to 17% by 2030 (Forest Service 2000).

Around the turn of the last millennia, social and environmental forest values gained more recognition and legislative protection by the implementation of Sustainable Forest Management (SFM) and EU Habitats and Birds Directives (DAFF 1996, Forest Service 2015b). Many of the land-use conflicts in Irish forestry relate to stakeholders having different opinions on how the three pillars of SFM (economic, social and environmental) should be balanced. The main conflicts are between using forests for timber production and using forests for enhancing and protecting habitats and biodiversity. A lot of biodiversity conflicts focus on how forestry operations impact water quality and freshwater pearl mussel (FPM) habitats and one of the FPM populations that is deemed to have the best chance of surviving in the future is present in the case study area (CSA). There are social conflicts around farmer's unwillingness to avail of afforestation grants, even if it is financially more beneficial, since they think it threatens and diminishes their culture and heritage as farmers. Many actors from government and civil society have expressed that they were not against forestry but didn't like the fact that extensive areas of blanket peat had been planted and that the two most common species in Irish forestry were non-native.

Actors from government are the most powerful since they are implementing legislation and thus have a strong coercion backing. The strongest actor, the Forest service, approve all afforestation grants, felling licenses and fertilisation applications and thus derive a lot of their power from this. The Forest service pay out afforestation grants and road construction grants, this alongside government actors that work to protect the environment give them a strong incentive power. The Forest service is responsible for the national forest inventory and other government actors record species and habitat status, and keep records of protected features (natural and cultural) which makes them very strong in providing dominant information.

Market actors are almost as powerful as government actors but must abide by the law and require approval from the Forest Service in order to get afforestation grants and felling licenses. Over half the forest estate is owned by Coillte (the Irish State forest company), the rest is privately owned, thus land ownership and control of the timber resource is the main source of coercion power for market actors. There are private forest companies that offer forest management services and advice to pri-



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vate forest owners, resulting in substantial incentives and a lot of dominant information. Some market actors (other than Coillte, forest management companies, wood processing industries and private forest owners) are lobby organisations that influence politicians and advocate their interests (Irish Farmers Association, Irish Forestry and Forest Products Association, Irish Timber Grower's Association, Wood Marketing Federation, Irish Timber Council).

Civil society actors are relatively weak, but many of them are interested in protecting the environment so their interest coincide with many government actors. Their desire to enhance and protect species, the natural environment, and Irish cultural heritage is their main incentive since it appeals to morals. Many civil society actors tend to engage large parts of the population, resulting in large networks that can identify and report on issues related to habitat degradation due to forestry operations. They also provide knowledge about species protection, biodiversity and how to enhance the environment. Their engagement with the public can make them very influential in rallying the population around causes when they believe that too drastic policy changes are being made.



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## 9. General country information Ireland

Following periods of deforestation for expanding industries, agriculture to support a growing population and shipbuilding between the 1600s to 1900s, the Irish forest cover was about 1% in the early 1900s (Forest Service 2008). To develop a forest industry in Ireland, the government started a large afforestation project mainly using the fast-growing exotic softwoods Sitka spruce (*Picea sitchensis* (Bong.) Carr.) and lodgepole pine (*Pinus contorta* Douglas). The main purposes of these forests were to produce timber and create jobs in rural areas with high unemployment. Since the early 1980s, government afforestation has declined and focus has shifted to encouraging private landowners to afforest their agricultural land in exchange for economic incentives (Forest Service 2015c). In 2012, about 10.5% of Ireland's land-use was forest (Forest Service 2013) and the goal is to bring the forest cover to 17% by 2030 (Forest Service 2000). The ecological and social benefits that forests provide are recognised in certification (PEFC (Ireland) Ltd 2014) and legislation (Forest Service 2015b). This is reflected in more awareness about sensitive species habitats, increased environmental consideration during forest operations and species diversification towards more native and broadleaf forest.

The Irish forest area is made up of 74.2% conifers and 25.8% broadleaves, Sitka spruce is planted on 52.5% of the forested area and is the most important commercial tree species (Forest Service 2013). Coillte, the State forest company and largest landowner in Ireland, owns 53.2% of the Irish forest estate, 34% is private forest that has been established through afforestation grants and 12.8% is private forests that weren't established through afforestation grants (Forest Service 2013).

Ireland's warming ocean currents means a relatively mild climate throughout the year with a high level of rainfall. These factors mean that forest growth rates are very high in Ireland when compared to many areas of Europe. Conifer forests can produce up to 34 $m^3 ha^{-1} yr^{-1}$. The high level of rainfall has contributed towards peat formation in Ireland; basin peat and blanket peat.

Basin peat forms in post-glacial shallow lakes, fed with nutrient rich water in areas with moderate rainfall and are mainly found in the midlands of Ireland (Renou and Farrell 2005). After years of plant parts decomposing along the shore, the raised bog eventually covers the entire lake. In the past, basin peats were historically harvested for fuel, they can be 6-7 m in depth and depending on peat depth, can be suitable for a wide range of species (Horgan et al. 2003).

Blanket peat is mainly found in high elevation areas, especially in the West of Ireland. Blanket peat forms when iron leeches down into the mineral soil and forms an ´iron pan´, which is almost impenetrable for water (Horgan et al. 2003). The soil then becomes waterlogged and sphagnums start growing, forming a thick layer of peat after many millennia that can be up to 2.5 m tick (Renou and Farrell 2005). Due to the blanket peat being nutrient poor, the suitability of species that can grow into a commercial crop is limited to Sitka spruce and lodgepole pine, depending on peat depth (Horgan et al. 2003). Thanks to mechanisation, both raised and blanket peat were extensively harvested for fuel in the early 20$^{th}$ century. Due to peatland's unsuitability for agriculture, the Irish state purchased a lot of cheap, high elevation blanket peat land for afforestation, the issue with blanket peats' nutrient deficiency was overcome by applying huge amounts of phosphatic fertiliser (Renou and Farrell 2005).



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The traditionally production oriented forest industry with fast growing exotic conifers and the afforestation on blanket peat appears to be the main sources of land-use conflicts in Irish forestry (Bonsu et al. 2015). Implementation of the EU Habitat and Bird Directives into the Irish Wildlife Acts at the turn of the last millennia considerably strengthened the legislative protection of biodiversity rich areas and the environment within Ireland (Forest Service 2000, 2015b).

Access to forest can be limited in Ireland; the public has no legislative right-of-way to access neither public nor private forest. However, Coillte have a company policy that allow the public to access all of their forests on foot, they also have many designated recreational forests with maintained walking paths and parking lots. To access many scenic areas in Ireland (i.e. for the purpose of hiking, biking, etc.), it is often necessary to walk through a forest, so there is a lot of interaction between these types of recreationalists and forests.

## 9.1 Forestry conflicts in Ireland

The Department of Agriculture, Food and Forestry (Now Department of Agriculture, Food and the Marine) published a forest strategy named *Growing for the Future (DAFF 1996)* in 1996. This strategy was an action towards the decision to adapt Sustainable Forest Management (SFM). Many of the current forest conflicts exist because there are many organisations that have varying management objectives on how Irelands' forests should be managed. Ireland's forest estate was established with a timber production focus and since SFM was adapted, there is a perception that Ireland does not fulfil the SFM expectations. New environmental requirements are being implemented to increase biodiversity and habitat protection in forests. Since rotation ages in Irish forestry can range up to 70 years, these new requirements are applied as grandfather clauses and the environmental requirements are implemented when operations are scheduled in the stand. This remains a source of forest conflicts in Ireland because people see the legacy production forest and expect new environmental rules to be implemented. Many of the current forestry conflicts in Ireland are presented in Table 18.

## 9.2 Forestry legislation and soft policy Instruments

The Irish Forestry act was implemented in 1946 and amended in 1988. It is the most relevant legislative text for the Irish forest industry. The Forestry act deals with issues such as felling licenses and how afforestation grants are granted. The Wildlife act was implemented in 1976, but as mentioned above it had few implications on forestry before the EU Habitat and Bird Directives were added to the Wildlife act in 2000. The Wildlife act of 2000 meant that a lot of habitat areas for birds, land and marine animals received legislative protection and the forest industry had to operate with more environmentally sensitive measures. In terms of ecosystem services, the Occupiers Liability Act 1995 is relevant for recreation and protects the landowner from being liable if recreationalists get injured on his/her property. A list of some legislative text and soft instruments affecting forestry in Ireland is presented in Table 19.



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*Table 18. Current forestry conflicts in Ireland*

| Conflict group | Conflict |
|---|---|
| Biodiversity | Forestry operations vs Freshwater Pearl Mussel and Water quality |
| | Forestry activities vs hen harrier nesting areas |
| | Production forest vs forest for biodiversity |
| | Low biodiversity values from non-native trees |
| | Degradation and loss of blanket peat for afforestation |
| Infrastructure and energy | Timber transports vs rural road usage |
| | Wind farms vs forestry vs communities |
| | Forestry has low contribution to bioenergy usage and local jobs due to wood processing plants not being located near much of the forest estate |
| Forest structure | Monocultures of Sitka spruce vs native forest species and mixed species forests |
| | Sustainable forest management practices vs forest certification |
| | Increasing forest cover to meet national goal vs farmers concern about loss of agricultural land and protecting their identity as farmers |
| | Uneven age distribution of the national forest estate may cause issues in providing even supply of resources to wood processing industry |
| | Forest located on blanket peat will not produce merchantable timber if not fertilised vs fertilisations impact on water quality |
| | Extensive use of non-native species vs using native woodland species |
| | Expensive to plant broadleaves due to browsing from deer |
| Civil society involvement in forestry | Access to and demand for forest recreation, hunting and angling rights |
| | Sustainable forest management practices vs stakeholder engagement and<br>involvement in consultation process |



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*Table 19. Legislative acts and soft instruments affecting forestry in Ireland*

| |
|---|
| Legislative acts concerning forestry in Ireland<br>• Forestry Act 1946 and 1988<br>• Wildlife Acts 1976 and 2000<br>• Roads Act 1993 to 2007<br>• Waste Management Acts 1996 to 2011<br>• Litter Pollution Acts 1997 to 2009<br>• Environmental Protection Agency Act 1992<br>• Local Government (Water Pollution) Acts 1977-1990<br>• National Monuments Acts 1930-2004<br>• Occupiers Liability Act 1995<br>• Planning and Development Acts 2000 to 2011 |
| Soft Instrument concerning forestry in Ireland<br>• Forestry Programme 2014-2020<br>• Code of Best Forest Practice (2000)<br>• Irish National Forest Standards (2000)<br>• Environmental Guidelines (2000)<br>• Afforestation Grant & Premium Schemes 2014-2020<br>• National Peatland Strategy (2015)<br>• PEFC<br>• Growing for the future (1996) |



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# 10. National actor analysis: Ireland

Information for the case study actor analysis was gathered from websites of organisations, documents and interviews from INTERGRAL, from the FastForest project and by conducting our own interviews with a wide range of different stakeholder.

## 10.1 Interests of actors: National level

The interest of forestry actors was based on the main use of their forest or their advocated position on forest utilisation (Table 20). Interests are ranked in three levels of positive interest (+++, ++, +) neutral (0), and three levels of disinterest (---, --, -). One point to note is that the main interest of stakeholders was assessed and thus forest managers interested in producing timber are assessed mainly from this stand point. In this study complying with legislation and environmental guidelines doesn't make a forest management company interested in nature conservation. It is worth mentioning that Coillte does more for recreation and biodiversity than the minimum legal requirement because they need to set a good example since the Irish state is their main shareholder and to make forestry more acceptable in the eyes of the public.

Seven actor groups were identified to consolidate the results of the actor analysis. The groups, are forest managers, the wood processing sector, state regulators, wind farm developers, outdoor recreation non-governmental organisations (NGOs), nature and environment conservation NGOs, and rural development.

Forest managers and wood processors, are both mainly interested in the provision of wood but forest managers have more interests and disinterests in other ecosystem services that doesn't concern the wood processing sector. State regulators are interested in almost everything and try to find a balance between promoting wood production and sustaining the environment. Wind farm developers are only interested in wind energy that can be harnessed in high elevation areas where much of the forest estate is located.

Outdoor recreation NGOs are interested in enjoying the outdoors and want roads and hiking trails to access recreation areas and enjoy aesthetic sceneries, they prefer mixed forests with high biodiversity over production monocultures, water quality for angling and game provision for hunting. Nature and environment conservation NGOs have similar interests to the outdoor recreationalists but there is more emphasis on biodiversity, preserving habitats and controlling invasive species rather than recreation. Rural development used to have a lot of interest in job creation when the forest industry was established but today their interest in forestry is more about recreation and tourism development.



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*Table 20. Interests of different actor groups in Ireland*

| NATIONAL actor groups interest in different ecosystem services | Forest Managers | Wood processing sector | State Regulators | Wind farm developers | Outdoor Recreation NGO | Nature and Environ-ment Conservation NGO | Rural Development |
|---|---|---|---|---|---|---|---|
| Provisioning ES | | | | | | | |
| Wood provision | +++ | +++ | ++ | - | - | -- | + |
| Game provision | -- | 0 | + | 0 | ++ | + | 0 |
| Wind energy | - | 0 | 0 | +++ | -- | + | + |
| Supporting ES | | | | | | | |
| Biodiversity | - | 0 | +++ | -- | ++ | +++ | + |
| Habitat for species | - | 0 | +++ | - | ++ | +++ | + |
| Regulating ES | | | | | | | |
| Carbon sequestration | + | ++ | +++ | --- | ++ | ++ | 0 |
| Climate regulation | ++ | 0 | + | + | + | +++ | 0 |
| Water quality | - | 0 | ++ | 0 | +++ | +++ | 0 |
| Pest control | ++ | + | + | 0 | ++ | +++ | 0 |
| Cultural ES | | | | | | | |
| Outdoor Recreation | + | 0 | + | -- | +++ | + | + |
| Aesthetic values | - | 0 | + | - | +++ | + | + |
| Tourism | 0 | 0 | 0 | - | + | 0 | ++ |

## 10.2 Power of actors: National level

Three different power sources were used in assessing the power of actors they are coercion, incentives, and dominant information.

Coercion refers to altering behaviour of other actors by force, bluffing with force that is non-existent, enforcing legislation, ignoring legislation (Krott et al. 2014).

Incentives is altering the behaviour of other actors with advantages or disadvantages. Incentives could be providing financial benefits like grant payment schemes, a higher timber price from certified forests, providing machinery, tree seedlings or labour. Appealing to moral, social conventions and the welfare of future generations is also considered an incentive (Krott et al. 2014).

Dominant information refers to altering behaviour of other actors by providing unverified information that is trusted, e.g. a professional forester advising a private land owner on how manage his



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forest or the forest administration publishing results of the latest national forest inventory (Krott et al. 2014).

Power is evaluated at three levels low (+), medium (++), and strong (+++) and is based on the identified power tools of each actor, which was then aggregated into actor interest groups. Due to the aggregation, groups that involve more actors are inherently stronger than a group involving only one or a few actors. Although this reflects the forest policy landscape in Ireland, table 21 should only be used a rough guideline.

The actor analysis shows that the most influential actor groups are the forest managers and the state regulators (Table 21). The forest ownership landscape is slowly changing in Ireland but most of the forest estate is owned by one actor, Coillte. Besides being the largest landowners, Coillte derives its power from controlling a lot of the wood supply, having a lot of experience in forest management, owning seedling nurseries and they were historically very involved in forest research. Along with Coillte there are private forest owners and several forest lobbying organisations promoting forests for timber production.

State regulators have their strongest power source from legislation and implementing the EU Habitat and Bird Directives meant a big change for the Irish forest industry. Additionally, the state agencies have dominant information through the national forest inventory, collecting data on the status of threatened species and mapping out areas that should be protected. Financial incentives to afforest and to establish roads for timber extraction are offered by the Forest Service, and immaterial incentives through appealing to morals by protecting species.

The wood processing sector, wind development, rural development, environmental NGOs and recreation NGOs have relatively little power in influencing forest policy compared to forest managers and state regulators. However, recreation NGOs and environmental NGOs can be very influential in rallying large parts of the population around certain causes (often drastic changes) to promote their stand point and influence policy makers.

*Table 21. Actor groups and their relative strength of power in Ireland*

| National actor groups | Coercion | Incen-tives | Dominant information | Power resources of the actor group |
|---|---|---|---|---|
| Forest Managers | ++ | +++ | +++ | Strong |
| State Regulators | +++ | +++ | ++ | Strong |
| Wood processing sector | + | ++ | + | Low-Medium |
| Wind Development | + | + | | Low |
| Environmental NGO | + | ++ | ++ | Low-Medium |
| Recreation NGO | 0 | + | + | Low |
| Rural Development | 0 | + | | Low |



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Actors can be aggregated into groups of government, market, and civil society to compare their inherent power structures (Table 22). Coillte, being semi-private, is essentially split between being a government and a market actor. Besides this, all government actors are essentially state regulators, all market actors are forest managers and wood processors, and civil society are the environmental and recreation NGOs. The power structure shows that government actors have the most power, followed by market actors and civil society has the least power. This power structure is the result of increased nature conversation and environmental consideration that has recently been introduced in Irish forestry, but government actors like the Forest Service retains a lot of power since all planting and felling operations carried out in Ireland requires their permission.

*Table 22. Power structures of actors in government, market and civil society in Ireland*

| Actors | Means of Coercion | Incentives | Dominant information | Power resources of the group |
|---|---|---|---|---|
| Government | +++ | +++ | ++ | Strong |
| Market | ++ | ++ | + | Medium |
| Civil society | + | + | + | Low |

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# 11. Case Study Actor Analysis: Barony of Moycullen

Information for the case study actor analysis was gathered from websites of organisations, documents and interviews from INTERGRAL, from the FastForest project and by conducting our own interviews with a wide range of different stakeholder.

## 11.1 General Case Study Information

The barony of Moycullen was chosen as the Irish Case Study Area (CSA). The barony is located predominantly in Connemara, in the county of Galway in Western Ireland. The CSA is 81 818 ha in size, has a population of roughly 22 000 people (Central Statistics Office 2011). There is 12 835 ha of forest, putting forest cover at 15.7% which is higher than the national forest cover at 10.5%. Coillte own 77.9% of the forest land while 22.1% is private forest. The CSA encompasses the Cloosh Valley Forest, Ireland's largest continuous forest. Much of the CSA consists of blanket bogs and peat harvesting has taken place in some areas. Much of the CSA is nutrient-poor, which is a limiting factor for species selection; 53% of the forest is spruce (mainly Sitka spruce), 43%is pine (mainly Lodgepole pine) and the remaining 6% of forest consist of other species, mainly of larches (Coillte 2009).

The CSA is located along the coast and thus wind exposure is an important aspect to consider for forests management, especially since peat doesn't provide much rooting stability for trees. Currently there is a large wind park being constructed, which will have 69 wind turbines. Along the coast and along the shores of there is a lot of agriculture, mainly pasture land and it's here that most of the private forest is located. The current state owned forest was mainly afforested in the 1960s and 1970s (Coillte 2009) and many of these stands are in their second rotation. The private forest is younger, mainly planted since the 1980s (Forest Service 2015a, c).

The CSA contains eight areas protected by National Parks and Wildlife Service: these are the Leam West Bog Nature Reserve, the Lough Corrib Special Area of Conservation (SAC), the Ross Lake and Woods SAC, the Gortnandarragh Limestone Pavement SAC, the Lough Corrib Special Protection Area (SPA), the Connemara Bog Complex SPA, the Moycullen Bogs Natural Heritage Area (NHA), and the Oughterard District Bog NHA. The Lough Corrib SAC (and the adjoining Oughterard watershed) is one of the 19 SACs in Ireland with populations of Freshwater Pearl Mussels (FPM) and one of the three identified SACs which has potential of ensuring the long-term survival of the FPM population.

The CSA is located near Ireland's fourth largest population center Galway, so there are many potential local outdoor recreationalists. Recreation activities include mountain hiking, hill-walking, mountain biking, pony riding, angling and hunting. The CSA is in Connemara which is a popular destination for tourism.

The combination of tightening forest regulations, forest that have been managed for a relatively long period (in an Irish context), the presence of viable FPM habitat, recreational usage and the potential for wind farm development makes the Barony of Moycullen an interesting CSA for ALTERFOR.



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## 11.2 Interests of actors: Case study level

The interest of forestry actors was based on the main use of their forest or their advocated position on forest utilisation (Table 23). Interests are ranked in three levels of positive interest (+++, ++, +) neutral (0), and three levels of disinterest (---, --, -). One point to note is that the main interest of stakeholders was assessed and thus forest managers interested in producing timber are assessed mainly from this stand point. In this study, complying with legislation and environmental guidelines doesn't make a forest management company interested in nature conservation. It is worth mentioning that about 30% of the forest in the CSA has some protection due to many SACs and SPAs, compared to the 15% protected forest in Ireland. However, since this high number is due to formally protected areas we assume that the forest managers are not more interest in nature protection than elsewhere in Ireland.

The seven actor groups mentioned in the National level actor analysis are also present in the CSA.

Forest managers and wood processors are mainly interested in the provision of wood but forest managers have more interests and disinterests in other ecosystem services that do not concern the wood processing sector. One difference is that due to the unsuitability of sites in the CSA for broadleaf species, forest managers are not really concerned about game provision as deer cause little browsing damage on conifers. Wind power causes fewer issues for forest managers in the CSA than in the rest of Ireland since the combination of blanket peat and high windthrow risk limit the top height of trees thus there is no conflict between tree height and wind power.

State regulators are interested in almost all ecosystem services and try to find a balance between promoting wood production and sustaining the environment, so that the requirements of SFM are met. Due to very low population densities and many sensitive habitats in the CSA, their interest in nature protection is higher in the CSA than in Ireland in general. Wind farm developers are interested in wind energy that can be harnessed in high elevation areas where much of the forest estate is located.

Outdoor recreation NGOs want roads and hiking trails to access recreation areas and enjoy aesthetic sceneries, they prefer mixed forests with high biodiversity over production monocultures. Hunters want access to shooting rights and higher game densities for game provision while good water quality is necessary for angling. Nature and environment conservation NGOs have similar interests to the outdoor recreation NGOs, but there is more emphasis on biodiversity, preserving habitats and controlling invasive species rather than recreation. Rural development used to have a lot of interest in job creation when the forest industry was established but today their interest in forestry is more about recreation and tourism development.



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*Table 23. Interests of different actor groups in the barony of Moycullen*

| CASE STUDY AREA | Forest Managers | Wood processing sector | State Regulators | Wind farm developers | Outdoor Recreation NGO | Nature and Environ-ment Conservation NGO | Rural Development |
|---|---|---|---|---|---|---|---|
| Provisioning ES | | | | | | | |
| Wood provision | +++ | +++ | ++ | 0 | - | -- | + |
| Game provision | 0 | 0 | + | 0 | ++ | + | 0 |
| Wind energy | - | 0 | 0 | +++ | -- | + | + |
| Supporting ES | | | | | | | |
| Biodiversity | - | 0 | +++ | -- | ++ | +++ | + |
| Habitat for species | - | 0 | +++ | - | ++ | +++ | + |
| Regulating ES | | | | | | | |
| Carbon sequestration | + | ++ | +++ | --- | ++ | ++ | 0 |
| Climate regulation | ++ | 0 | + | + | + | +++ | 0 |
| Water quality | - | 0 | ++ | 0 | +++ | +++ | 0 |
| Pest control | ++ | + | + | 0 | ++ | +++ | 0 |
| Cultural ES | | | | | | | |
| Outdoor Recreation | + | 0 | + | -- | +++ | + | + |
| Aesthetic values | - | 0 | + | - | +++ | + | + |
| Tourism | 0 | 0 | 0 | - | + | 0 | ++ |

## 11.3 Power of actors: Case study level

The three power sources used in assessing the power of actors are coercion, incentives, and dominant information.

Power is evaluated at three levels low (+), medium (++), and strong (+++) and is based on the identified power tools of each actor, which was then aggregated into actor interest groups. Due to the aggregation, groups that involve more actors are inherently stronger than a group involving only one or a few actors. Although this reflects the forest policy landscape in Ireland, Table 24 should only be used a rough guideline.

The actor analysis shows that power structure in the CSA is very similar to the national power structure; the most influential actor groups are the forest managers and the state regulators (Table 24). Proportionally Coillte owns more of the forest land in the CSA compared to the national forest estate



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and the CSA has a higher forest cover than Ireland in general. This also means that the forest managers have relatively less power in the CSA while state regulators, recreation and environmental NGOs have more power. There are three explanations to this. Firstly, the watersheds with viable populations of FPM, SACs and SPAs in the CSA have restricted forest operations, more protected forest, open bog and waterbodies. Secondly, many organisations stated that blanket peat should never have been planted in the first place, so the controversy surrounding blanket peat forestry also plays a role in diminishing the forest manager's power in the CSA. This issue is not unique for the CSA since blanket peat forestry is a common feature along the Atlantic seaboard in western Ireland. Thirdly, the proximity of the CSA to Galway and Connemara means that there are many recreationalists and tourists in the area whom voice their concerns about forest management. These concerns are often in relation to clearfelling, rutting from machinery and requesting more broadleaf and mixed forest area and landscape amenity. Many affluent individuals, working in Galway, live in the CSA and might not necessarily understand the economic benefits of forestry.

*Table 24. Actor groups and their relative strength of power in the barony of Moycullen, Ireland*

| CSA actor groups | Coercion | Incentives | Dominant information | Power resources of the actor group |
|---|---|---|---|---|
| Forest Managers | ++ | +++ | +++ | Strong |
| State Regulators | +++ | +++ | ++ | Strong |
| Wood processing sector | + | ++ | + | Low-Medium |
| Wind Development | + | + | | Low |
| Environmental NGO | + | +++ | +++ | Medium |
| Recreation NGO | 0 | +++ | ++ | Medium |
| Rural Development | 0 | + | 0 | Low |

Actors can be aggregated into groups of government, market and civil society to compare their inherent power structures (Table 25). Coillte, being semi-private, is essentially split between being a government and a market actor. Besides this, all government actors are essentially state regulators, all market actors are forest managers and wood processors, and civil society are the environmental and recreation NGOs. The power structure shows that government actors have the most power, followed by market actors and civil society tie with equal amounts of power. This power structure is the result of increased nature conversation and environmental consideration that has recently been introduced in Irish forestry, but government actors like the Forest Service retains a lot of power since all planting and felling operations require permission from them.



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*Table 25. Power structures of governmental, market and civil society actors (Barony of Moycullen, Ireland)*

| Actors | Means of Coercion | Incentives | Dominant information | Power resources of the group |
|---|---|---|---|---|
| Government | +++ | +++ | ++ | Strong |
| Market | ++ | ++ | + | Medium |
| Civil society | + | ++ | ++ | Medium |

## 12. Conclusions

Forestry is a new concept in large parts of Ireland; following heavy deforestation during the renaissance and industrial revolution the forest cover was about 1% in the early 1900s. Large scale afforestation was initially done by the state to establish a production oriented forest industry. The forest cover is about 12% and all afforestation is now done on private land with grant payments as an incentive. Social and ecological values have been acknowledged with the adaptation of Sustainable Forest Management and implementation of EU Birds and Habitats Directives. However, exotic fast-growing conifers are still the dominating species in Irish forestry and the cause for most forest policy conflicts. Some of the most common conflicts both nationally and in the CSA, relate to afforestation of previous bog habitat, forestry impact of FPM habitat and water quality, the use of non-native conifers rather than native species and broadleaves, the use of clearcuts and forestry impact on visual amenity.

The interests of actors differ whether they belong are state regulators, market actors and civil society. Market actors are typically interested in managing forests for financial revenue and provision of wood fibre, civil society are more concerned about recreation and biodiversity. State regulators are interested in finding an even balance between provisioning of wood fibre but also promote biodiversity.

Nationally, state regulators have the most power, especially since they enforce and can make legislation. Market actors have medium power, and civil society have low power. Market actors have a lot of power from land ownership and incentives from doing business. Civil society power comes from appealing to morals and providing information about recreation and biodiversity. Market actors have slightly less power in the CSA while state regulators and civil society stronger because of the high amount of sensitive ecological features, mainly because of the FPM.



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## Italy- Case Study the North East of Veneto Region

Mauro Masiero, Davide Pettenella

*Summary*

Italy has experienced a radical change in forest cover that doubled in the last 50 years, in the social demands for forest products and services and in the structure of the wood-working industry, but its institutional organizations, mode of forest governance and the political- legal frameworks have only changed slightly. The objectives and contents of Italian forest policy have slowly evolved over time, but most of the Italian formal institutions connected with the forest sector, at all levels, have been unable to reform and adapt themselves to the new challenges posed by the changing environmental, social, economic and political scenarios.

Although the concept of multifunctional forestry is quite traditional and well established in Italian forestry, the momentum recently gained by ecosystem services is creating conflicts between different actors based on varying priorities between different forest ecosystem services and how to exactly implement multi-functional forestry. This is emphasized by traditional conflicts between State (i.e. central) and Regional Authorities, poor vertical and horizontal integration in forest policies and responsibilities, and the more recent conflicts between non-traditional (e.g. environmentalists) and traditional actors. Recent budget cuts and institutional re-arrangements due to the spending review have also contributed to exacerbating conflicts.

The conflicts and the main problematic issues discussed include:

- proactive forest management vs. abandonment of marginal areas (e.g. in mountainous areas),
- forest ownership fragmentation and consequent limitations (abandonment, lack of profitability…) and needs to favor networking/association of smallholders,
- increasing gap between the primary sector (forests and forest management) and the industrial sector (wood and paper),
- industrial vs. energy use of wood,
- the role and valorization of non-wood forest products and services often with a public-good nature (natural capital accounting and mechanisms for establishing payments for ecosystem services),
- non-traditional (civil society and private sector) vs. traditional public actors and ways to facilitate dialogue and cooperation among them (e.g. innovative private-public partnerships),
- visibility of the forest sector and knowledge/perception by the general public.

Traditional (public) forestry actors still maintain a central/strong role and a powerful position to influence forest policy. Government authorities at both national and meso-levels are still the most powerful actors in forest management and stakeholders. The State Forest Service (CFS) -though recently reformed and merged with a military police corps- is probably the most well-known entity in the forest sector by the general public. Although some exceptions exist, the role and influence of other actors, including non-public ones, at the national level are much more limited and can mostly be perceived at a lower scale (sub-regional, local). Even when non-public actors might have enough power to influence forest policies, they often have no strong interest in doing so. This is the case for example of the main wood and paper companies that largely depend on wood imports. One of the



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most dynamic segments within the forest sector is the one related to bioenergy, although conflicts exist both within the segment itself (e.g. medium-small scale plants vs. big plants, heating/combined heating and power generation vs. power generation, etc.) and with other actors/segments (e.g. industrial vs. energy use of wood). Private forest owners are almost voiceless because there are not national wide associations of forest owners, moreover Italy has no representative in either of the two most important associations of private forest owners in Europe. Public forest owners are loosing power (due, among other issues, to budget cuts) and they lack adequate representativeness and coordination at both national and international level. Forest enterprises suffer similar conditions, although a new organization to give them a common representation at national scale has been recently created and is gaining visibility. Environmental NGOs are quite active but have a marginal role in forest policy and forest management at the national scale. Finally organizations dealing with products different from wood are gaining relevance but still they are more active at sub-national (and sometimes very local) level. This is the case for example of wild forest products production and trade, as well as for organizations dealing with services delivered by forests (e.g. carbon sequestration, tourism and recreation, mountain therapy, etc.). Although a growing number of initiatives are emerging, in most of cases they are still at a preliminary stage and poorly coordinated. Best practices and models exist, but they often remain isolated and with limited capacity to influence policy and decision-making.

The case study area -in the North East of Veneto Region, Northern Italy- represents an interesting example of living "laboratory" for this new issues and initiatives and for testing innovative forest management solutions. It consists of lowland forests close to urban areas (north of Venice), with no prevalent productive function but with huge potentialities in terms of other functions and services: wild forest products production (mostly truffles and pine seeds), biodiversity conservation, carbon sequestration and, above all, cultural services (tourism and recreation). The area is visited every summer by about 3 millions of tourists and, starting from 35 years ago, has been subject to a large afforestation program. Forests are owned by local Municipalities, while management activities are carried out through various forms: direct management by Municipalities, management agreement with private companies or not-for profit entities, rent to private, etc. Forest owners and managers are supported by the Lowland Forest Association (*Associazione Forestale di Pianura*, AFP), a unique case of private-public cooperation in lowland forest management in Italy. AFP has been established to help active forest management in the area, encourage positive impacts for locals and enhance the dialogue with multiple stakeholders. The area has recently been FSC certified, being the first case in Veneto, where PEFC certification is traditionally supported by Regional Public Forest Authorities. Management operations are not just financed through Municipal budget, but also through funds raised by the Lowland Forest Association via other sources, such as the Rural Development Program and private investors that are increasingly interested in investing in forest projects to offset their carbon emissions, mitigate their environmental impacts, improve their image, etc. Ongoing and planned investments aim to increase the capacity of the forests to deliver ecosystem services, including cultural ones: all these services are taken into account into the newly developed and approved forest management plan for the area.

Innovative management solutions however have to face traditional and/or emerging actors. These include both public actors (Regional Authorities, Forest Service) and private ones. Although management remains challenging, new models and arrangements are being developed. This includes for ex-



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ample the appointment of a representative of local environmentalist into the Board of the Association and the recent agreement with the local Hunting Association for the management of a forest area and the prevention of poaching activities. Hotel managers and the tourism industry are also being involved as the managed area increases.

Due to proximity to urban areas and the large number of visitors, as well as to the specific ecological (and socio-economic) features of local forest resources (forest remnants, new plantations, periurban parks, etc.) management operations are not standardised and are mostly oriented to facilitate the evolution towards more natural and stable forest ecosystems. This also leaves managers the opportunity to decide future operations based on the progress of development processes and to decide the type and intensity of management operations according to specific conditions. From a purely technical point of view there is not a fixed management model to replicate and much is left to case-by-case decisions made by the forest manager(s) within the framework of a broader strategy set-up through the management plan, and based on coordination with relevant stakeholders. In the short to medium term, selective systems appear as the only viable forest management solutions. Nonetheless it is worthwhile underlining that new agreements and arrangements (both formal and informal) and networking/cooperation among different actors are part of these new management models and likely represent the most relevant and challenging component of future decision making for the management and development of the area.



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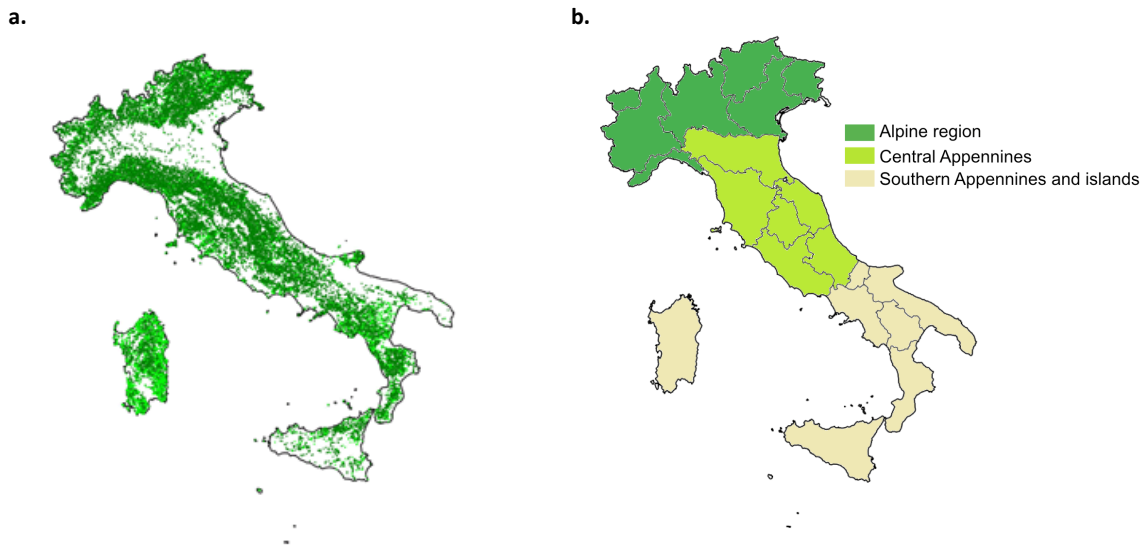
## 13. General country information Italy

Italy hosts a total forest area of about 10.9 million hectares (ha) -i.e. 9.3 million ha Forests and 1.6 million ha Other Wooded Lands (OWLs) (CFS, 2015), that corresponds to a forest cover of about 36% of the total national area (Figure 1a). Forests are mostly located in mountainous or hilly areas (95%), while lowland forests mostly consist of industrial poplar plantations and arboriculture systems, with very limited semi-natural forest remnants. During the last 50 years the forest cover has doubled (Secco *et al*., 2017).

Forest resources are quite different depending on their geographical position, in the Alpine (North) or Apennine (Centre or South and Islands) macro-regions (INFC, 2005) (Figure 1b). For example Forests are mostly concentrated in the Alpine (38%) and Central Appennines (36%) macro-regions, while the Southern Apennines and Islands' macro-region hosts 62% of OWLs. High forests prevail in the North (Alpine macro-region) (>50%). Both the growing stock per hectare and mean annual increment per hectare vary significantly. They range, respectively, from a minimum of 56.4 $m^3$/ha and 2.0 $m^3$/ha in Sardinia (Southern Appennines and Islands macro-region) to a maximum of 312.4 $m^3$/ha and 6.1 $m^3$/ha in the Autonomous Provinces of Trento and Bolzano (Alpine macro-region). Forests with a higher quality (i.e. higher production potential) are more frequently covered by forest management plans (e.g. up to 94% in the Autonomous Province of Bolzano, in the Alps).

*Figure 1. Forest distribution (a) and geographical macro-regions (b) in Italy*




Pure broadleaves forests correspond to about 68% of Forests and 52% of OWLs; pure conifer forests represent about 13% of total Forests, being mostly concentrated in the Alpine region (76%).

About 42% of forests are managed as coppices (mostly as coppice with standards), whereas high forests represent 36%, and the remaining proportion is not classified or consists of very specific management types (e.g. cork oak or chestnut forests). Coppices predominate in Central and Southern



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Italy, whereas most of the productive high forests (mainly coniferous ones) are in the North-Eastern part of the Country.

About 66% of Italian forests are privately owned, mostly consisting of small forests owned by individuals (79%): the final result is an extreme forest ownership fragmentation that affects forest management practices and profitability. The remaining 34% forests are public, with a prevalent role played by local municipalities (65.5%) (INFC, 2005).

Despite the relatively large amount of forest cover, for various reasons Italian forests have been systematically underutilized over the years. Today, only 24% of the net annual increment is harvested, i.e. less than half of the average figure at EU level (56%). Over about 50 years (1950-2007) the forest cover has doubled, wood consumption tripled, while the economic value of domestic timber production has halved. The expansion of forest area is one of the most relevant land use changes currently underway in the country (+6.2% in the last 10 years, from 2005 to 2015; +0.6% in the last year), mainly associated with farmland abandonment and natural forest expansion (Secco *et al*., 2017).

The forestry and logging sector share on the national Gross Domestic Product (GDP) has reduced considerably in the last decades and remains negligible (it accounts for about 0.05% of national GDP). The whole forest sector share (i.e. including the contributions of wood industry and pulp and paper industry) has had similar trends. Also the employment (formal sector) and the number of enterprises in the forest sector have reduced significantly. Notwithstanding a general decrease in overall wood imports in recent years, Italy remains one of the major European wood importers, accounting for 15% of the EU sawnwood imports in 2013. As for the industrial wood, the self-sufficiency rate is only 17% (with 4.7 millions of cubic meters of production of raw material and sawnwood and 14.2 millions of cubic meters of consumption) (UNECE FAO, 2015). These data show the structural disconnection between the use of domestic forests and the national wooden-based industrial activities (Ciccarese *et al.*, 2014), which is associated to a lack of wood mobilization, land abandonment and very limited active management. Despite the fact that about 65% of domestic removals consist of wood for energy, Italy is the world main importer of firewood and the fourth largest importer of wood residues, particles and chips, as well as the first European importer of pellets for residential use. The disconnection between national forests and wood and paper industry also reflects on forest certification data: while Italy ranks in the first 3 to 5 positions globally in terms of number of FSC and PEFC chain of custody certificates, certified forest areas remain limited (about 820,000 ha PEFC certified and 45,000 ha FSC certified) (FSC, 2016; PEFC, 2016).

Domestic industrial wood production (i.e. removals) is mostly concentrated in two clusters: (i) more than 70% of softwood industrial production is provided by the three North-Eastern regions (Trentino Alto-Adige, Veneto and Friuli Venezia Giulia); and (ii) about 50% of hardwood industrial production is provided by poplar plantations in the Po Valley (North).

Domestic forest removal trends have been mostly influenced by the market for wood for energy rather than by the demand for industrial timber. Industrial timber removals remained more or less stable until the end of the last Century, when a downturn started. On the other hand the absolute and relative incidence of wood for energy among total removals increased, especially in areas where coppices prevail. This has been interpreted as a general de-specialization trend within the Italian



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forest sector favored by several factors, including (among others) lower complexity of firewood production (e.g. lower mechanization level), viability for smallholders, large firewood demand at local scale (especially in mountainous areas), the existence of a more informal market, etc.

Apart from wood and wood-based products Italian forests deliver multiple services that are not (or not fully) reflected into national accounts. A major role is played by non-wood forest products (or Wild forest products), such as mushrooms, truffles, resin, fruits, etc. While in many cases economic activities related to these products remain largely informal, there is an increasing number of cases where wild product production became structured and more important than wood production in terms of direct and indirect income opportunities, job creation, visibility etc.

As regards the policy (and normative) framework, details are provided in the paragraph below.

## 13.1 Current forest policy conflicts and problems

Due to the effects of the decentralization process started in the Seventies (see below) the forest policy framework results very fragmented and sometimes inconsistent or even contradictory.

Although there is a general consensus on broad concepts like forest multifunctionality and the need to encourage active forest management to improve wood mobilization -for both industry and bioenergy purposes- while ensuring multiple services delivered by the forests, their implementation in the field remains a bit vague and not always consistent. Moreover, given the extremely fragmented situation of the Italian forestry sector, very weak (or even absent) collaborative networks exist among private and corporate forest owners, forest users, public forest enterprises and forest administrations at national level. Where relationships exist between the traditional forestry sector and other sectors' actors (e.g. environmentalists, agricultural administrative bodies, biodiversity conservation authorities), they are likely to be uncooperative or even conflicting (Secco *et al*., 2017). As reported in the paragraph below, some new initiatives were launched very recently (e.g. National Forest Forum meeting) however they are still at a very preliminary stage and it is not possible to foresee what kind of impact they might have.

As regards forest management, in the recent past some strong debate occurred among supporters of "classic" and "close to nature silviculture" and those of "systemic silviculture" (Ciancio, 2010 and 2011; Mori, 2011), however this remained mostly at a theoretical level and without practical consequences on forest operations and forest management activities in practice.

An overview of the most common conflicts and problems in Italian forest policies is reported in Table 26 below. Conflicts and problems have been categorized according to 9 different categories, i.e. (1) general issues, (2) nature conservation, (3) wood production and industry, (4) energy transition, (5) wild forest products, (6) climate change, (7) recreation, (8) hunting, (9) work in forests.

The expansion of forest areas during the last fifty years brought to the emergence of new issues, problems and even conflicts. The forest sector has been traditionally dominated by central public institutions (in particular the Forest Service) and the decentralization process created conflicts with emerging regional authorities. The situation has been exacerbated by the fragmentation of forest



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responsibilities, internal (unsolved) conflicts among Ministries and the recent spending review. Regional authorities that invested in the past in the recruitment of forest professionals for their new offices, have been asked to cut their costs, with the blocking of the turn-over of forest officials for some years and the dismantling of the small local administrative units, with a lowering of the quality of their services, and without being able to develop more flexible adaptive structures. Budget cuts have also had strong impacts on other previously existing public administration structures: both Mountain Communities and Provinces have been abolished; forest associations among Municipalities and Regional agencies providing advisory services to farm and forest managers have been reformed, in some cases they have been abolished and the officers transferred to other offices with administrative functions. The most affected components of the public administration have been those more close-to-the-field activities, with more relevant roles at very local level. In the meanwhile, however, the forest legal framework has not changed: it has remained rigid and not adapted to modern demands (Corrado and Merlo, 1999; Venzi, 2008; Vidale *et al*., 2012).

Budget cuts are also expected to have major effects on forestry and forest authorities because of the contemporary reduction of Rural Development Program funds. Funds allocated to Forest Measures for the period 2014-2020 are reduced with respect to the previous one: while in 2007-2014 RDP they represented 14.3% of the total funds, in 2014-2020 they account for only 8% (Colanzi and Sidorini, 2016). This reduction is due to the fact that Regional administrations have not been able to fulfill their spending potentials: they spent only 70.5% of the total available funds (2.4 million €) (Romano, 2015). This can partly be a consequence of the highly fragmented administrative structure: the management of 21 separate Rural Development Programs, with different sets of Forest Measures, has caused significant problems of information of the potential beneficiaries and high transaction costs by the administration, exacerbated by limited interactions and coordination among Regions in exchanging lessons learned and ideas for possible common solutions (Secco *et al*., 2017).

The lack of a real and effective vertical integration among bodies in charge of defining/implementing forest policies often brings to poor coordination of public institutions. Conflicts among Municipalities, protected areas authorities, and Regional Departments are very common (Secco *et al*., 2017). In more recent years, the growth of tools like forest certification has created room for non-traditional actors, generating a strong reaction by traditional ones. The conflicts between FSC and PEFC schemes in Italy go far beyond intrinsic features, technical aspects and normal market competition of the two schemes and largely depend on the fact that the public institutional organizations in charge of forestry at local level in Italy (Regions) felt uncomfortable with sharing decision-power with new, non-professional forest actors like environmentalists. Because of this, a group of Regions, mostly from the North-East of the Country, decided to create and support the PEFC national initiative by means of direct funds, communication and technical assistance to forest owners. In this way, the public authorities have been able to keep their predominant role within the forestry arena without explicitly declaring it.



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*Table 26.Overview of current conflicts and problems in Italian forest policies*

| ***Conflict category*** | ***Conflict*** |
|---|---|
| **General issues** | Forest abandonment vs. Active forest management |
| | Management restrictions (e.g. hydrogeological constrain) vs. Active forest management |
| | Civil society (and private sector) vs. Traditional public actors |
| | Forest/forestry reality vs. Forest/forestry perception by society at large |
| | Consistent forest definition |
| | Quality and reliability of forest data/statistics (e.g. forest removals) |
| | Poor visibility of the forest sector |
| | Lack of harmonization among different planning tools/requirements (forestry, nature protection, landscape protection, energy, etc.) |
| | Forest ownership fragmentation (smallholders, ghost owners, abandonment, lack of profitability, need for association mechanisms, etc.) |
| | Complex and sometimes non consistent normative framework (lack of vertical and horizontal integration): harmonization and simplification needed to reduce transaction costs |
| **Nature conservation** | Non-use to allow natural development of forests vs. sustainable harvesting |
| | Integration between forest management plans and Natura2000 management plans |
| | Non-native and alien tree species |
| | Introduction of legally binding „Best practice" and recommendations |
| **Wood production and industry** | High-value vs. low-value wood products |
| | Local vs. imported wood |
| | Lack/Loss of primary processing |
| | Forest road network |
| | Foreign forest enterprises harvesting Italian forests (economic and environmental impacts) |
| | Illegal timber and informal harvesting |
| **Energy transition** | Industrial vs. energy wood use (cascading approach) |
| | Big (mostly for power) vs. medium-small (for heat or combined heat and power) biomass energy plants |
| **Wild forest products** | Formal vs. informal activities |
| | Fiscal regime and normative framework |
| **Ecosystem services and Climate change** | Biodiversity, soil protection, water management and climate mitigation/adaptation issues integrated within forest management plans |
| | Valuing ecosystem services (accounting systems, fiscal regime, detaxation…) |
| | Forest carbon stock used by State vs. forest owners (Register needed, double accounting risk, guidelines needed) |
| | Guidelines and norms for the voluntary carbon market |
| | New certification systems (transaction costs) vs. Valorization of existing ones |
| **Recreation** | Increased/changed interests of recreational users vs. conservation and use |
| | Scenery and landscapes vs. economic interests |
| | Coexistence of multiple recreation uses (e.g. hikers, bike riders, bikers, horse riders, etc.) |
| | Active forest management and harvesting, and recreation |



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| | |
|---|---|
| | Costs of obligation of forest owners to safeguard forests for hazards of recreational users |
| **Hunting** | Browsing damages versus economic and ecological interests |
| | Regular hunting vs. Poaching |
| | Hunting/Fauna management plans |
| | Derogations for hunting activities (conflicts with environmentalists and EU Regulations/norms) |
| **Work in forests** | Formal vs. informal workers (Health and safety conditions, qualification) |
| | Local vs. Outsider forest enterprises/workers |
| | Public (regional) forest workers |

Source: own elaboration

## 13.2 Instruments and legal competences in Italian forest policies

Between the first and second World War, a strong central forest administration was built up in Italy based on the military-oriented State Forest Service (*Corpo Forestale dello Stato*, CFS). With the approval of the 1948 New Constitution, five Autonomous Regions[1] (4) and Provinces[2] (2) were created together with sixteen ordinary Regions. The forest sector remained under the control/responsibility of the central authority and only the five Autonomous Regions and Provinces achieved considerable independence from the State in forest administration (Pettenella, 1994). In the '40s, '50s and '60s, the forest sector played a mainly social function, providing employment opportunities and representing an important source of income in marginal areas, especially in Southern Italy and mountain areas. This contributed to reinforce the role of the CFS at national level (Secco *et al*., 2017). In 1977 the decentralization process decreed by the 1948 constitution was finally started, including transfer of competences over forest matters to regional administrations (i.e. Regions and Autonomous Provinces). This brought to some conflicts between the central CFS authority and officials of the Regions/Autonomous Provinces regarding tasks assignment and State land management. As a result, a central CFS authority was maintained while all tasks and responsibilities related to forest management and monitoring were being transferred to regional administrations. During the '80s the regional administrations developed their own organizational structure and regional governance procedures, thus leading to a fragmented structure at national level, with 21 different regional forest laws and plans (Corrado and Merlo, 1999). The transfer of responsibilities has been a long-lasting process due to strong resistance from the central administration to relinquish its traditional functions (Pettenella, 1994). Decentralization led to differentiated organizational models among Regions (Secco *et al*., 2017): (i) (mainly) Northern regions structured Regional Forest Services, creating sub-national forest authorities, (ii) Central and Southern regions are still using the central Forest Service's personnel for their policies implementation, through official bi-lateral agreements with the State, and (iii) some Central regions further decentralized responsibilities from Regional to local authorities. Decentralization has been implemented in several other sectors, with similar consequences of institutional

[1] Autonomous Regions are Sicily, Sardinia, Trentino Alto Adige and Valle d'Aosta. Friuli Venezia Giulia was given the status of Autonomous Region in 1963.

[2] Autonomous Provinces are the Autonomous Province of Trento and the Autonomous Province of Bolzano, altogether making up the Autonomous Trentino Alto Adige Region.



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fragmentation. Italy has, for example, 21 different Rural Development Programs (one for each of the 21 Regions and Autonomous Provinces), with different and not coordinated strategies, measures and actions (Cesaro *et al*., 2013). In 1986 the first National Forest Plan was issued, although it remained quite ineffective because it was unclear with regard to the authority in charge of its implementation and not supported with a specific implementation budget (Corrado and Merlo, 1999; Maetzke and Cullotta, 2016). A second National Forest Plan was published in 2008 as the result of a long negotiation process and due to pressures from the European Commission for the country to comply with European and international commitments for the development and adoption of national forest plans (Carbone and Savelli, 2009). The Plan, however, is a Framework Programme (*Piano Quadro per il Settore Forestale*, PQSF) and was not associated with any financial provision to the sector (Romano *et al*., 2012). In 2016 (November, 29th) a National Forest Forum meeting has been organized by the Ministry of agricultural food and forestry policies (*Ministero delle Politiche Agricole, Alimentari e Forestali*, MIPAAF) to encourage discussion among stakeholders and collect inputs for the development of the new national normative framework and the update of the National Forest Strategy. Three additional meetings -focused respectively on environmental, social and economic issues- are expected in 2017.

In the last decades the CFS maintained a strong role as forest police administrator in charge of patrolling for environmental and forest illegalities, but it progressively lost its traditional role of providing technical assistance to forest owners that have been partly assumed by Regional and local institutions. A major reform process, accelerated by spending review needs, has merged the CFS with a special national military police corps (*Carabinieri*) in 2016[3]. As a result the CFS definitively lost its specificities and technical skills on forest-related matters. With this reform the State authority has reinforced a command-and-control based approach to forest policy that prevailed in the past, with forests mainly considered as land resources to be passively protected against illegal practices, rather than mobilized within a rural development strategy (Secco *et al*., 2017). With the same reform process a Forest Department has been created within MIPAAF and will become active from 2017. Besides MIPAAF some competences on specific forest matters are given to the Ministry for the Environment and the Protection of Land and Sea (e.g. biodiversity protection, protected areas, etc.) and the Ministry of Cultural Heritage and Activities, and Tourism (landscape conservation).

In brief, the forest sector is characterized by a strong fragmentation of competences, poorly guided at central level, without a comprehensive sectorial policy supported by coordinated budget allocations and with limited horizontal coordination among Regions. Due also to the complexity of the legal framework -with dozens of national and local laws and rules regulating single types of activities, such as wood harvesting or mushroom picking- the policy and related governance framework of the whole sector appears particularly confused, without a clear and common oversight. The national policy framework is influenced by several international and European policies, although sometimes coordination and vertical integration result problematic.

[3] Decreto Legislativo (i.e. Decree) del 384 Consiglio dei Ministri del 28/07/2016 n.124.



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Table 27 provides an overview of legally-binding law and soft instruments for the forest sector in Italy.

*Table 27. Overview of legally-binding law and soft instruments in Italy*

| | |
|---|---|
| **Italy – National** | **Legally-binding law**<br>• National Forest Act (1923, replacing Law 3967 of 1877)<br>• Customary Rights Act (1927), implemented through Decree n.1766/1927 (1927) and further updated by L. 31 n. 97 (1994)<br>• Water and Hydropower Act (1933)<br>• Devolution Acts for agriculture- and forestry-related matters (1972 and 1977) complemented by Devolution Law (1997, also known as Bassanini's Law) and Constitutional Law n.3/2001 (2001).<br>• Water Quality Act (1989) complemented by Water Act (1994, also known as Galli's Act) and Decree n.156/2006 (2006)<br>• Framework Law for Protected Areas (1991)<br>• National Hunting Law (1992)<br>• Natural and Semi-natural Habitats, and Wild Fauna and Flora Act (Decree n.357/1997) (1997), complemented (and partly modified) by Decree n. 120/2003 (2003)<br>• Framework Forest Law (2001)<br>• Forest propagation materials and nurseries Framework Act (2003)<br>• Code of Cultural Heritage and Landscape (2004)<br>• Forest Programme Guidelines (2005)<br>• Code on the Environment (2006, embodying Law 431 of 1985 also known as Galasso's Law) complemented by additional regulations set by Decree n.4/2008 (2008)<br>• Occupational Health and Safety Law (2007), complemented by Decree n.81/2008 (2008)<br>• Timber Regulation/FLEGT Acts (2012 and 2014)<br>**Soft instruments**<br>• National Forest Plan (1986)<br>• Forest Sector Framework Programme (2008)<br>• Bioeconomy in Italy (BIT), National Bioeconomy Strategy (draft 2016) |
| **Coordination between State and Regions, and among State and other actors** | • State-Regions Conference (*Conferenza Stato-Regioni*)<br>• National Consultation Forum of the Forest and Wood Sector (*Tavolo Foresta-Legno*) |
| **Italy – Regions/Autonomous Provinces** | **Legally-binding law**<br>• Regional Forest Laws and Regulations<br>• Regional Forest programmes/plans<br>• Regional Forest propagation materials and nurseries Acts<br>• Regional Rural Development Programmes<br>• Forest-fire prevention plans<br>• Qualification, training and licensing of forest operators<br>**Soft instruments** |



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| | |
|---|---|
| | • European Agricultural Fund for Rural Development (EAFRD)<br>• Extension services in agriculture and forestry<br>• Forest nurseries<br>• Forest certification |
| **Italy – Sub-regional / Local** | **Legally-binding law**<br>• Sub-regional (e.g. at province-scale) Forest Regulations<br>• Formally approved forest management plans<br>• Formally approved management plans for protected areas<br><br>**Soft instruments**<br>• Forest certification |

Source: own elaboration.

## 14. Actor analysis: Italy, national level

There are many actors and multiple interests in the forest sector in Italy. They vary according to (among others) their nature (e.g. public/private), scale (e.g. national/regional/local), aims, resources and ultimately relative power in influencing decision-making processes.

The main forest-related actors have been identified based on previous studies and documents at national and sub-national scale (e.g. Pettenella and Romano, 2010; PQSF, 2008; Secco *et al*., 2011), taking advantage of the analysis recently developed by Secco *et al*. (2017).

### 14.1 Interest of actors: Italy, national level

Interests of different actors have been distinguished according to three main ecosystem service (ES) categories (CICES, 2016) -i.e. provisioning, regulating and cultural services- plus biodiversity and habitat conservation (supporting services). Actors have been distinguished into public (Table 28.a) and non-public (Table 28.b) ones. For some actors one ES category clearly prevails on the others, while for some actors cross-cutting interests can be identified, i.e. actors have a stake in different ES and ES categories.

Public actors have prevalent interests in supporting and regulating services. This is the case for example of the Ministry of Environment that has the mandate to act for nature conservation and enhancement, and the State Forest Service that is in charge of policing to prevent/control environmental crimes. The Ministry of Environment has also interest in Regulating ES, in particular with reference to carbon sequestration because it has responsibility over the implementation of climate-regulation and mitigation policies. A large interest exists also with reference to forest management as a way to prevent/mitigate hydrogeological risks, due to high costs connected to other solutions as well as to reconstruction. This is also linked to the fact that about 87% of Italian forests are subject to management limitations/constraints because of some hydrogeological risk. Interest for provisioning services



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is multifaceted; the Ministry of Agriculture, Forestry and Food Policies has an interest in wood and wild forest product production for rural development promotion and the support of local economies and the primary sector in general; the State Forest Service has an interest in this services mostly in terms of policing and control; public forest owners look at wood and wild products production as potential income sources to support their budget (e.g. timber auctions, picking permit fees): they are probably the public actor with the stronger interest in provisioning services. As regards cultural services, some interest exists for tourism and recreation activities as rural development opportunities for the diversification of local income resources. In many cases this is linked to the provision of forest products (especially non wood ones, like mushrooms, truffles, wild herbs, etc.) that attract visitors and tourists and tend to qualify as tool for the promotion of local territories with the support of private actors. Among cultural services, landscape and aesthetics are of special interest for the Ministry of Cultural Heritage and have a direct connection with forest management.

Regional Forest Authorities rule, promote and support forestry at regional (or province) scale. Their interest in terms of ecosystem services vary from region to region, however in principle it can be stated that they support a broad range of services covering all categories. In some cases (especially in Southern Italy) the forest sector also plays a social function, providing employment opportunities to a large number of workers as seasonal public forest employees. This is the case, for example, of Sicily with some 30,000 publicly employed forest workers performing activities like plantations, infrastructure maintenance, fire prevention, etc. While public employment represents a sort of welfare measure, employees have significant power in terms of votes associated to their employment opportunities. On the other hand, because of ongoing spending review public opinion tends to be quite critical towards public expenditures to public forest workers that are often perceived as non-efficient.

Private actors tend to have more focused interests. Private forest owners and forestry enterprises have a direct interest in wood provision while chartered agronomists/foresters have an indirect interest (job opportunities in terms of advice/consultancy and technical support services). Wood and paper industry in theory have a strong direct interest, but in practice this quite nuanced due to the fact that they strongly rely on imports and only a limited proportion of the industrial input is domestically sourced. The bioenergy sector has a direct interest because about 65/70% of domestic forest removals are intended for energy purposes. Conflicting interests and competition might exist with regard to the same service -wood provision- depending on the final use (i.e. industrial vs. energy use). In principle the promotion and adoption of a cascading approach should prevent this problem, nonetheless competition for raw materials (and consequent potential impacts on prices) remains an argument in the debate between the wood/paper and the bioenergy industries.

Private forest owners also have some interest in wild products as a resource for income integration and chartered agronomists/foresters have an indirect interest in terms of job opportunities (advice/consultancy and technical support services). This might also have some connections to tourism and recreation activities that can give additional income opportunities for forest owners (e.g. picking permit fees).

Environmental NGOs have interests mainly in connection to supporting (biodiversity conservation) and regulating services (carbon sequestration and water quality). Their interest in wood provision is mainly linked to the support of local economies and the contribution to climate mitigation through



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renewable energies, nonetheless at local scale they sometimes maintain a watchdog role with reference to forest operations, especially within/close to protected areas.

*Table 28. Interests in ecosystem services of selected actor groups (national level):*

(a) public and (b) non-public actors

| | **(a) Public actors** | | | | | |
|---|---|---|---|---|---|---|
| | **Ministry of Agriculture, Forestry and Food Policies** | **Ministry of Environment** | **Ministry of Cultural Heritage & Landscape** | **State Forest Service** | **Regional Forest Authorities** | **Public forest owners** |
| *Provisioning ES* | | | | | | |
| Wood (timber & firewood) provision | ++ | -- | -- | ++ | ++ | +++ |
| Wild forest products (mushrooms, truffles, herbs,…) provision | ++ | -- | 0 | ++ | ++ | +++ |
| Game provision | - | --- | 0 | ++ | - | + |
| *Supporting ES* | | | | | | |
| Biodiversity | + | +++ | + | +++ | + | ++ |
| Habitats | + | +++ | + | +++ | + | ++ |
| *Regulating ES* | | | | | | |
| Carbon sequestration | ++ | +++ | 0 | ++ | + | + |
| Water quality | + | +++ | 0 | 0 | + | ++ |
| Hydrogeological protection | ++ | ++ | ++ | ++ | ++ | +++ |
| *Cultural ES* | | | | | | |
| Outdoor recreation | 0 | 0 | 0 | - | 0 | + |
| Aesthetics | + | ++ | +++ | + | + | + |
| Tourism | 0 | - | - | - | + | ++ |

| | **(b) Non-public actors** | | | | | |
|---|---|---|---|---|---|---|
| | **Private forest owners** | **Farmer associations** | **Forestry enterprises** | **Wood (including bioenergy)/Pulp and paper industries** | **Chartered Agronomists and Foresters (and their associations)** | **Environmental NGOs** |
| *Provisioning ES* | | | | | | |
| Wood (timber & firewood) provision | +++ | ++ | +++ | +++ | +++ | + |
| Wild forest products (mushrooms, truffles, herbs,…) provision | ++ | ++ | 0 | 0 | ++ | - |



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| | | | | | | |
|---|---|---|---|---|---|---|
| Game provision | + | --- | - | 0 | - | --- |
| *Supporting ES* | | | | | | |
| Biodiversity | - | + | - | - | + | +++ |
| Habitats | - | - | - | - | + | +++ |
| *Regulating ES* | | | | | | |
| Carbon sequestration | 0 | + | 0 | + | + | +++ |
| Water quality | 0 | +/- | 0 | 0 | + | +++ |
| Hydrogeological protection | - | + | - | - | ++ | + |
| *Cultural ES* | | | | | | |
| Outdoor recreation | + | 0 | - | - | 0 | 0 |
| Aesthetics | 0 | 0 | - | - | + | + |
| Tourism | + | 0 | - | - | 0 | - |

## 14.2 Power of actors: Italy, national level

Power is defined as *"capability of an actor to influence other actors"* (Krott *et al*. 2014, p.35) Based on the actor-centered power approach (Krott *et al*. 2014) the assessment of power is based on the criteria coercion, incentives, and dominant information sources.

Coercion is defined as altering behavior with force, including the threat of force and even bluffing about force that does not really exist.

Incentives are defined as altering behavior with advantages or disadvantages. Material and immaterial (dis-)incentives can be distinguished. Material incentives are money and also all technical sources, e.g. machines, plants, food or support in labor. Immaterial incentives offer social or psychological advantages, e.g. social conventions, morals.

Dominant information sources are defined as altering behavior by supplying unverified information trusted by the subordinate, e.g. within ideologies or based on superior expert knowledge.

Following the actor-centered power approach, for each actor group it has been evaluated if power resources have a strong impact (+++), a medium impact (++), or a low impact (+) on forest management (Hubo and Krott 2015) (Table 29).

The analysis of the power resources of actors at national level showed that power is quite concentrated on the State Forest Service and Regional Forest Authorities. Both of them exercise power mostly by means of coercion, although in different ways: the state Forest Service through controls in the field, authorizations, issuing of penalties, etc., while Regional Forest Authorities mainly through development of laws, approval of forest management plans etc. The State Forest Service has maintained a central, powerful position and has traditionally been very strong in influencing national decisions on resources and power allocation until the recent reform (Secco *et al*., 2017). While the reform is still being implemented, it can be argued that transfer of competences from the State Forest



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Service to a special national military police corps (*Carabinieri*) can be read has a reinforcement of the "command-and-control" based approach by the central authorities. As in the past, forest policy might then tend to consider forests mainly as resources to be passively protected/conserved rather than mobilized through appropriate management within a more general rural development strategy involving multiple actors.

Forest owners, both public and private ones, have a very limited power. In the case of private owners this is mostly due to the extreme fragmentation of private forest areas and the lack of national wide associations of forest owners, or specific sections dealing with forest resources within the national associations of landowners. More in general, none of the private actors has a powerful position with reference to decision-making. The wood/paper industries in principle have some potential ability to influence decisions, however large companies are often not interested in influencing national forest policies, as their supply chains are totally based on imports.

When considering power resources of interests in different ecosystem services at national level (Table 30) it can be observed that none of them qualifies as strong. Means of coercion tend to prevail again and they play a marginal role only in the case of carbon sequestration, water quality and tourism/recreation. Wild forest products, biodiversity and habitat conservation are the ecosystem services showing the stronger power resources and, in more general terms, actors related to provisioning and regulating ecosystem services have stronger power resources to impact forest management. This is also the case of hydrogeological protection and aesthetics (landscape protection and conservation) where however means of coercion are the only ones in use.

At the national level, public actors –including the State Forest Service- have high power resources to impact forest management (Table 31). The role of (central) state authorities has been reinforced during the last years with a shift back from governance to government of forest resources (and natural resources in general). These problems have been exacerbated by the financial and political crisis of the last years, and the consequent need to reduce public spending in the sector. While investments should have been made to structure and support the new decentralized bodies, and to drive the engagement of the higher level of governance (Rojas-Briales, 2005), local institutions have been asked to progressively cut their budgets and reduce their activities. However, in the meanwhile, no serious attempts have been made to put in place alternative mechanisms to promote private-public network-based governance systems and the old "command and control" top-down hierarchical style is still predominant (Secco *et al*., 2017). As already mentioned, this goes together with the prevalence of means of coercion, while other resources, in particular incentives (e.g. through the rural development funds), play a minor role. The prevalence of public authorities and means of coercion also reflects on the limited dynamicity of the forest sector.

As regards private actors, in principle wood and paper industries have enough power to influence forest management through incentives and dominant information, however in most of cases they are not much interested in domestic sources. The bioenergy sector has a more direct role in this and is much more dynamic in mobilizing domestic resources. In more recent times non-forest private actors have started to invest in the forest sector (afforestation and reforestation, improved forest management) as a way to compensate impacts related to their activities (mostly with reference to carbon emissions) and, in some cases, to differentiate their business. In any case their overall capacity to influence forest management remains limited.



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Finally, despite some signals clearly indicate that civil society is creative and can bring innovation to forest management (e.g. lowland private-public partnership, truffle/mushroom picker associations, environmental education and nature tourism initiatives, social inclusion through "forest therapy" activities, etc.) it still plays a marginal role and has limited power in influencing forest management. Some inter-sectoral networking experiences among environmental organisations and the private sector exist. This is the case, for example, of forest certification: an effective, mutual relationship has been established between environmentalists and other forest actors in the creation and management of the FSC national working group, the development of FSC national standards, and the implementation of campaigns to promote responsible forest management and certification.

*Table 29.Overview of power resources of different interests*

| **Actor's interests** | | **Power resources** | | | |
|---|---|---|---|---|---|
| | | **Means of coercion** | **Incentives** | **Dominant information** | **Power resources of the interest** |
| **Public** | Ministries | ++ | ++ | ++ | **Medium-Strong** |
| | State Forest Service | +++ | + | ++ | **Strong** |
| | Regional Forest Authorities | +++ | ++ | ++ | **Strong** |
| | Public forest owners | 0 | + | + | **Low** |
| | Universities and Research Centers | 0 | + | + | **Low** |
| **Non-public** | Private forest owners | 0 | 0 | 0 | **Low** |
| | Farmer associations | 0 | + | + | **Low** |
| | Forestry enterprises | 0 | + | 0 | **Low** |
| | Wood/Pulp and paper industries | 0 | ++ | ++ | **Low-Medium** |
| | Chartered agronomists | 0 | + | ++ | **Low** |
| | Hunters | 0 | + | ++ | **Low** |
| | Environmental NGOs | 0 | ++ | ++ | **Low-Medium** |

*Table 30. Overview of power resources of interests in different ecosystem services (Italy, national level)*

| **Interest in:** | **0verall power resources** | **Means of coercion** | **Incentives** | **Dominant information** |
|---|---|---|---|---|
| *Provisioning ES* | | | | |
| Wood (timber & firewood) provision | **Medium** | +++ | ++ | + |
| Wild forest products (mushrooms, truffles, herbs,…) provision | **Medium-Strong** | ++ | +++ | ++ |
| Game provision | **Medium** | +++ | + | ++ |
| *Supporting ES* | | | | |
| Biodiversity | **Medium-Strong** | +++ | ++ | ++ |
| Habitats | **Medium-Strong** | +++ | ++ | ++ |



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| | | | | |
|---|---|---|---|---|
| *Regulating ES* | | | | |
| Carbon sequestration | **Low** | + | + | ++ |
| Water quality | **Low** | + | + | + |
| Hydrogeological protec-tion | **Medium-Low** | +++ | 0 | + |
| *Cultural ES* | | | | |
| Outdoor recreation | **Low** | 0 | + | + |
| Aesthetics | **Medium** | +++ | 0 | + |
| Tourism | **Low** | 0 | + | + |

*Table 31. Overview of power resources of different actor types (Italy, national level)*

| | **Means of coercion** | **Incentives** | **Dominant information** | |
|---|---|---|---|---|
| **Private actors** | + | ++ | ++ | **Medium** |
| **Civil society actors** | 0 | ++ | + | **Low** |
| **Public actors** | +++ | + | ++ | **High** |

## 14.3 Power of forest actors to impact forest management

Government authorities at both national and meso-levels are still perceived as the most powerful actors in forest management by many forest owners, managers and other stakeholders. The CFS is probably the most well known body by the Italian society at large and -as reported above- their competencies are currently being transferred to *Carabinieri*. With regard to Northern Italian Regions Saccone *et al*. (2013) reported that the 3 main regional administrative units that have assumed responsibilities in the forestry sector are those dealing with: 1) protected areas or, alternatively, 2) rural development and 3) agriculture. As commented by Secco *et al*. (2017) this is perfectly coherent with a stronger political role played by administrations concerned with nature protection, land use planning and economic development. Regional forest authorities (Forest Services, Forest Administrations) have competences on defining and implementing forest and forest-related policies -forest management plans, management of forest nurseries, extension and training services, forest certification, etc.- including definition of measures and funding through Rural Development Programmes and, in more general terms, influence on resource allocation.

Many other actors belonging to different sectors can directly or indirectly influence forest policy and decision making in forest-related issues. Apart from the institutional actors (i.e. for example the representatives of protected areas within Regions, who have formal "rights" to determine rules affecting the forest sector), there are a number of actors who are "informally" trying to influence decision-making. Saccone *et al*. (2013) found that the most relevant actors in Northern Italian Regions are the dominant political parties and the farmer's associations and their representatives. Other groups, such as for example environmental non-governmental organizations (NGOs), and society at large (citizens) are considered to have marginal or no capacity to influence decisions related to changes in the forest sector structure.



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Forest owners in Italy -either public or private ones- are not or poorly organized, thus lacking representativeness and, as a consequence, political power. A national association of private forest owners does not exist, the three national farmers' unions (Coldiretti, Confederazione Italiana Agricoltori and Confagricoltura) have very limited direct interests in the forestry sector and no national offices/units specialized in forests and forestry. Federforeste, i.e. the federation of municipal forest properties and their associations, has only a few tens of members out of the thousands of existing municipal forest owners. The national association of regional forest administration (ANARF) has only 5 members and very little representative power. At the same time (and as a consequence of the above-described situation) Italy is the only European Country (with Poland) that is not member of the Confederation of European Forest Owners; there are no Italian representatives in the Union of Foresters of Southern Europe; there are no representative of State forests in EUSTAFOR and only a small regional organization (Veneto Agricoltura, within Veneto Region) has recently been accepted as an associated partner (Secco *et al*., 2017).

As regards forest enterprises, they still have limited capacity to influence forest policy decisions, although in some cases they are becoming increasingly organized. This is the case, for example, of the Alliance of Agro and Agro-food Cooperatives that includes about 350 forest cooperatives totalizing some 11,000 members and employees. In recent years a National Forest Enterprise Consortium (*Coordinamento Nazionale Imprese Boschive*, CONAIBO) has been launched and -although precise figures are not available- is getting increasing visibility and relevance, including formal participation to the national consultation forum of the forest and wood sector.

Both forest owners and enterprises are often supported by private consultants, including chartered foresters/agronomists providing direct support in defining and planning forest management operations, as well as supporting in access to rural development funds and, in a few cases, to innovative solutions as well. Chartered foresters/agronomists and their associations, however, have very limited capacity to influence forest policy at national level, while they might have some influence at regional and local level.

The wood industry sector has some potential ability to influence forest management, however this strongly depends on the size of single companies. Big companies, as well as national industry federations (e.g. Federlegno and Assocarta) grouping them, have limited interest in influencing forest management and policies at national scale, because they mostly rely on imported materials. At the same time the bio-energy sector has grown a lot during the last years and it is currently probably the most (if not the only) dynamic segment of the forest policy arena (Secco *et al*., 2017). It includes different players and their associations, including NGOs, associations among stove producers, pellet and chip producers/traders, energy plant managers, etc. Some of these players have the capacity to influence forest management and related decision-making: in particular this is the case for NGOs and organizations that are in favor of medium-small plants, for heat or combined heat and power generation, fed with locally produced biomass. Big plants are mostly aimed to power generation and in many cases depend on imported inputs rather than local ones. In the last years some conflicts arose between the wood/paper industry and the bioenergy sector because of competition for raw materials and prices and this has animated some debate around forest management issues, in particular with regard to the implementation of the "cascading approach".



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Environmental NGOs are quite active in the forestry sector with a prevalent focus on deforestation, forest degradation, illegal logging (in particular with reference to imported materials), poaching and biodiversity conservation. Only a few are active at national scale, while most of them are local organizations. Their higher influence is related to the introduction of (strict) limitations to forest management activities (especially in protected areas) to preserve biodiversity, as well as the capacity to reach the media and gain visibility. The general public often perceives these NGOs as advocates of environmental and social issues because their arguments appeal also to morals and norms.

Finally, the Academia and the "research world" in general provide high education and training to future forest experts, contribute to advancement in forest-related science knowledge, support innovation and stimulate the scientific debate on forest resources. Although some scientific organization has a significant capacity to influence policy discourses at national level and sometimes even policy makers at various levels, in general the capacity of science to influence policy in its concrete implementation of forest management measures/actions is very limited (Secco *et al*., 2017). This also reflects on the fact that, for many reasons, research outputs are increasingly oriented towards (peer-reviewed) scientific journals rather than technical ones.

## 15. General case study information: Lowland Forest Association (Eastern Veneto)

Veneto is one of the 20 administrative regions (NUTS 2) in Italy. It is located in the North-East of the Country (Figure 2a) and bordered to the East by the Adriatic Sea, to the North-East by Friuli Venezia Giulia, to the South by Emilia-Romagna, to the West by Lombardy and to the North by Trentino-Alto Adige. It covers a total area of about 18,400 km$^2$ (8$^{th}$ largest region in Italy) (Istat, 2011) and hosts about 4.92 Million inhabitants (5$^{th}$ most populated region in Italy) (Istat, 2016a).

Veneto is a striking example of what in the sixties was called the "Italian economic miracle". Until the mid-fifties Veneto was a land of peasants, poverty and migration, plagued by constant floods, while later on it became one of the leading Italian industrial regional economies (EC, 2016). It currently accounts for about 9% of the national Gross Domestic Product (GDP) and ranks 7$^{th}$ among Italian regions in terms of GDP per capita with a value equal to 111% of the EU-28 average (Eurostat, 2016). Unemployment rate is among the lowest three in Italy (around 7% in 2016) (Istat, 2016b).

The industrial sector accounts for about 30% of the regional GDP (Banca d'Italia, 2016). It has a highly specialized and competitive manufacturing base, mostly made of small and medium enterprises (SMEs) and characterized by several specialized local industrial districts/clusters (e.g. mechanics, agro-food industry, textiles, glasses gold and jewelry, furniture, etc.). Agriculture accounts for about 2% (Banca d'Italia, 2016) of the regional GDP and 10% of the national agricultural production (Regione Veneto, 2010). As regards services, special attention shall be given to tourism. Due to a broad and differentiated range of attractions -from historical and art cities like Venice, Padua, Verona and Vicenza, to the seaside, from the Dolomites to Garda Lake- Veneto is the leading region in Italy for tourism activities and 6$^{th}$ in Europe. In 2015 more than 17 Million tourist arrivals (11.2 Millions, i.e. 65% being foreigners) and about 63.2 Million tourist presences (42.2 Millions, i.e. 67% being foreigners) were reported (ENIT, 2015; Caner, 2016).



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According to the preliminary figures published by the National Forest Inventory Veneto hosts a total forest area of 465,624 ha (CFS, 2015) with a +4.7% expansion (approximately +5,000 ha/year) during the last 10 years, mostly as a consequence of natural forest expansion in marginal areas. About 90% of regional forests are concentrated in mountainous and hilly areas, mostly in the Northern and Western part of the region. Coniferous and broadleaf forests are more or less equally represented and the most common forest types are spruce forests (34%), ash/hop-hornbeam (21%) and beech forests (17%) (INFC, 2005).

Based on 2015 statistics[4] forest removals in Veneto totaled about 0.13 million $m^3$ -more or less equally shared among industrial assortments and firewood- (Istat, 2015) i.e. about 2.3% of total removals at national scale. Forest removals (especially for industrial assortments) are mostly concentrated in the alpine areas, with some additional contribution by lowland poplar (and other species) plantations (about 2,100 ha) (INFC, 2005). Although Veneto hosts some relevant furniture industry clusters -the main one being in Treviso area and including some 2,000 companies- the link with local wood production remains very weak and raw materials are mostly imported.

The case-study area is located in the Eastern part of Veneto, North-East of Venice (Figure 2.b). The overall area at large includes nine different municipalities within the Province of Venice, covering a total area of about 69,000 ha and hosting about 140,300 inhabitants (Istat, 2011a and 2011b). It includes very fertile and productive farmlands were cereals (corn and maize) and vegetables are grown. The area is close to Venice and other touristic places (towns and beaches) along the Northern Adriatic Sea, and around 3 million tourists visit it every summer.

More in detail, the case-study area stretches over 315.4 ha, 291 ha of which are covered by forests (92.3% of total case study area)[5] (Figure 2.c). Forests mainly consist of (i) newly/recently planted forests (afforestation and reforestation areas, max 20 years old), (ii) 60-70 year old planted forests (mostly planted pine forests) and (iii) semi-natural lowland forest remnants. All forests included within the case study area are public owned (mostly by local Municipalities), while management tasks are carried out through various forms: direct management by the municipality, management agreement with private companies, rent to private, management agreement with the local Forest Service etc. Management activities are coordinated by a public-private Association, called Lowland Forest Association (*Associazione Forestale di Pianura*, AFP[6]) that helps dialogue among multiple actors and supports forest owners raising funds for improving their forests and the benefits they provide to local communities. The Association attracts both public (e.g. through the Rural Development Program) and private funds, for example by giving investors the possibility to invest in local forests under different conditions and via different mechanisms (afforestation, off-set payments, etc.).

[4] Based on empirical evidence and scientific research, national statistics on forest removals are largely considered to underestimate real removals.
[5] Unless otherwise stated figures for the case study are sourced from Rasera (2016).
[6] Formerly Eastern Veneto Forest Association (*Associazione Forestale Veneto Orientale*, AFVO).



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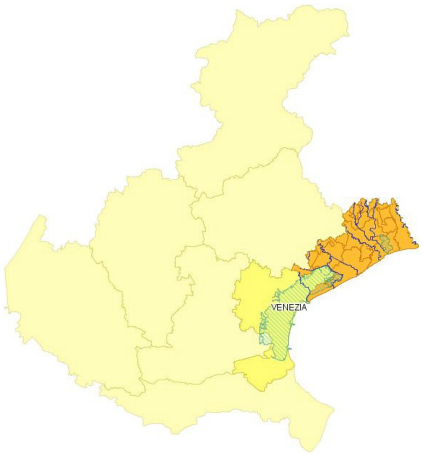
*Figure 2. Veneto (in red) location*

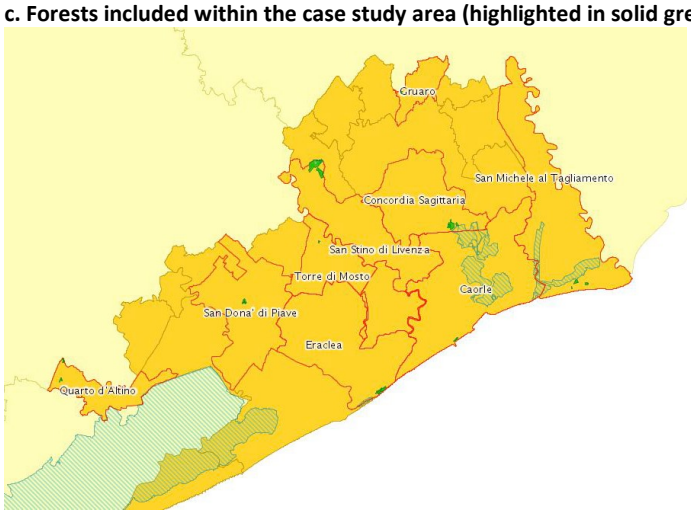
**within Italy (a), case study area (b) within Veneto and forest areas within the case study (c)**

**a. Veneto region within Italy**


**b. Case study area within Veneto (highlighted in orange)**




**c. Forests included within the case study area (highlighted in solid green)**




Source: Paneghel, 2014

Wood production is not the main function for these forests. Although they can provide (and actually they do) firewood to local people, they deliver a variety of ecosystem services ranging from tourism and recreation, to wild forest products supply (mainly truffles and pine nuts), from biodiversity conservation to hunting, etc. About 24% of the case-study area falls within the Natura 2000 network, hosting valuable animal and plant habitats and species, including some endemic ones (e.g. *Rana latastei* and *Euphrasia marchesettii*). Moreover, given the proximity to urban areas forests are characterized by a relevant social dimension and, at the same time, forest operations and management choices are subject to control/monitoring by local communities. All these multiple services are so important that they have been specifically addressed by the newly developed forest management plan for the whole area. The plan has been designed in order to meet requirements for FSC forest management certification. The area, indeed, has undergone preparation for FSC certification and



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become the first FSC-certified forest in Veneto, where regional and local public administration have traditionally been in support of PEFC certification.

## 15.1 Current forest policy conflicts and problems

Specific forest and socio-economic features characterize the case study area. First of all it does not fall within traditionally productive mountainous forest areas: the area is flat and local forests are not primarily intended for wood production, nonetheless they deliver a broad range of ecosystem services (biodiversity and habitat conservation, carbon sequestration, recreation and tourism, etc.). It is located close to urban areas and characterized by high visibility: this can create conflicts/problems with local communities in general or some specific groups of actors (local environmental NGOs) concerned by forest operations and management solutions. In particular this is linked to dualism between active forest management and forest conservation and to the fact that people living in lowland urban and periurban areas are often unfamiliar with/unused to forest management and harvesting operations. Although wood production is not the main service provided by local forests, still they have some potentialities in terms of biomass production mostly in relation to thinning operations needed to improve forest composition and structure.

As regards environmental NGOs, their concerns mostly refer to fauna and flora conservation due to the fact that the area (including farmlands and wet areas close to the coast) is a natural corridor within a highly urbanized region, characterized by the presence of a dense road network and other infrastructures, including one of the main motorways and one of the main railway routes in Italy. As mentioned, about 24% of the area belongs to the Natura 2000 network and one forest area belongs to a Regional Park (Sile River Regional Park). Local communities and NGOs have also expressed some concerns with regard to hunting activities on both mammals and birds. Such concerns, however, mostly refer to poaching activities detected in the area. This is considered an issue also by regular hunters organized under the form of a Hunting Association (*Federcaccia*): they have recently finalized an agreement with the Lowland Forest Association for the management of one of the forest areas (*Bosco delle Lame*), including the prevention of poaching activities.

Along the coast Venice and other touristic places/towns attract several millions tourists per year, with a large incidence of foreigners (mostly from Germany and Austria). Besides visiting art cities (like Venice) and enjoying beach sides tourists express a growing demand for active holidays, including hiking, bicycling, horse-riding, nature photography, wild-life watching etc. within/close to natural areas. Tourism service providers (including hotel and camping managers) are starting to understand the importance of local forests and natural resources to complement the services they offer. As a consequence, forest management operations shall guarantee access to the forest, ensuring safe conditions for users/visitors as well as preventing damages to the most valuable habitats. Some of the forest areas are also suitable (and actually exploited) for wild product collection. This is the case of pine nuts from stone pine forests and truffle from pine forests and other forest types.

An additional issue regards the recent interest by some private companies to invest in afforestation/reforestation projects to offset their emissions and environmental impacts at large and, more in general, to improve their image. This could help expanding forest areas, while favoring public-



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private partnerships also considering that no funds are made available for afforestation/reforestation activities in lowland areas through the regional Rural Development Program.

## 15.2 Instruments and legal competences in forest politics in Veneto

As a consequence of the devolution process described in paragraph above Veneto Region has acquired responsibility over forestry matters. The regional Forest Act dates back to 1978 and has been integrated/updated through more recent norms. Among other issues, it includes requirements and indications for the development of forest management plans (subject to approval by Regional Authorities). Apart from the Forest Act, specific Forest Regulations exist, in particular for areas where a valid forest management plan is not in place and/or areas subject to hydrogeological constraints and limitations. Additional regulations/legally binding issues regard regional Decrees for the identification of Natura2000 areas and the implementation of impact assessments.

Administrative setting in Veneto recently underwent major changes. Forest tasks are no longer the responsibility of a specific dedicated Department, which has been dismantled and fragmented under other sectors (i.e. Agriculture and Rural Development, Biodiversity protection, Soil protection and hydrogeological risk management, Tourism, and Environment protection – as for forest fires management). The former Regional Forest Service was split into five offices, one for each of the provinces in Veneto, and the amount of resources and activities left to Forest Service has dramatically decreased. More recently the Regional Forest Service has been re-arranged into two sub-units/offices, one for the eastern and the other for the western part of the region. Such a decrease also affected Veneto Agricoltura, i.e. the Regional Agency for technical extension and assistance that maintains some operative tasks such as managing region-owned forests, providing technical assistance to economic actors, organizing training and environmental education services, while other activities (e.g. forest nursery management, plantations development in lowland areas, etc.) have been progressively reduced in the last decade. CFS's functions at regional scale are limited to policing.

Table 32 provides a summary list of the main legally-binding and soft instruments for Veneto.

*Table 32. Legally-binding law and soft instruments in Veneto, Italy*

| **Veneto** | **Legally-binding law** |
|---|---|
| | • Veneto Forest Act<br>• Veneto Forest Regulation (*Prescrizioni di Massima e Polizia Forestale*)<br>• Several Council Decrees regarding forest management<br>• Regional Council Decree on truffle picking in coastal pine forests<br>• Veneto Hunting Law (Regional Law 50/1993 and subsequent updates)<br>• Veneto Fauna and Hunting Management Plan<br>• Veneto Land Use Coordination Plan<br>• Veneto Regulation on management of Natura 2000 sites (in particular for impact assessment procedures) |



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| | |
|---|---|
| | **Soft instruments**<br>• European Agricultural Fund for Rural Development (EAFRD)<br>• Extension and training services<br>• Forest nurseries |
| **Veneto –**<br>**Sub-regional/ Local** | **Legally-binding law**<br>• Province and Municipal Land Use Plans<br>• Approved forest management plans<br>• Approved Natura 2000 site management plan<br>• Regulations for public use of Prassacon and Bandiziol forests<br><br>**Soft instruments**<br>• Forest certification |

## 16. Actor analysis: Case study Veneto (Lowland Forest Association)

Actor analysis has been developed building on pre-existing analysis (Paneghel, 2014), stakeholder consultations and other meetings occurring at the case-study scale in connection to forest certification procedures[7] and other activities, and additional *ad-hoc* data collection.

Important actors within the case study area include the Lowland Forest Association, forest owners (mostly local municipalities), the Regional Forest Service, the Regional Authority for Rural Development funds, Regional Forest-related Departments, the Regional Agency for Technical Extension in Agriculture and Forestry, hunters (and their associations), wild product pickers, forest enterprises, other companies (e.g. willing to invest in the creation of new forest areas to compensate their emissions and/or other impacts, and to increase their image/reputation), tourists/visitors, civil society organizations (environmental and cultural ones), and local population.

As already mentioned, most of the area belongs to local municipalities but management activities are performed by a variety of actors, including farmers, private entities, not-for-profit organizations, and the Regional Forest Service. About 21% of the forest areas are directly managed by municipalities that however normally rely on private forest enterprises (through tender procedures) for performing harvesting operations, including thinning. Forest management is mostly oriented to help evolution towards more natural conditions, while at the same time emphasizing relevant ecosystem services like tourism and recreation, carbon sequestration and biodiversity conservation. Wood production is limited and mostly consists of wood for energy (firewood and chipped-wood) although there might be some potentialities for different (low-value) assortments (e.g. wood for packaging from pine). Appropriate forest management choices might also favor the production of valuable broadleaf timber (for sawnwood and veneer production) in the long term. Private forest owners are not currently

[7] These include, among others, the following events: New AFP Forest Management Plan Launching Seminar (San Donà di Piave (Venice), 3rd November 2016) and the workshop "AFP is preparing for FSC certification: changes and benefits" (Portrogruaro (Venice), 14th November 2016).



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involved in the Association, however planned afforestation/reforestation activities are likely to facilitate their involvement in the next future.

The area is very much relevant for fauna resources, both mammals and birds. Nature photography, bird-watching, environmental education and hunting are largely performed and the demand for such services is on increase. As regards hunting, the local unit of the Italian Hunting Association (Federcaccia) is in charge of managing fauna repopulation activities within one forest area, while preventing/monitoring poaching activities and, at the same time, performing thinning and other basic management operations. In general terms recreation and tourism activities require *ad hoc* management operations (harvesting, thinning, pruning) to ensure safe conditions for visitors and/or infrastructures (e.g. access roads, parking areas, etc.) and create appropriate access conditions (e.g. by allowing/not allowing access to certain areas, or by "forcing" the staying on paths). Signals and boards providing information are required as well.

As regards wild forest products, pine nuts are currently gathered by a local cooperative in San Michele al Tagliamento forests, while truffles (*Tuber borchii Vittadini* and *Tuber Albidum Pico*) are collected by various gatherers in different sites: both activities can contribute to differentiate/increase forest owners' revenues and result quite attractive also for visitors/tourists. Wild forest product production is linked to forest management: low forest density favors higher truffle yields, therefore forest management operations in areas where favorable conditions for truffle-growing exist (coastal pine forests, holm-oak forests and oak-hornbeam forests) should be oriented to keep density appropriately low. This could be compatible with operations aiming to favor regeneration by natural broadleaf species (e.g. holm-oak, *Quercus ilex*). Density reduction through thinning in pine forests would also create more favorable conditions for pine nuts production from *Pinus pinea*. Where compatible with naturalization aims, inoculated-pine trees can be planted to support nut production while creating favorable conditions for truffle growing. Low forest density conditions can also favor the growth of other wild products, in particular wild asparagus (*Asparagus officinalis*). The University of Padova is currently performing some studies in the area, in cooperation with the Lowland Forest Association and forest owners, to assess the potential truffle production and identify appropriate management solutions. Appropriate mechanisms for avoiding overexploitation and illegal collection as well as to allow the assignment of collection rights upon payment of fees should be defined based on existing experiences in Italy.

Active forest management is not always appreciated by local environmental NGOs that monitor fauna and flora conditions, especially for endemic/rare species and valuable habitats. These organizations sometimes criticized forest operations and their impacts and gain visibility on local media and communities. In order to favor the dialogue among owners, managers and conservationists, a representative of local environmental NGOs has been appointed as a member of the Board of the Association.

Tourists and recreationists are among the main beneficiaries/users of the forest areas. The growing demand for forest areas and connected services (hiking and bicycling paths, environmental education facilities, etc.) is a challenge but also an opportunity for the local tourism sector. Active and nature-based holidays can complement traditional holidays at the beachside and visits to art-cities, resulting attractive for a wide market segment. At the same time, the increased offer of recreation and leisure opportunities is a benefit offered to local population and can contribute increasing the wellbeing and general health conditions of locals.



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## 16.1 Interest of actors: Lowland Forest Association (Eastern Veneto)

Interest of actors at the case study scale has been assessed according to the same approach used at the national scale. Results are summarized in Table 33. As regards Regional Departments dealing with forestry issues, they cover a wide set of prevailing interests somehow similarly to what has been observed for different Ministries at the national scale. The Regional Authority for Rural Development and Agriculture Payments (AVEPA) plays a relevant role: it supports measures/activities directly or indirectly linked to different ecosystem services. The Regional Agency for technical extension and assistance (Veneto Agricoltura) has also multiple interests, although with stronger expertise and experience in traditional services like provisioning (e.g. wood production) and regulating ones (e.g. biodiversity protection), as well as a growing attention towards cultural services (recreation and tourism linked to agriculture and forestry).

Public forest owners within the case study area mostly consist of municipalities. On the one hand provisioning services can ensure them some revenues (e.g. from wood sales), on the other they are interested in managing their forests in order to offer recreation opportunities and wellbeing to both local communities and visitors, including tourists. This is also a way to support local economies by helping enriching and differentiating services offered by the local tourism sector.

As for the non-public actors, the situation is much more diversified. The Lowland Forest Association has crosscutting interests, covering more or less all the ecosystem services in the list. Provisioning services are of interest for private forest owners, although so far they are not included within the Association (wood and wild products). Local forest enterprises are interested in wood provision because this implies additional job opportunities and revenues. In principle also local companies involved in firewood trade have a stake in wood production, however given the (relatively) limited amount of available firewood and (above all) the lower prices for imported materials, such an interest is not so strong in practice. Local restaurants (e.g. *pizzerie*) have some interest in wood production too, as well as local population that can benefit from locally produced firewood for feeding their heating systems and for other household uses. Wild forest products are relevant for professional pickers (e.g. cooperatives specialized in gathering pine nuts) and for non-professional ones (e.g. recreationists and/or locals). Game provision represents an ecosystem service of interest for local hunters, including poachers.

As regards biodiversity and habitat conservation, they are perceived as important ecosystem services mostly by local environmental NGOs and (to lower extent) by other groups (e.g. hunters -not including poachers- and the local population). In particular local environmental NGOs would prefer a very minimal forest management approach on existing forest stands, to reduce impacts on fauna and flora resources. In the last years a growing number of companies expressed some interest in investing in forest projects to increase biodiversity conservation and habitat quality (as well as carbon sequestration). Although the area targeted through these projects is still limited, the potential is huge. NGOs and companies (as well as the Lowland forest Association) have also an interest in carbon sequestration. In the next future this could also become an issue for hotel managers and tourists, the former being able to offer the latter the opportunity to offset their emissions by investing (off-set payments) in local forest areas.



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Finally, many different groups, including the Lowland Forest Association, hotel managers, and the local population, perceive cultural services as relevant. Some interest exists also by (potential) investing companies that can offer recreation opportunities through newly created forests and gain additional visibility.

*Table 33. Interests in ecosystem services of selected actor groups (case study level)*

(a) public and (b) non-public actors

| | **(a) Public actors** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **Regional Dept. Agriculture and RD** | **Regional Dept. Biodiversity protection** | **Regional Dept. Tourism** | **Regional Dept. Soil protection** | **Regional Dept. Civil protection** | **Regional Authority for Rural Development and Agriculture Payments** | **Regional Agency for technical extension and assistance** | **(Province) Forest Service** | **Public forest owners (municipalities)** |
| *Provisioning ES* | | | | | | | | | |
| Wood (timber & firewood) provision | +++ | - | 0 | + | ++ | ++ | +++ | +++ | +++ |
| Wild forest products (mushrooms, truffles, herbs,…) provision | +++ | - | + | 0 | + | + | + | + | +++ |
| Game provision | + | -- | 0 | 0 | 0 | 0 | 0 | + | ++ |
| *Supporting ES* | | | | | | | | | |
| Biodiversity | ++ | +++ | + | 0 | 0 | ++ | ++ | ++ | + |
| Habitats | ++ | +++ | + | 0 | 0 | + | ++ | ++ | + |
| *Regulating ES* | | | | | | | | | |
| Carbon sequestration | +++ | + | 0 | 0 | 0 | + | ++ | + | + |
| Water quality | + | 0 | 0 | + | 0 | 0 | ++ | 0 | ++ |
| Hydrogeological protection | ++ | 0 | 0 | +++ | ++ | 0 | + | ++ | ++ |
| *Cultural ES* | | | | | | | | | |
| Outdoor recreation | + | - | +++ | 0 | 0 | ++ | + | 0 | ++ |
| Aesthetics | + | + | +++ | 0 | 0 | 0 | + | ++ | ++ |
| Tourism | + | - | +++ | 0 | 0 | ++ | ++ | 0 | +++ |

| | **(b) Non-public actors** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Private forest owners** | **Lowland Forest Association** | **Forest enterprises** | **Wood/Firewood trade companies** | **Other companies (sponsorship, C-offsetting)** | **Local wild-product collectors** | **Local environmental NGOs/groups** | **Hunters** | **Hotels/Hotel managers** | **Tourists** | **Local population** |
| *Provisioning ES* | | | | | | | | | | | |
| Wood (timber & firewood) provision | +++ | +++ | +++ | ++ | + | + | --- | 0 | 0/+ | 0 | ++ |



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| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Wild forest products (mushrooms, truffles, herbs,…) provision | ++ | +++ | 0 | 0 | + | +++ | -- | 0 | ++ | ++ | ++ |
| Game provision | - | ++ | 0 | 0 | 0 | 0 | -- | +++ | + | 0 | + |
| *Supporting ES* | | | | | | | | | | | |
| Biodiversity | - | +++ | -- | 0 | +++ | ++ | +++ | ++ | 0/+ | ++ | + |
| Habitats | - | +++ | -- | 0 | +++ | + | +++ | ++ | 0 | ++ | + |
| *Regulating ES* | | | | | | | | | | | |
| Carbon sequestration | + | +++ | -- | 0 | +++ | 0 | +++ | 0 | 0 | + | + |
| Water quality | 0 | +++ | 0 | 0 | ++ | 0 | +++ | 0 | + | + | ++ |
| Hydrogeological protection | - | ++ | -- | 0 | + | 0 | + | 0 | 0 | 0 | + |
| *Cultural ES* | | | | | | | | | | | |
| Outdoor recreation | - | +++ | 0/- | 0 | +++ | 0 | - | --- | ++ | +++ | +++ |
| Aesthetics | 0 | +++ | - | 0 | +++ | 0 | +++ | 0 | + | +++ | +++ |
| Tourism | - | +++ | 0/- | 0 | 0 | 0 | -- | --- | +++ | +++ | + |

## 16.2 Power of actors: Lowland Forest Association (Eastern Veneto)

Power of actors has been analyzed according to the same approach adopted above. Results are presented in Table 34 below. After decentralization, forest tasks have been split among five different administrative units at Regional level, under the responsibility of various other sectors, no longer with a single coordination unit at regional level. Traditional public authorities (Regional Forest Services) tried to maintain their control over forest management and, as emerged in previous studies (Secco *et al*., 2017), they are reported as the most powerful forest stakeholders in the region at both Regional (since they are entrusted with the (technical) decision-making authority) and State level (control of law compliance by harvesting companies). As already observed at the national scale, coercion is the main power resource used.

Another powerful actor is the Regional Authority in charge of managing Rural Development and Agriculture Payments because it has monitoring and checking responsibilities over the issuing of funds/payments to farmers and other applicants. These funds play a crucial role for forests not having a primary production function and provide support for performing both planting and thinning and other management operations. It is worthwhile mentioning, however, that one of the key services proved by the Lowland Forest Association consists of fundraising activities, to support activities of members and reduce dependency from Rural Development funds (e.g. FSC Smallholder Fund, private sponsorships, etc.). Municipalities are also perceived as important actors at local level: as forest owners they can decide to become members of the Association or not, (to some extent) negotiate forest management activities and decide whether to make additional funds available from their own budget or not.

Forest enterprises have limited power since they depend on forest management activities planned by the municipalities and normally tendered. The Lowland Forest Association has recently set-up



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procedures asking enterprises willing to operate in the area to have appropriate professional expertise and to be trained on forest certification requirements. Such a requirement has been defined since the area is now FSC certified and as a measure to improve management quality. Specific training sessions have been organized to allow enterprises achieving the required skills/awareness.

Local environmental NGOs have some power since they can take action against forest management operations they do not consider appropriate and get visibility towards local population and public opinion in general. A representative of environmental NGOs has recently been appointed as a member of the Board of the Association.

Hunters, who have links with the local political representatives, are reported as powerful actors: despite being a minority and decreasing group in the Region with respect to the whole population, they are able to successfully lobby for their interests (Secco *et al*., 2017). As mentioned above they have signed an agreement with the Lowland Forest Association for the management of an area and the prevention/control of poaching activities.

*Table 34. Overview about power resources of actors with different interests in Veneto, Italy*

| **Actor's interests** | | **Power resources** | | | |
|---|---|---|---|---|---|
| | | **Means of coercion** | **Incentives** | **Dominant information** | **Power resources of the interest** |
| **Public** | Regional forest/forestry-related Departments | +++ | ++ | ++ | Strong |
| | Regional Authority for RD and agriculture payments | +++ | +++ | + | Strong |
| | Regional Agency for technical extension and assistance | 0 | ++ | ++ | Medium-Low |
| | Forest service | +++ | + | ++ | Medium-Strong |
| | Tourism Information and Welcome Offices | 0 | ++ | ++ | Medium |
| | Public forest owners (municipalities) | ++ | ++ | + | Medium |
| **Private** | Private forest owners | 0 | 0 | 0 | Low |
| | Lowland Forest Association | ++ | +++ | +++ | Strong |
| | Forestry enterprises | 0 | + | 0 | Low |
| | Wood/Firewood trade companies | 0 | + | 0 | Low |
| | Other companies (sponsorship, C-offsetting) | 0 | +++ | ++ | Medium |
| | Local wild-product collectors | + | ++ | + | Medium |
| | Local environmental NGOs/groups | 0 | ++ | ++ | Medium |
| | Hunters | ++ | + | ++ | Medium |
| | Local sport groups/individuals | + | + | + | Low |
| | Hotels/Hotel managers | 0 | + | + | Low |
| | Tourists | ++ | + | ++ | Medium |
| | Local population | ++ | 0 | ++ | Medium |



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Strong power resources can be identified with reference to both public and non-public actors. As for the formers (Regional forest/forestry-related Departments, Regional Authority for Rural Development and Agriculture Payments and Forest service), they mostly base such a power on means of coercion like laws and normative issues, monitoring and control measures, etc. Incentives are also used: for example for many years the Region has managed a regional PEFC group certification and has been giving technical and financial support to forest owners for joining the group[8]. Incentives can also be available under the form of rural development funds: holding a forest certification ensures higher chances for successfully apply for these funds. Among non-public actors the Lowland Forest Association plays a relevant role, combining different power resources: it provides funds and technical support just for members, including the development of *ad hoc* projects, support towards FSC forest certification, and communication and visibility. It also builds partnerships with other actors (new members, potential investors, potential partners, university and research institutions etc.) and lobbies in favor of members. The Association has also access to some dominant information, since it can provide information on markets, innovative solutions, available funds etc. that otherwise would not be easily accessible to the members.

Private investors have an increasingly strong power, mostly in terms of incentives: they can decide to invest to create new forest areas and/or enlarge and improve existing ones. This can imply both the purchase of areas and, more often, renting of lands from public or private owners. These companies also have some dominant information with reference to market and prices for ecosystem services, often with the support of external advisors.

Forest enterprises and local wood/firewood traders have extremely limited power because timber harvesting has limited relevance in the area. As regards hunters, they have strong lobbying capacity, and can exercise some control over members of the Hunting Association. They can also offer incentives, e.g. management of areas in turn of poaching prevention. They also have more direct impacts on forest management by their actual physical actions within the forest when realizing their interests.

Civil society actors interested in nature conservation are influential by appealing to the moral obligation to protect nature and their high reputation and credibility by the general public. Towards this (or, at least, part of it) they also exercise dominant information.

As regards tourists, they can exercise power by deciding to visit a certain place or not and where/how to spend their holidays. They can also exercise coercion in terms of services they demand. On the other hand they might be willing to pay extra money for these services and/or they indirectly provide incentives by paying city taxes while staying in the area.

All other actors play a marginal role with reference to power to influence forest management. Local population can have some coercion power (e.g. criticisms and protests against management solutions, however this is mostly leaded by local NGOs/associations, but also electing majors and municipal council members). Hotel managers (and their associations) can promote recreational use of forests by including recreation opportunities within the services they provide. This might also include carbon off-setting initiatives. Nonetheless these initiatives are still in a preliminary stage and so far they do not have significant effects on forest management.

[8] The Region is now on the process to pass the management of the PEFC Regional Group to a new entity, however it is not still clear who will be the manager.



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Biodiversity and habitat conservation prevail in terms of power resources of interests. Provisioning and (some) cultural service have medium power, while regulating services (with the only exception of carbon sequestration) have limited power (Table 35).

To summarize, power resources to impact forest management are mostly concentrated on public (Forest Departments, Forest Service and Regional Authority for Rural Development and Agriculture Payments) and private actors (Lowland Forest Association). Civil society has moderate power, mostly with reference to the role of local NGOs and other organizations (Table 36).

*Table 35. Overview of power resources of interests in different ecosystem services (Veneto, Italy)*

| **Interest in:** | **0verall power resources** | **Means of coercion** | **Incentives** | **Dominant information** |
|---|---|---|---|---|
| *Provisioning ES* | | | | |
| Wood (timber & firewood) provision | **Medium** | +++ | ++ | + |
| Wild forest products (mushrooms, truffles, herbs,…) provision | **Medium** | ++ | ++ | ++ |
| Game provision | **Medium** | +++ | ++ | + |
| *Supporting ES* | | | | |
| Biodiversity | **Medium-Strong** | +++ | ++ | ++ |
| Habitats | **Medium-Strong** | +++ | ++ | ++ |
| *Regulating ES* | | | | |
| Carbon sequestration | **Low- Medium** | + | ++ | + |
| Water quality | **Low** | + | + | + |
| Hydrogeological protection | **Low** | ++ | 0 | + |
| *Cultural ES* | | | | |
| Outdoor recreation | **Medium** | +++ | + | + |
| Aesthetics | **Low** | +++ | 0 | + |
| Tourism | **Medium** | +++ | + | + |

*Table 36. Overview about power resources of different actor types in Veneto, Italy*

| | **Means of coercion** | **Incentives** | **Dominant information** | |
|---|---|---|---|---|
| **Private actors** | ++ | +++ | ++ | **Strong** |
| **Civil society actors** | + | ++ | ++ | **Medium** |
| **Public actors** | +++ | ++ | ++ | **Strong** |



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### 16.3 Power of non-traditional forest actors to impact forest management

As already mentioned the Lowland Forest Association represents a unique case for lowland forests in Italy and has gained growing power and relevance for the management of local forest resources. The most innovative dimension for the Association consists on its capacity to link multiple public-private actors with interests on local forest resources. These include public forest owners, public bodies/authorities with responsibilities over forests/forestry, university (e.g. for research activities, training events, field-training for students, etc.), consultants, environmental NGOs, hunters and their Association, potential investors from different sectors, etc.

Multifunctional forest management is part of this approach and all management operations aim to valorise the multiple services offered by local forests. This is well reflected into the newly developed forest management plan that includes ecosystem services and set-up management solutions for their conservation and enhancement. Due to proximity to urban areas and the large number of visitors, as well as to the specific ecological (and socio-economic) features of local forest resources (forest remnants, new plantations, periurban parks, etc.) management operations are not standardised and are mostly oriented to facilitate the evolution towards more natural and stable forest ecosystems. This also leaves managers the opportunity to decide future operations based on the progress of development processes and to decide the type and intensity of management operations according to specific conditions.

The Association attracts funds for improving forest management both in terms of increased quality of management operations, and enlargement of forested areas. This includes new management agreements and solutions (e.g. with the Hunting Association, or with an external FSC group certification manager), the research for new members (e.g. Venice Province) and the creation of new areas through new investments. This also includes a closer connection and cooperation with local environmentalists that have a representative within the Board of the Lowland Forest Association.

Visibility of forest resources and management solutions requires a continuous dialogue with various actors, including local population and tourists. Communication and information/dissemination activities are part of the management strategy for this area.

## 17. Conclusions

The case study area consists of forest resources that are not typical productive forests within mountainous areas. The specific features and dynamics of these resources require tailored management solutions, including *ad hoc* and innovative arrangements among different actors. This is one of the reasons why, while traditional public actors still (try to) maintain their power, the Lowland Forest Association is gaining a stronger role as long as it succeeds in involving a larger number of actors. Besides being a proactive actor itself, the Association operates as a kind of hub: it facilitates networking of different players for developing management solutions for local resources. Its capacity to attract funds from different sources (public and private, regional/national and international) to give



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visibility to activities and to support dialogue among different stakeholders is accelerating the adoption of new management models and bringing some innovation (both in absolute and relative terms). Examples include the achievement of the first FSC forest management certification at regional scale, while Regional Public Bodies have normally played a direct role in politically, technically and financially supporting PEFC certification, the inclusion of ecosystem services into the forest management plan as a basis for orienting future management operations, the continuous dialogue with multiple actors having different interests in responsible and multifunctional management of local forest resources, the cooperation with local universities and research groups to develop and test innovative solutions, the participation to international projects, etc.

Limited financial profitability of forest resources, high visibility and some resistance by more conservative actors as well as less informed ones (e.g. part of local population) represent some of the limiting factors and challenges to address.

Future forest management models should take into account the demand for multiple services by a broad number of actors as well as the specific ecological features and dynamics of local forests. From a purely technical point of view there is no standardised management model to replicate and much is left to case-by-case decisions made by the forest manager(s) within the framework of a broader strategy set-up through the management plan and dialogue with stakeholders. In the short to medium term, selective systems appear as the only viable management solutions, however there might be room to test different approaches as soon as local population and other key stakeholder become more confident about active forest management. It is worthwhile underlining that new agreements and arrangements (both formal and informal ones) and networking/cooperation among different actors are part of these new management models and likely represent the most relevant and challenging component of future decision making and innovation processes.



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## Lithuania - Case Study Telšiai

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*Summary*

Current Lithuanian forestry can be described as a struggle between the traditional silvicultural focus on maximizing sustainable timber production and increasing attention on environmental and social values. After the restoration of independence and turning towards market economy, timber was considered one of the few domestically available raw materials. This, also the modernization of forestry technologies, the liberalization of international trade and privatization, including forestland restitution to pre-war landowners and their heirs doubled the forest harvesting. Simultaneously, the acceptance of international environmental standards, joining the EU led to "greening" of society together with introducing or increasing environmental regulations, implemented through segregation management and integrative measures. So, the major forest policy conflicts and problems both at the national and case study area levels are due to struggle between maintaining stern regulation versus increasing the decision freedom for forest owners and managers in practically all forestry aspects.

Forest policy arena is strongly dominated by state forest institutions, including the forest management requirements which are identical to state and private forest owners, disregarding totally different management conditions and owners' needs. Prevailing public opinion on forests and forestry is in principle negative, as the involvement of public in taking forest management decisions is also low. State forest management via 42 state forest enterprises, simultaneously being legally self-subsistent and economically independent entities but fulfilling the requirements to provide conservation, recreational, social services, if far from being efficient and is pending for reforms. Private foresters are predominantly very fragmented, sometimes rather weak, however aiming diverse management objectives, ranging from strongly economic to purely conservational. Timber trade is strongly influenced by third parties and non-transparent round timber auctioning and interests on local timber industries. Implementation of nature protection measures has also introduced some hesitations on the economic and ecologic effectiveness of solutions. Afforestation, especially on abandoned agricultural lands is promoted, however it is reaching the margins. Research and education in forestry is characterised by limited resources and still unbalanced research personnel and institutions.

Development of legal competences and instruments in Lithuanian forestry was relatively stagnant during last years. However, new Government plans to improve legal forestry environment, and the management models of state and private forests, to support timber industries and to solve some environmental problems. Even though the new Government has been in power just for several months, some steps on fulfilling its program are already evident, e.g. the plans for restructuring state forest management and reduce the number of state forest enterprises have already been announced.

At the national scale, the differences between the interests in ecosystem services are clearly seen if governmental and non-governmental actors' groups are compared. The governmental actors are usually interested in diversity of ecosystem services while the non-governmental actors tend to be more concentrated on a specific ecosystem services. The actors interested in timber provision and



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environmental conservation are most powerful in forest policy processes at the national level, much due to the fact, that they are represented not only by civil society and market actors, but also by the governmental actors. Medium power resources belong to the actors interested in the provision of renewable energy, timber processing, hunting and certification. The weakest in this context are the actors interested in recreation, water provision, and employment in forests. The governmental actors exercise power primarily through coercion due to their executive power. Power of civil society actors is mainly based on unverified information which is spread within lobbying processes, in public relations, contribution to research projects and general participation in the public discourse. Market actors mainly apply some material incentives by regulating timber demands and prices. It should be noted that strong state influence and powerful forest legislation doesn't allocate much power of the non-traditional forest actors.

Similarly to the national level, the strongest actors at the case study level are interested in forest management, recreation and nature conservation. Telšiai state forest enterprise is the actor with the biggest power among the actors with the interest in forest management, although it is also strongly controlled by the state authorities. The governmental actors have the strongest power resources in the case study and the market actors have the medium influence – this fits the findings at the national level. Nevertheless, the power of civil society actors at local level is somewhat higher the one at national scale. Actors with interests in wood provision, supporting and cultural ecosystem services have the strongest power resources to impact forest management in the case study. The environmental NGOs in the case study area have less influence, if any, on the forest policy than on the national level.



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## 18. General country information: Lithuania

In 2015, according to the Lithuanian forest resource assessment, the total forest land area was 2,179,900 ha covering 33.4% of the country (Lietuvos miškų ūkio statistika 2015). The area of forest stands tended to increase during the last decade, e.g. it raised by more than 5% (Lietuvos miškų ūkio statistika 2003). Coniferous stands cover 56.0 % of the forest area (Scots pine – 35%, Norway spruce – 20.9%) followed by 40.4 % of softwood deciduous tree species (including birch species – 22.3%, black alder – 7.3%, grey alder – 7.3% and aspen – 4.1%). The total growing stock volume amounts to 528.9 million m³ (Lietuvos miškų ūkio statistika 2015) and tends to increase. The gross annual increment is 18.8 million m³, this corresponds to 8.9 m³ $ha^{-1}$. State forests cover 1,084,500 ha, private forests – 866,200 ha, and 229,200 ha of forest are reserved for restoration of ownership rights to former owners (Lietuvos miškų ūkio statistika 2015). All Lithuanian forests are divided into four functional groups according to prevailing functional objective. Group I includes forests for which no management is applied and all cuttings are prohibited (1.2%). Group II represents ecosystem protection and recreational forests (12.2%) for which cuttings are allowed at the age of natural maturity. Forests with water, soil, landscape or valuable natural features to be protected such as genetic and culture reserves as well as forest seed stands are under Group III (15.2%). Finally, Group IV represents commercial forests (71.4%). In 2016, special sub-group for plantation forests was introduced.

As highlighted by Brukas (2015) the Lithuanian forestry is young by the European standard, the national forest administration only emerged after establishing the Republic of Lithuania in 1918. Nevertheless, it has experienced serious changes during the last century, related to altering political regimes, social and economic environments, but rather stagnant development of professional forestry. Before Lithuania gained independence in 1918, forests were mostly owned by noble landlords of foreign origin, quite poorly managed and severely depleted (Brukas, 2003; Mankus, 2003). Land reform, resulting in the domination of State forests, the establishment of ordered silvicultural practices and maintenance of rather intensive utilization were characteristic for the interwar period (Brukas 2003; Kairiūkštis 2003; Brukas 2015). Another period of rather intensive forest cutting occurred during WWII, resulting in the lowest ever proportion of forested land in the current day territory of Lithuania (Juknelienė and Mozgeris 2015). Forest cover in Lithuania tended to increase during the Soviet period (Lietuvos miškų ūkio statistika 2015) basically due to (i) the aspiration to preserve domestic forest resources, i.e. underestimated timber resources, conservative approaches to estimating annual cutting norms and significant amounts of timber shipped from the Russian Federation, (ii) peculiarities of the planned economy, i.e. putting huge weight on managerial hierarchies rather than economic reasoning, (iii) strong referral to the classical German theory of normal forests, which emphasized the sustainable flow of timber from forest stands of the highest possible productivity – as full stem technology was shaping harvesting technologies, very long rotations were applied and (iv) the large scale afforestation projects as well as natural transformation of other land areas to forest (Kenstavičius and Brukas 2003).

The restoration of independence in 1990 resulted in significant changes in Lithuanian forestry. First of all, turning towards a market economy, timber was considered one of the few domestically available raw materials. Additionally, the modernization of forestry technologies, the liberalization of international trade and privatization, including forestland restitution to pre-war landowners and their heirs, all resulted in notably increased forest felling – annual volumes of removals increased from 3.0



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mill. $m^3$ in 1990 to 7.4 mill. $m^3$ in 2013 (Lietuvos miškų ūkio statistika 2015). On the other hand, the "greening" of society and the acceptance of international environmental standards (like Rio 1992, signing international agreements, joining the EU in 2004) led to newly introduced or increased environmental regulations, implemented through segregative management (e.g. an increase in protected areas and setting of management restrictions through the forest land zoning) and integrative measures (e.g. voluntary set-aside from forestry activities of some forests of high conservation value or key woodland habitats, and the leaving of biodiversity trees and deadwood in commercial forests) (Andersson et al. 2005; Ministry of Environment 2010; Brukas et al. 2013a; Brukas 2015).

## 18.1 Current forest policy conflicts and problems

The main discourses around forest management in Lithuania can be seen as a struggle between "the new" and "the old", i.e. rapid social changes push for reforms in forestry (sometimes in opposing directions) while the forestry at large is trying to nurture the traditional professional values, norms and structures (Brukas et al. 2013a). At a core, one can discern an (partly latent) "ideological struggle" between the traditional silvicultural focus on maximizing sustainable timber production and the new aspirations. By the latter we refer to the increased attention on environmental values on the one hand and better economic performance of state forestry on the other. Also, there is an ongoing struggle between maintaining stern regulation versus increasing the decision freedom for managers of state forests and particularly private forest owners.

Based on actor analyses, most important current conflicts about forest management of in Lithuania are summarized in Table 37.

*Table 37. Overview of current conflicts and issues in Lithuanian forest politics*

| ***Conflict category*** | ***Conflict*** |
|---|---|
| **General** | Forest policy arena is strongly dominated by state forestry institutions, especially by the policy-formulating Forest Department under the Ministry of Environment and the state forestry coordinating Directorate General of State Forests vs the influence of other actors (private forestry, timber industry, municipalities, wide public, NGOs, etc.) |
| | Forestry administration under jurisdiction of Ministry of Environment vs economic and rural development aspect of forest sector |
| | Regulation versus freedom in practically all forestry aspects |
| | The theory of normal forest vs modern concepts of "sustainable forestry" |
| | "Greening" of forestry through segregative forest management vs integrative forest management |
| | Deliberation between conservation, economic, and recreational interests/meaning of "sustainable forestry" |
| | Society vs Forestry: prevailing public opinion is that private foresters are just cutting while state foresters are hunting or steeling. On the other hand, professional foresters consider the public as being completely incompetent in any forestry issue and thus to be eliminated from any related discussion |
| | Forestry vs other land uses, e.g. land for housing, industries, mining, water reservoirs |



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| | |
|---|---|
| **State forest management** | State forest enterprises being legally self-subsistent and economically independent entities vs the requirements to provide conservation, recreational, social services |
| | 42 SFEs as self-subsistent and economically independent entities vs one institution, responsible for state forest management |
| | Using services of contractors to perform forest harvesting and transportation vs utilization of own resources (i.e. harvesting and transportation by the SFEs) |
| | Regulative power of General forest enterprise vs status of 42 SFEs as self-subsistent and economically independent entities |
| **Private forest management** | Requirements for forest management transferred from state to private forestry, disregarding totally different management conditions and owners' needs |
| | Fragmentation of small-scale forest holdings vs effective forestry, technological innovations |
| | Mentality of private forest owners based thinking on "forest as livelihood" vs "forest as object of safe investment" |
| | Treating private forest owners as a potential threat to the forests by forestry authorities |
| | Potential conflicts between two associations representing the interests of private forest owners |
| | Restrictions (some) to foreign investors to purchase land in Lithuania |
| | Inexperience and weakness of small private forest owners vs aggressiveness of forest businessmen in their business relationships |
| **Forest inventory and management planning** | Dominating role of State forest service in all forest inventory and management planning aspects and neglecting opinion as well as the actual needs of other actors |
| | Mandatory requirements of forest management plan and strictly regulated inventory and planning principles vs actual needs and specifications for forest management planning |
| | Redundant forest inventory systems (NFI, inventory of mature forests, stand-wise inventory for all forests) vs effective, open, economically sound and based on current technologies forest inventory solutions |
| **Timber trade and processing** | Influence of "third parties" in round timber trade, including non-transparent round timber auctioning vs direct contacts between forest owners/managers and timber processing industries |
| | Lacking transparency in timber scaling, excessive timber re-measurements, ineffective timber marking |
| | Interests of Lithuanian timber industries vs interests of state forest enterprises |
| | After introducing 5% tax on harvested timber for private forests, radically dropped down the industrial round-wood supply from private forests |
| | Interest of timber industries vs timber round-wood exports |
| | Furniture industry lacking semi-manufactures needed for production. Board factory in Kazlų Rūda has no possibility to expend its production potential. So, Lithuanian furniture industry has limited developed potential even in the markets they have already entered |
| **Nature conservation** | Chaotic system of protected areas and environmental restrictions vs clear legal competences and forest management approaches |
| | Reserve status to allow natural development of forests vs. sustainable harvesting |
| | Implementation of Natura-2000, woodland key habitats, resulting in restrictions of commercial (Group IV forests due to Natura 2000 or WKH) vs real environmental values |
| | Nature conservation measures vs non-available compensation mechanisms for forest owners/managers to implement such measures. I.e. majority of forest owners/managers would accept additional conservation measures if being compensated for that |



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| | |
|---|---|
| | Urbanization development vs restrictions in protected areas (as a result of land reform) |
| | ENGOs acting as consultancy companies and orientation on well financed environmental projects or public shows vs real nature conservation interests |
| | Avoidance of non-native tree species vs economic considerations |
| | Forest conversion towards more natural ecosystem types vs plantation of economically most beneficial tree species |
| | Requirements to increase the share of non-clear cutting vs validated and effective forestry practices |
| | Deadwood share, requirements to leave biodiversity trees when harvesting vs real environmental values |
| | Wildlife protection measures vs forest management restrictions vs real values for wildlife |
| | As the forests in protected areas are not managed by the administrations of protected areas, there are conflicts with forest owners/managers due to differences in interpretation of forest management objectives and implementation of forest management models |
| | Huge diversity of interests, first of all commercial ones, in protected areas vs nature conservation |
| | Aiming to increase the amount of oak forests vs actual potential and economic considerations |
| **Energy** | Material vs. energetic wood use |
| | Lack of subsidization of energetically used timber |
| | Intensification of harvesting measures vs nature conservation |
| | Regulative manner in state forest enterprises in production of energetic wood without cost-benefit evaluation and optimization of technologies |
| | Over-optimistic expectations regarding energetic wood availability vs realistic supply opportunities |
| | Pipeline construction through forests |
| **Climate change** | Increasing the afforestation vs agriculture |
| | Improved climate mitigation measures in silviculture to increase the carbon accumulation |
| | Financial compensation for owner for climate change mitigation services of forests |
| | Exporting round wood vs processed timber (in terms of carbon accounting) |
| | Adopting forestry solutions mitigating the climate change vs adopting forestry to changing climate |
| **Recreation** | Increased/changed interests of recreational users vs. conservation and use |
| | Scenery and landscapes vs. economic interests |
| | Motor cross vs. economic and other recreational interests |
| | Accessibility to recreational facilities vs private property interests |
| | Undeveloped water-ways and river- and lake port infrastructure to increase the tourism potential |
| | Private land ownership and non-conventional for recreational areas functions vs accessibility of recreational areas for public |
| | Undeveloped or even lacking tourism marketing vs tourism potential. Lithuania lacks an image as tourism-attractive country |
| **Hunting** | Browsing damages vs economic and ecological interests |
| | Damages for farmers vs game abundance |



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| | |
|---|---|
| | Decreasing population of wild boar due to African swine fever virus vs game resource availability and preferences of hunters |
| | Interests of hunting clubs vs private land owners |
| | Game animals belong to the state vs private land ownership. This leads into the conflict while developing the hunting management plans |
| | Permanent discussion on hunting laws, frequently changing legal acts regulating the hunting |
| **Work in forests** | Harder working conditions in forest comparing to other industries (leading to the lack of employees) |
| | Labor productivity vs job safety of forest workers |
| | Low minimum wages for forest workers vs increasing living costs and temptation for emigration |
| **Research and education** | Limited resources vs unbalanced research personnel and institutions |
| | Never ending discussion on optimization of higher education in Lithuania, including reorganizations of redundant universities and overlapping study programs |
| | System of state financing for university education based on "study baskets" – overconcentration of forestry students at college vs university, reduced motivation and potential of university students |
| | Undeveloped studies and research in timber trade and wood science |
| | Low salaries and motivation of education and research staff |

## 18.2 Instruments and legal competences in Lithuanian forest politics

The main directions of Lithuanian forest policy are defined by the Parliament and determined by laws. State forest strategy is formed by the Ministry of Environment, which also prepares national forestry programmes. Forest Department at the Ministry of Environment directly takes part in formation, organisation and coordination of forest policy and strategy. State policy related to forest management is delegated to the State Forest Service. Among other functions, the service performs state control of forest condition, use, reforestation, afforestation and protection as well as issues cutting permits to all forest owners, administrators and users. With the aim to separate policy-making and management, Directorate General of State Forests (DGSF) was created in 1996 and it soon became and influential actor. 42 State forest enterprises (SFEs) are legally self-subsistent and economically independent entities, however, the influence of the DGSF was raising over the years. Today, the SFEs must largely follow the detailed legislative requirements, orders from DGSF and prescriptions of forest management plans. On the other hand, the number of SFEs is fixed in the Forest law, indicating great lobbying power of the state forestry. Main areas related to forest policy are distributed to different ministerial jurisdictions, as identified in Table 38. There are also other ministries and subordinated institutions listed among the actors, however their role is less significant in forest policies.



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*Table 38. Ministerial jurisdictions in charge of forest-related policies*

| Policy area | The primary ministerial jurisdiction | Competences, related to forest policy |
|---|---|---|
| Forestry (forest management) | Ministry of Environment (Department of Forests) | According to the Forest Law (2011), The Ministry of Environment formulates the forestry strategy and forestry programmes. |
| Wood-based industry | Ministry of Economy | According to its Statute (LRV 1998), the Ministry is tasked with formation & implementation of economic policy with all its facets, incl. competition, privatisation, enterprise law, etc. |
| Wood energy | Ministry of Energy<br><br>Ministry of Environment | According to the (Law on Biofuel… 2000):<br>In charge for the development of production and use of […] waste from forestry and wood wastes.<br>Responsible for evaluating the potential of products and waste from forestry |
| Rural development | Ministry of Agriculture, (Department of Rural Development) | According to the Law of Agricultural and Rural Development 2002, the Government and the Ministry of Agriculture is in charge of formulating and implementing rural development policy. |
| Environment | Ministry of Environment | According to the Law of Environmental Protection (2002), Ministry of Environment formulates and implements the environmental policy. |

Source: Brukas et al. 2013a

The following major legal acts regulate the forest management in Lithuania:

- International:
  - Convention on Biological Diversity
  - Convention on Wetlands of International Importance
  - Convention on Wetlands of International Importance, especially as Waterfowl Habitat
  - Convention on International Trade in Endangered Species of Wild Fauna and Flora
  - Bern Convention Conservation of European Wildlife and Natural Habitats
  - Convention on Conservation of Migratory Species of Wild Animals
- Legally-binding laws:
  - Constitution of Lithuania
  - Forestry law
  - Law on Environment Protection
  - Law on Protected Areas
  - Law on Land
  - Law on Flora
  - Law on Wildlife
  - Law on water
  - Hunting law
  - Law on protected wild fauna, flora and fungi species
  - Law on environmental impact assessment of planed economic activity
  - Law on protection of immovable cultural heritage



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  - Law on territorial planning
  - Law on environmental monitoring
  - Law on roads
  - Law on taxation for using state natural resources
  - Law on state environment protection control
  - Tourism law
  - Subsoil Law
- Regulations, rules, instructions, orders:
  - Master (general) plan for the whole Lithuania
  - Regulations on Genetic Reserves
  - Regulations on forest seed growing
  - Guidelines for Reforestation and Afforestation
  - Basic principles for habitats or areas important for birds' protection
  - Rules of Cuttings
  - Rules of forest sanitary protection
  - Rules of forest fire prevention
  - Description of the procedures for assigning forests to forest groups
  - Rules of forest management schemes developing
  - Forest management planning rules
  - Pre-harvest inventory rules
  - Sale Regulations of growing (uncut) state forest
  - Roundwood sale regulations
  - Regulations on management and use of private forests
  - Logging rules in to-be privatized forest
  - Rules of visitation of forests
  - Rules of picking-up of mushrooms in the forests of Lithuania
  - Procedures of forest land conversion to non-forestland
  - Special conditions of land and forests use
  - Commitment of directorate general of state forest to FSC principles and criteria
- Soft instruments:
  - National forest policy and implementation strategy 2002-2015
  - National forestry sector development programme for 2012-2020
  - National environment protection strategy
  - National sustainable development strategy
  - Lithuanian climate change policy and special program on climate change
  - Lithuanian rural development programme 2014-2020
  - Conception of continuous forest management planning
  - Special program for financing general forestry needs

- Development of legal competences and instruments in Lithuanian forestry was relatively stagnant during last years. E.g. the last Lithuanian government (2012-2016) led by social democrats declared, that major forest management issues in Lithuania are solved and any changes may occur only if ultimately needed (Mizaras, 2017). New parliament elections put



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to power The Lithuanian Farmers and Greens Union that is a new force on the Lithuanian political arena. The program of the new government includes several objectives related to forest policy, even if being rather vague in solutions to achieve them. For example, the program of the government assumes improving forestry legal environment, the management model of state (strengthening the representation of public interests and increasing the return of owner's equity in SFEs, management in forests reserved for restitution, increasing the role of municipalities in forest management) and private forests (more power in using hunting areas by land and forest owners, direct EU payments to forest owners for forestry and restrictions in forest use), supporting timber industries (sustaining working places in timber industries, investment priorities in modernization of timber industries and biotechnologies, use of state forests for the need of local timber industries, reducing exports of unprocessed timber and increasing the share of exported timber products) and solving some environmental problems (introducing principles of sparing hunting, care about heritage places in forests, reducing the amounts of clear cutting and monocultures, fines for forest damages redistributed and used to compensate the forest owners, environmental subsidies coordinated with long term obligations). Also, some changes forestry administration are discussed, e.g. merging 3 departments of Ministry of Environment, which deal directly with the issues of forests, protected areas and environment policy, or merging State forest service and State service of protected areas, which are listed among the most influential actors in Lithuanian forest politics. Finally, the Ministries of Environment and Agriculture are suggested to be moved from capital city Vilnius to Kaunas. This is being justified by the need for strengthening regional development. Locating major forestry-related actors in Kaunas (e.g. the State Forest Service, SC State forest inventory and management planning institute, research and education institutions are situated in Kaunas) may cause tangible redistribution of actors' power.



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# 19. Actor analysis: Lithuania, national level

Lithuania is a country that has been going through an economic transition from socialistic past to market economy (Mizaras 1993; Černiauskas and Dobrovolskas 2011). Bigger accent on the economical profitability and the restitution of private property rights for the forest owners led to a big variety of interests in forests. These interests are represented both by large and small stakeholder organizations, as well as by individual actors. However, by this moment there is little research performed on the existing interest groups.

Based on the previous research data (basically INTEGRAL project), interviews, personal experience and communications, analyses of available on-line documents and other sources, also elaborating on the experience and examples of the colleagues from abroad, we identified governmental, market, and civil society actors on the national level, having the influence on the modern forest governance in Lithuania (Brukas et al. 2013a).

## 19.1 Interest of actors: Lithuania, national level

Interests are understood as being "based on action orientation, adhered to by individuals or groups, and they designate the benefits the individual or group can receive from a certain object, such as a forest" (Krott 2005). The assessment of interests is based the actor's forest use and advocated positions up to present.

The assessment of actors' interests in Lithuania was based on the website data, document analysis and forestry expert opinions.

Actors mainly interested in timber provision are economically directly or indirectly dependent on forests. However, their preference for the high harvesting intensity and commercially-welcomed tree species is often limited by the strict Lithuanian forest legislation.

The actors interested in timber provision tend to state that there is too high number of wild animals. Still, hunting in Lithuania is also commercialized, and is a part of income of state forest management companies, what leads to a conflict between these two interests. Also, hunting can be considered as a part of Lithuanian culture, so the hunting associations have quite some impact on the forest policy formation.

Regarding the supporting and regulating forest ecosystem services, we could also observe a clear difference between the governmental and non-governmental actors. The non-governmental sector is mainly represented by the environmental NGOs, which can be distinguished by their radical views and negative approach to logging and hunting. On the governmental level the actors with the interests in supporting and regulating services are the state environmental protection agencies and national/regional park administrations. Contrary to NGOs, these actors have broader views and sometimes better understanding of forestry and are ready to cooperate with the forest management actors. However, some conflicts still arise due to the big share of set-asides in potentially highly productive areas and due to the large number of restrictions in the commercially used forests.



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The water companies in Lithuania are not very much in charge of forest politics due to the fact, that they mainly use artesian water. Their interests overlap with the forest politics only because many wells are located in the forest areas. This leads to their negative attitude to all activities which could pollute the surrounding environment (such as logging, hunting, tourism and recreation).

Actors with an interest in cultural ecosystem services had a similar approach on the governmental and non-governmental spheres. In both cases the actors give priority to the nice sceneries, easy access to the forests, high natural and cultural values. Still, the private actors put bigger emphasis onto a touristic business, which often includes some bicycle-renting, water-skiing, horse-riding and wake-boarding activities. However, in most cases these activities also are performed in the areas with a high natural and aesthetical value. This caused some conflicts between this group and the actors interested in timber provision and at the same time with the actors interested in nature protection. It is important to note the existing inner conflict within the administration of national and regional parks, which are interested both in nature protection and economical profit from the big number of visitors.

In Lithuania, there is a clear difference between the interest groups within governmental and non-governmental actor groups. Governmental actors (especially in forest management) tend to be more orientated to the multi-functional forestry, being interested in several ES groups. There are three actors (Ministry of Environment, Forest department of the Ministry of Environment and State forest service) which were segregated into a separate group "Near all interests" in Appendix 26. These actors are responsible for the forest policy formation and control with regard to most ES. The non-governmental actors in Lithuanian forest politics usually tend to be more concentrated on a certain ES group (Table 39).

*Table 39. Interests in ecosystem services of selected actor groups (Lithuania, national level)*

| | **Forest management** (e.g. state forest management and private forest owner organizations) | **Timber Industries** (e.g. sawmills, papermills) | **NGOs representing employment in forests** (e.g. labor unions) | **Outdoor recreation associations** | **Hunting associations** | **Water associations** | **Nature + environment conservation NGOs** |
|---|---|---|---|---|---|---|---|
| **Provisioning ES** | | | | | | | |
| Wood provision | +++ | +++ | ++ | - | - | - | -- |
| Game provision | + | - | + | 0 | +++ | - | -- |
| Mushrooms | 0 | 0 | 0 | + | 0 | 0 | ++ |
| Berries | 0 | - | 0 | + | 0 | 0 | ++ |
| Medical plants | 0 | 0 | 0 | + | 0 | 0 | ++ |
| **Supporting ES** | | | | | | | |
| Biodiversity | + | - | 0 | + | + | 0 | +++ |
| Habitats | + | - | + | + | + | 0 | +++ |
| **Regulating ES** | | | | | | | |
| Carbon sequestration | + | --- | 0 | 0 | 0 | 0 | +++ |



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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Climate regulation | + | 0 | 0 | 0 | 0 | 0 | +++ |
| Water quality | 0 | 0 | 0 | 0 | 0 | +++ | +++ |
| Pest control | ++ | ++ | + | + | 0 | + | +++ |
| **Cultural ES** | | | | | | | |
| Outdoor recreation | 0 | 0 | + | +++ | - | -- | + |
| Aesthetics | 0 | 0 | 0 | +++ | + | 0 | + |
| Tourism | + | 0 | 0 | +++ | - | -- | + |

## 19.2 Power of actors: Lithuania, national level

Power is defined as *"capability of an actor to influence other actors"* (Krott et al. 2014, p.35) Based on the actor-centered power approach (Krott et al. 2014) the assessment of power is based on the criteria coercion, incentives, and dominant information sources.

Coercion is defined as altering behavior with force, including the threat of force and even bluffing about force that does not really exist. Incentives are defined as altering behavior with advantages or disadvantages. Material and immaterial (dis-)incentives can be distinguished. Material incentives are money and also all technical sources, e.g. machines, plants, food or support in labor. Immaterial incentives offer social or psychological advantages, e.g. social conventions, morals. Dominant information sources are defined as altering behavior by supplying unverified information trusted by the subordinate, e.g. within ideologies or based on superior expert knowledge.

The analysis of the power resources of actors at the national level showed that the actors interested in timber provision and environmental conservation are most powerful in forest policy processes. This can be explained the fact that these interests are represented not only by civil society and market actors, but also by the governmental actors. Medium power resources belong to the actors interested in the provision of renewable energy, timber processing, hunting and certification. The weakest are the actors interested in recreation, water provision, and employment in forests.

The main power resource of governmental actors at the national level is coercion based on executive power for environment and forests, and their capacity to frame the forest policy. These actors set both material incentives by approving and regulating the funding for the forest sector, approving cutting norms and immaterial incentives through the formation of forest management units' structure, organization of different venues and amount of the job positions in forest sector. Sometimes such actors can contribute to the spreading of unverified but not necessary biased information by taking up arguments of environment and nature conservation groups and partially basing arguments on values instead of facts.

Following the actor-centered power approach, for each actor group it has been evaluated if power resources have a strong impact (+++), a medium impact (++), or a low impact (+) on forest management (Hubo and Krott 2015). At the national level, actors interested in forest management and environmental, nature, and landscape conservation have the highest impact on forest management. Actors interested in timber industries, hunting, certification, and renewable energy regeneration have



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medium impact on forest management. Actors interested in employment in forests, water provision and recreation have only low impact on forest management in national forest policy processes (Table 40).

*Table 40. Overview of power resources of different interests (Lithuania, national level)*

| Actor's interests | Power resources | | | |
|---|---|---|---|---|
| | **Means of coercion** | **Incentives** | **Dominant information** | **Power resources of the interest** |
| Forest management | **+++** | **+++** | **+++** | **Strong** |
| Timber processing | **0** | **++** | **++** | **Medium** |
| Employment in forests | **0** | **+** | **++** | **Low** |
| Renewable energy regeneration | **0** | **++** | **+++** | **Medium** |
| Recreation | **0** | **+** | **+** | **Low** |
| Hunting | **++** | **++** | **+++** | **Medium** |
| Certification | **+++** | **++** | **+++** | **Medium** |
| Water provision | **0** | **0** | **0** | **Low** |
| Environmental, nature, and land-scape conservation | **+++** | **+++** | **+++** | **Strong** |

At the national level, the most powerful are the actors with interests in timber provision and actors interested in the supporting and regulating ecosystem functions, such as biodiversity, habitats for species, carbon sequestration, climate regulation and pest control. Though climate regulation and carbon sequestration are not the hottest topics in Lithuanian forest policy discussions, the main actor, who is in charge of these question, is the Ministry of Environment – the actor with the executive power for environment and forests. The only interest in regulating ecosystem services, which is represented by the low power resources, is water provision. Actors interested in cultural ecosystem services have low power resources and only marginal impact on forest policy processes, as well as the actors interested in such provisioning services as mushrooms, berries and medical plants (Table 41).

*Table 41. Overview of power resources of interests in different ecosystem services (Lithuania, national level)*

| Interest in | Overall power resources | Means of coercion | Incentives | Dominant information |
|---|---|---|---|---|
| ***Provisioning services*** | | | | |
| Wood | **Strong** | **+++** | **+++** | **+++** |
| Mushrooms | **Low** | **0** | **+** | **+** |



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| | | | | |
|---|---|---|---|---|
| Berries | **Low** | **0** | **+** | **+** |
| Game | **Medium** | **++** | **++** | **+++** |
| Medical plants | **Low** | **0** | **+** | **+** |
| Other(s):<br><br>Fish | **Low** | **0** | **+** | **+** |
| ***Supporting services*** | | | | |
| Biodiversity | **Strong** | **+++** | **+++** | **+++** |
| Habitat for species | **Strong** | **+++** | **+++** | **+++** |
| ***Regulating services*** | | | | |
| Carbon sequestration | **Strong** | **+++** | **+++** | **+++** |
| Climate regulation | **Strong** | **+++** | **+++** | **+++** |
| Water quality | **Low** | **0** | **0** | **0** |
| Pest control | **Strong** | **+++** | **+++** | **+++** |
| ***Cultural services*** | | | | |
| Outdoor recreation | **Low** | **0** | **+** | **+** |
| Aesthetic values | **Low** | **0** | **+** | **+** |
| Tourism | **Low** | **0** | **+** | **+** |

At the national level, the governmental actors have strongest power resources to impact forest management. Civil society actors have low power resources to impact forest management (Table 42). Governmental actors at the national level in Lithuania are quite strong due to the command-and-control model, used in the state forest governance. Forest legislation is very strong, severely restricting the private property rights, e.g. in Swedish comparison (Brukas et al. 2014). Power of civil society actors in forest policy at the national level is mainly based on unverified information which is spread within lobbying processes, in public relations, contribution to research projects and general participation in the public discourse. Market actors mainly apply some material incentives by regulating the demand for the tree species and marked prices for timber. Furthermore, most civil society actors and some market actors appeal to moral and norms in their arguments by justifying their preferences for forest management.

*Table 42. Overview of power resources of different actor types (Lithuania, national level)*

| | **Means of coercion** | **Incentives** | **Dominant information** | |
|---|---|---|---|---|
| **Market actors** | **0** | **++** | **++** | **Medium** |
| **Civil society actors** | **+** | **+** | **++** | **Low** |
| **Governmental actors** | **+++** | **+++** | **+++** | **Strong** |



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## 19.3 Power of non-traditional forest actors to impact forest management

Until 1991 Lithuania was a part of a Soviet Union with its strongly-centralized economical system (Brukas 2003; Kairiūkštis 2003; Brukas et al. 2013b; Brukas 2015). During the Soviet times the command-and-control model of the forest governance became usual for Lithuania, and is still applied nowadays. Strong state influence and powerful forest legislation doesn't leave much space for the decisions and power of the other actors.

The environmental NGOs and associations have a big variety of interests, representing all regulating and supporting ES. Unlike many European countries, such NGOs don't apply the means of coercion and influence forest policy mainly by setting immaterial incentives by appealing to the moral norms. Still, their main power resource is spreading unverified information about forestry and the impact of forest management on nature are spread within lobbying processes, in public relations, contribution to research projects and general participation in the public discourse. Despite the relatively large number of such NGOs, their influence on forest policy is relatively weak.

The hunters' associations have quite strong influence on the state forest policy due to their high financial resources, cultural value of hunting and the often close personal relations to decision-makers. Important is to note that many foresters and forest policy decision-makers have a big interest in hunting themselves, what makes the hunting lobby even more powerful. The fishermen associations don't have such close relation and strong influence on the forest policy.

The actors interested in mushrooms, berries and medical plants are not very powerful on the national level despite the culture of berry- and mushroom-picking in Lithuania. Mostly this interest is supported on the local level, and on the national level is represented mainly by the trading companies, which have some material incentives by offering the price for non-wood forest products and spreading unverified information about non-wood forest product resources.

The recreational organizations are also quite weak regarding the influence on forest policy. The rural tourism in Lithuania is usually performed by non-organized private groups, so the tourism associations and organizations affect forest policy mainly by spreading unverified information about landscapes and recreational value of forests. Recreational activities in forests are still considered mainly as potential business area in the public discourse.

Traditionally some influence on forest policy is exercised by the actors having a main interest in science and education. Such actors mainly act through the dominant information, spreading often theoretical and hardly applicable in practice expert opinion about forest management, biodiversity and landscape questions. Some material incentives can also be set by offering the funding from European Union and national sources for the partnership in scientific projects, what leads to the medium influence of such actors.

Growing interest to the renewable energy sources brought medium influence on the forest policy to the biomass energy producers. Mainly such actors act through the dominant information about the effects of renewable energies on economy of the country and its citizens, as well as on nature. Also, some material incentives are set by offering the prices for the biomass of the certain tree species.



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Summarizing the information presented above, we can assume, that the governmental actors, especially interested in wood provision and environment protection, have the biggest influence on the formation of the forest policy. Yet, summarizing the total power of the market and civil society actors interested in timber processing, renewable energy provision, hunting and certification there can be noticed quite big influence of the market sector, however, not big enough comparing to the state power within forests.



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## 20. General case study information: Telšiai

The case study area (CSA) corresponds to the area managed by Telšiai SFE. The association with Telšiai SFE is rather formal and relates basically to the nomenclature used for identification of forest stands in the Lithuanian State Forest Cadaster. This means that the area includes both state forests managed directly by Telšiai SFE and other forests, including private ones, owned and managed by other legal and physical persons. The CSA is located in the north-western part of Lithuania and belongs to Žemaitija. Žemaitija (literally "*lowlands*") or Samogitia is one of the five ethnographic regions of Lithuania. General characteristics of the landscape are: medium productive mixed spruce forests dispersed on relatively unproductive agricultural land. The CSA feature hilly landscapes, limited agricultural interests, and relatively large areas of low productivity agricultural lands, potentially suitable for afforestation. The CSA has also a huge potential for tourism development, due to its natural beauty, cultural and historical heritage. The traditional Lithuanian culture is closely related with forest.

The CSA covers an area of 253,983 ha or represents around 3.9% of the Lithuanian area. The CSA is located basically in two municipalities or districts: Telšiai (53%) and Plungė (44.8%), however, some minor parts on the edges belong to Rietavas (1.5%) and Skuodas (0.7%) municipalities (further these two municipalities are often omitted from the analyses). The population in CSA was 77,821 people in 2016 (Statistics Lithuania, http://osp.stat.gov.lt/). The hilly landscape is characterized by forestry and agricultural production which contribute to 87% of land use. 35% of the case study area is covered by forests. The forest ownership structure in the CSA is: private and other forests (still reserved for restitution) – 60.5%, state-importance forest managed by SFE, national park and state reserves – 37.48%, state forests managed by Ministry of defence – 0.3%, municipal forests – 0.1%, state-importance forests managed by other legal entities – 0.1%.

The main forest manager in the CSA is Telšiai SFE with 42,801 ha. Coniferous stands prevail in Telšiai SFE (52.4 %). Softwood deciduous forests cover 35,093 ha (42.8%) and hardwood deciduous forests – 3,929 ha (4.8%). The dominant tree species are spruce (27,636 ha), birch (20,179 ha) and pine (15,114 ha). Telšiai SFE manages also forests of Žemaitija National park (8.6% of the area) and two regional parks – Varnių (10.1%) and Salantų (0.1%). The Žemaitija National park is a protected territory with the main goal is to preserve landscape complexes of national importance and cultural heritage that represent peculiarities of Žemaitija's nature and culture in the ethno cultural context, ensure balanced use and recovery of natural resources, provide conditions for educational tourism, scientific research and environmental monitoring (www.zemaitijosnp.lt). Forest distribution by groups defining the forestry regime is as follows: Group I – strict reserves forests – 1,812 ha (2.0 %); Group II – forests of special purpose, including A – ecosystem protection forests on 11,616 ha (13.0 %) and B – recreational forests on 772 ha (0.9 %); Group III – protective forests – 22,472 ha (25.3 %) and Group IV – commercial forests – 52,295 ha (58.8 %).

The CSA has well-developed industries such as food processing, wood and timber products, furniture, textiles arts and crafts. Forestry is an important industry of Telšiai CSA, too. The forests contain a fairly large number of recreational facilities: educational, recreational and specialised paths, viewpoints, places of respite, recreational zone. It has an important significance in the development of tourism in the region.



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## 20.1 Current forest policy conflicts and problems

Forest policy problems and conflicts identified for the CSA level, are largely valid for other areas in Lithuania. Similar forest management principles practically apply for all management areas corresponding to the CSA, so they could be also discussed among the national ones. The focus in this chapter is on forest policy conflicts and problems with involvement of local actors or related to local specifics and usage of forest resources.

CSA level issues raised during the interviews with local forest managers and owners, experts working on preparing and reviewing internal forest management plan for Telšiai SFE, and reported by INTEGRAL project are listed in Table 43. It should be also noted that important contribution on building the list of local forest policy conflicts and problems as well as on defining the actors influencing the forestry, was received from SC State Forest Inventory and Management Planning Institute, which is currently developing internal forest management plan for Telšiai SFE.

*Table 43. Overview of current forestry and forest policy conflicts and problems (Telšiai, Lithuania)*

| ***Conflict category*** | ***Conflict*** |
|---|---|
| **General** | Too many legal acts regulating different forestry aspects, which sometimes overlap or even contradict and are hardly to implement operationally vs flexibility in taking forest management decisions |
| | Old fashioned mentality and management style determining the way of thinking and behavior (regulations, punishments, controlling, making more strict restrictions) vs liberalism |
| | Distribution of land managed by Telšiai SFE among several municipalities (in relation to paying taxes) |
| | Varying size of forest districts (there are 8 districts in Telšiai SFE), involving uneven forest management and administration costs |
| **State forest management** | Unclear situation regarding management of forests reserved for restitution. The area of forest land reserved for restitution still amounts in the CSA 11.2% |
| | Increased share of sanitary cuttings vs the reduced share of thinnings |
| **Private forest management** | Many regulations are introduced without asking the opinion of forest owners even violating their rights vs transparency and combining different interests. E.g. there are cases when the forest has been returned to private forest owner within the restitution process under relatively more liberal management regime, however, the forest group later has been changed increasing the management restrictions without compensation |
| | Seeking for short term benefits vs long term planning |
| | Too many private forest estates and too small forest owners vs more functional estate sizes for private forestry. E.g. average area of private forest estate in the CSA is 3.07 ha, number of owners – 10,372 and number of estates – 14,279 |
| | Restitution process is not yet complete |
| | Practically abandoned thinnings due to forestry cost saving vs silvicultural requirements |
| | Poor quality of roads to access the private forest estate or absence of the roads |
| | Disproportionate requirements on forest cuttings, care and reforestation |
| | Knowledge gaps on numerous aspects on forest management |
| **Forest inventory and management planning** | Contradicting approaches of forest management and protected areas on proposals of internal forest management project for Telšiai SFE, which is currently under preparation, basically due to contradicting legal issues |



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| | |
|---|---|
| | Regulations defining the requirements for a certain forest group are changed in principle faster than the procedures required to change the forest groups thus, introducing some uncertainties in forest management planning |
| **Timber trade and processing** | Significant share of third parties in round wood sales vs direct selling to timber processing industries |
| | Small sawmills may not use their facilities in an effective way due to lack of round-wood for processing for reasonable price |
| | Low competitive ability, casual contracts of small businessmen limiting sustainable production |
| **Nature conservation** | Interests of forest owners and managers vs interests of protected areas in the forest land of the CSA. The share of forests with some management restrictions (42.1%) is larger in the CSA than the average figure for Lithuania (28.9%) |
| | Numerous management restrictions in commercial (Group IV) forests due to unbalanced nature protection systems. E.g. forest grouping is overlapped with additional management restrictions due to establishing potential habitats, woodland key habitats without even considering that the forest is already assigned for commercial activity and without evaluating economic loses and discussing any compensations |
| | Different protected areas do overlap introducing misunderstandings regarding protection objectives and management approaches |
| | Construction activities in the forest vs forestry and ecosystem management. These conflicts are especially strong in protected areas. |
| | Requirement to increase the share of non-clear cutting vs natural conditions in the CSA (prevailing spruce forests, poor natural pine regeneration) |
| | Professionals from protected areas are under ambiguous pressure: they are considered both as prohibiting and being too much relaxed regarding the violations of legal requirements |
| | Abandonment of agricultural lands by private owners especially in protected areas. Agricultural activities, especially maintenance of the grasslands is rather difficult but welcome to sustain biodiversity |
| | Development of management plans for protected areas taking too long |
| **Energy** | Fuel wood making relatively large share in forest use among local population vs more economically sound timber utilization (this also refers to climate change, as the fuel wood does not participate in carbon accumulation) |
| **Climate change** | Measures mitigating the climate change lacking appropriate financing |
| **Recreation** | Great potential of CSA for recreation and tourism vs actual use. Local municipalities are, however, sharpening their focus on tourism, sometimes abandoning other economic activities, such as declining industry |
| | Not enough recreational facilities vs increasing flows and demands of visitors |
| | Insufficient educational tourism and ecological education, limited focus on accepting local tourists |
| | Sometimes unbalanced visitors' flows result in ecosystem disturbances, polluted environment, degraded green areas and changing landscape |
| | Large number of attractive spots for visitors vs preparedness to accept tourists. Even if available, the facilities are not adopted for foreign visitors, lacking information. |
| | Limited availability of attractions, non-season and non-weekend activities, well arranged beaches, hiking and bicycle tracks, sport facilities, especially for foreign tourists |
| **Hunting** | Too large number of wild animals (even birds) vs actual availability of forage, leading to damages to forest and farms |



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| | |
|---|---|
| **Work in forests** | Uncertainty about the future employment perspectives among the administration of Telšiai SFE due to never ending discussions on reorganization of state forest management system |
| **Research and education** | Too weak "education of local population" of multipurpose forestry vs strongly dominating "nature protection" concepts, actively disseminated first of all by National and regional parks, as well as by other communication means |

## 20.2 Instruments and legal competences in case study forest politics

All national level instruments and competences identified above apply at the CSA level, too. However, the implementation is largely delegated to local units of respective institutions. A significant part of Telšiai SFE activity may be regarded as that of any enterprise on the market dealing with forest logging and timber sales. However, Telšiai SFE conducts also many tasks that directly relate to implementation of forest policy goals: forest growing activities from seed to logging; maintenance of infrastructure (roads, ditches), also on private land; forest fire and diseases prevention and fighting; installing and maintaining recreational facilities for visitors; environmental conservation measures; services for private owners.

State budget supports policy implementation on private forests by allocating officers of the Klaipėda regional branch of Forest control department of the State forest service, whose primarily mission is forest control. On the other hand, substantial support to private forestry comes from the Rural Development Programme, which is administered by Telšiai branch of the National Paying Agency. Competencies and functions related to forest policy of Žemaitija National park include: conserving the system of lakes and forests, that is the most valuable of the kind in Žemaitija; preserving park's environment and cultural heritage; disseminating knowledge of environmental protection and promoting appropriate recreation activities and primarily cognitive tourism. The role of Varniai regional park (only small area of Salantai RP belongs to the CSA, the functions are pretty the same) is in: conserving the environmental and cultural values of the lake region; disseminating environmental awareness and promoting appropriate recreation activities. Should be underlined, that forests belonging to National and regional parks are directly managed for forestry by Telšiai SFE, sometimes introducing conflicts regarding the legal competences and instruments to be used.

The functions of Telšiai and Plungė municipalities: improving the economy of the region, development of the rural areas, protection of the cultural values, environmental stability, increase of the touristic value of the area, effective collaboration of other actors – are much in the line with specific interests and competences of other above mentioned actors and they are taking some part in implementing forest policy locally. On the CSA, we did not identify any significant organisational structures for forest owner cooperation, forestry and timber business neither found any active environmental NGO having significant influence on forest policy locally.

The following is a list of additional legal acts influencing the forestry at local level:

- Regional Development Plans
- Regional Planning Programs



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- District/Land Development Plans
- Management plan for Varniai RP (special planning)
- Management plan for Salantai RP (special planning)
- Management plan for Žemaitija NP (special planning)
- Forest management scheme for Telšiai County
- Internal forest management plan for Telšiai SFE (since 2016, as well plans for previous decades)



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## 21. Actor analysis: Case study Telšiai

The actors in the case study were identified based on the previous INTEGRAL studies, web search and the interviews with local key actors who were asked to identify further actors relevant for forest use and management in the case study area. Important actors in the case study area are the Telšiai SFE, the administrations of a national and a regional park, regional forest owners' association, local branches of the forest control service and national paying agency and the district municipalities, private forest management companies, some timber-processing enterprises and the forest owners.

The state forest area of the case study is under the responsibility of Telšiai SFE. Nevertheless, the biggest share of the case study forests (60%) is private. The average size of the private forest property is 3 ha, what results in a big amount of small-scale forest owners. Such owners frequently don't pay much attention to the management of their forests and leave it either for recreational purposes or just cut the unmanaged forests at the cutting age. Large-scale forest owners tend to pay more attention to the forest management; however, they try to minimize the costs and perform less thinnings than SFE. The main tendency in the private forests is smaller share of pre-commercial thinnings and bigger share of commercial ones. Also, more than 10 thousand ha of forests is left for the restitution of the private property. By the moment these forests are managed by Telšiai SFE – in fact, the management is restricted to forest protection.

Nature conservation in the CSA is conducted mainly by Varniai regional park and Žemaitija national park administrations. As it was mentioned in the actor analysis on the national level, these organizations aim for a dialog and cooperation with SFE, what strongly diminishes the conflict between the timber provision and nature protection interests. The interviews with representatives from the administrations of protected areas revealed high professionalism in different forestry related aspects and willingness to collaborate. The environmental NGOs with more radical views are not relevant actors on the case study level.

Recreation in the case study area is also actively performed in the national and regional parks. The other actors, interested in recreation and tourism, are the local rural tourism association and the regional tourism information centre. These actors are mainly concentrated on the touristic business, such as farmstead rent, bicycle tours and excursions and are quite weak in relation to forest policy. The local hunting association is quite active and is a serious actor in forest policy. The situation with hunting in the CSA is the same as at the national level, and the hunters' lobby can be regarded as quite powerful. The timber-processing actors are rather numerous in the CSA, what means a big share of market actors in our study. Some timber-processing companies do also buy forest land for the further forest management, what puts them to the one scale with the large-scale forest owners.

Some influence is also made by the local people, who traditionally have access to the forests. The recreational activities and mushroom/berry-picking don't require any special permissions, still, they are not the only activities, performed by the locals. Traditionally the villagers prepare the firewood themselves, making the contract with the SFE for the performance of pre-commercial thinnings on the certain plot. This action allows the locals to get the firewood for a reduced price.



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## 21.1 Interest of actors: case study Telšiai

Interests are understood as being *"based on action orientation, adhered to by individuals or groups, and they designate the benefits the individual or group can receive from a certain object, such as a forest"* (Krott 2005). The assessment of interests is based the actor's forest use and advocated positions up to present. As information sources to identify actor's forest use and advocated positions within the case study area we used the qualitative data from document analysis, expert opinions and interviews with the key actors.

The interests of actors within the case study more or less correspond to the interests analysed on the national level (Table 44). The strict state forest legislation doesn't allow much freedom in the decisions, and the actors' behavior in the case study is strongly controlled by the above-standing authorities. Actors interested in forest management differ on a governmental and non-governmental level. Governmental actors (Telšiai SFE) have a wider scope of interests, which include not only covering costs by incomes, but also some nature protection and biodiversity issues. In case of non-governmental actors, such as forest owner associations and large-scale forest owners, the main interest is timber provision and maximal income. Small-scale forest owners usually regard their forests as a site for their own recreational activity, mushroom- and berry-picking and as a family value.

As it was mentioned before, the actors with nature conservation interests within a case study tend to cooperate with the actors with the interest in wood provision. Though such actors are strongly interested in a large scale of set-asides, for some scale they are also interested in wood provision for their own usage, such as touristic path installation. Some share of the income for such actors comes from the voluntary payments from the recreationalists. The interests of hunters, recreation associations and water companies are the same as on the national level.

*Table 44. Interests in ecosystem services of selected actor groups (Telšiai, Lithuania)*

| | **Forest management** (e.g. state forest management and private forest owner organizations) | **Timber Industries** (e.g. sawmills, papermills) | **NGOs representing employment in forests** (e.g. labor unions) | **Outdoor recreation associations** | **Hunting associations** | **Water companies** | **Nature conservation organizations** (e.g. national and regional parks) |
|---|---|---|---|---|---|---|---|
| **Provisioning ES** | | | | | | | |
| Wood provision | +++ | +++ | ++ | - | - | - | + |
| Game provision | + | - | + | 0 | +++ | - | - |
| Mushrooms | + | 0 | 0 | + | 0 | 0 | + |
| Berries | + | - | 0 | + | 0 | 0 | + |
| Medical plants | + | 0 | 0 | + | 0 | 0 | + |
| **Supporting ES** | | | | | | | |
| Biodiversity | + | - | 0 | + | + | 0 | +++ |
| Habitats | + | - | + | + | + | 0 | +++ |
| **Regulating ES** | | | | | | | |
| Carbon sequestration | + | --- | 0 | 0 | 0 | 0 | +++ |
| Climate | + | 0 | 0 | 0 | 0 | 0 | +++ |



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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| regulation | | | | | | | |
| Water quality | 0 | 0 | 0 | 0 | 0 | +++ | +++ |
| Pest control | ++ | ++ | + | + | 0 | + | +++ |
| **Cultural ES** | | | | | | | |
| Outdoor recreation | + | 0 | + | +++ | - | -- | + |
| Aesthetics | 0 | 0 | 0 | +++ | + | 0 | + |
| Tourism | + | 0 | 0 | +++ | - | -- | + |

## 21.2 Power of actors: case study Telšiai

Power is defined as *"capability of an actor to influence other actors"* (Krott et al. 2014, p.35) Based on the actor-centered power approach (Krott et al. 2014) the assessment of power is based on the criteria coercion, incentives, and dominant information. Following the actor-centered power approach, for each actor type and each interest in ecosystem services and forest functions it is evaluated if power resources have a strong impact (+++), a medium impact (++), or a low impact (+) on forest management (Hubo and Krott 2015).

As well as on the national level, the strongest are the actors interested in forest management, recreation and nature conservation. Still, within the forest management interest there is a difference between the governmental actor (Telšiai SFE) and non-governmental actors (forest owner association and the independent forest owners). Telšiai SFE is the actor with the biggest power among the actors with the interest in forest management, although this actor is also controlled by the state authorities. The forest owner association also has quite big power, mainly expressed through material and immaterial incentives to the private forest owners by the help with forest management plan formation, logging, timber realization and the organization of different courses and events. The large-scale forest owners have medium power, and the small-scale forest owners are the weakest within this interest. The powerful actors with the strong interest in recreation are represented mainly by the regional administration offices, interested in high economic income and touristic value of the region. Their power is based on their decision-making authority status, material and immaterial incentives and possibility to spread unverified information. The non-governmental recreation associations have low power resources as well as on the national level. The actors interested in timber processing, renewable energy provision, certification and hunting have medium power resources. The actors with the main interest in employment in forests have low power resources on the case study level (Table 45).

*Table 45. Overview about power resources of actors with different interests (Telšiai, Lithuania)*

| **Interest in** | **Power resources** | | | |
|---|---|---|---|---|
| | **Means of coercion** | **Incentives** | **Dominant information** | |
| Forest management | +++ | +++ | +++ | **Strong** |
| Buying and processing timber | + | ++ | + | **Medium** |
| Employment in forests | + | + | + | **Low** |



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| | | | | |
|---|---|---|---|---|
| Renewable energy regeneration | **0** | **++** | **0** | **Medium** |
| Recreation | **+++** | **+++** | **+++** | **Strong** |
| Hunting | **++** | **++** | **++** | **Medium** |
| Certification | **+++** | **++** | **+++** | **Medium** |
| Water provision | **0** | **0** | **0** | **Neutral** |
| Environmental, nature, and land-scape conservation | **+++** | **++** | **+++** | **Strong** |

As well as on the national level, governmental actors have the biggest power resources in the case study. Market actors have the medium influence, what also corresponds to the national level results. However, on the case study level the civil society actors have medium power resources compared to the low power resources on the national level (Table 46). This can be explained by the bigger influence of the local associations and people on the regional level.

*Table 46. Overview about power resources of different actor types in Telšiai, Lithuania*

| | **Means of coercion** | **Incentives** | **Dominant information** | |
|---|---|---|---|---|
| **Market actors** | **++** | **++** | **+** | **Medium** |
| **Civil society actors** | **++** | **++** | **++** | **Medium** |
| **Governmental actors** | **+++** | **+++** | **+++** | **Strong** |

In the case study, actors with interests in wood provision, supporting and cultural ecosystem services have the strongest power resources to impact forest management (Table 47). The actors interested in water provision are neutral in relation to the forest policy on the CSA.

*Table 47. Overview about power resources of different interests in ecosystem services (Telšiai, Lithuania)*

| **Interest in** | | **Means of coercion** | **Incentives** | **Dominant information** |
|---|---|---|---|---|
| **Provisioning services** | | | | |
| Wood | **Strong** | **+++** | **+++** | **+++** |
| Mushrooms | **Low** | **+** | **+** | **+** |
| Berries | **Low** | **+** | **+** | **+** |
| Game | **Medium** | **++** | **++** | **++** |
| Medical plants | **Low** | **+** | **+** | **+** |
| Other(s): Fish | **Low** | **+** | **+** | **+** |
| **Supporting services** | | | | |
| Biodiversity | **Strong** | **+++** | **+++** | **+++** |
| Habitat for species | **Strong** | **+++** | **+++** | **+++** |
| **Regulating services** | | | | |
| Carbon sequestration | **Medium** | **+++** | **+++** | **+++** |
| Climate regulation | **Medium** | **+++** | **+++** | **+++** |



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| | | | | |
|---|---|---|---|---|
| Water quality | **Neutral** | **0** | **0** | **0** |
| Pest control | **Strong** | **+++** | **+++** | **++++** |
| **Cultural services** | | | | |
| Outdoor recreation | **Strong** | **+++** | **+++** | **+++** |
| Aesthetic values | **Strong** | **+++** | **+++** | **+++** |
| Tourism | **Strong** | **+++** | **+++** | **+++** |

## 21.3 Power of non-traditional forest actors to impact forest management

The environmental NGOs in the case study area have even less influence on the forest policy than on the national level. We did not identify any NGO having specific interests on the CSA only, of course, if not taking into consideration larger scale initiatives covering also the CSA forests. Some locals can be the members of such organizations or movements, however, it doesn't make such NGOs the more relevant actors for the formation of the forest policy of the region.

The situation with the hunters in the case study area is quite the same as at the national level. Hunting has strong traditions in most Lithuanian regions, so though there is a conflict between a large number of game animals and the interest in timber provision, hunting lobby remains quite powerful. Despite the large share of private forests in the case study, in Lithuania the open access to all forests is obligatory, so the hunters have the right to hunt in the private forests as well.

The recreational associations are quite weak, however, the interest in tourism and recreation is represented by such powerful actors as regional administrations. As governmental actors, they have a possibility to influence forest policy as a decision-making authority in recreational activities, landscape protection and cultural heritage. These actors also can spread unverified information about silviculture and sustainable forestry. Recreationists and tourists also have some influence, mainly by their direct access to the forests, however, this influence is rather low.

Another actor with moderate power resources are the local people. As well as the recreationists, they have the direct access to the forests, where they can perform some minor forestry operations by the prior contract with the state forest enterprise. Also, the locals often spread unverified information about all forestry and nature protection aspects.

Summarizing this information, we can assume that the general situation at the case study level is quite similar to the national level. In both cases, state authorities are the most powerful to impact forest management. Other actors have some but quite limited impact on forest management within the case study. In contrast to the situation at the national level, the civil society actors have more power resources at the regional level.



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## 22. Conclusions

Lithuanian forestry today can be described as a struggle between “the new” and “the old”, i.e. rapid social changes pushing for reforms in forestry and maintaining the traditional professional values, norms and structures. Forest policy arena is strongly dominated by state forestry institutions, especially in the policy formulation. The major forest policy conflicts and problems both at the national and case study area levels are due to struggle between maintaining stern regulation versus increasing the decision freedom for forest owners and managers in practically all forestry aspects.

The governmental actors in Lithuania, especially interested in wood provision and environment protection, have the biggest influence on the formation of the forest policy. The total power of the market and civil society actors interested in timber processing, renewable energy provision, hunting and certification is also quite strong, however, it is less the power of governmental actors, especially within state forests. The pattern of actors’ power resources at CSA level is rather similar to the national level. The governmental actors are the most powerful in forest management and other actors have less influence. The civil society actors were identified as having relatively more power resources at the regional level than at the national level.

Although the development of legal competences and instruments in Lithuanian forestry was relatively stagnant during last years, the Parliament elections in autumn 2016 and new political forces which formed the Government promise significant changes in legal forestry environment. These pertain to the management model of state and private forests, support to timber industries and solving some environmental problems.



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## The Netherlands

Bas Arts, Marjanke Hoogstra-Klein, Jim van Laar

*Summary*

This report section is part of the EU Horizon 2020 project ALTERFOR (*Alternative Models for Future Forest Management*), and has been written to report on the research carried out within the frame of Work Package 4. It describes and analyses the stakeholders involved in forest management in the Netherlands. Data were collected using several sources, including scientific articles, web-based information, professional publications (such as annual reports of organizations), expert knowledge, and interviews that were carried out in the EU-financed INTEGRAL project (2013) and in MSc research on the Dutch forest sector (2016).

The total Dutch forest area approximates 373,480 ha (11% of the land surface). Coniferous species and broadleaves each occupy about 50% of the forests. About 46% of the forest area is composed of single species forest stands (20% broadleaves, 26% conifers), mixed broadleaves cover 21%, mixed conifers 6%, and broadleaves mixed with conifers 22%. The main tree species are Scots pine (32%) and oak (18%). About half of the forests are publicly owned (48%), the other half (52%) is owned by private owners and organizations. Forest management can be characterized by efforts to achieve a balanced combination of different forest functions, avoid risks and increase forest stability, use natural processes, and limit investments. Forest owners have the right to use, open up and manage their property according their own visions; the government can only commit (private) forest owners to engage in a certain management of their forest and to open up their property for visitors when a forest owner receives financial support from the government (such as the Subsidy scheme for landscape and nature management, and the Estate Act). Forest policy in a classical, sectorial sense does not exist anymore in The Netherlands, the regulatory discourse has now shifted towards 'forest and nature governance'.

In the Netherlands, the multifunctional character of forests and forest management is reflected in a diversity of stakeholders involved in forest management. The key actors in Dutch forest management and nature conservation are the central state, the provinces, the municipalities, the (semi-public and private) organizations that manage nature and forest areas (particularly the Dutch National Forest Service, *Natuurmonumenten* and the *Landschappen*), private owners (incl. the umbrella organisations representing private owners), and the forestry actors (employers and employees; particularly the former *Bosschap*, Union of Forest Associations, and VVNH).

The diversity of stakeholders involved represents a range of interests. The Dutch government focuses strongly on the multiple-use of forests, combining especially wood provision, biodiversity and nature, and recreation. This is reflected in the management by the Dutch National Forest Service, who combines wood provision, with biodiversity and recreation. In comparision, Natuurmonumenten and the Provincial Landscapes focus less on wood provision, and more on the supporting services. Private forest owners focus again more on wood provision, and less on habitats. The eNGOs and the timber industry have a more limited interest; eNGOs focus mainly on the regulating services, and the timber industry on wood provision.



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State actors – central government, provinces and municipalities – hold the strongest power resources to regulate and influence the Dutch forest sector. In contrast, both market actors and civil society actors 'only' have medium power in the sector. But jointly, they may outnumber state power (like in the design and choice of specific forest management models or regarding forest certification schemes).

State actors particularly use coercion and incentives as power resources, whereas non-state actors particularly use dominant information sources. The following forest ecosystem services are most relevant in the Netherlands: wood and game (provision), biodiversity and habitats (support), water quality (regulation) and recreation and tourism (cultural services).



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# 23. Introduction

This report is part of the EU Horizon 2020 project ALTERFOR (*Alternative Models for Future Forest Management*). The ALTERFOR project explores the potential to optimize forest management models currently in use in different forested areas in European countries. This report has been written to report on the research carried out within the frame of Work Package 4. Work Package 4 aims at the facilitation of the implementation of desired Forest Management Models (FMMs) in different case study areas in Europe and of cross-national knowledge transfer on these FMMs (ALTERFOR, 2016).

The first step in Work Package 4 is a stakeholder analysis for the different case study areas. A stakeholder analysis systematically describes and analyses the stakeholders of an issue at stake (Rietbergen-McCracken & Narayan-Parker, 1998), which in this report is the topic of forest management. The stakeholder analysis is a basis for two deliverables within ALTERFOR (D4.1: "Report on actors driving forest management models in selected European countries"; D4.5: "Scientific paper on actors driving forest management models in selected European countries"). This report describes the stakeholder analysis for the Netherlands. Contrary to the other countries where specific regions were selected as case study areas, the Dutch research team chose to focus on the Netherlands as a whole. Several reasons underlie this choice, such as the relative small forest area and forest sector in the Netherlands, the ability to better involve more stakeholders, and the interest of the Dutch forest sector to have a national instead of a regional focus. Data for the stakeholder analysis were collected using different sources, including scientific articles, web-based information, professional publications (such as annual reports of organizations), expert knowledge, and interviews with key stakeholders in the Dutch forest sector that were carried out in the context of: (1) the EU-financed INTEGRAL project, led by Hoogstra-Klein (2013; 27 interviews); and (2) master thesis research on mutual interactions and political influence in the Dutch forest sector, supervised by Arts (see Kremers, 2016; 22 interviews). Hence, besides other data sources, the findings of this report are based on secondary insights from 49 interviews.

First, chapter 24 provides a general background describing forests and forest management in the Netherlands. Chapter 25 reports on the stakeholder analysis, describing a) the different stakeholders involved in Dutch forest management, b) the interests of these stakeholders, and c) the power of the different stakeholders. Chapter 26 finalizes and concludes the research.

# 24. General country information The Netherlands

## 24.1 Basic data on forests

In the Netherlands, around 373,480 ha (11% of the land surface) is covered with forest. These forests are unevenly distributed over the Netherlands. The province of Gelderland has the highest amount of forests (101,705 ha), followed by the province of Noord-Brabant (75,730 ha). The provinces of Groningen and Zeeland have the least amount of forest (7,484 ha and 3,742 ha, respectively) (Schelhaas et al., 2014).



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The average age of conifers is now 67 years, for broadleaves it is 55 years (Schelhaas et al., 2014). Today, the main tree species in Dutch forests are Scots pine (32%) and oak (18%) (Probos, 2014), both sessile (*Quercus robur* L.) and pedunculate oak (*Quercus petraea* (Matt.) Liebl.) (Van der Maaten-Teunissen and Schuck, 2013). Coniferous species occupy about 51% of the forests, and broadleaves account for 49% of the total forest area. Around 46% of the forest area is composed of single species forest stands, 20% of which are broadleaves and 26% conifers. Mixed broadleaves cover 21%, mixed conifers 6%, and broadleaves combined with conifers 22% of the area. The remaining area (5%) consists of open and young forests (Probos, 2014).

The average standing stock (dead trees excluded) is 216.6 m3/ha. Standing dead wood is about 6.4 m3/ha, and lying dead wood is about 6.8 $m^3$/ha. Average increment is 7.3 $m^3$/ha/yr. The total annual fellings amount to about 1.3 million $m^3$, which equals to 3.4 $m^3$/ha/yr (which is less than half of the average increment). Two third of the fellings take place in coniferous forests, the other third in broadleaves (Schelhaas et al., 2014).

## 24.2 Forest ownership

Forest ownership in The Netherlands can be characterized as diverse (see Table 48 for a detailed overview). Almost half of the forests are publicly owned (48%), the other half (52%) is owned by private owners and organizations (Probos, 2014).

*Table 48. Forest ownership distribution in The Netherlands*

| *Category* | *Forest (in ha)* | *Category* | *Forest (in ha)* |
|---|---|---|---|
| Dutch National Forest Service | 90,041 | Nature conservation organisations | 41,380 |
| Ministry of Finances | 9,026 | Natuurmonumenten | 28,178 |
| Ministry of Defense | 7,704 | Companies/businesses | 19,702 |
| Other state | 4,292 | Estate | 19,482 |
| Provinces | 1,760 | Other privately organized | 10,567 |
| Municipalities | 51,074 | Private ownership | 63,183 |
| Other public | 4,402 | Unknown | 2,530 |

Source: Schelhaas et al., 2014

The diversity in ownership can partly be explained from a historical background. Until the end of the 19th century most of the forests were private and communal property. With the industrialization, the demand for wood increased, leading to a situation in which investments in forests became more interesting from a financial point of view, both for private persons as for public institutions. Uncultivated areas were afforested both by the state (such as the Dutch National Forest Service), municipalities and private persons. At the beginning of the 20th century, nature protection got attention in Dutch society and the first nature organizations were founded. Some of these organisations also purchased forest areas. In the first half of the 20th century, forests owned by the state and the private persons were therefore mainly for timber production, while the forests owned by the nature organisations were managed from a nature point of view. From the 1960's, the decrease in timber demand



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in combination with high cost for the management of forests led to a situation in which forest management was financially not that attractive anymore (Hoogstra and Willems, 2005). Despite the financial support from the government, as a result, during the last half of the 20th century the area of private forest ownership decreased slightly. Only in the last decades, private forestry has again increased somewhat, mainly due to the afforestation of farmlands (Schanz and Ottitsch, 2004).

Forest ownership in the Netherlands is not only diverse, but also at a relatively small-scale. More than 14,000 private forest owners possess less than 5 ha, 1,321 own between 5 and 200 ha and only 41 private owners have more than 200 ha. In contrast to the very small areas, the state possesses relatively large units of forest areas, which are mostly managed by the Dutch National Forest Service. Local authorities and other public bodies own mostly small woodlands, which are often regarded as quite similar to private ownership from a forest management viewpoint. Finally, a special and influential category of ownership is that of the nongovernmental nature conservation bodies (both present at national, provincial, and sometimes on regional level). They own 16% of the Dutch forests. Formally these organisations are private associations or corporations, but their role and status is often compared to that of the Dutch National Forest Service (apart from financing). They have an impressive amount of members/supporters in Dutch society, which gives them not only more financial support but also stronger political influence than other categories of forest ownership (Van Wijk et al., 2005).

## 24.3 Forest management

Until the 1970's, the prevailing silvicultural systems were monoculture systems with clear cutting and replanting (Mohren and Vodde, 2005). The reforestation subsidies granted by the government supported this way of management (Schmidt et al., 2003). Gradually the view on the monoculture systems changed as it caused several difficulties, e.g. it delivered only one type of product (function) and it was very sensitive to calamities as storm, fire and plagues. These factors, in combination with decreasing wood prices and increasing interests from Dutch society in other functions than wood production (such as the recreational and nature functions of forest), made the forest sector think about other silvicultural systems (Probos, 2004). In the 1970's, the concept of multiple use was adopted in Dutch forestry. In the 1980's, also important changes in the silvicultural practices took place. One of the major reasons for this were the severe storms that took place in 1972 and 1973, resulting in extensive areas of wind-blown stands. The area of wind-blown stands was so large that immediate clearance and reforestation of all the stands was not possible. However, in many areas good natural regeneration took place. This proved that "natural regeneration was silviculturally possible as the ecological conditions had gradually evolved since the first plantations" (Schmidt et al., 2003). At the same time, specific silvicultural practices were developed to enhance the nature function of forest, e.g. the killing of trees by stripping a ring of the bark or the use of large grazing animals (Londo, 1991). As the "close to nature" forestry proved to be interesting for all the different stakeholders (forest managers, policy makers, nature conservationists, recreationists, etc.) the attention for this system increased. In the first half of the 1990's new silvicultural approaches were adopted and developed: "Pro Silva" and "Integrated Forest Management" (IFM, Geïntegreerd Bosbeheer).



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Both approaches can be characterized by efforts to achieve a balanced combination of different forest functions, avoid risks and increase forest stability, use natural processes, and limit investments. In practice, they lead to increased use of natural regeneration, mixed stands, uneven-aged stands, and selective felling. In a survey of Van Blitterswijk et al. (2001) among 413 Dutch forest owners and managers (with forest areas > 5 ha), 75% of the respondents indicated that they apply IFM. The survey, however, also showed, that various interpretations exist of what IFM exactly entails, leading to different forest management practices.

## 24.4 Access to forest areas

Within the boundaries of the Dutch Forest Act and the Bestemmingsplan ("destination plan", determined on the municipal level), forest owners have the right to use, open up and manage their terrain according their own visions (De Savornin Lohman, 2000). The only exceptions for the owners are the hunting of specific animals and the collection of plant species cited in the 'Flora- and Fauna Law' (Dutch implementation of the EU Birds and Habitats Directive), or if their terrain is located in an area destined for Natura2000 by the Dutch government (Ministry of LNV, 2008).

The government can only convince (private) forest owners to engage in a certain management of their forest and to open up their property for visitors when a forest owner receives financial support from the government. There are two main subsidies applicable for these engagements. First, the 'Subsidieregeling Natuur- en Landschapsbeheer' (SNL; subsidy scheme nature and landscape management, own translation) is a regulation designed to reward terrain owners, including forest owners, to manage their terrain according to certain principles, which facilitate the development and conservation of a certain habitat (LNV-Loket, 2012). With SNL, the nature management regulations and plans have been decentralised from the national government to the provinces.

Second, if a forest owner owns an estate with historic and cultural values, it will be eligible for the 'Natuurschoonwet' (Estates Act) (De Savornin Lohman, 2000). Under this law, a forest owner can apply for receiving tax reduction for maintaining the estate to a certain size as one continuous area rather than a fragmented landscape. An estate owner is, however, not obliged to open up their terrain to recreationists, but the tax reduction is higher when a terrain is accessible to the public (Den Boon and Schuurman, 2008; De Savornin Lohman, 2000; Veer et al., 2006).

## 24.5 Legal arrangements influencing forest conservation and management

Currently, the Netherlands does neither have a formal forest policy nor a National Forest Program (NFP) (Veenman et al., 2009). Over the last 25 years, forest policy has been fully integrated into nature conservation policy that falls (surprisingly) under the Ministry of Economic Affairs nowadays. Some parts were also simply abandoned (such as subsidies for plantations). No wonder that the last official forest policy plan stems from 1991, so from more than 20 years ago. In addition, an NFP, in



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accordance with FAO and UNFF recommendations, has never been adopted, because the Dutch government never thought this was necessary. Nonetheless, we still have a Forest Act (from 1961) that obliges anyone who cuts a tree to replant it, but this law is destined to become integrated in a new nature law in the Netherlands as of January 1st 2017. Table 49 gives an overview of Dutch legal and policy goals and instruments *related* to forests (since forest policy in a classical, sectorial sense does not exist anymore in The Netherlands).

*Table 49. Dutch legal and policy goals, and instruments related to forests*

| **Policy field** | Forests |
|---|---|
| **Key policies** | Forest Act, Nature Conservation Policy, Nature Acts, Estates Act, Spatial Planning, Agricultural Policy / CAP |
| **Political decision-maker** | National government monitors international commitments (CBD, N2000), provinces and municipalities are responsible for all other objectives and instrument (e.g. reserves, national parks, ecological network) |
| **Formal goals of policies** | (1) Multiple-use forest management<br>(2) Maintaining and enhancing forest biodiversity |
| **Specific types of instruments utilized** | – Taxation (e.g. exemption for forest holdings and real estates in Estates Act)<br>– Legislation (e.g. Forest Act, Flora and Fauna Act, Nature Conservation Act, EU Timber Regulation, Birds and Habitats Directives, CAP)<br>– Information schemes (e.g. on the marketing of forest products and services)<br>– Voluntary agreements (e.g. the realization of the EHS, the national ecological network)<br>– Subsidies (e.g. for management of forest areas SNL) |
| **Integration of** | Forest policy with nature conservation policy. |

Source: Hoogstra-Klein et al., 2013

Of course, Dutch forest and nature laws and policies do link to climate change policy (e.g. carbon sinks), energy policy (e.g. wooden biomass; goal is to reach 10% of energy use through renewable sources in 2020, at least a third of this should come from biomass (wood but also other sources)), landscape policy (*Nota Ruimte, Kwaliteitsagenda Landschap* and *Agenda Vitaal Platteland)* and agricultural policy (e.g. agro-environmental schemes and POP2). All of these, however, do not contain *specific* measures and instruments for forests, at least not for the Netherlands itself. Internationally, though, our country, for example, contributes to REDD+ policy (although very modestly), that enhances forest conservation, improved forest management and the establishment of forest carbon sinks in developing countries, as forms of climate change mitigation paid by developed countries.

# 25. Stakeholder analysis The Netherlands

## 25.1 Stakeholders involved

The first step of the stakeholder analysis is to identify the main stakeholders in the Dutch forest sector. The question who or what a stakeholder is, has been subject of much debate in the scientific literature (Orts and Strudler, 2009). In this report, we define stakeholder in a broad way, referring to those actors, organizations and/or institutions that have a stake/interest/concern in the forest resource, either directly (e.g through involvement in the management and use of the forest resource) or indirectly (e.g. those not directly managing or using a forest, but who can affect or can be affected by the management or use of the forest resource) (FAO, 1998; Freeman, 2010). To determine the stakeholders in the Dutch forest sector, we made use of different sources of information (expert knowledge, web and document analysis, and interviews that were carried out in the EU-financed INTEGRAL project). In the Netherlands, the multifunctional character of forests and forest management is reflected in a diversity of stakeholders involved in forest management. Appendix 30 provides



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an extensive overview of these stakeholders (n≈175). A list of *main* stakeholders can be found in Table 50. This table is an outcome of the interviews carried out in the EU financed INTEGRAL project, in which experts (n=20) and forest managers (n=27) were asked to list the – in their eyes - main stakeholders as regards the management, use and protection of forests in The Netherlands.

*Table 50. Main actors in Dutch forestry, as perceived by experts and forest managers as found in the INTEGRAL project*

| Actors mentioned | Times mentioned by experts (%) (N = 20) | Times mentioned by managers (%) (N = 27) |
|---|---|---|
| Dutch National Forest Service (*Staatsbosbeheer*) | 15 (75%) | 12 (44%) |
| Society for preservation of nature monuments in the Netherlands (*Natuurmonumenten*) | 15 (75%) | 12 (44%) |
| De Landschappen | 13 (65%) | 9 (33%) |
| Private forest owners | 10 (50%) | 4 (15%) |
| Dutch government (including Ministry of Economic Affairs and the Ministry of Defence) | 10 (50%) | 14(52%) |
| Union of Forest Associations (*Unie van Bosgroepen*) | 9 (45%) | 3(11%) |
| Provinces | 8 (40%) | 4 (15%) |
| Dutch Forestry Board (*Bosschap*) | 8 (40%) | 2 (7%) |
| Municipalities | 6 (30%) | 2 (7%) |
| Environmental organisations/Pressure groups (*Vogelbescherming, Vlinderstichting etc.*) | 6 (30%) | 1 (4%) |
| Dutch Federation for Private Landownership (FPG) | 5 (25%) | 3 (11%) |
| Royal Dutch Forest Society (KNBV) | 5 (25%) | 2 (7%) |
| Alterra Research Institute | 5 (25%) | 0 |
| Forest Managers/Advisors/Estate Managers | 4 (20%) | 0 |
| Educational Institutes | 4 (20%) | 0 |
| Probos Foundation | 4 (20%) | 1 (4%) |
| Civilians/Society | 3 (15%) | 6 (22%) |
| Timber Market (also for woody biomass) | 3 (15%) | 4 (15%) |
| Dutch Timber Association (AVIH) | 3 (15%) | 1 (4%) |
| FSC/PEFC | 2 (10%) | 0 |
| Netherlands Timber Trade Association (VVNH) | 2 (10%) | 0 |
| Dutch Timber Platform (*Platform Hout*) | 1 (5%) | 0 |
| EU | 1 (5%) | 1 (4%) |
| Hunters and the Hunting associations | 1 (5%) | 0 |
| Dutch National Fund for Rural Areas (*Groenfonds*) | 1 (5%) | 0 |
| Foundation Critical Forest Management (*Stichting Kritisch Bosbeheer*) | 1 (5%) | 0 |
| Ecologists and Cultural Historians | 1 (5%) | 0 |
| Individual persons | 1 (5%) | 0 |
| Entrepreneurs / companies | 0 | 4 (15%) |

Source: Hoogstra-Klein et al., 2013



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As the table shows, the key actors in Dutch forest management and nature conservation are the central state, the provinces, the municipalities, the (semi-public and private) organizations that manage nature and forest areas (particularly the Dutch National Forest Service, *Natuurmonumenten* and the *Landschappen*), private owners (incl. the FPG representing private owners), the forestry actors (employers and employees; particularly the former *Bosschap*, Union of Forest Associations, and VVNH), and eNGOs. The top 5 of most mentioned actors, as perceived by both managers and experts, consists of the Dutch National Forest Service (SBB), *Natuurmonumenten*, the *Landschappen*, the government, and the Union of Forest Associations.

## 25.2 Stakeholders' interests

Second step of the stakeholder analysis is the determination of the different interests of the (main) stakeholders. This report follows the definition of interest from Krott (2005), who understands interests as being *"based on action orientation, adhered to by individuals or groups, and they designate the benefits the individual or group can receive from a certain object, such as a forest"*.

## 25.3 Interests of key stakeholders

The assessment of the different interests of the key forest actors in the Netherlands in terms of Ecosystem Services (ES) is displayed in Table 51. This table represents six stakeholder groups, which were grouped according to their interest(s), based on the use of the forest and/or on advocated positions up to present. Different sources of information (expert knowledge, web and document analysis, and interviews that were carried out in the EU-financed INTEGRAL project) were used to collect this information.

In the following, our assessment of the interest of these key actors is described in more detail.

*Table 51. Interests in ecosystem services of key actors (The Netherlands)*

| | Forest owners | | | State | Market | Society |
|---|---|---|---|---|---|---|
| | **Dutch National Forest Service** | **Natuurmonumenten, Landschappen** | **Private owners (incl. FPG, Union of Forest Associations, VBNE)** | **Dutch government (national, provincial and local level)** | **Timber and wood processing industry** | **eNGOs** |
| *Provisioning ES* | | | | | | |
| Wood provision | ++ | + | ++ | ++ | +++ | 0 |
| Game provision | 0 | 0 | + | 0 | 0 | 0 |
| Mushrooms | 0 | 0 | 0 | 0 | 0 | 0 |
| Berries | 0 | 0 | 0 | 0 | 0 | 0 |
| Medical plants | 0 | 0 | 0 | 0 | 0 | 0 |



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| | | | | | | |
|---|---|---|---|---|---|---|
| *Supporting ES* | | | | | | |
| Biodiversity | ++ | +++ | ++ | ++ | + | +++ |
| Habitats | ++ | +++ | 0 | ++ | + | +++ |
| *Regulating ES* | | | | | | |
| Carbon sequestration | + | 0/++ | 0 | + | 0 | +++ |
| Climate regulation | + | 0/++ | 0 | 0 | 0 | 0 |
| Water quality | + | 0/++ | + | + | 0 | ++ |
| Pest control | 0 | 0 | 0 | 0 | 0 | 0 |
| *Cultural ES* | | | | | | |
| Outdoor recreation | ++ | ++ | ++ | ++ | 0 | 0 |
| Aesthetics | ++ | ++ | ++ | ++ | 0 | 0 |
| Tourism | + | 0 | ++ | ++ | 0 | 0 |

*Staatsbosbeheer (Dutch National Forest Service)*

Staatsbosbeheer manages 265,000 hectares of state owned forest and nature across the Netherlands. The Dutch National Forest Service has formulated four main topics in their recently revised corporate plan for the period 2016-2020) (Staatsbosbeheer, 2015):

(1) greater protection (relates to topics such as biodiversity, green heritage, Natura2000, habitats, connected and resilient nature reserves),
(2) enriched experience (relates to topics such as citizen involvement, culture, and recreation & tourism),
(3) wise and sustainable use (relates to topics such as timber production, bio-based economics, but also other ways of generating income),
(4) organisation excellence (relates to topics such as transparency, cost neutrality, and social benefits).

Considering these four themes, we scored the Staatsbosbeheer high for

a) biodiversity and habitats (mentioned under topic 1),
b) the cultural services (especially outdoor recreation and aesthetics) (mentioned under topic 2, but also referred to under topic 3 as a way to generate additional income, e.g. by renting vacation houses or the organization of excursions), and
c) wood provision (as an important aspect of topic 3).

Additionally, we gave a score to several of the regulating ES, as these are mentioned, though not specifically as main aims, in Staatsbosbeheer's corporate plan. These are the supply of clean water, and climate change (Staatsbosbeheer, 2015).



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*Natuurmonumenten, Provincial Landscapes*

Natuurmonumenten manages 101,066 hectares of forest and nature distributed over 363 areas in the Netherlands. The main objective of this organisation is to "*protect animals and plants which are native to this country and enable people to enjoy the countryside by providing footpaths, cycle paths, observation points and excursions*" (Natuurmonumenten, 2016b). This objective resulted in high scores on a) biodiversity and habitats and b) the cultural services. We judged the score on a) somewhat higher than on b,) considering the historical background of the organisation, namely as a nature conservation organisation. The score on climate regulation is given because of Natuurmonumenten's explicit interest in forest and nature's role in climate change regulation. One of the main themes in their Nature Vision is the role nature and landscape can provide by solving climate change and sustainability questions (Natuurmonumenten, 2016b). Though not presented as an important interest by Natuurmonumenten, we also gave a score for wood provision as the sales of wood and woody biomass forms part of their income (Natuurmonumenten, 2016a).

Closely related to Natuurmonumenten are the twelve Provincial Landscapes - Janssen (2009) even called these organisations "*a regional offshoot of Natuurmonumenten".* As regards the interests, we, therefore, considered it to be acceptable to assess their interests together with Natuurmonumenten. All the Provincial Landscapes focus on the protection of nature, often in combination with cultural heritage (such as castles, dolmens, and barrows) (see e.g. Drents Landschap, 2016 or Geldersch Landschap & Kasteelen, 2016). Like Natuurmonumenten, they find it important that Dutch society can enjoy their forest and nature areas. As described by one of the Provincial Landscapes: *"in 90% of our nature areas you can recreate, and undertake sport- or nature activities*" (Fryske Gea, 2016 – own translation). As with Natuurmonumenten, wood provision is not a major issue, but forms a source of yearly income for those Provincial Landscapes managing forest areas. Interests in the frame of the regulating services could not be found as clearly as with Natuurmonumenten. We rated this therefore lower.

*Private forest owners/FPG/Union of Forestry Associations/VBNE*

The group of private forest owners (or organizations representing private owners) forms a heterogeneous group as regards interests. Some private owners completely focus on wood production, while for others this is of no interest at all. The interviews with forest managers carried out in the frame of the INTEGRAL project present an indication of the importance of the different ecosystem services among private forest owners (see Table 52). Scores in these tables are very high for recreation and tourism, aesthetic services, biodiversity and timber (actively managed for by more than 80% of the forest managers, and primary ES for the majority of the managers interviewed). These ES received therefore a high score in Table 52. We also scored for NWFPs (hunting) and clean water as more than one third of the managers actively manage for these ES.



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*Table 52. Provision of ES according to forest managers interviewed (n=27) in the INTEGRAL project*

| Ecosystem Services | Provision through active FM | Assigned importance | | |
|---|---|---|---|---|
| | | Primary | Secondary | Involuntary/ Implicit |
| Timber | 22 (81%) | 16 (59%) | 9 (33%) | 2 (7%) |
| Wood Fuel / Biomass | 11 (41%) | 1 (4%) | 18 (67%) | 8 (30%) |
| NWFPs – Food - Hunting | 11 (41%) | 6 (22%) | 9 (33%) | 12 (44%) |
| Clean water | 10 (37%) | 2 (7%) | 8 (30%) | 17 ((63%) |
| Biodiversity | 23 (85%) | 21 (78%) | 5 (19%) | 1 (4%) |
| (Eco)tourism | 26 (96%) | 16 (59%) | 11 (41%) | 0 (0%) |
| Aesthetic Services | 25 (93%) | 18 (67%) | 9 (33%) | 0 (0%) |
| Carbon Sequestration | 1 (4%) | 0 (0%) | 2 (7%) | 25 (93%) |

Source: Hoogstra-Klein et al., 2013

*Dutch government (state, provinces, local authorities)*

Multifunctional forestry is a key concept in Dutch policy. The most recent description of multifunctional forests in Dutch policy can be found in the documents on Sustainable Energy Production, which define a multifunctional forest as (Netherlands Enterprise Agency, 2015, p. 14-15):

> "*A forest whose management focuses on the conservation and/or enhancement of several coexisting functions such as nature, landscape, recreation and the production of wood and biomass. In general, no single dominant feature stands in the way of the conservation and/or enhancement of the other functions (for instance, forest management must not focus exclusively on optimum timber production). In practice, the multifunctionality of the forest can be seen in the consistency of the management measures implemented: measures to strengthen specific species (flora and fauna), conservation of the recreational infrastructure (footpaths), logging operations.*"

Despite that according to the definition forests can be managed for several functions, the definition clearly shows the importance of four functions for Dutch society: 1) nature/biodiversity, 2) recreation, 3) landscape, and 4) wood production. This explains the relatively high score we assigned to these interests. Next to these four functions, we also scored on carbon sequestration and water quality. As regards carbon sequestration, Dutch forest and nature laws and policies also link to climate change policy (e.g. carbon sinks) and energy policy (e.g. woody biomass, as a way to increase the energy use through renewable resources) (Hoogstra-Klein et al., 2013). Water quality is an important issue in many of the provincial and local (municipal, water boards) policy plans (see e.g. Province of Limburg (2003)). Interesting to mention in this respect is that forest areas are classified as nature areas in the water board taxes, which results in lower taxes per ha because of their importance for the quality of the water (VBNE, 2016a), and that water boards have "fixed seats" in their board of directors for representatives from forest and nature (Bosschap, 2013).

*Timber and wood processing industry*

The Netherlands is an import country as regards wood and timber. Only 10% of the wood/timber used by Dutch society finds its origins in Dutch forests (Staatsbosbeheer, 2016). Despite this low



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number, especially umbrella organisations such as the AVIH (Forestry contractor organisation) and the VVNH (Royal Dutch timber trade organisation) are important stakeholders representing the timber industry in Dutch forest management. Their main interest is the provision and processing of (sustainably produced) wood and timber. As, for example, the AVIH (Forestry contractor organisation) writes, their members focus on "*the execution of all kind of forestry work (incl. for instance the clearing of storm damage), the buying and selling of round wood and delivery of sawn goods and products for paper industry, panel industry and biomass for the energy sector*" (AVIH, 2016a). The mission of the VVNH (Dutch Timber trade organisation) includes the promoting of a strong and positive image of wood and timber products, and the use of wood from sustainably managed forests (VVNH, 2016). High scores, therefore, on the interest "wood provision".

*Environmental NGO's*

In the Netherlands, the nature conservation and environmental sector is well organised in a multitude of nongovernmental organisations. Examples of these NGOs include Greenpeace, *WereldNatuurFonds (WNF)* (the Dutch branch of WWF), *Milieudefensie* (the Dutch branch of Friends of the Earth), and *Vogelbescherming Nederland* (Netherlands Society for the Protection of Birds). Though the specific focus may differ, for the whole group of eNGOs one can state that the main interests is on the supporting and regulating ES (climate change issues, and water quality).

## 25.4 Conflicts between interests

Different ideas about conflicts of interest about ES exist. Some of the experts interviewed are of the opinion that an integration of functions on stand level is possible. Most of the experts are however of the opinion that different functions cannot be integrated on stand level and should therefore be segregated, e.g. because an integration of functions lead to suboptimal situations and can lead to conflicts between different user types (Hoogstra-Klein et al., 2013). Examples given were (Hoogstra-Klein et al., 2013):

- conflicts between functions, e.g. recreation versus timber harvest, nature protection versus timber harvest;
- conflicts within a function, e.g. recreational activities such as mountain bikers and walkers.

Solutions are found in, a.o. (Hoogstra-Klein et al., 2013):

- focusing on one ES only;
- zoning – where the production of certain ES are allocated to specific areas within the forest area;
- preventing conflicts - an example given is communication about timber harvest to recreationists and local inhabitants via local newspapers, information boards in the forests and websites to announce the harvest and explain the background of the harvesting activities.



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## 25.5 Power analysis

The third and last part of the stakeholder analysis is to characterize the main stakeholders in term of power. Power is defined here as the "capability of an actor to influence other actors" (Krott et al., 2014). Similar as in the two previous parts, different sources of information were used to collect the data on power issues (expert knowledge, web and document analysis, and interviews that were carried out in the EU-financed INTEGRAL project and by Kremers, 2016). The section starts with a general description on the position of different stakeholders, followed by a more detailed power analysis based on the concepts of coercion, incentives, and dominant information sources.

## 25.6 Position of key stakeholders

*Forest owners*

As discussed, forest ownership in the Netherlands is small-scale and diverse. Private persons and institutions own 41%, which is mostly very fragmented. In contrast the state owns 31% of the forest area in relatively large units, which are largely managed by the Dutch National Forest Service. Local authorities and other public bodies own 16% of mostly small woodlands. Finally, a special and influential category of ownership is that of the nongovernmental nature conservation bodies (national and provincial). They own 11% of the forest area and a considerable part of all nature reserves in the Netherlands. Formally these organisations are private associations or corporations, but their role and status have become quite similar to that of the National Forest Service (apart from financing). They have an impressive amount of members and supporters in Dutch society, which gives them more financial support and stronger political influence than other categories of forest ownership (Van Wijk et al., 2005).

The experts interviewed in the EU INTEGRAL project were asked to grade the amount of autonomy they think forest owners/managers have, on a scale of 1 (no freedom) to 5 (absolute freedom). The results can be found in Figure 3. Overall, it can be concluded that forest managers experience a relatively high amount of freedom in which they can decide themselves what to do. The most limiting factors mentioned were (in order of importance): the governmental subsidies for managing forest and nature, national laws (e.g. Forest Act, Estate Law), Natura2000, financial restrictions (e.g. low budget, low market prices), and lack of knowledge/diminishing knowledge on forest management (Hoogstra-Klein et al., 2013).



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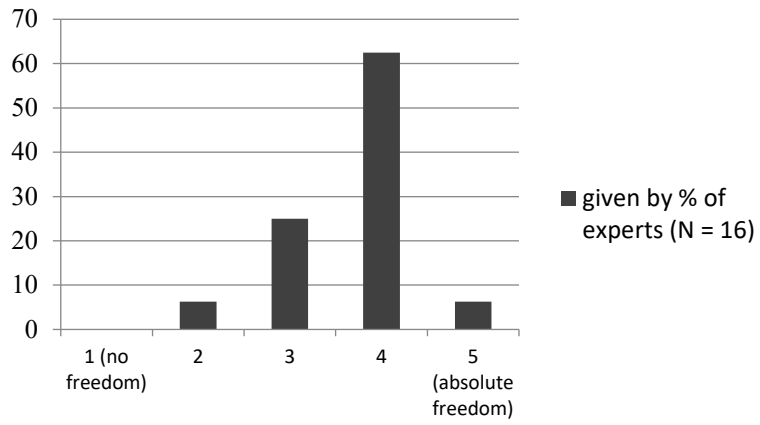
*Figure 3: Autonomy of forest managers as perceived by experts*




Source: Hoogstra-Klein et al., 2013

The experts also reflected on the stakeholders that are most influential as regards the decision-making of forest owners and managers. The five most important actors are listed in Table 53. Not surprising, these five actors directly link to the limiting factors described above.

*Table 53. Actors mentioned by experts to be most influential as regards forest owners and managers' decision-making*

| 5 most important actors | Influence |
|---|---|
| Dutch national government (including Ministry of Economic Affairs and the Ministry of | Make policies, decide upon laws and provide the budget for subsidies |
| Provinces | Distribute and assess subsidies; implementation of nature policy |
| (Timber) market | Determine volume and prices for market |
| Union of Forest Associations (Unie van Bosgroepen) | Provide knowledge which forest owners rarely question; develop management plans |
| Forest Managers/Advisors/Estate Managers | Provide knowledge which forest owners rarely question; develop management plans |

Source: Hoogstra-Klein et al., 2013

The INTEGRAL interviews showed that forest managers are able to influence Dutch politics and society. One of the examples given was the lobby by representatives of large forest owning organizations, such as *Natuurmonumenten*, the *Landschappen* and the Dutch National Forest Service (SBB), as well as by representatives of private forest owners, resulting in a €200 million of budget cuts for forest and nature conservation undone. Another example mentioned was the Society for Preservation of Nature Monuments in the Netherlands (*Natuurmonumenten*) drafting revisions for the Forest Act



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(*Boswet*), which will be incorporated under the new Nature Protection Law (*Wet Natuurbescherming*) (Hoogstra-Klein et al., 2013).

Main source of conflict for forest owners and managers is with the group of (individual) visitors (Hoogstra-Klein et al., 2013). Examples include forest visitors not agreeing with management activities (e.g. harvesting, cutting of (monumental) trees or removal of forest for open spaces), and forest visitors not following the rules (e.g. having dogs not on a leash, mountain biking in areas where it is not allowed). As visitor opinions and support are considered to be important, many forest owners and managers make use of local newspapers, meetings, excursions and signs on the roads to mediate with local interest groups, residents and visitors about work that is going to be conducted in the forest. This reduces complaints and increases the support for forest management plans. Also firewood is sold to local residents to increase support. Some use social media to ask visitors what their wishes are, and some employ participation when setting up management plans (Hoogstra-Klein et al., 2013).

*Dutch government*

The Netherlands can be characterised as a decentralised unitary state in which policy responsibilities are distributed between national (state), regional (provinces) and local (municipalities) level. Forest policymakers can be found mainly on national and provincial government level. In addition, some municipalities may also employ forestry officials, especially when they are in charge of a relatively large forest area. Forest policy used to be made by forestry professionals, especially when the National Forest Service was still authorised to deal with both forest management and forest policy matters (till 1988). Nowadays, forest policy has become largely integrated with nature conservation policy and countryside policy. This also resulted in policy makers being recruited from a much broader field of knowledge, including ecology but also economics, law, sociology and public administration (Van Wijk et al., 2005). The Ministry of Economic Affairs holds the major responsibility for "forest policy" in the Netherlands. As a result of the Dutch decentralisation policy, provincial authorities play an increasingly important role in countryside planning as well as forest management, a.o. through their responsibility for the subsidy schemes for landscape and nature manage. The municipalities also exert an important influence on the implementation of the policies. Especially through their authority to decide on detailed land-use zoning, they have an important role in regulating the use of private and public property. Furthermore, some municipalities are also forest owners, which make them a considerable factor in forest policy. Dutch governmental policy is explicitly aimed at involving these various groups of stakeholders in forest management and policy. This allows forest users to effectuate forest policy, and thus forest management, through their respective interest representation organisations.

*Timber and wood processing industry*

Traditionally, the timber and wood processing industry in the Netherlands is characterised by a multitude of relatively small companies. As only 10% of the total Dutch wood consumption comes from Dutch forests, many of the companies do not depend on the Dutch forest for their wood supply. Consequently, no strong and integrated forest – wood chain has developed (Van Wijk et al., 2005). The timber trade and wood industry are not considered to be influential on the national policy level, although with an increase of attention for the timber production function of forests over the last years this seems to change a bit (Hoogstra-Klein et al., 2013). However, as described in the section



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on forest owners above, for forest owners the timber market is of utmost important as wood provision forms an important source of income, especially with the subsidy cuts. Most important determinants for the wood prices are the cost of production, and the market demand (AVIH, 2016b).

*eNGO's*

The nature conservation and environmental sector is well organised in a multitude of non-governmental organisations. Some of these organisations are predominantly engaged in managing nature reserves (including important forest areas) (in this report, therefore, classified as "forest owners"). Other organisations act as lobby groups advocating environmental protection and nature values (Wiersum and Van Vliet, 1999; Schmidt et al., 2003; Van Wijk et al., 2005). Environmental and nature conservation organisations, backed by a large constituency of members (in the range of three million citizens), have been particularly influential in setting the policy agenda on how to develop forest management (Zevenbergen, 2003).

## 25.7 Power assessment

Inspired by the actor-centred power approach of Krott et al. (2014), the assessment of power of stakeholders from the Dutch forest sector below is based on the criteria coercion, incentives, and dominant information sources. 'Coercion' is defined as altering behavior with force, including the threat of force and even bluffing about force that does not really exist. 'Incentives' are defined as altering behavior with advantages or disadvantages. Material and immaterial (dis-)incentives can be distinguished. Material incentives are money and also all technical sources, e.g. machines, plants, food or support in labor. Immaterial incentives offer social or psychological advantages, e.g. social conventions, morals. 'Dominant information sources' are defined as altering behavior by supplying unverified information trusted by the subordinate, e.g. within ideologies or based on superior expert knowledge.

As regards the use of specific power instruments by stakeholders in the Dutch forest sector, Kremer's (2016) overview of instrument used by forest policy makers on the one hand and forest managers on the other is insightful (see Table 54). Whereas state actors ('forest policy') particularly make use of legal and economic instruments to regulate and influence the Dutch forest sector, non-state actors ('forest management') particularly exercise influence through communicative and physical instruments. Translated to the criteria coercion, incentives, and dominant information sources of Krott's et al. power assessment, such implies that Dutch state actors in the forest sector are particularly 'good at' coercion and incentives, whereas non-state actors are particularly good at dominant information sources. Of course, one should not generalize these insights to all individual state and non-state actors in the sector.



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*Table 54. Various power instruments at the disposal of state and non-state actors in the Dutch forest sector*

| Instrument | Forest policy (mainly state actors) | Forest management (mainly non-state actors) |
|---|---|---|
| **Legal** | +++<br>(laws, regulations) | +<br>(ownership) |
| **Economic** | +++<br>(fees, subsidies, budget cuts) | +<br>(market power) |
| **Communicative** | ++<br>(policy plans, programs) | +++<br>(lobby, advocacy, research) |
| **Physical** | +<br>(spatial planning) | ++<br>(demonstration projects) |

Source: *based on: Kremers, 2016; Legend: +++ (often used) ++ (regularly used) + (hardly used)*

Table 55 shows that state actors – central government, provinces and municipalities – hold the strongest power resources to impact Dutch forest management. Yet, both market actors and civil society actors hold medium power in the sector, and jointly, they may even outnumber state power in specific cases. An example of the latter is the detailed application of forest management models and nature conservation approaches in the field. Although the Dutch government prescribes biodiversity conservation and multifunctional forestry as important public aims for the sector in their policy plans, and implement these aims by coercion and incentives in particular, the various specifications and technicalities of conservations and management are designed and applied by forest managers themselves. This is expressed by the high autonomy forest managers claim for themselves in the Dutch sector (see above; Hoogstra-Klein et al., 2013) as well as by the claim of many Dutch forest managers that forest policy is *following* them in forest management aims and models, and *not* guiding them (Kremers, 2016). Moreover, the latter study also illuminates that mutual influence patterns in the Dutch forest sector changed over time. Whereas in the 1980s and 1990s forest policy substantially impacted forest management, particularly through subsidies, forest management gained more autonomy vis-a-vis forest policy over time and became more involved in public (self)governance of the sector.

*Table 55. Power resources of different actor types in forest management (The Netherlands)*

| Actor type | Power resources | | | |
|---|---|---|---|---|
| | **Means of Coercion** | **Incentives** | **Dominant information sources** | **Overall estimation of power resources** |
| **Market actors** | **+** | **++** | **++** | **++ (medium)** |
| **Civil Society actors** | **+** | **+** | **+++** | **++ (medium)** |
| **State actors** | **+++** | **+++** | **++** | **+++ (strong)** |

*Legends: Strong impact: +++; Medium impact: ++; Low impact: +; No impact: 0*

Within the group of market actors, particularly the timber industry, the water provision bodies, the tourism industry and the Dutch National Fund for Rural Areas are most influential. The most important power resource of those market actors are incentives. Secondly, within the group of civil society actors, particularly the Society for the Preservation of Nature, the Provincial Landscapes, the



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Dutch Hunting Association, the ANWB (Royal Dutch Touring Club) and FSC/PEFC are most influential. The most important power resource of those civil society actors are dominant information sources. Thirdly, within the group of state actors, particularly the Ministry of Economic Affairs, the Provinces, the municipalities and the EU are most influential. The most important power resource of those state actors is coercion.

Appendix 31 shows how power in the Dutch forest sector is divided over different forest ecosystem services and various resources. Particularly relevant are wood and game (provisioning services; relevancy mainly based on incentives and information), biodiversity and habitats (supporting services; relevancy mainly based on coercion and information), water quality (regulating services; relevancy equally based on all three power resources) and recreation and tourism (cultural services; relevancy mainly based on incentives and information). These key forest ecosystem services seem all equally relevant to Dutch society in general and the Dutch forest sector in particular; this is probably related to the strong influence of multifunctional forestry in the Netherlands.

## 26. Conclusions

The Dutch forest sector is small. Only 11% of the Netherlands is covered by forests and the timber industry marginally contributes to gross GDP (less than 1%). Self-sufficiency in timber is therefore below 10%, so nearly all timber for Dutch consumption is imported. Moreover, forest ownership is substantially fragmented, although most owners follow similar management models, i.e. try to balance the various values and functions of forests in variants of integrated forest management (IFM). All this leads to harvest figures substantially below annual increment. Although the sector is small, this report identifies nearly 175 stakeholders. Most important and powerful ones are national and subnational governments, the EU, the timber industry, the water provision bodies, the tourism industry, the Dutch National Fund for Green Investments, the Society for the Preservation of Nature, the Provincial Landscapes, the Dutch Hunting Association, the ANWB (Royal Dutch Touring Club) and FSC/PEFC. State actors in the forest sector particularly use coercion and incentives as power resources, whereas non-state actors particularly use dominant information sources. The following forest ecosystem services are most relevant to both Dutch society and the forest sector: wood and game, biodiversity and habitats, water quality and recreation and tourism.



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## Portugal – Case Study Vale do Sousa

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*Summary*

There is a general consensus among political decision makers in Portugal about the need to improve forest policy in order to cope with the problems affecting the forest sector, but there are different opinions about the priorities that should be given to the different problems and the policy instruments that should be used to cope with these problems. The general consensus about the need for policy changes is reflected in the unanimity of the decisions made at the National Parliament concerning Forest Policies. Most of the Portuguese forests are primarily intended for provisioning forest ecosystem services, e.g. roundwood, pulp and paper and other non-wood forest products. Furthermore, actors such as forest owners and timber industries prefer high harvesting intensities, high shares of eucalypt stands and low amounts of shrubs in forest because of wildfire risk. However, conflicts between different actors exist based on varying priorities between different forest ecosystem services and about how to exactly implement multi-functional forestry. Most important current conflicts about management of forests in Portugal are associated with the following issues:

- Landscape integrated management goals vs. small-scale private property rights;
- Central vs. local policy making;
- Role of the public administration vs. role of forest owners' associations;
- Payment of non-market ecosystem services;
- Preventive vs. suppression fire policy measures;
- Use of non-native tree species;
- Use of timber for traditional uses vs. use of timber for bioenergy;
- Plantation vs. other types of forest;
- Outdoor recreation activities vs. property rights;
- Wildfire risk mitigation management vs. close-to-nature management.

The collective action and the representation of actors within the forest sector have been improving in general and within the case study area, but not up to the point of being very influential in the forest policy making process. Due to property rights, private forest owners are key actors for forest management.

Actors from timber industries impact forest management through their role in managing their landbase (owned or rented) and by lobbying in favor of higher shares of eucalypt and cork oak. They further influence forest management by market incentives. Furthermore, actors from the renewable energy sector became increasingly important for forest management because of the increased demand of timber for bioenergy. Actors from nature and environmental conservation non-governmen-



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tal organizations have some power at national level, mostly through information and moral incentives, but they are less influential in Vale do Sousa, at the local level. Actors representing employment in forests have very little influence on forest policy processes.

Actors with recreational interests are almost meaningless for forest policies at the national level. However, recreational interests are supported by significant nature activities promoted by several entities and may thus be influential at the local level; recreationalists enforce their interests directly by accessing and using forests.



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## 27. General country information Portugal

Forests are the main land use in continental Portugal accounting for 35 % of total land area (Figure 4), around 3.15 million ha, according to the last National Forest Inventory(IFN6) (ICNF, 2013). The forest area decreased during the period 1995-2010 at a net loss rate of -0.3% per year. This decrease is related to frequent and intense wildfires. The abandonment of agriculture land (24% of total area) and the increase of shrubland and pasture land (32% of total) are also reported.

State ownership represents only 3% of the Portuguese forest land. Private ownership account for 87% (70% of which have less than 4 ha, while 1% have 100 ha or more) and communal land 10% of the total forest area (Figure 5). The area of forests integrated in the network of national nature conservation areas corresponds to 19% of the forest area in continental Portugal while 23% of the forest area is included in the Natura 2000 European network (Pereira, 2014; Reboredo and Pais, 2014).

There are three major forest tree species in Portugal: eucalypt (*Eucalyptus* spp.) is the main tree species in continental Portugal (26% of the total forest area), cork oak (*Quercus suber L.*) is the second (23%), followed by maritime pine (*Pinus pinaster* Aiton) (23%) (ICNF, 2013). The remaining area is occupied by holm oak (*Quercus ilex* L.) (11%), stone pine (*Pinus pinea* L.) (6%) and other broadleaf and conifer species (17%). A considerable increase in wooded areas (forest stands) with stone pine (+54%) and chestnut (+48%) has been recorded.

The decrease of maritime pine (*Pinus pinaster* Aiton) and the expansion of eucalypt plantations were the most significant trends in the last decades. The total area of maritime pine decreased 263,000 ha between 1995 and 2010 (-13%). Most of this area changed to “shrub/grassland” (165,000 ha), 70,000 ha changed to eucalypt stands, 13,000 ha changed to urban areas and 13,700 ha was planted with other tree species.

Portuguese forests are different according to its regional distribution. In the South, forest areas consist mostly of *montado* agroforestry systems, combining cork oak and holm oak with agriculture and grazing activities. In the North and Central regions forests consist mostly of conifer stands (*Pinus pinaster* Aiton) and eucalypt stands (*Eucalyptus* spp.) (pure or mixed).

Most Portuguese forests are primarily intended for production functions, not only for roundwood but also for pulp and paper, cork and other non-wood forest products. This means that the dominant paradigm associated to forest management is the one giving priority to wood production. However multifunctional management situations can be found, especially in the *montado* systems, where the dominant production is based on cork extraction, also a valuable non-wood forest product.

In Portugal, wildfires have been common events, with an increasing intensity, since the 1950s. The years of 2003 and 2005 were particularly catastrophic and, since then, fires have been at the top of the agenda of public concern in Portugal. The total burned area exceeded 400,000 ha in 2003 and almost 350,000ha in 2005 (Figure 6). These events have been very important in influencing the forest policy agenda and decision-making process.



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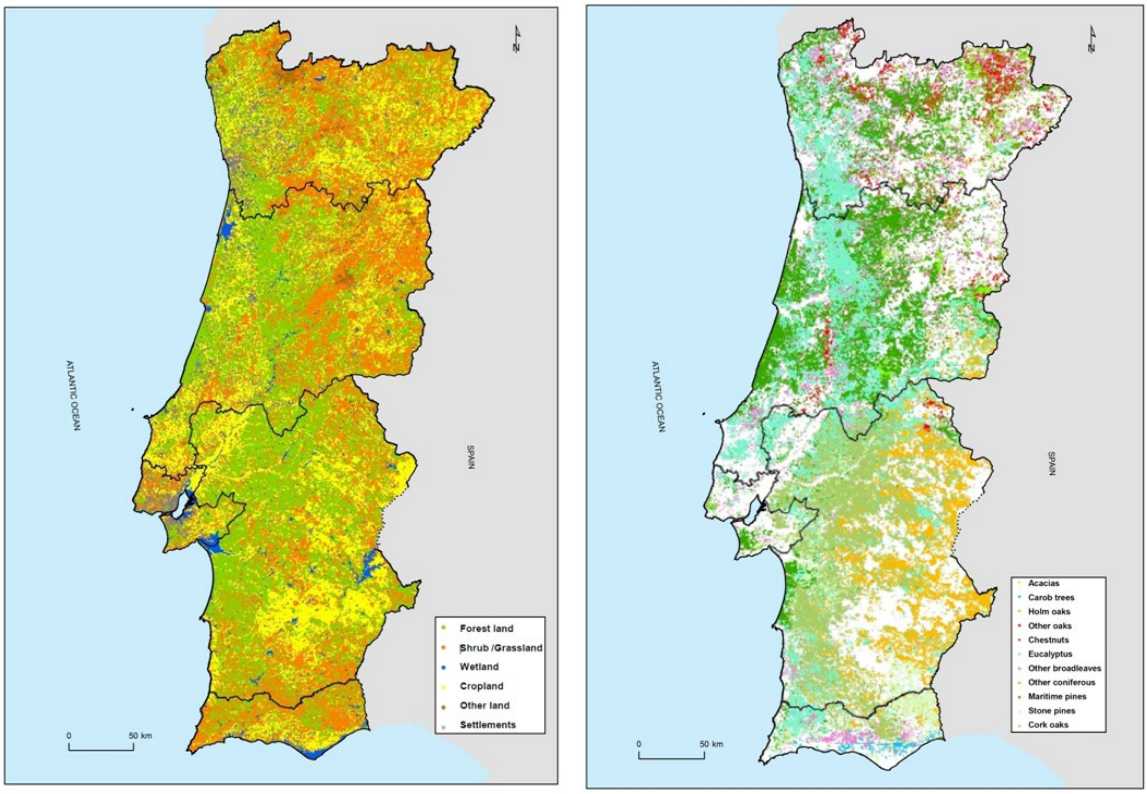
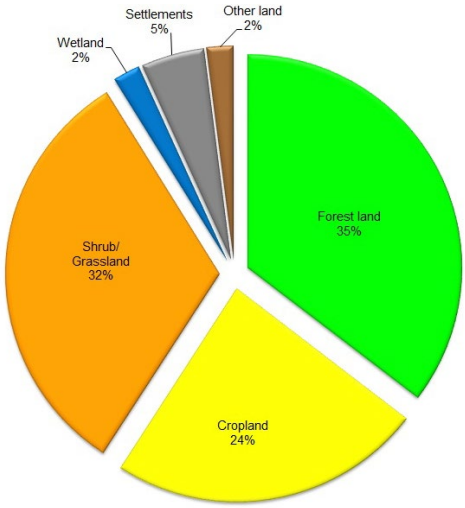
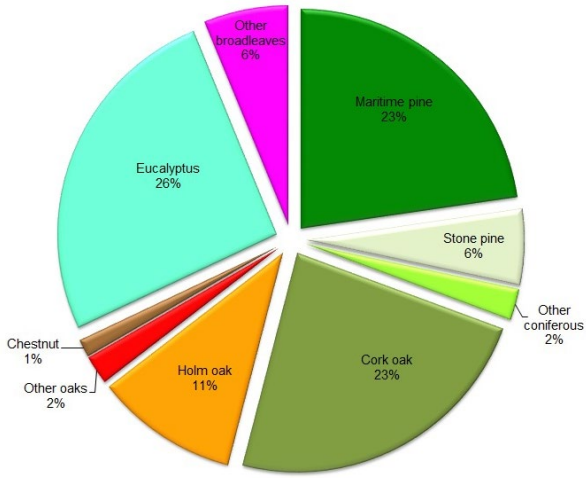
*Figure 4. Land use and forest land of Portugal*




**Land use**




**Forest land (tree species)**

Sources: adapted from ICNF, 2013 and Uva, 2014

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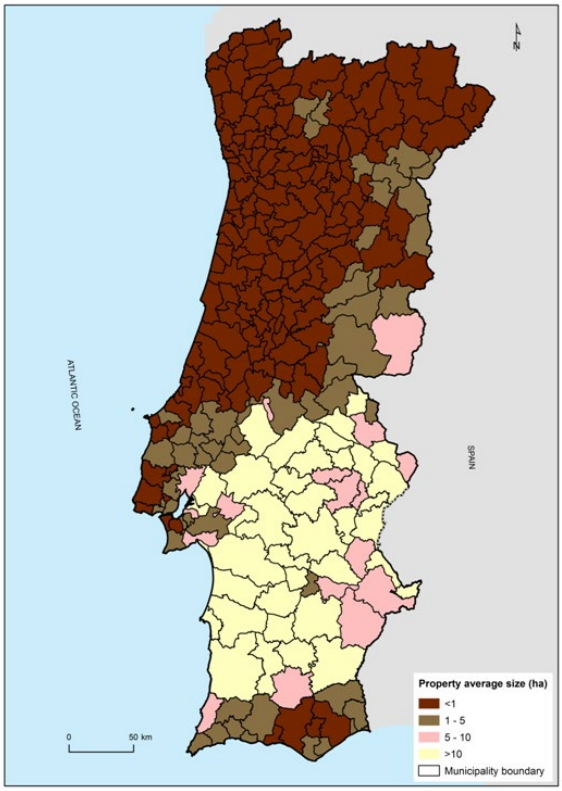
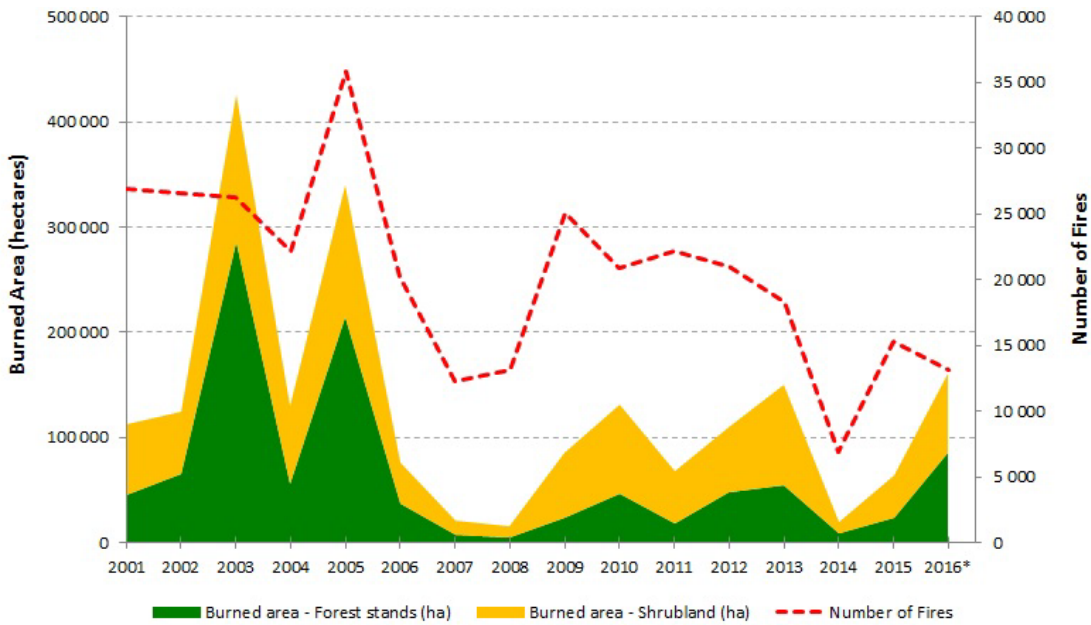
*Figure 5: Forest ownership in Portugal*




Source: adapted from DGCI, 2006 in ENF, 2015

*Figure 6: Burned area and number of fires in Portugal (2001-2016)*




* provisional data

Source: AFN, 2011 and ICNF, 2016a



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## 27.1 Current forest policy conflicts and problems

There is a general consensus among political decision makers in Portugal about the need to improve forest policy in order to cope with the problems affecting the forest sector, but there are different opinions about the priorities that should be given to the different problems and policy instruments. The general consensus about the need for policy changes is reflected in the unanimity of the decisions made at the National Parliament concerning Forest Policies. Most important conflicts about management of forests in Portugal are associated with the following issues:

- Landscape integrated management goals vs. small-scale private property rights;
- Central vs. local policy making;
- Role of the public administration vs. role of forest owners' associations;
- Payment of non-market ecosystem services;
- Preventive vs. suppression fire policy measures;
- Use of non-native tree species;
- Use of timber for traditional uses vs. use of timber for bioenergy;
- Plantation vs. other types of forest;
- Wildfire risk mitigation management vs. close-to-nature management.

In recent forest policy research seven conflict groups have been identified characterizing current Portuguese forest policy: (1) conflicts related to nature conservation; (2) conflict related to (renewable) energy; (3) conflicts related to climate change; (4) conflicts related to recreational forest use; (5) conflicts related to hunting; (6) conflicts related to employment in forests; and (7) conflicts related to general guidelines and priorities of forest use (Table 56).

*Table 56. Overview of current conflicts in Portugal forest policy*

| ***Conflict category*** | ***Conflict*** |
|---|---|
| **General guidelines** | Owner vs. society: who should decide |
| | Landscape integrated management goals vs. small-scale individual propriety rights |
| | Preventive fire policy measures vs. suppression policy |
| | Central vs. local policy making |
| | Sectorial vs. Territorial approaches to forest policy |
| **Nature conservation** | Non-native tree species |
| | Genetic modified tree species |
| | Plantation vs. other types of forest |



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| *Conflict category* | *Conflict* |
|---|---|
| | Wildfire risk mitigation management vs. close-to-nature management |
| | Implementation of Natura 2000 |
| **Energy transition** | Use of timber for traditional uses vs. use of timber for bioenergy |
| | Intensification of harvesting measures vs. soil protection |
| | Wind energy projects in forests vs. conservation |
| | Expansion of power grids above forests |
| **Climate change** | Most effective climate mitigation measures in silviculture |
| | Owner's financial compensation for climate change mitigation services of forests |
| **Recreation** | Increased/changed goals of recreational users vs. conservation and use |
| | Scenery and landscapes vs. economic goals |
| | Motor cross vs. hunting and other recreational interests |
| | Forest owners' rights vs. mushroom and other WFP pickers |
| **Hunting** | Interests of forest owner vs. interests of hunters and their autonomy |
| **Work in forests** | Job safety of forest workers |
| | Work in forestry vs. non-work for conservational purposes |

## 27.2 Instruments and legal competences in Portuguese forest policy

Currently, there are two reference documents for the forest sector at the National level: the Forest Policy Act (Lei de Bases da Política Florestal - LBPF, in Portuguese) and the National Forest Strategy (Estratégia Nacional para as Florestas - ENF, in Portuguese).

The Forest Policy Act (Law no. 33/96, 17 August) came into force in 1996, aiming at sustainable forest management promotion and the enhancement of forest multi-functionality. It also created regional forest management plans (PROF) and forest management plans (PGF) as key elements of forest policy.

The National Forest Strategy (ENF), developed in 2005-2006, has been revised in 2015 (Council of Ministers Resolution no. 6-B/2015, 4 February), providing guidelines for the public and private intervention in forest areas in the future decades. The ENF is the top element of the Portuguese forest policy and planning system. It provides guidelines for the management of forests and the development of the forest sector. This strategy outlines the major forestry trends that are further developed in regional forest planning. The ENF considers the forest sector as national natural endowment, but recognizes it is threatened and/or conditioned by climate change, forest fires, pests, diseases and invasive plants, globalization and market risks, urbanization and institutional risks (Valente et al. 2015).



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The current Portuguese planning system for the forest sector is divided into four territorial levels, National, Regional, Municipal and Local. The major policy and technical areas of intervention are forest management, desertification, forest health and forest fire protection. The scope of the different types of plans (Decree Law no. 16/2009, 14 January), the Regional Forest Plans (Plano Regional de Ordenamento Florestal - PROF, in Portuguese); the Forest Management Plans (Planos de Gestão Florestal - PGF, in Portuguese); and the Specific Plans for Forest Intervention (Planos Específicos de Intervenção Florestal - PEIF, in Portuguese) – is defined according to the framework presented above.

The Regional Forest Plans (PROF) provide silvicultural models for different ecological situations and for different management objectives; they provide goals for the forest area and the species composition at the regional level. Silvicultural guidelines are included in the regional plans and are to be applied by all forest owners. Pending on the size of the forest holding, management plans are mandatory, need to be approved by the Institute for the Nature Conservation and Forests (ICNF), and published in the official government bulletin. These plans are legally binding both for public authorities and for private agents. Regional plans provide guidelines for forest planning, e.g. the identification of the most appropriate silvicultural systems and resource management techniques; the definition of the list of forest species to favor in the expansion or conversion of the forest area; assessing the potential of forest areas, from the point of view of its dominant uses and functions; the definition of critical areas in terms of forest fire risk, soil erosion sensitivity and high ecological, social or cultural importance, as well as the specific guidelines for forestry and sustainable use of resources to implement in those areas.

The structure of the forest management plan (PGF) is defined by law. A technical standard for the development of PGFs is published by the Institute for the Nature Conservation and Forests (ICNF). The Forest Policy Act stipulates that it is compulsory for all public and community properties to have a PGF. In the case of private forest holdings, the development and adoption of PGF is only mandatory for those exceeding the size established in each PROF (usually 25, 50 or 100 ha, depending on the region). The implementation of the actions predetermined in PGF and PEIF (which were created in 2009 mainly for Forest Intervention Zones) is ensured through forest projects, either concerning reforestation or the improvement or infra-structuring of forest stands.

The Forest Intervention Zones (Zonas de Intervenção Florestal - ZIF, in Portuguese) were legally established in 2003-2005 in order to give public authority support to the voluntary collective action of forest owners' towards forms of grouped management and protection of their forests (Pinho, 2014). ZIF were defined as "continuous forest areas with between 1000 and 30,000 ha, under a mandatory intervention plan and administered by a single managing entity". The ZIF legislation (2005, altered in 2014 - Decree Law no. 27/2014, 18 February) prescribes that the State is responsible for supporting the establishment of forest holdings large enough to enable efficiency gains in their management, thereby increasing "territorial resilience to fires". The ZIF law calls for establishing a multi-owner contiguous surface of at least 1000 ha (in 2005, 750 ha in 2014) and prescribes that a minimum of half of this working area should belong to the forest owners who voluntarily become members of the ZIF and are willing to abide by the collective forest management rules they will define and approve.

"To be created, the ZIF should also have a managing body, responsible for drawing up a global Forest Management Plan PGF for the whole area. This plan is then to be approved by the National Forest Authority, subject to compliance with the regional spatial plans devised by this entity. Once approved



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it would become mandatory inside ZIF boundaries for members and even non-members" (Canadas et al. 2016). Public funding exists for the establishment and first two years of operation of the ZIF, but there is no public support for operating costs after the second year.

In October 2016, there were 180 ZIF, representing more than 21,000 forest owners, responsible for joint management of areas extending over 927,296 ha (ICNF, 2016c) and corresponding to 29% of the country's forest areas and about 10% of the country's mainland area.

Following the catastrophic fires of 2003 and 2005, Portugal established a National Plan for Forest Fire Protection (Plano Nacional de Defesa da Floresta Contra Incêndios – PNDFCI, in Portuguese), linked to regional, municipal and local specific forest fire protection plans, and connected to the remaining forest and spatial planning framework (Council of Ministers Resolution no. 65/2006, 26 May). Since 2006 a National System for Forest Protection against Fires was established, organized in three main pillars: (a) structural prevention; (b) surveillance, detection and inspection; and (c) combat and post-fire surveillance. It aims at increasing resilience of forests to fires, reducing the consequences of forest fires, improving fire management and suppression, rehabilitating and recovering forest ecosystems and adapting the organization structure. It encompasses a plan of action, measures and goals, as well as the identification the entities responsible for implementing them. The operationalization of the plan is then defined at the district and municipal levels (Valente et al. 2015).

Last October the Portuguese Government proposed for public discussion over a period extending up to January 2017 a package of legislation for the "Reform" of forest policy. This new legislation is thus not yet in its final form, but as it is, it is not likely to have a substantial impact in the forest sector within the study area.



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*Table 57. Overview of legally-binding (law) and soft instruments in Portugal*

| | |
|---|---|
| **Portugal – National** | **Legally-binding law**<br>• Forest Policy Act (1996)<br>• Hunting National Act (1999)<br>• National Forest Strategy (2006), revised (2015)<br>• National Plan for Forest Fire Protection (2006)<br>• Regional Forest Management Plan (PROF) and Forest Management Plan (PGF) Law (1999), altered in 2010 and 2009 respectively. PROF legislation is currently under revision.<br>• Specific Plans for Forest Intervention (PEIF) Law (2009)<br>• Forest Intervention Zones (ZIF) (2005), revised (2009), altered (2011 and 2014)<br>• National Plan for Forest Fire Protection (PNDFCI) Law (2006)<br>• Municipal Forest Technical Offices (GTF) Law (2009)<br>• National Forest Fund (FFP) (2004)<br>• Natura 2000 Network Plan (PSRN2000) (2008)<br>**Soft instruments**<br>• Rural Development Plan (PDR 2020) |
| **Portugal – Regional/ Local** | **Legally-binding law**<br>• Regional Forest Management Plans (PROF) for different regions<br>**Soft instruments**<br>• Forest Management Plans (PGF)<br>• Specific Plans for Forest Intervention (PEIF)<br>• Municipal Plans for Forest Fire Protection (PMDFCI)<br>• Municipal Forest Technical Offices (GTF) |



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# 28. Actor analysis: Portugal, national level

Interest groups can be defined as "organized groups with the aim to influence public policy without seeking to attain political office themselves" (Juerges and Newig, 2015a). These groups have been gaining a formal expression and increasing importance especially from the 1980's onwards when most organizations representing their interests were created. The interest groups considered are named "forest management", "timber trade and processing", "renewable energy regeneration", "employment", "hunting and fishing", and "environmental, nature and landscape conservation" among others (Appendix 32).

The absence of previous scientific studies on these forest-related interest groups at the national level (Louro, 2016; Soares; 2015; Soares & Oliveira, 2006) imposes some caution to their identification and characterization of their interests. The characterization that is presented below should therefore be considered as hypotheses that require further validation in the context of studies with a larger scope than the present one.

## 28.1 Interest of actors: Portugal, national level

Interests are understood as being *"based on action orientation, adhered to by individuals or groups, and they designate the benefits the individual or group can receive from a certain object, such as a forest"* (Krott, 2005). The assessment of interests is based on the actor's forest use and advocated positions up to present. As information sources to identify national actor's forest use and advocated positions qualitative data from website and document analysis, and interviews with key actors were triangulated.

The non-governmental actors in Portuguese forest policy at the national level can be categorized in actors representing mainly interests in provisioning forest ecosystem services (forest management, timber industries and hunting NGOs), and actors representing mainly interests in supporting ecosystem services (nature and environmental NGOs)(Table 58).

Most actors interested in provisioning ecosystem services, e.g. timber, prefer high harvesting intensities and a tree species selection based on the demand of timber industries. Conflicts may exist between actors interested in maximizing timber output and actors interest in supporting ecosystem services. Nature conservation and environmental groups who aim to protect forest resources are among the actors interested in the supporting and regulating forest ecosystem services.

Nature conservation and environmental groups often have a preference for forest management models with high nature conservation standards, set asides, and mixed forests (in species and age structure) in patch landscapes. As a consequence of different ecosystem services' preferences actors representing nature conservation and environmental protection are often in conflict with actors representing forest management (Table 58). The intensity of this conflict could be greatly reduced if there were appropriate policy instruments to internalize forest externalities. Actors representing forest management are not opposed to nature conservation and environmental protection, but they call for that kind of internalization instruments in order to meet this type of goals.



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The governmental actors at the national level can be classified into actors mainly interested in provisioning forest ecosystem services and actors mainly interested in the protection of supporting and regulating forest ecosystem services. These actors have a conflict over the setting of priorities for forest management and planning and over the mix of ecologic and economic interests in forests. There are no governmental actors with strong interests in cultural forest ecosystem services.

*Table 58: Interests in ecosystem services of selected actor groups (national level)*

| | **Forest management** (e.g. public and private forest owner organi-zations) | **Timber Industries** (e.g. sawmills, papermills) | **NGOs representing employment in forests** (e.g. labor unions) | **Outdoor recreation NGOs** (e.g. hiking and mountain biking groups) | **Hunting and Fishing NGOs** | **Water associations + companies** | **Nature + environment conservation NGOs** |
|---|---|---|---|---|---|---|---|
| ***Provisioning ES*** | | | | | | | |
| Wood provision | +++ | +++ | +++ | 0 | - | 0 | + |
| Game provision | - | 0 | 0 | 0 | +++ | 0 | 0 |
| Mushrooms | 0 | 0 | 0 | + | 0 | 0 | ++ |
| Medicinal plants | 0 | 0 | 0 | + | 0 | 0 | ++ |
| Fish provision | 0 | 0 | 0 | 0 | +++ | 0 | 0 |
| Honey | 0 | 0 | 0 | 0 | 0 | 0 | ++ |
| ***Supporting ES*** | | | | | | | |
| Biodiversity | - | 0 | 0 | ++ | ++ | + | +++ |
| Habitats | - | 0 | 0 | +++ | - | + | +++ |
| ***Regulating ES*** | | | | | | | |
| Carbon sequestration | ++ | 0 | 0 | 0 | 0 | 0 | +++ |
| Climate regulation | 0 | 0 | 0 | 0 | 0 | 0 | +++ |
| Water quality | 0 | 0 | 0 | ++ | +++ | +++ | +++ |
| Pest control | +++ | +++ | ++ | + | ++ | + | + |
| Wildfires reduction | +++ | ++ | +++ | +++ | +++ | +++ | + |
| Soil erosion | ++ | 0 | 0 | 0 | 0 | +++ | +++ |
| ***Cultural ES*** | | | | | | | |
| Outdoor recreation | -- | 0 | 0 | +++ | - | 0 | - |
| Aesthetics | - | 0 | 0 | +++ | + | 0 | +++ |
| Tourism | - | 0 | 0 | +++ | - | 0 | - |



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## 28.2 Power of actors: Portugal, national level

Power is defined as *"capability of an actor to influence other actors"* (Krott et al. 2014). Based on the actor-centered power approach (Krott et al. 2014) the assessment of power is based on the criteria of coercion, incentives, and dominant information sources.

- Coercion is defined as altering behaviour with force, including the threat of force and even bluffing about force that does not really exist. Incentives are defined as altering behaviour with advantages or disadvantages.
- Material and immaterial (dis-)incentives can be distinguished. Material incentives are money and also all technical sources, e.g. machines, plants, food or support in labor. Immaterial incentives offer social or psychological advantages, e.g. social conventions, morals.
- Dominant information sources are defined as altering behaviour by supplying unverified information trusted by the subordinate, e.g. within ideologies or based on superior expert knowledge.

Portuguese forest policy is often criticized for being inconsistent. There are a very few of studies that go beyond the registering of declarations of intent to clarify further the interests at stake and that may also clarify the power resources that different interest groups at the national level have in this policy process.

Available literature review showed that forest policy processes in the past five decades were led by the actors interested in timber provision: governmental actors and interest groups. In the last decades, forest policy processes have also been influenced by interest groups related to fire fighting interests. The remaining actors interested in other ecosystem services have less power resources to impact forest policy processes at the national level, but this influence is increasing.

Following the actor-centered power approach, for each actor group it has been evaluated if power resources have a strong impact (+++), a medium impact (++), or a low impact (+) on forest management (Hubo and Krott 2015). At the national level, actors interested in timber industries have strong impact on forest management in national forest policy processes. Actors interested in forest management, environmental, nature, and landscape conservation, water provision, certification, hunting, and renewable energy regeneration have medium impact on forest management. Actors interested in employment in forests and recreation activities have only low impact on forest management (Table 59).

At the national level, market actors and governmental actors have strong power resources to impact forest management. Civil society actors have medium power resources to impact forest management (Table 60). Governmental actors have a strong coercion power. The ministries and subordinated national agencies have power resources based on executive power of legislations regulating and (dis)incentivizing the behaviour of the civil society and of market actors. They have the ability to convey dominant information through the media and the regional agencies if they want to influence the forest management models.



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*Table 59: Overview of power resources of different interests*

| Actor's interests | Power resources | | | |
|---|---|---|---|---|
| | **Means of coercion** | **Incentives** | **Dominant information** | **Power resources of the interest** |
| Forest management | ++ | ++ | +++ | **Medium** |
| Timber processing | +++ | +++ | +++ | **Strong** |
| Employment in forests | + | + | + | **Low** |
| Renewable energy regeneration | ++ | +++ | ++ | **Medium** |
| Recreation | ++ | + | + | **Low** |
| Hunting | ++ | + | ++ | **Medium** |
| Certification | ++ | ++ | +++ | **Medium** |
| Water provision | ++ | + | ++ | **Medium** |
| Environmental, nature, and landscape conser-vation | + | ++ | +++ | **Medium** |

*Table 60: Overview of power resources of different actor types*

| | **Means of coercion** | **Incentives** | **Dominant information** | |
|---|---|---|---|---|
| **Market actors** | +++ | +++ | +++ | **Strong** |
| **Civil society actors** | ++ | + | ++ | **Medium** |
| **Governmental actors** | +++ | +++ | +++ | **Strong** |

At the national level, most powerful are actors with interests in timber provision, actors interested in the supporting ecosystem functions biodiversity and habitats for species and actors with interests in wildfires regulating forest ecosystem services (Table 61). Actors interested in the other regulating ecosystem services and actors interested in outdoor recreation at cultural ecosystem services have medium power resources to impact forest management.

The actors interested in timber provision mainly cluster around the interest groups of forest management and of timber processing and trade. In the timber processing and trade group it is necessary to distinguish the pulp industry and the sawmilling industry, since their power resources to impact forest management and policy are also different. The pulp industry represents an oligopoly with strong impact in the definition of the internal market prices for wood and good lobbying capacity with respect to governmental actors. As managers of wood production units with high technical capacity, they are models of forest management for neighbouring owners at the local level. The other forest industries have a much lower level of concentration and don't have a direct or indirect intervention in the supply of the kinds of wood they use, except as buyers of this material.



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Interest groups related to non-industrial private forest owners include forest owners' associations (FOA). These associations are also the main actors responsible for the creation of the forest intervention zones (ZIF) established since 2005. Even though the influence of this group has been growing, it is still far from having a decisive influence in the forest policy making process, mostly because it represents small scale private forest owners with weak political influence.

*Table 61: Overview of power resources of interests in different ecosystem services, national level*

| Interest in | Overall power resources | Means of coercion | Incentives | Dominant information |
|---|---|---|---|---|
| ***Provisioning services*** | | | | |
| Wood | **Strong** | **+++** | **+++** | **+++** |
| Game | **Medium** | **++** | **+** | **++** |
| Mushrooms | **Low** | **+** | **+** | **+** |
| Medical plants | **Low** | **+** | **+** | **+** |
| Fish | **Low** | **++** | **+** | **+** |
| Honey | **Low** | **+** | **+** | **+** |
| ***Supporting services*** | | | | |
| Biodiversity | **Strong** | **+++** | **++** | **+++** |
| Habitat for species | **Strong** | **+++** | **++** | **+++** |
| ***Regulating services*** | | | | |
| Carbon sequestration | **Medium** | **++** | **+** | **++** |
| Climate regulation | **Medium** | **++** | **+** | **+++** |
| Water quality | **Medium** | **++** | **+** | **++** |
| Pest control | **Medium** | **+++** | **++** | **++** |
| Wildfires reduction | **Strong** | **+++** | **+++** | **+++** |
| Soil erosion | **Medium** | **++** | **++** | **+** |
| ***Cultural services*** | | | | |
| Outdoor recreation | **Medium** | **++** | **++** | **+** |
| Aesthetic values | **Low** | **+** | **+** | **+** |
| Tourism | **Low** | **+** | **+** | **+** |



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## 28.3 Power of non-traditional forest actors to impact forest management

Most of the interest groups representing forest owners' interests are recent and far from being the most powerful in Portuguese forest policy. Interest groups representing cork and pulp and paper industries have so far dominated Portuguese forest politics. They maintain market power and close relations to government agencies. The interest groups representing the recent lumber industry and the new renewable energy industry are also led by powerful economic groups in the Portuguese economy. They seek to mobilize their power resources to influence forest policy. The groups representing renewable energy industries have the societal climatic change concerns in their favor.

Since the late 1980s the interest groups representing nature conservation and environmental interests have been gaining greater political expression. In the two last decades they were successful in creating various nature conservation legislative regulations, especially supported by European legislations strengthening the protection of species and ecosystems. Furthermore, they use immaterial incentives which are supported by urban population sectors, which lack personal relationship to agricultural production and forestry. The market groups representing water provision interests have similar power resources and support.

The main groups representing hunter interests have been powerful enough to promote legislation in favor of "associative hunting zones", but their impact on forest management models is moderate. Today they are faced with the aging of the hunters.

The Portuguese wood markets already have the presence of certification organizations affiliated both with PEFC and FSC systems. Their impact on forest management models is still low but increasingly important.

At the national level the other non-traditional forest interest groups, e.g. recreational interests, have still low power resources to impact on forest management.

Forest owners manage their forests and take decisions, within the framework of their economic rationalities, which define their forest management models. In this sense, forest owners are the key players in forest management. Organizations representing them are recent and are not among those with the greatest power to influence forestry policy. In the forest products market, forest owners are merely price takers. Interest groups representing the forest industries are the strongest side of the domestic market of forest products and the strongest private interest group in terms of impact on forestry policy. In spite of that, other actors and interest groups such as nature and environmental conservation groups have been imposing forest practice regulations to protect biodiversity, habitats, ecological corridors and water lines.



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## 29. General case study information: Vale do Sousa

Vale do Sousa's case study area might be considered representative of forest management practices, and forest ownership structure, of the North-Western Portugal Forest Sector. Its topography being very uneven, the forest holdings are typically of small scale, fragmented in multiple blocks, almost all being privately owned.

The average precipitation is high (last 30 years annual average of 1240 mm), but unevenly distributed throughout the year, with three very dry months (June, July and August) with average rainfall of 31.1 mm and three very humid months (October, November and December) and an average precipitation of 170.4 mm. The soils are mostly poor, well drained and thin. The average temperature varies annually between 9.5ºC in January and 20.8ºC in August, from rain to cycling.

The case study area covers the southern part of the Sousa Valley, and more precisely an area of 14,840 ha corresponding to the following ZIF separated by the Douro river: Entre-Douro-e-Sousa (north of the Douro river) and Paiva (south of the Douro river). The total number of forest owners who are members of these ZIF is 360, but the area mentioned above includes other forest owners who have land inside the ZIF, but are not members yet.

Forests are the main land use. The predominant forest species are eucalyptus (*Eucalyptus globulus* Labill) and maritime pine (*Pinus pinaster* Aiton) in both pure and mixed stands. *Gonipterus platensis* disease constitutes a major problem for eucalypt forest in case study area. Eucalypt pulpwood and maritime pine saw logs rank very high in the list of ecosystem services provided by Vale do Sousa. On this, the case study area diverge from other forested areas in North-Western Portugal, were the importance of eucalyptus area is not as important, and maritime pine is more important, but this situation has been changing towards a pattern closer to the situation existing in Vale do Sousa.

Wildfires have been very frequent in the three municipalities over which the study area is distributed (Figure 7). There were years with particularly high incidence, such as 2003, 2005, 2010 and 2013, each of these years with more than two thousand hectares of burnt forest area. The year of 2005 was particularly catastrophic. The total burned area in the municipalities of Paredes, Penafiel and Castelo de Paiva, exceeded 9,000 ha in 2005 (Figure 8), 57% of burned area was in case study area. These were years where the same high incidence of fires also existed all over the country and not only in Vale do Sousa. On the whole, over the period 2001/ 2015 the total forest burnt area amounted to 26,395 ha. Further, there has been a recurrence of one "big" fire (fire with more than 1000 ha of burnt area) in the case study area almost every two years. These events have had a great influence on management decisions taken by forest owners'. They prefer eucalyptus stands, because their shorter rotation and because, in case of wildfire occurrence the income loss is smaller. Other forest species with longer rotations, e.g. maritime pine, chestnut, rank lower in forest owners' preferences (interviews VS16, VS17).

The Vale do Sousa Forest Owners' Association (AFVS) is the only forest owners' association existing in the case study area. Therefore, it is the only voice representing the forest owners in the dialogue with public authorities and other stakeholders. It is, also, almost the only organization providing technical support to forest owners, and the only one having forest sapper brigades to carry on preventive silvicultural works for reducing the risk of forest fires.



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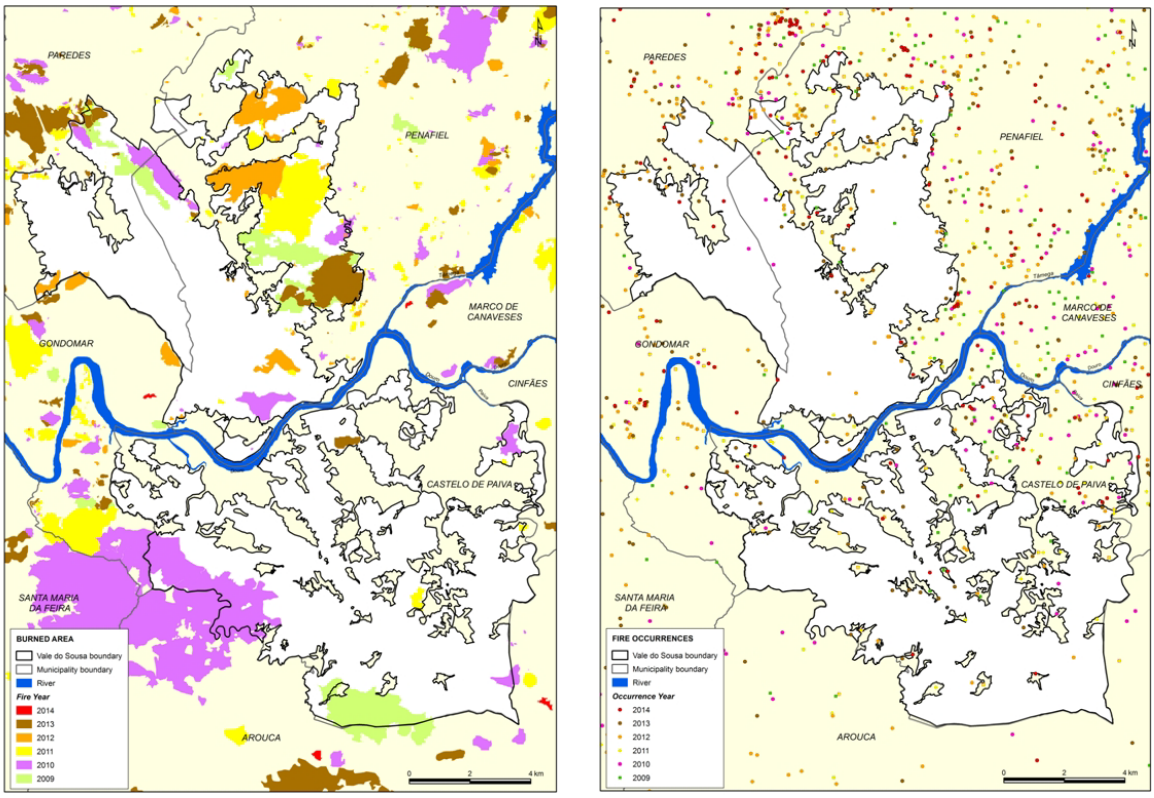
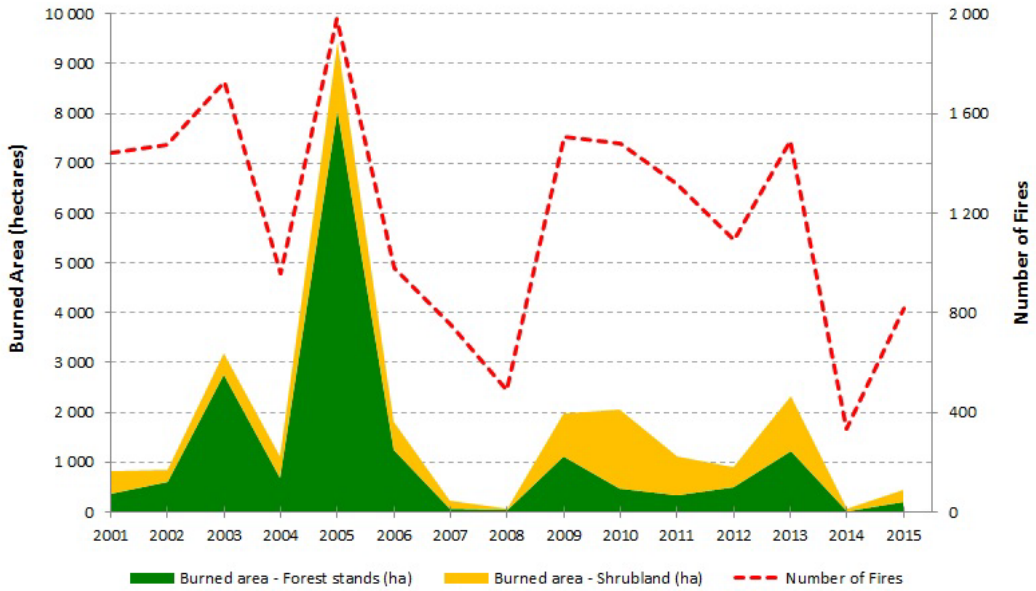
*Figure 7: Distribution of burned area and fire occurrences in Vale do Sousa (2009-2014)*




**Burned area** **Fire Occurrences**

Source: ICNF, 2016b

*Figure 8: Burned area and number of fires in the municipalities of Paredes, Penafiel and Castelo de Paiva (2001-2015)*




Source: ICNF, 2016b



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The Vale de Sousa area is under a Regional Forest Plan (PROF), a regional planning tool that aims at promoting sustainable forestry according to national forest policy guidelines. The forest management plans (PGF) of the two ZIF in the case study are follow the guidelines of the PROF. The forest owners with forest stands within the perimeter of the ZIF are obliged to follow those forest management plans after their approval by the general assembly of the ZIFs and the public National Forest Authority (ICNF).

The case study socio-demographical environment is heterogeneous, since it includes two contrasting areas on both river Douro banks. Municipalities to the North (Paredes and Penafiel), at a short driving distance from the major urban area of Porto are inhabited by many urban commuting residents, while the municipality to the South (Castelo de Paiva) contrast to these as a typical North-Western Portugal rural and lowly populated and with less commuting residents. Also the latter is still losing population while the population in the former is increasing. Nevertheless, as the municipalities to the North of Douro demographically outnumber Castelo de Paiva, the region as a whole is still increasing its population numbers.

## 29.1 Current forest policy conflicts and problems

By far, the main problem for the local forestry sector is the high risk of forest fires. The main problem for the forest policy making process, at the local level, is the fact that the three municipalities don't use their capacities to cooperate, in a substantial way, with the forest owners' association in the actions to reduce the risk of forest fires and to increase investment in forests (interviews VS7a and VS7b).

The forest policy regime, at the national level, is perceived by forest owners as (a) too regulatory, i.e. with too many laws and regulations applying to forestry and management activities, and thus as a burden to forest owners, and (b) too demanding for the forest estates actual capacity to generate income. The forest policy regime is perceived as having been developed in urban centers and with no adequate knowledge of local conditions. For example, interviews mention the fuel treatments' legal requirements in the case of small forest estates as unrealistic as these treatments' cost largely exceed the small estates returns (Sottomayor et al, 2013). Further, regulations on the plantation of some species, e.g. eucalyptus, are often ineffective (interviews VS4; VS7A; VS7B; VS16; VS17; VS19).

There are also several inefficiencies in the operation of forest policies. Firstly, the excessive bureaucracy of the multiple licensing processes or of policy support applications. Secondly, the excessive length of time between applying for licences or for forest incentive schemes and the communication of decisions to the applicants. Such bureaucracies and long waits often render non feasible the intended operation or action, particularly when its feasibility is time, or season dependent (Sottomayor et al, 2013).



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It is also pointed out that too many instances and levels of government interfere, and sometimes conflict, with forest owners' applications to forest incentive schemes. Actors mention the interference of two government actors: the Institute for the Nature Conservation and Forests (Ministry of Agricultural, Forestry and Rural Development) and the municipal administrative authorities (Municipalities of Penafiel, Paredes and Castelo de Paiva). Actors also referred that too much public funds are spent on forest fires combat compared to the amount spent on fire prevention, and that this allocation should be changed in favour of fire prevention, the reason being that in this way less money would be spent with more benefits.

## 29.2 Instruments and legal competences in Vale do Sousa forest policy making process

In the case study area, local authorities with legal competences concerning forestry are the municipalities. These legal competences concern the protection of forest against wildfires. More precisely, they are responsible for the coordination of main local stakeholders in this domain and for the coordination at the municipal level of forest fighting operations. Municipalities are, also, one of the public authorities involved in the process of approval of forest plantation projects. All remaining legal competences concerning forestry are in the hands of national authorities (e.g. Institute for the Conservation of Nature and Forest).

*Table 62: Legally-binding law and soft instruments in Vale do Sousa*

| | |
|---|---|
| **Vale do Sousa – Regional/ Local** | **Legally-binding law**<br>• Regional Forest Plan (PROF) of Tâmega<br>• Forest Intervention Zones (ZIF) of Entre Douro e Sousa and Paiva<br>• Natura 2000 Network Plan (PSRN2000): PTCON0059 - Rio Paiva and PTCON0024 - Valongo (2008)<br>**Soft instruments**<br>• Forest Management Plans for the ZIF (PGF)<br>• Specific Plans for Forest Intervention in the ZIF (PEIF)<br>• District Plans for Forest Fire Protection (PDFCI) of Porto and Aveiro<br>• Municipal Plans for Forest Fire Protection (PMDFCI) of Paredes, Penafiel and Castelo de Paiva<br>• Municipal Forest Technical Offices (GTF) of Paredes, Penafiel and Castelo de Paiva |



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## 30. Actor analysis: Case study Vale do Sousa

Forest-related governmental, civil society and market actors were identified based on a) previous studies of the Portuguese forest sector, b) interviews and a c) a web search with national, regional and local key actors who were asked to identify additional actors they thought relevant for forest use and management in the case study area. The list of important actors in the case study area includes the national forest authorities (ICNF, Institute for the Nature Conservation and Forests), the Vale do Sousa Forest Owners' Association (AFVS - Associação Florestal de Vale do Sousa), individual forest owners, parish councils that own forestland, local municipalities, several wood products transformation firms (e.g., pulpmills, sawmills, fuelwood firms, biomass and pellet mills),investment funds, environmental and nature conservation associations (local and regional), recreationists who use forests for biking, hiking and motor sports, hunters and inland fishermen.

Almost all the forest area is privately owned. The forest management plans for the two ZIF were prepared by AFVS. The forests are managed either directly by their owners, or by pulp and paper companies and forest investment funds to which forest owners rented their land. Forest holdings are fragmented and there are a non-negligible number of cases where the forest owners don't live near their forests and/or are not engaged in active management of their forests (interviews VS8; VS9; VS10; VS11; VS12; VS13; VS14; VS15; VS16; VS17; VS19). The priority of owners who do actively manage their forests is, in most cases, the generation of income through timber supply. Typically, small-scale forest owners tend to engage more in active management to generate revenues than large-scale landowners (interviews VS2; N16).

Nature conservation is advocated by the local and regional environmental non-governmental organizations that emphasize biodiversity concerns and target a reduction of the eucalyptus area (interviews VS20; VS21; N12).

The case study area is used by several recreational activities (e.g. picnics, mountain biking, etc.) given its location within a short distance from a major city (Porto) and other urban areas. There are several hunters' associations, with hunting permitted throughout the case study area, even though this is not an area which is now relatively poor in terms of game resources.

### 30.1 Interest of actors: Case study Vale do Sousa

Interests are understood as being *"based on action orientation, adhered to by individuals or groups, and they designate the benefits the individual or group can receive from a certain object, such as a forest"* (Krott 2005). The assessment of interests is based the actor's forest use and advocated positions up to present. As information sources to identify actor's forest use and advocated positions within the case study area qualitative data from document analysis, participatory observations and interviews with key actors are triangulated.

The interests of individual and collective actors within the case study correspond to the general interests related to Portuguese forest policy (Table 63). Actors such as forest owners and timber industries prefer high harvesting intensities, high shares of eucalyptus stands and low amounts of shrubs



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in forest because of wildfire risk (interviews VS8; VS9; VS10; VS11; VS12; VS13; VS14; VS15; VS16; VS17; VS19; N3; N4). It is clear that wood supply (timber, fuel wood and other biomass for energy) is the main concern of forest management due to its role in income generation.

*Table 63: Interests in ecosystem services of selected actor groups (case study)*

| | **Forest management** (e.g. local public and private forest owners) | **Timber Industries** (e.g. local sawmills, pulpmills) | **Employment in forests** (e.g. labor unions, local contractors, forestry experts) | **Outdoor recreationists** (e.g. hikers, mountain bikers) | **Hunters and Fishermen** (inlands) | **Water associations + companies** | **Nature + environment conservation NGOs** |
|---|---|---|---|---|---|---|---|
| ***Provisioning ES*** | | | | | | | |
| Wood provision | +++ | +++ | +++ | 0 | 0 | 0 | + |
| Game provision | 0 | 0 | 0 | 0 | +++ | 0 | 0 |
| Mushrooms | 0 | 0 | 0 | + | 0 | 0 | + |
| Medicinal plants | 0 | 0 | 0 | + | 0 | 0 | + |
| Fish provision | 0 | 0 | 0 | 0 | ++ | 0 | 0 |
| Honey | ++ | 0 | 0 | 0 | 0 | 0 | ++ |
| ***Supporting ES*** | | | | | | | |
| Biodiversity | - | 0 | 0 | ++ | ++ | + | +++ |
| Habitats | - | 0 | 0 | + | + | + | +++ |
| ***Regulating ES*** | | | | | | | |
| Carbon sequestration | + | + | 0 | 0 | 0 | 0 | +++ |
| Climate regulation | 0 | 0 | 0 | 0 | 0 | 0 | ++ |
| Water quality | + | 0 | 0 | +++ | +++ | +++ | +++ |
| Pest control | +++ | +++ | ++ | + | ++ | + | ++ |
| Wildfires reduction | +++ | +++ | +++ | +++ | +++ | +++ | +++ |
| Soil erosion | ++ | + | 0 | 0 | 0 | +++ | +++ |
| ***Cultural ES*** | | | | | | | |
| Outdoor recreation | -- | -- | -- | +++ | -- | - | -- |
| Aesthetics | 0 | 0 | 0 | +++ | + | 0 | +++ |
| Tourism | - | 0 | 0 | ++ | - | 0 | - |



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Most actors related to forestry, including forest owners who actively manage their forests, argue against the lack of active management of a non negligeable part of the forests in the study area, with the resulting increasing fuel loads contributing to the escalation of the risk of forest fires (interviews VS8; VS9; VS10; VS11; VS12; VS13; VS14; VS15; VS16; VS17; VS18; VS19; VS21; N3; N4).

In the areas without cadastre[9] there are cases where the boundaries of the forest holdings are not well defined. When this happens this can be a source of conflict among forest owners and make some of them to reject forest management operations with results and impacts which can be messed up by that fuzzy definition of forest holdings boundaries (interviews VS2; VS3; VS6; VS7a; VS11; VS14; VS16; VS17; VS19).

Conflicts between urban residents and forest owners are also frequent in the urban-forest interface, as a consequence of the lack of effective fuel management by some owners (interviews VS1d; VS3; VS4). Moreover, the lack of policy support for effective landscape-level forest management planning makes it difficult for individual forest owners to understand the setting of constraints to his management options (e.g. the prohibition of planting eucalypt in ecological corridor area) when no compensation is paid for the provision of forest ecosystem services to the society at large (interview VS7a).

Forest owners make investment decisions according to the private profitability of their forest land uses. If this profitability is negative, they don't investment, and simply comply with the mandatory fuel treatments require by law (interviews VS1a; VS1d; VS6; VS10; VS12; VS15; VS16; VS17; N3). The majority of actors suggest a multi-functional forest management approach that would rank with higher priority the timber production. The latter is perceived as having the potential to trigger forestry investments and provide a framework that might encourage supply of other ecosystem services. Nevertheless, the actors emphasize the need for payment of ecosystem services in order to make that multifunctional management planning approach economically sustainable for private forest owners (interviews VS1a; VS1d; VS7a; VS21; N3; N5). The pulp and paper companies rented some land from local forest owners under some long term leasing contracts. For these companies forest certification can be a way to ensure the implementation of good forest practices and the provision of ecosystem services, e.g. protection against erosion, water quality and regulatory services (wildfires) (interviews N3; N4; N5).

Actors with nature conservation interests advocate forest management plans targeting larger areas with native forests and more diversity, lower harvesting intensities, lower areas of eucalyptus and the recovery of riparian galleries (interviews VS1c; VS1d; VS20; VS21; N12). They understand the importance of eucalyptus for the local and the national economies, but they emphasize the promotion of a more biodiverse forest. They advocate a landscape mosaic that would encompass native species (mainly broadleaves, e.g. chestnut) as buffer zones and natural barriers for controlling the spread of wildfires and pests (interviews VS20; N12).

Actors from forestry and nature conservation agree that a major forest management conflict in Vale do Sousa is related to outdoor recreation activities, in particular motorized ones. Unorganized events that take place in the forest without authorization of forest owners, lead to the opening of rails in

[9] Until very recently, there was no cadastre in the whole study area. The situation changed partially with the implementation of the cadastre in the municipalities where the ZIF of Entre-Douro-e-Sousa is located (municipalities of Penafiel and Paredes).



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the forest stands, causing soil erosion and the degradation of the riparian galleries, as well as the vegetal cover in forest stands. So, the actors (interviews VS1a; VS1c; VS1d; VS5; VS6; VS7a; VS7b; VS9; VS12; VS13; VS14; VS15; VS18; VS19; VS20; VS21; N3; N4; N5) emphasize that recreational activities in forests should be regulated because of their negative impact on forests and of the stress they put on forest owners.

A major concern in Vale do Sousa's rural areas, and particularly of forest owners with their holdings situated in more remote places, is the nearly complete lack of effective rural patrolling, with no dissuasion of activities such as fire starting, timber stealing, dumping garbage in the forest, trespassing on private property and vandalism of natural and built heritage (interviews VS1a; VS1c; VS1d; VS5; VS6; VS8; V9; VS10; VS11; VS13; VS14; VS15; VS16; VS17; VS18; VS21; N3; N4).

The regulatory service of wildfires impact minimization has a strong interest for all actors within the case study because of the substantial number of fires and the resulting burned area in Vale do Sousa. Wildfires are a negative incentive to forest investment and management, affecting the multifunctions of forests (interviews VS1a; VS1d; VS16; VS17; VS18).

It is difficult for forest owners to sell burnt wood because sawmills and pulpmills do not consume it and biomass plants typically consume more wood than burnt wood or forest residues (interviews VS16; VS17; VS19). There are, also, legal constraints on the disposal of the burnt wood in years of extensive forest fires. For timber companies often the best option is to burn it in the forest, with a permit issued by the municipality (interviews VS16; VS17).

## 30.2 Power of actors: Case study Vale do Sousa

Power is defined as *"capability of an actor to influence other actors"* (Krott et al. 2014, page 35). Based on the actor-centered power approach (Krott et al. 2014) the assessment of power is based on the criteria coercion, incentives, and dominant information.

Following the actor-centered power approach, for each actor type and each interest in ecosystem services and forest functions it is evaluated if power resources have a strong impact (+++), a medium impact (++), or a low impact (+) on forest management (Hubo and Krott, 2015).

Actors interested in forest management (e.g. private forest owners) are most powerful to impact forest management within the case study area based on their private property rights on forests (Table 64). Governmental actors interested in forest management have coercive authority in insuring compliance of private actors with the legislation related to protection against wildfire and other issues related to forests (interview VS1a; VS1c; VS2; VS3; VS4).

The Vale do Sousa Forest Owners' Association (AFVS), with more than 500 associates, provides a range of forest services to the forest owners in the case study area, mainly the services of its three brigades of forest sappers who do work all around the year to reduce the risk of forest fires. This association also provides to its members and other forest owners' technical advice and information about public policy instruments related to forests.



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Another relevant function of this association comes from the fact that it was the organization which promoted the creation of all the ZIF existing in Vale do Sousa and was chosen by the ZIF members to be the management entity of these ZIF. Part of these responsibilities were the forest management plans (PGF) and "specific forest intervention plans" (PEIF) for those ZIF (interviews VS7a; VS7b). The majority of the forest actors interviewed have indicated that the AFVS has been effective in influencing forest owners and their management practices, when they ask for its technical advice.

In general, forest owners apply traditional management practices in a rather ad-hoc manner, i.e. without the benefit of a well-defined forest management plan. Typically, they also decide according to the example provided by neighbours, rather than according to technical advice. Pulp and paper companies (with areas in Vale do Sousa rented from local forest owners under long term lease contracts), manage their stands in order to maximize net present value, according to a well-defined forest management plan. These companies have some influence on the other forest owners when they try to replicate their forest management practices ("forest management by imitation") (interviews VS1a; VS1b; VS1d; VS2; VS3; VS4; VS7a; VS9; VS18).

*Table 64: Overview of power resources of actors with different interests in the case study*

| **Actor's interests** | **Power resources** | | | |
|---|---|---|---|---|
| | **Means of coercion** | **Incentives** | **Dominant information** | **Power resources of the interest** |
| Forest management | +++ | ++ | ++ | **Medium** |
| Timber processing | +++ | +++ | +++ | **Strong** |
| Employment in forests | + | + | ++ | **Low** |
| Renewable energy regeneration | ++ | ++ | ++ | **Medium** |
| Recreation | +++ | + | + | **Medium** |
| Hunting | ++ | + | + | **Low** |
| Certification | ++ | ++ | +++ | **Medium** |
| Water provision | ++ | + | + | **Low** |
| Environmental, nature, and landscape conservation | + | ++ | ++ | **Medium** |

Actors interested in buying and processing timber set financial incentives to be able to meet the timber demand by the industry. The timber industry influences further forest management practices by requiring the certification of the wood. Moreover, some industries play role in the enhancing of forest management practices by developing research and owning nurseries. The profitability of forest investments decreased over the last decade, at least, as a consequence of the increase in forest management costs and the decrease in timber real prices.



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Thus financial incentives play an important role in framing forest management practices. The market for fuelwood has expanded, but it is informal, to a large extent. So there is very few information about it. This informality is a form of tax evasion. Firms who buy timber for other purposes claim for regulation of this market because there is unfair competition from firewood buyers who, by not paying taxes, can pay prices to forest owners up to three times more than them (interview VS16; VS17; VS19).

Nature conservation authorities have some legal competencies in forestry, specifically in relation to the implementation of the Natura-2000 network. Civil society actors interested in nature conservation have a limited capacity in this area, but they can be influential by appealing to the moral obligation protecting nature.

Actors interested in hunting and recreation, and actors related to forestry workers impact forest management by their actual physical actions in the forests. The union of forestry works (SETAA) has little representativeness and little influence, with very few workers being unionized. Governmental actors interested in the provision of clean drinking water impact forest management by prohibiting and advocating certain forest management practices.

In the last decade there has been a sort of "municipalisation" of forest policy in Portugal, with municipalities gaining more competencies and more public funds to intervene in forestry. This is the case in forest fires prevention and suppression and in the licensing of forest plantations. In this case, municipalities have a say in this process, for which they charge a tax on the forest investor, with no legal boundaries on the level of these taxes. So, different municipalities may decide in different ways and charge at different levels, causing conflicts with forest investors and other public administrations (Sottomayor et al, 2013).

The media through its impact on public opinion influences decisions of the forest owners and their risk perception (e.g. impact of the pine nematode pest on the profitability of the forest investment). So, forest outreach and education emerge as important communication channels to provide forest owners with adequate information (interviews VS11; N1; N4).

Market actors have the strongest power resources to impact forest management in the Vale do Sousa case study. Governmental actors rank lower in the power to impact forest management. Civil society actors are the lowest powerful to impact on forest management in the case study area (Table 65).

*Table 65: Overview of power resources of different actor types in the case study*

| | Means of coercion | Incentives | Dominant information | |
|---|---|---|---|---|
| **Market actors** | **+++** | **+++** | **+++** | **Strong** |
| **Civil society actors** | **++** | **+** | **+** | **Low** |
| **Governmental actors** | **+++** | **++** | **++** | **Medium** |

Actors with interests in wood provision have the strongest power resources to impact forest management among market actors (Table 66).



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The Vale do Sousa area extends over three municipalities that have been substantially impacted by wildfires over the last decade (Figure 8). All relevant actors develop substantial resources and efforts (e.g., education, equipment) to prevent wildfires, namely by promoting and implementing fuel management practices. Nevertheless, the public budget allocated to wildfires fighting is currently almost four times the budget allocated to wildfire prevention (INTEGRAL, 2015).

*Table 66: Overview of power resources of different interests in ecosystem services (case study)*

| Interest in | Overall power resources | Means of coercion | Incentives | Dominant information |
|---|---|---|---|---|
| ***Provisioning services*** | | | | |
| Wood | **Strong** | **+++** | **+++** | **+++** |
| Game | **Low** | **++** | **+** | **+** |
| Mushrooms | **Low** | **+** | **+** | **+** |
| Medicinal plants | **Low** | **+** | **+** | **+** |
| Fish | **Low** | **+** | **+** | **+** |
| Honey | **Low** | **+** | **+** | **+** |
| ***Supporting services*** | | | | |
| Biodiversity | **Low** | **+** | **+** | **++** |
| Habitat for species | **Low** | **+** | **+** | **++** |
| ***Regulating services*** | | | | |
| Carbon sequestration | **Low** | **+** | **+** | **+** |
| Climate regulation | **Low** | **+** | **+** | **+** |
| Water quality | **Low** | **+** | **+** | **+** |
| Pest control | **Medium** | **+++** | **++** | **++** |
| Wildfires reduction | **Strong** | **+++** | **++** | **+++** |
| Soil erosion | **Low** | **+** | **+** | **+** |
| ***Cultural services*** | | | | |
| Outdoor recreation | **Medium** | **+++** | **+** | **+** |
| Aesthetic values | **Low** | **+** | **+** | **+** |
| Tourism | **Low** | **+** | **+** | **+** |



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## 30.3 Power of non-traditional forest actors to impact forest management

Environmental NGOs pay an important role at country-level and influence urban perceptions of forestry. Yet they have little direct impact on forest management by forest owners. At a local level, nature conservationists implement some small-scale nature conservation projects, like planting native forests in public (interview N12) and private forest areas in cooperation with the public administration or with private owners, respectively (interview VS20).

They also develop environmental education activities through walks in the forest (interview VS21). Environmental NGOs make part of the stakeholders' panel in the forest certification system. So, in these processes they may have some influence (interview N14). However, the power of nature conservation organizations to impact forest management within the case study area is limited.

Hunters impact forest conditions due to their direct impact on wild game densities within the forest. They benefit from forest management, but in Vale do Sousa they don't do this kind of management (interview VS1a). Other recreational users impact forest conditions by physically accessing forests for the kinds of uses corresponding to their interests (e.g. mountain biking off-road, motor-cross). These activities impact the natural regeneration of forests; promote soil erosion and the degradation of the riparian galleries. They also affect the good maintenance of forest trails needed to facilitate wildfire fighting and access to forests for management operations.

Timber industry companies' impact forest management mainly through timber prices and demand. For the companies in the energy sector using woody biomass, the ones that are active area in this area are those that produce pellets, mainly for exports.

In conclusion, the actors with more impact in forest management at this local level are of the same types as at the national level, with the addition of the municipalities and recreational users. Other actors have a limited impact on forest management. Indeed, the interviews showed that most actors exchange information (often on a monthly basis) regarding the availability of funding and of technical support with the Forest Owners' Association (AFVS), the Institute for Nature Conservation and Forests, the municipalities of Penafiel, Paredes and Castelo de Paiva and the timber industries, thus highlighting the influence and impact of these actors in forest management in the case study area.



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## 31. Conclusions

In the case study area forests are almost all privately owned. Therefore, private forest owners are the actors with more direct influence in forest management. The most important group in terms of number of owners includes predominantly small-scale owners, in many cases, part-time or aged farmers, or other people living in rural areas, near their forests. The most important group in terms of forest land area includes owners who, in many cases, live in urban areas in the region or in more distant places, belonging to the middle class, or to higher income classes, with the agricultural portion of their land leased out to tenants, in case they can find one, and the forest portion remaining under their direct control.

Even though, it is fair to say that in these two groups there is a non negligeable number of cases corresponding to owners who are not active at all in the management of their forests, this is a statement that cannot be extended to the whole case study area. In those two groups there are owners who rented out land to entities with capacities for active forest management, namely pulp and paper companies (Feliciano et al, 2015), and the majority of the owners, in terms of land area, are members of a forest owners' association from which they request services for works reducing the risk of forest fires or for increasing the productivity of their forest lands. Members and non-members of this association also appeal to other forest services providers for the management of their forests when this is profitable in private terms (the case of eucalyptus plantations), or when they have other motivations to have their forests well managed besides timber supply for sale.

For the main reason behind the no, or insufficiently active management of forests and the resulting increasing risk of forest fires the actors interviewed mention the decline in the rural population causing a diminishing use of forest residues and shrub biomass for fuel.

Concerning the provision of technical advice to forest owners to cope with these problems, in the case study area this is almost entirely done by the forest owners' association, since foresters in the public administration, at the local level, are very few and burdened with insuring compliance of private stakeholders with forest law. The same can be said about the provision of technical advice by the municipalities.

Also, in the case study area there is the unfavourable situation of municipalities not using the competencies and resources they have to promote and effective cooperation with the forest owners' association.

These may be the reasons why forestry policy and forest policy actors are not perceived by forest owners and forest industries as very favourable to forestry. Their complaints are the following: (a) regulation and licensing of eucalyptus plantations too strict on one hand and too ambiguous on the other hand, as too many entities decide upon it, sometimes differently; (b) too much bureaucracy for licensing forest investment and other forestry activities; (c) too much time taken by public authorities to decide about applications for financial incentives schemes to forestry.

On the positive side, and in spite of all these difficulties, some forest actors that were interviewed mentioned the presence in this area of technologically improved forest harvesting machinery, with more efficiency and less biomass waste in harvesting operations.



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The major positive dynamics in the case study area mentioned by the actors that were interviewed are the following: (a) the emergence and increasingly influential role of the local forest owners' association (AFVS); (b) the establishment of ZIF which can have a role in promoting a landscape approach to the supply of ecosystem services and in improving forest management practices, particularly in burned areas; (c) adoption of certification schemes by forest owners, supported by the technical advice of the forest owners' association (d) opportunity to take advantage of the results and outcomes from research projects in which AFVS has been involved (Borges et al. 2016).

The creation of Vale do Sousa ZIFs is seen by forest owners as a great opportunity to overcome the problems of small scale and fragmentation of their forest holdings. What they complain is about the lack of public support beyond the first two years of existence of the ZIF and about the lack of positive discrimination in tax policy, access to public incentive schemes for forestry and in other domains for the members of the ZIF compared to those who didn't join the ZIF, when this discrimination was initially promised by the governmental authorities.

Forestry money income in case study area comes almost uniquely from selling wood, mainly eucalyptus pulpwood. The private profitability of forest investment has been decreasing for decades, the turning point being when the rural population started to decline and the technological changes in agricultural and rural domestic production led to a decreasing use of forest shrub biomass, with the resulting increase in the risk of forest fires. In a situation where these changes were not compensated by the implementation of mechanisms for payment of the environmental services provided by forests, the private profitability of forestry became negative in many cases (Mendes, 2004). As a result, private forest owners are less and less willing to engage in more active forest management. The management activities they do carry out are mostly reactive (Baptista e Santos, 2005), either because they need to fill a circumstantial financial need, or because there a wildfire occurred and they are forced to clear-cut a burnt forest plot.

Afforestation happens only in the cases where private profitability exists without public financial incentive schemes (eucalyptus plantations), or when those schemes exist and are very favourable (Mendes, 2004). In the other cases, forests are simply kept as a value reserve used to meet unforeseen future financial needs (Baptista e Santos, 2005). Nevertheless, the perception of the reserve value is threatened by wildfire risk, leading to a further decline of the level of active management (Sottomayor et al, 2013), except in the cases where the forest owners request the services of the brigades of sappers of the forest owners' association, or other similar several to reduce that risk.

Recreationalists impact forest management in the case study area. These actors and forest managers have different preferences for forest management practices, favouring alternative ecosystem functions. Conflicts exist between actors preferring timber provision and actors interested in the cultural ecosystem service outdoor recreation, in particular in the case of motorized activities.

Actors interested in nature conservation are relevant in the case study area, but less powerful than actors interested in renewable energy regeneration and forest certification.

The diversity of interests highlights the potential of using decision support tools that may help forest owners and other stakeholders negotiate and combine alternative forest management programs according to the range of ecosystem services they may provide (Borges et al. 2016).



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## Slovakia- Case study Podpoľanie

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*Summary*[10]

The actor landscape within forest politics in Slovakia become more diverse since early 1990s. More precisely, the transformation from planned to market economy has been accompanied by many institutional changes. Among others, not only new formal institutions such as legally binding laws or soft instruments are introduced or renewed, but also actor landscape is transformed. In this respect, the main institutional upheaval in forestry is related to the changes in forest ownership structure. Specifically, the forest ownerships rights of non-state forest owners are restored. However, the restitution process is still ongoing due to various reasons. Additionally, new actors such as environmental governmental or non-governmental organizations, privately owned business and various associations are formed. In summary, nowadays forest arena consists not only of forestry related actors but also of actors from outside the forestry network (e.g., nature protection, water, energy from renewable resources, agriculture, and various businesses)

Traditional forestry related actors (governmental and non-governmental) still play the most important role in the forest management. Due to their direct access and decision-making authority over forests based on ownership structure, traditional forestry actors can be considered as key actors for forest management. Actors interested in hunting can be also considered as indirectly influential because of the importance of wild game densities for forest management. Due to changes in formal institutions related to nature protection and conservation, the governmental but especially non-governmental actors become gradually powerful (e.g., media, lobby, public discourse) in respect to forest management. Additionally, actors from timber processing industries impact forest management via increased lobby in favor of higher felling volumes, higher shares of coniferous species, or influence forest management by market forces. In contrast, actors from the renewable energy sector had become increasingly important for forest management because of increased demand for timber due to energetic use.

Generally, the power concerning forest politics at national level is split among actors from and outside forestry arena. Governmental actors mainly interested in forestry and nature have the highest impact on forest politics. From outside the forestry arena, the forest politics is also strongly formally or informally influenced by an agriculture related actors. Furthermore, the governmental actors and even in some cases also (environmental) non-governmental actors are influenced by businesses rather than politics. The power is increasingly being taken by businesses, which either formally (e.g., associations, non-governmental organizations) or informally influence forest politics. Actors at national level interested in forestry and recreation/tourism represented via various associations and

[10] The main goal of the WP4 research is to assess actor's power as driving force in forestry in order to better understand what power is and how it could be manipulated. Knowing the results, various ways to deal with the power could be isolated. Yet, the interviews at national and CSA Podpoľanie level are still ongoing (January, February) due to complexity of the topic and time issues, so we expect even more insights from and outside forestry arena concerning characteristics of key actors, their interests and especially use of their power resources in forest politics and forest management.



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organizations have rather low impact on forest politics. For instance, although associations of non-state forest owners try to have effect (e.g., participating in forest policy formulation processes), their negotiation position is weak. In contrast, actors representing nature via various (environmental) non-governmental organizations exercise medium power in forest politics in Slovakia. Actors interested in timber processing, water and production of energy from renewable resources associated in various associations or organizations have also medium impact on forest politics.

At the level of CSA Podpoľanie the power of various actors concerning forest politics is relatively low. Thus, the results need be interpreted with caution and power characteristics need to be distinguished between forest politics and forest management.



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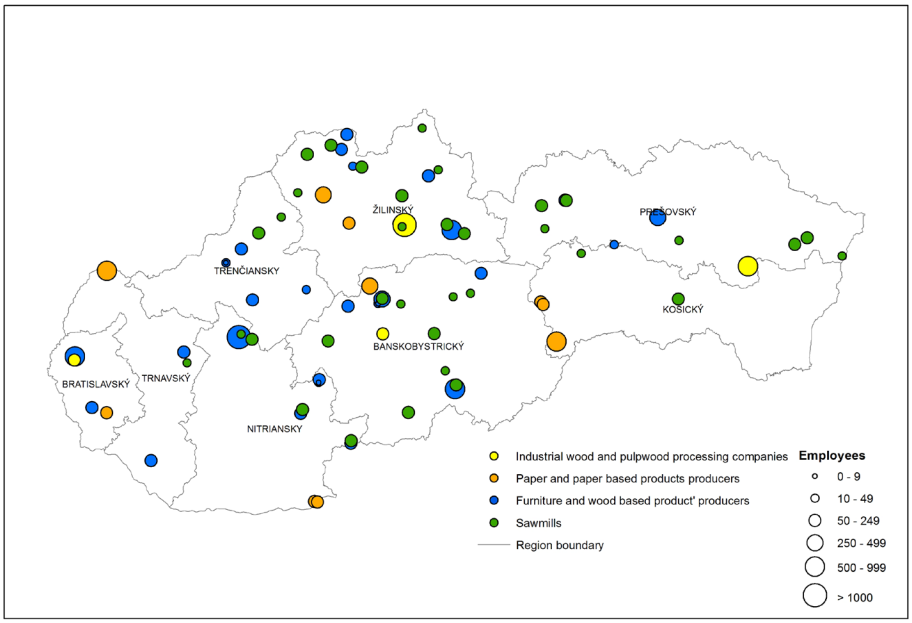
## 32. General country information: Slovakia

Around 45% of Slovakia's surface is covered by forests; in total, Slovakia has around 2 million ha of forest cover. The share of broadleaved threes is 62% to 38% of coniferous trees. The most common tree species are: beech (33%), spruce (24%), oak (11%) and pine (7%). Growing stock in forests is currently around 574.4 million $m^3$ volume of the timber inside bark. Accordingly, an average stock increment is 264 $m^3$/ha (Šmelko et al., 2008).

In 2014 the annual timber felling volume reached 9.417 million $m^3$ out of which circa 65 % was salvage felling. This generally high salvage volume is associated with increasing calamities (e.g., wind calamity from 15th of May of 2015) (Ministry of Agriculture and Rural Development of the SR, 2015). More detailed information concerning worsening state of the forests or increasing calamities with respect to climate change could be obtained from various publications (e.g., Hlásny & Sitková 2010; Kunca 2010; Kunca 2011; Kunca 2012; Hlásny & Turčáni 2013; Kunca 2013; Kunca 2014; Kunca 2015; Minďáš & Škvareninová 2016).

Around 6.8 million $m^3$ of the felled timber had been further processed in the wood processing industry located in Slovakia. The industry consists of around 78 timber processing companies with 20 and more employees (Figure 9) and further circa 700 small wood processors. More data concerning wood processing industry and timber flow is provided in publications of Parobek & Paluš (2008); Parobek et al. (2014); or Kaputa et al. (2016).

*Figure 9: Map of 78 timber processing companies with 20 and more employees in Slovakia (in 2012)*




*Source: Brodrechtova et al., 2014*



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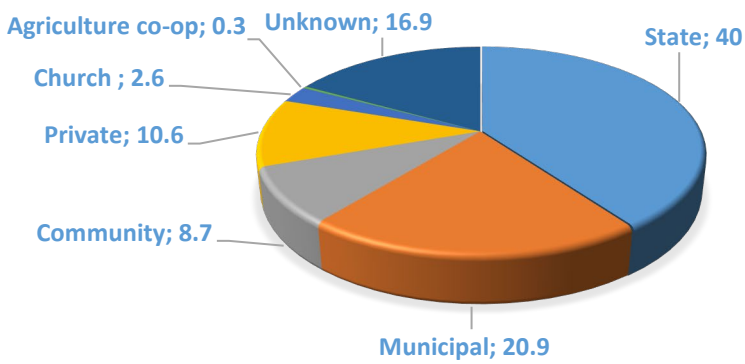
Generally, the main source of income in Slovak forestry had been generated via timber sale. For instance, in 2014 the sale of timber reached around 430 million EUR, which equals to almost 82% of the whole income of the forestry sector. The situation is even more pronounced in the case of non-state forest owners whose income consisted of almost 89% from the sale of timber (Ministry of Agriculture and Rural Development of the SR, 2015).

*Forest ownership structure*

In Slovakia, 40% of forests are state- and 43.1% are non-state (e.g., private, communal, municipal, church, agricultural cooperatives) owned (Figure 10). Yet, the ownership rights for the remaining 16.9% (327 569 ha) of the forests (also called as unknown) had not been restored. This is due to such reasons such as: an application is still being processed, high fees charged for the surveying plans necessary for registering the property into cadaster (areas with officially identified ownership), unidentified users (due to wrongful data in cadaster or due to unfinished inheritance procedures), or known users but without required documentation (Ministry of Agriculture and Rural Development of the SR, 2015; Brodrechtova et al., 2016). Owners of these forests are therefore officially represented by the state-owned enterprise *Forests of the SR.*

However, not all of these unknown forests are also managed by the state. More precisely, 53.6% (1 040 921 ha) of the forests is managed by the state-owned enterprises. The remaining forests (47.4%) are managed by the non-state forest owners or their private entities via professional forest manager (Bavlšík et al., 2010; Ministry of Agriculture and Rural Development of the SR, 2015; Brodrechtova et al., 2016).

*Figure 10: Forest ownerships structure of 2014 (in %) in Slovakia*




*Source: Ministry of Agriculture and Rural Development of the SR, 2015*

In Slovakia, the most common private entities utilized are: land associations, limited companies, shared companies, individual persons with/without business license, administrative units attached to municipalities (e.g., Sarvašová & Šiška, 2010; Ambrušová et al., 2015; Šulek 2016). For example,



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the main role of forest owners associations is to coordinate activities for ensuring the sustainable management and productivity of forest land, provide advises and training to their members, or try to access and influence the policy-making arena (Šálka et al., 2016).

More detailed information concerning the ownership structure developments in Slovakia or related facts could be found in publications of Konôpka et al. (1999); Konôpka (2004); Sarvašová & Tutka (2005); Ambrušová et al. (2015); Hricová et al. (2015); or Sarvašová et al. (2015).

*Forest management*

In terms of forest management aims there are three distinct forest classes in Slovakia: commercial forests (72%), protective forests (17%) and forests with restricted management (11%) (Ministry of Agriculture and Rural Development of the SR, 2014). Commercial forests suit wood production and other provisioning functions, protective forests are oriented towards promotion of regulating and supporting functions, and forests with restricted management (e.g., nature reserves, protected forests, military forests) mostly complete cultural functions (see Papánek, 1978; Hladík, 1995; Tutka, 2003; Bavlšík et al., 2010). These forest classes are especially important as they generally set the particular forest management goals (Sedmák et al., 2013). Additionally, to guarantee professional forest management and in compliance of the Act on Forests (Act no. 326/2005 Coll. on Forests) it is necessary both, to organize forest management according to the forest management plan and also via professional forest manager with required education and experience. In other words, the forest management in Slovakia has to be organized according to the obligatory forest management plan based on the Act on Forests (Act no. 326/2005 Coll. on Forests).

More detailed information concerning the forest management in Slovakia could be found in publications of Bavlšík et al. (2009); Šmelko et al. (2008) but also in Konôpka et al. (1999); Bavlšík et al. (2010); Konôpka et al. (2010); Sedmák et al. (2013); Šmelko et al. (2014).

*Forest policy*

In Slovakia forest policy roots could be formally dated back to seventieth century as in 1879 the first forest law- Act no. 31/1879 on Forests was introduced. Since then forest policy had been challenged and formed mainly in association with distinguished four politico-economic periods of twentieth century (Table 68). Comprehensive information concerning the history of forest policy or forest history in general could be found in many publications (e.g., Kavuljak, 1942; Bavlšík et al., 2010; Zdycha et al., 2002; 2008; Stockmann 2016; Vencúrik, 2016).

*Current problems associated with forestry*

Based on overview of current conflicts in Slovakia (Table 67) following groups of problems dominate in Slovakian forestry:

1. Inconsistency among objectives of forestry related policies in general and particularly legally binding laws



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2. Struggle between industrial and energetic wood use
3. Differences between forest owners (wants) and general societal demands

*Table 67: Overview of current conflicts in Slovakia*

| ***Areas of interests*** | ***Examples of conflicts*** |
|---|---|
| **General guidelines** | Agricultural sector preferred over forestry |
| | Multifunctional forest use versus segregation |
| | Networking, personal patronage, clientelism |
| **Policy** | Inconsistency among forestry related laws |
| | Lack of connection among forest policy and other sectoral policies |
| | Insufficient cooperation, coordination of activities and communication among forestry related sectors |
| | Fragmented ownership structure/ongoing restitution process |
| | Complicated/costly forest management planning |
| **Nature conservation** | Timber use versus biodiversity conservation/water protection |
| | Dramatically enlarged areas under various nature protection |
| | National protection network versus Natura-2000 |
| | Absent financial incentives for forest management restrictions |
| **Energy transition** | Timber use versus biomass use for energy production |
| | Subsidization of energetically used timber |
| | Intensification of harvesting measures versus nature conservation |
| | Large exports of forest chips |
| **Wood processing** | Absent higher added value wood processing capacities |
| | Large exports of (coniferous) round wood |
| **Climate change** | Absent effective climate mitigation measures in silviculture |
| | Best climate adaptation strategy |
| | Absent transfer of knowledge into forest management planning |
| **Recreation** | Timber use versus recreation |
| | Increased demand/absent financial incentives |
| | Hunting/other recreational interests |
| **Hunting** | Browsing damages versus economic and ecological interests |
| | Various interests and pressure of agricultural sector |
| **Public** | Free access and use of ecosystems/absent financial incentives |
| | Discourse biased towards nature protection versus forest management/timber production |
| | Discourse biased towards wrongful interpretation of the negative climate change impacts on ecological stability of forest as a failures of forestry |
| **Water** | Absent effective water protection despite history of water use and robust legislation |
| | Absent water politics in the SR – draft proposed in 2015. Current conditions are not taken in account in water use and protection |
| | Insufficient protection of springs and streams/rivers |



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| | |
|---|---|
| | Excessive felling of streamside stands and their processing in form of chips for energy production |

*Current forest policy related problems*

Forest policy does not only mean organized forestry, but also some smaller or deeper problems currently exists (Table 67). The main problems are predominantly associated with incoherent objectives of various (forestry related) legally binding laws (e.g., Act no. 326/2005 Coll. on Forests versus Act no. 543/2002 Coll. on Nature and Landscape Protection; Act no. 562/2005 Coll on Fire prevention versus Act no 543/2002 Coll. on Nature and Landscape Protection; or Act no. 220/2004 Coll on Protection and Use of Agricultural Land versus Act no. 543/2002 Coll. on Nature and Landscape Protection).

Especially, forest owners and/or forest managers are often confronted by confusing policy objectives of Act no. 326/2005 Coll. on Forests and Act no. 543/2002 Coll. on Nature and Landscape Protection. This inconsistency additionally reinforced by the dramatically increased proportion of nature protected areas (Figure 11) causes progress of various conflicts:

1. According to Act no. 543/2002 of the Coll. on Nature and Landscape Protection are protected areas in the fifth protection zone the areas with highest protection and no human intervention is allowed. An exception has to be approved by the *Ministry of Environment*. This regulation contradicts with regulations based on Act no. 326/2005 Coll. on Forests, which for example state that forest managers are obliged to carry out preventative measures in order to avoid any damages to the forests. They are also required to carry out protective and defensive measures against damage caused by harmful factors. Therefore, if calamity has effect on forests it is in responsibility of the forest managers to reduce its consequences. This is mainly due to fact that affected areas are often source of insect infestation or fires among others. As both laws are hierarchically equal, inconsistences in their objectives create conflicts and problems in daily forest management practices, and especially in protected areas.

2. As the proportion of nature protected areas dramatically increased, according to Act no. 543/2002 of the Coll. on Nature and Landscape Protection, which restricts human activities in protected areas the property rights in general and forest management specifically are restricted. This problem became even more pronounced due to introduction of NATURA 2000.

3. Forest policy but especially nature protection and conservation policy is impacted via formal or informal initiatives of environmental non-governmental organizations or groups. For instance, their scientific erudition has been questioned in the process of NATURA 2000 sites designation.

4. Obligation of the state to compensate for financial loss as a result of nature protection restrictions has been anchored in 1997 in Act no. 287/1994 of the Coll. on Nature and Landscape Protection and later via Act no. 543/2002 of the Coll. on Nature and Landscape Protection. However, the situation concerning this matter is currently unsatisfactory (including mutual accusations, court hearings, penalties and complicated relations between forestry



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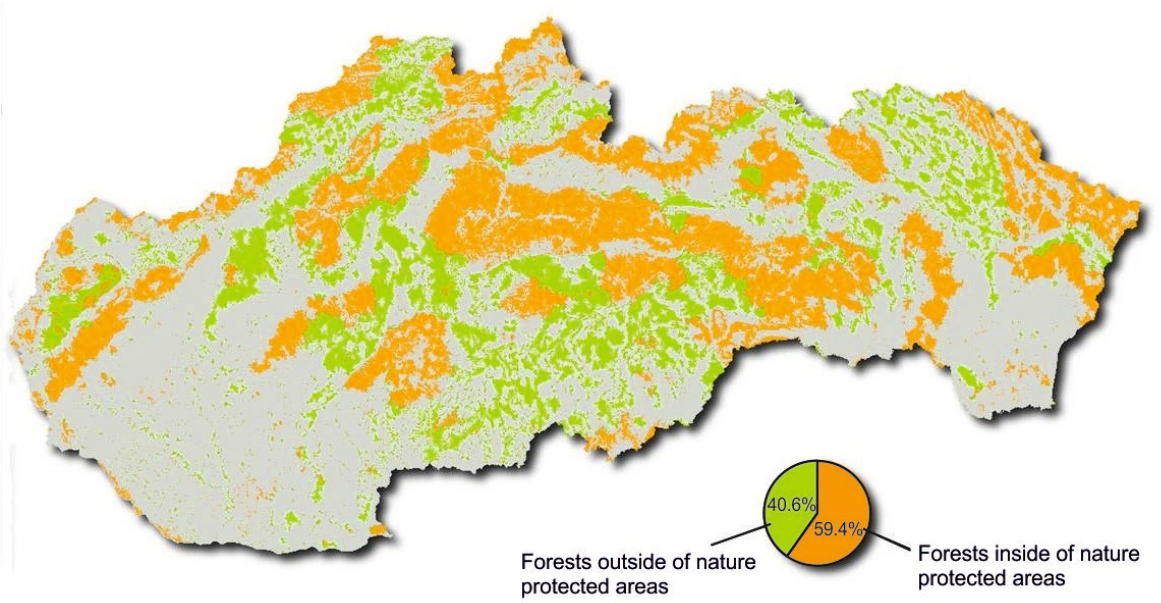
and nature protection). In addition, there are not sufficient funds for the compensations for restrictions as promised during the creation of NATURA 2000.

5. Obligation of the state to compensate for financial loss or expenses as a result of owners' rights restrictions or as a result of providing special ecosystem functions (e.g., water) has been proposed also in the Act no. 326/2005 Coll. on Forests (e.g., §35) or in the Act no. 364/2004 of the Coll. on Waters (e.g., §78). However, on voluntary basis the concerned actors are currently not providing any compensation. Moreover, the court hearings would be probably not effective and costly as concerned actors (e.g., water businesses, energy businesses) are often represented by various interest or financial groups with strong political influencing power.

*Figure 11: Map of proportion of nature protected areas in forests of Slovakia (2014)*




*Source: Enviroportal, Information portal of Ministry of Environment of the SR, 2016*

More information concerning incoherent (forest) policies or concerning problems could be found in publications of Kovalčík et al. (2012); Dobšinská (2013); Dobšinská et al. (2013); Sarvašová at al. (2013); Sarvašová et al. (2014); or Brodrechtova et al. (2016).

### *Current forest management planning problems*

The concept of multifunctional forestry (*in sensu* Papánek, 1978; Midriak, 1981) had been initiated in Slovakia in the 1950s (Table 68). Papánek (1978) proposed a sophisticated technique of identification, qualification, ranking and integration of the functions fulfilled by forests growing in the certain area (Sedmák et al., 2013). The final integration (according to prevailing forest functions) give rise to



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three forest classes in Slovakia: commercial forests (72%), protective forests and supporting functions (17%), and forests with restricted management (11%).

*Table 68: Overview of major historical developments in Slovak forest politics of twentieth century*

| ***Time frame*** | ***Major historical developments*** | ***Basic characteristics of used forest management*** |
|---|---|---|
| Since 1990 | **Market- oriented economy** | Multifunctional forestry for a forest estate: orientation toward shelterwood and selection systems with natural regeneration of forest, small area clear-cuts allowed |
| 1945 – 1989 | **Centrally planned economy** | Introduction of multifunctional principles for forest management unit: shelterwood and selection systems with natural regeneration of forests and increase of small area clear-cuts with special emphasis on artificial regeneration |
| 1918 – 1948 | **Market- oriented economy** | Introduction of forest tending and silviculture: clear-cuts preferred with gradual increase of use of shelterwood and selection systems |
| Prior to 1918 | **Disintegration of Austro-Hungarian empire** | Establishment of organized forestry |

*Source: Brodrechtova at al., 2016*

The forest classes are crucial input used in forest management planning, which consists of complex and detailed diagnosis of the state of forest (Brodrechtova et al., in prep.). The forest management plan is the main output of the forest management planning (its elaboration is supported by both, complex and detailed diagnosis). The forest management plan is generally elaborated every ten years and its preparation is conducted by licensed organizations (planners) (Figure 12) beginning approximately a year prior to its actual initiation. The expenses for elaboration of forest management plans are carried out by the forest owners in the case the owner applies and chooses the planner by himself (not common in practice). In the case the forest owner does not choose a planner himself, the *National Forest Centre* (Figure 12) is responsible for an organization of public procurement for his forest management plan elaboration. In this case, the costs are carried out by the state. The forest management plan is thus a tool of the state to support principles of sustainable forest management, but it is also a tool to control forest owners. However, forest management plan is not only an instrument of public policy, but also forest owners and forest managers see it as a tool for ensuring sustainable forest management. Different opinion have small-scale non-state forest owners for whom following the forest management plan is costly mainly due to forest management/planning problems on small areas. Participation of forest owners is enabled during the whole preparatory and approval process of forest management plan. Moreover, the participation in forest management plans' elaboration is open to particular actors (additionally to forest owners or managers, *State forest administration* or *Public environmental administration of SR)*.



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Elaboration of forest management plans is part of the forest management planning in Slovakia. The advantages of forest management planning are seen in (Kulla et al., 2010): unity of the system that would advocate for joint forest policy and introduction of new knowledge, full-area records concerning nature potential based on forest classes, and an automated connection of detailed diagnosis with forest management plans in all forests. In contrast, the forest management planning has currently also many shortcomings (Kulla et al., 2010): high number of forest management models with minimal deviations (currently are existing around 140.000), subjective approach by elaboration of models-absent empirical support, one sided system almost exclusively oriented towards age-class forest system, absent economic and ecological consequences concerning resulting models, absent adaptation measures in respect to climate change and risk analysis, weak flexibility concerning transfer of new knowledge, and limited participation of forest owners in forest management planning.

The main shortcomings of current forest management planning in Slovakia could be further justified also via other views:

a. The complex preparation and also elaboration of the forest management plans is mainly financed by the state. Increasing volume of collected geo-data, forest management restrictions and forest management risks, high number of involved interest groups or stakeholders contributes to rise of elaborateness and costs of forest management planning and plans themselves (Machanský, 2014). Moreover, although 100% of forests are under forest management plans, 15% of the forests are not managed anyway.

b. As the health of forests (predominantly spruce monocultures) has declined mainly because of various climate change effects (Ilavský & Longauer, 2003; Kulla & Sitková, 2012; Gubka et al., 2013; Griffits et al., 2014), transfer of new knowledge on adaptive actions against the impacts of climate change is fully missing in the forest management planning (Kulla et al., 2010). More precisely, within forest management planning exists an option to adjust the forest management plan according to changed forest health status (the initiative could come from the planner or even forest owner); however, decisions of the planners are rather subjective and not in line with the latest scientific knowledge.

c. Additionally, generally within forest management planning particularly in respect to detailed forest state survey are used methods developed in the past when the structure and state of the forests were different. For instance, currently the area of uneven-aged forests has been increasing that causes problems concerning estimations of growing stocks in the stands. This was one of the reasons why the National Forest Inventory (see Bavlšík et al., 2009) revealed higher growing stocks in the Slovakian forests by 24% (Šmelko et al., 2008).

d. Moreover, the current forestry paradigm (based on age classes and standard measurements of age classes) had been developed in the past and for the large-scale forest owners, respectively their managing legal bodies, which in past was solely the state. Due to institutional changes introduced in the early 1990s (Table 68) this paradigm is not efficient especially for the small-scale forest owners. This is due to difficulty (or even impossible) to ensure stable area of individual age classes evenly distributed over the small–scale owner's area.



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e. With introduction of Act on Forests in 2005 (Act no. 326/2005 Coll. on Forests) was legally introduced non-state forest owners' participation in the forest management planning (before 1989 it was only the state as the only forest manager). More precisely, the forest owners' opinion, comments, and demands are accounted for in the last phase (approval phase) of elaboration of forest management plans. In this respect forest owners have possibility only to modify the final proposal of forest management plan (Sedmák et al., 2013). Nevertheless, their participation within forest management planning is still rather minor (e.g., Moravčík & Konôpka, 2009; Sedmák et al., 2013; Sarvašová et al., 2014) and often depends on forest owners/manager's awareness and negotiation skills (*in sensu* of Act no. 326/2005 Coll. on Forests).

## 32.1 Instruments and legal competences in Slovak forest politics

In 2005 was enacted the latest version of forest law (Act no. 326/2005 of the Coll. on Forests). Nevertheless, the forests in Slovakia had been already managed according to earlier versions of the regulations and forest laws (1565, 1769, 1879, 1960, 1977) (see Kavuljak, 1942; Bavlšík et al., 2010; Zdycha et al., 2002; 2008; Stockmann 2016; Vencúrik, 2016). Currently, from the existing primary legally binding laws (Table 69) the most crucial for the forestry in Slovakia is Act on Forests (Act no. 326/2005 of the Coll. on Forests). In addition, these key regulations influence forestry in Slovakia:

i. Act no. 166/1960 of the Coll. on Forests and Forest Management and its regulation Act no. 17/1961 of the Coll. on Forest Management. It specifies the forest management distribution units (forest management unit, working circle, and compartment). For determination of felling volume are decisive increment conditions in addition to stock volume and distribution. In act are determined forest classes (commercial forests, protective forests).

ii. Act no. 100/1977 of the Coll. on Forests and its regulation Act no. 14/1978 of the Coll. on Forests Classification, Silviculture Methods and Forest Management. In act are specified forest classes (commercial forests, protective forests, and forests with restricted management), obligatory data for forest management plan, silvicultural system, role of thinning and restoration phase, and principles of forest management in forests.

iii. Act no. 100/1977 of the Coll. on Forests and its additional regulation Act no. 5/1995 of the Coll. on Forest Management. It determines new forest management distribution units as forest management unit that is part of forests according to their use (management) for which the forest management had been already elaborated.

iv. Act no. 100/1977 of the Coll. on Forests and its additional regulation Act no. 5/1995 of the Coll. on Forest Management supplemented by Act no. 119/2002 of the Coll. on Forest Management. It characterizes storey as forest management distribution unit, changes maximal width of the large-scale silvicultural form, defines final felling as a last stage in restoration using shelterwood sivlicultural system, and defines forests that could be classified as protective forests.



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v. Act no. 326/2005 of the Coll. on Forests and its regulation Act no. 453/2006 of the Coll. on Forest Management and Forest Protection. It characterizes the subclasses/subcategories of the forests, principles of categories establishment, criteria for afforestation of young forests, changes forest management unit to unit for which forest management plan is elaborated, and defines four silvicultural systems (shelterwood, clear-cutting, special purpose, and selection system)

For forestry in Slovakia from the present-day soft instruments is the most important the National Forest Programme of the SR (Table 69). The National Forest Programme of the SR is a key strategic document prepared by both, the *Ministry of Agriculture and Rural Development of the SR* and *National Forest Centre* (Figure 12). Published in 2007, the program represents an important tool for ensuring sustainable forest management, inter-sectoral cooperation, and fulfilment of international commitments related to the forests. The focus of National Forest Programme of the SR is to: support ecological forest management, improve and protect the environment, improve quality of life, increase long-term competitiveness, and strengthen cooperation, coordination and communication. For instance, problems concerning cross-sectoral cooperation identified by the programme are: lack of consistency between forest policy and other sectoral policies, insufficient cooperation, coordination of activities and communication with forestry related sectors (e.g., nature and landscape protection).

The whole text could be found in the publication of *Ministry of Agriculture and Rural Development of the SR* and *National Forest Centre Zvolen* (2007) and additional information concerning formulation processes in Dobšinská (2013).

*Table 69: Overview of current legally-binding laws and soft instruments in Slovakia relating to forestry*

| | |
|---|---|
| **Slovakia – Legally-binding laws** | • **Forestry**<br>Act no. 326/2005 of the Coll. on Forests |
| | • **Forestry related legislation**<br>Act no. 259/1993 of the Coll. on Slovak Forestry Chamber<br>Act no. 215/1995 of the Coll. on Geodesy and Cartography<br>Act no. 314/2001 of the Coll. on Fire Prevention<br>Act no. 274/2009 of the Coll. on Game Management<br>Act no. 138/2010 of the Coll. on Forest Reproduction Material<br>Act no. 75/2015 of the Coll. on Rules Concerning Provision of Support in Relation to Measures of Programme for Rural Development |
| | • **Nature protection**<br>Act no.17/1992 of the Coll. on Nature Environment<br>Act no. 543/2002 of the Coll. on The Nature and Land Protection<br>Act. no. 15/2005 of Coll. on Protection of Species freely living Animals and freely Growing Plants through Regulation of their Trade<br>Act. no. 24/2006 of Coll. on Appraisal of Influences on Natural Environment |
| | • **Water**<br>Act no. 442/2002 of the Coll. on public water conduit and sewerage<br>Act. no. 364/2004 of the Coll. on Waters |



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| | |
|---|---|
| | • **Energy**<br>Act no. 657/2004 of the Coll. on Heat Energy<br>Act no. 24/2006 of the Coll. on Environmental Impact Assessment<br>Government Ordinance No. 317/2007 on Rules for Energy Market Functioning<br>Act no. 309/2009 of the Coll. on the Support of Renewable Energy Sources and Highly Effective Combined Production<br>Act no. 250/2012 of the Coll. on Regulation in Network Industries<br>Act no. 251/2012 of the Coll. on Power Industry<br>Act no. 321/2014 of the Coll. on Energy Effectiveness |
| | • **Ownership matters**<br>Act no. 71/1967 of the Coll. on Administrative Action<br>Act. no. 229/1991 on Consolidation of Property Rights and Other Agricultural Property (first restitution law)<br>Act no. 330/1991 of the Coll. on Land Consolidation, on Acquiring Title Rights to Land, on Land Offices, on Land Fund and Land Associations<br>Act no. 97/2013 of the Coll. on Land Communities<br>Act no. 180/1995 of the Coll. on Certain Measures for the Settlement of Ownership Rights to Land<br>Act no. 181/1995 of the Coll. on Land Associations |
| **Slovakia – Soft instruments** | • **Forestry**<br>National Forest Programme of the Slovak Republic_2007<br>Prognosis and visions of the development of Slovak agriculture, food economy, forestry and rural areas_2007<br>Indicative action plan of the National Forest Programme of the Slovak Republic_2008<br>Strategy of Forestry Development_2008<br>Forestry Strategy_2008<br>Vision, Prognosis and Strategy of the Slovak Forestry Development_2009<br>Concepcion of Agriculture Development in 2013-2020_Forestry part<br>Rural Development Programme 2014-2020 |
| | • **Nature protection**<br>Strategy, Rules and Priorities of State Environmental Policy_1993<br>National Environmental Action Program_1996<br>Conception on Nature protection and landscape_2006 |
| | • **Water**<br>Conception on Water Management Policy of SR till 2015 |
| | • **Energy**<br>Concepcion of Renewable Energy Resources Utilization_2003<br>National Program of the Biofuels Development_2005<br>Strategy oh the Higher Utilization of Renewable Energy Resources in SR_2007<br>Conception of Energetic Effectiveness of the SR_2007<br>Action Plan for Energy Effectiveness 2011-2013<br>Action Plan for Biomass Utilization 2008-2013<br>Strategy of Energy Security_2008<br>National Action Plan for Energy from Renewable Sources_2010<br>Energy Policy of SR_2013 |



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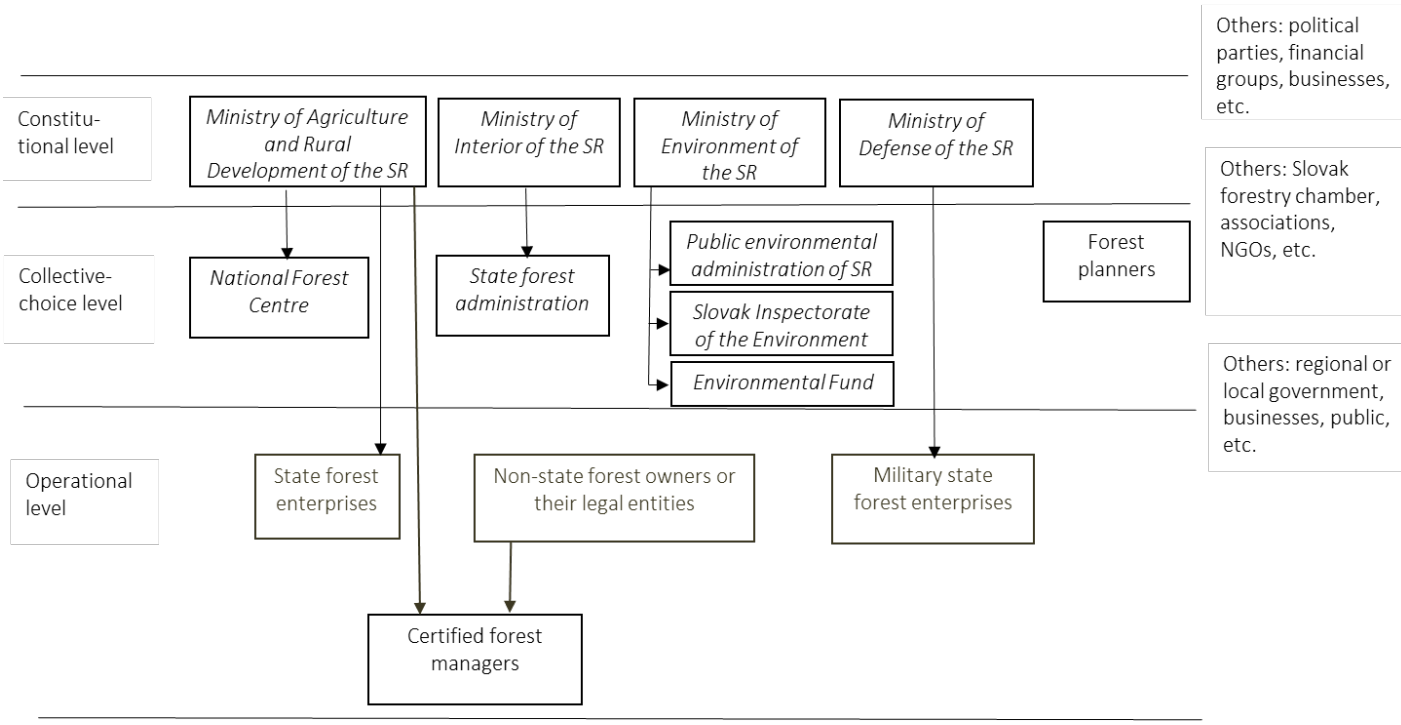
# 33. Actor analysis: Slovakia (national level)

## 33.1 Overview of actors

There is a variety of interests in forests in Slovak forest politics. They are symbolized by a broad range of state and non-state actors (Figure 12; 13) with a diversity of goals, strategies, structure and available resources.

Overview of key actors at three institutional levels (*in sensu* Ostrom, 2005) in Slovakia is provided in Figure 12. While constitutional level affects who decides and how decisions are made in collective-choice arena, the collective choice level is where decisions made affect the rules in use at the operational level. At operational level decisions made affect forest management.

*Figure 12: Overview of various actors at three institutional levels (in sensu Ostrom, 2005) in Slovakia*




*Source: Brodrechtova et al., in prep.*

### *Governmental actors*

Currently is the *Ministry of Agriculture and Rural Development of the SR* a supreme national authority on forests. The duties of the ministry are secured via the *Forestry Department* and its four units (e.g., State Administration for Forest Management Unit, Unit for Forest Policy and Economics, Game Management Unit, and Independent Unit for Timber Processing). In addition to the supreme national authority of forests defined by §58 of Act on Forests (Act no. 326/2005 of the Coll. on Forests), the *Forestry Department* conducts a range of other tasks.



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Practical issues of the state administration are done via the *state forest administration* located under the *Ministry of Interior of the SR* (Figure 12). However, methodological, control and professional direction of state forest administration is done by the *Ministry of Agriculture and Rural Development of the SR.* The task of the *state forest administration* is mainly associated with procedural decisions based on Act no. 71/1967 of the Coll. on Administrative Action, especially activities related to elaboration and approval of forest management plans, their adjustments, as well as administrative action concerning game management. Additionally, they are also responsible for providing advises on various aspects of forest management or game management, execution of state supervision in forests and other tasks associated with generally binding regulations executing the Act on Forests (Act no. 326/2005 of the Coll. on Forests).

Furthermore, under jurisdiction of the *Ministry of Agriculture and Rural Development of the SR* is *National Forest Centre* with the following main duties: forest research, agricultural modification of forests, complex diagnostic of the forest condition and master planning, public procurement of forest management plans, forest agriculture information system, thematic state maps on forest agriculture, education and training in FA, consultation services, and public relations, education and forest pedagogy.

The *Ministry of Agriculture and Rural Development of the SR* additionally oversees state forest enterprises. Specifically, three state owned enterprises such as *Forests of the SR*, *Forest-Agricultural Estate Ulič*, and the *State Forests of TANAP*. Yet, the four *Military Forests and Estates of SR in Pliešovce*, *Kežmarok, Malacky*, and *Kamenica nad Cirochou* are a statutory units of *the Ministry of Defense of the SR* (Figure 12). State forest enterprises also manage majority of so called unknown forests and forests leased from non-state subjects. For training purposes, the *Forests of the SR* lease over 900 ha of their forests to the *Forestry High School in Banská Štiavnica*, over 300 ha to *Forestry High School in Prešov*, and over 9 000 ha to the *Technical University in Zvolen*. *Forestry High School in Liptovský Hrádok* has a standing training contract with the state-owned enterprise *Forests of the SR* and thus does not lease state forests.

The state supervision in protected forests is done via *Public environmental administration of SR* under the *Ministry of Environment of the SR* (Figure 12). More precisely, the ministry is the central state administrative authority and supreme inspection authority in environmental affairs. To ensure inspection activity of the government of the SR, the *Ministry of Environment of the SR* coordinates activities of all ministries and other state administrative authorities of the SR concerning environmental matters. Its responsibilities are in the areas of nature and landscape protection, waste management, protection of water resources and quality of groundwater and surface water, fisheries and forestry in national parks, environmental impact assessment of activities and their consequences, air protection, geological works, genetically modified organism, national environmental policy, and unified information system on environment and area monitoring. Among others, *Public environmental administration of SR* supervise state administration of environmental care undertaken by municipalities and provide technical assistance to municipalities with application of environmental laws.

In Slovakia, next to *Public environmental administration of SR* exists *Slovak Inspectorate of the Environment*. *Slovak Inspectorate of the Environment* is another specialized supervisory authority for the state supervision and imposes fines on the environmental matters and implements local governments in the area of integrated prevention and pollution control. There are other eight contributory organizations under jurisdiction of the *Ministry of Environment of the SR*: *State Nature Protection of*



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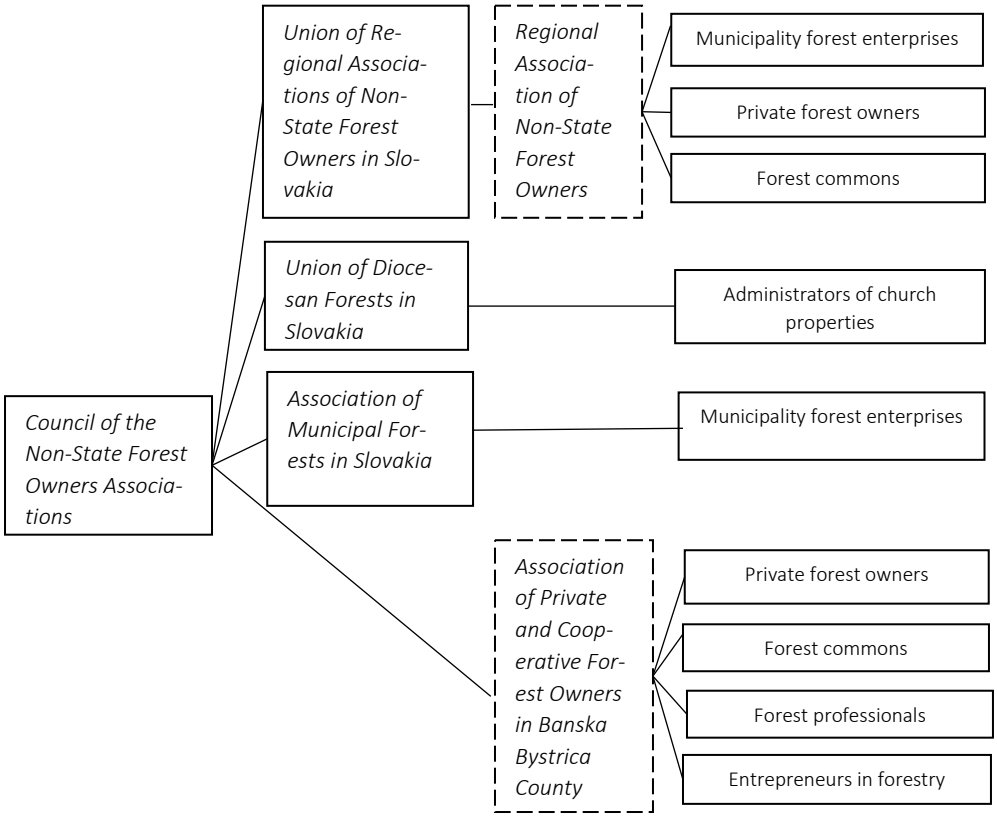
*the SR*, *Slovak Environmental Agency*, the *Slovak Mining Museum*, the *Slovak Museum of Nature Protection and Speleology*, the *Slovak Hydro-meteorological Institute*, *State Geological Institute of Dionýz Štúr*, *Water Research Institute*, and *ZOO Bojnice*. The ministry additionally oversees three state-owned enterprises *Water Management Construction*, *Slovak Water Management Enterprise* and *Recycling Enterprise of Moldava* in Moldava nad Bodvou.

### *Associations of non-state forest owners*

Very important group of actors in forestry are non-state forest owners. As forest ownership structure is rather fragmented in Slovakia, non-state forest owners form various associations at national or regional level.

Activities of non-state forest owners in Slovakia are coordinated under the *Council of the Non-State Forest Owners Associations* (Figure 13), which in turn represents common process in advocating interests of non-state forest sector (Konôpka, 1999*).* It is made up of the *Union of Regional Associations of Non-State Forest Owners in Slovakia, Union of Diocesan Forests in Slovakia, Association of Municipal Forests in Slovakia*, and *Association of Private and Cooperative Forest Owners in Banska Bystrica County* (Appendix 38)*.*

*Figure 13: Structure of forest owner associations at national, regional and local level in Slovakia*




*Source: adapted after Dobšinská & Sarvašová (2012)*



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*Union of Regional Associations of Non-state Forest Owners* is a partner to *Ministry of Agriculture and Rural Development of the SR* and is permitted to participate in legislation processes of general mandatory regulations. *Union of Diocesan Forests in Slovakia* associates legal subjects and church bodies, which manage forests in Roman Catholic Church ownership. Forest owners like municipalities and towns are merged in *Association of Municipal Forests in Slovakia*. *Association of Owners of Private Forests and Forests in Shared Ownership in Banská Bystrica County* is a forum for forest owners, urbars, forage communities, businessmen in forest economy and natural persons with forestry education, who are providing training to the members of the association.

Many associations were established because of the common problems with restitution concerning the same type of estate on the basis of ownership. Currently the main task of forest owners associations in Slovakia is to coordinate activities for ensuring the sustainable management and productivity of forest land, influence forest related policy, and give advises to their members (Ambrušová et al., 2015; Hricová et al., 2015; Šálka et al., 2015).

### *Forestry related actors*

Certified forest manager is natural person who is competent person, has valid certification concerning his competency, has valid contract for provisioning of certified forest manager services with forest owner or his legal entity, and is registered in register for certified forest managers. Manager can manage area of max. 2 000 ha unless he has for every additional 1 000 ha a person with forestry education. All costs concerning certified forest manager's activity are carried out by the forest owner or his legal entity. His duties and obligations are stated in Act no. 326/2005 of the Coll. on Forests (§47; §48). Conditions concerning how to obtain certification are defined in regulation Act no. 451/2006 of the Coll. on Certified Forest Manager.

Forest planner is either natural or juridical person with whom forest owner, manager or public procurer closed contract for elaboration of forest management plan. Besides being holder of a license to carry on this activity, this person has to have higher education with special focus on forestry, and minimum of five years of experience in forest management in accordance to Act no. 326/2005 of the Coll. on Forests (§42). Volume of testing and test conditions are defined in regulation Act no. 441/2006 of the Coll. on Examination of Specialized Skills for Elaboration of Forest Management Plan. For issuing as well as removal of the license concerning specialized and technical skills for elaboration of forest management plan is responsible the *Ministry of Agriculture and Rural Development of the SR.*

The *Slovak Forestry Chamber* supports and advocates any legal, professional, social and economic interests of its members. The chamber cooperates with state forestry administration, municipalities, (environmental) non-governmental organizations, associations of non-state forest owners or with other natural and juristic persons involved in forestry or nature protection.

The *Association of Forest Sector Employers* (with 21 members) focuses on activities concerning protection of employers' interests, the Labor Code disputes and collective bargaining.

*Council for Economic and Social Understanding in the Forest Sector* is formed by three representatives: the *Ministry of Agriculture and Rural Development of the SR*, the *Association of Forest Sector Employers* and the *Trade Unions of Timber, Forest and Water Industries*. The Council participates in negotiations concerning an amendment of Social Insurance Act or the State Budget Act.



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The *Slovak Hunting Chamber* set up according to the Act no. 274/2009 Coll. on Game Management, supports and advocates for its members concerning game management, nature protection and conservation, or other game management related activities.

The *Slovak Hunting Union* is a civic association according to the Act no. 83/1990 Coll. on Citizen Assembling, which represents interests of hunters (approximately 50 000). Among the priorities of the union are: providing lifelong education to its members and general public in order to improve their understanding of game management and hunting, enhancing moral and ethical principles of hunting, or preserving hunting traditions. Additionally, the *Slovak Hunting Union* is actively involved in the youth education through clubs of young friends of hunting attached to district and regional branches of the *Slovak Hunting Union*. Also, they actively cooperate with the *State Veterinary and Food Authority* on the prevention and suppression of wildlife diseases and enhancement of conservation of protected species of animals.

The *Slovak Forest Certification Association* is an independent voluntary professional association of legal entities with interests in forest sector. It develops and administers the national system of forest certification under PEFC Council (Programme for the Endorsement of Forest Certification Schemes), establishes rules for the certification of the Chain-of-Custody as well as defines requirements for both the auditors and certification bodies. It is an independent professional association of legal entities whose 16 members are according to their stakeholder interests divided into 3 chambers: Chamber of Forest Owners, Wood-processing Industry Chamber, and Chamber of other Interest Groups. The Association is a regular member of the PEFC Council (Programme for the Endorsement of Forest Certification Schemes) that promotes sustainable forest management through independent third party forest certification.

### *Nature protection and conservation related actors*

In the field of nature conservation the most important role has *State Nature Protection of the SR*. It is special professional and state organization with nationwide coverage mainly focused on providing tasks in the field of nature conservation and landscape management, including caves administration. The *State Nature Protection of the SR* headquarter is in Banská Bystrica in addition to two branch offices, nine administrations of the national parks and 14 administrations of protected landscape areas. In the CSA Podpoľanie operates for instance the *Administration of Protected Landscape Area Poľana - the Poľana Biosphere Reserve*.

From the environmental and non-governmental organizations operating in Slovakia could be named few (Appendix 38): *DAPHNE - Institute of Applied Ecology*, *EKOFORUM - Net of Environmental Non-governmental Organizations*, *WWF Slovakia*, *WOLF - Forest Protection Movement*, *Friends of the Earth Slovakia*, *SOS/Birdlife Slovakia*, *SWS Slovak Wildlife Society*, among others. The non-governmental actors (formally or informally - lobby, use of media), try to access and influence the policy-making arena among their other activities.



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*Actors representing wood processing industry*

*Slovak Association of Wood Processors (over 100 members)* is an independent, voluntary organization of wood processing companies. The association is organized in five specialized sections: wood processing section (e.g., different enterprises from sawmills to research institutes), furniture section (e.g., furniture producers), technology and materials suppliers section, section of producers of wooden buildings, and section of sellers of Slovak furniture. It is a full member of the *National Union of Employers* and the *Confederation of Industry of Slovakia*. All the current members are leaders in wood processing industry or related industries (manufacturing or trading companies), or have scientific research potential, their operations do not pollute the environment and develop a number of export-oriented activities. The benefits for members include various discounts, sharing of information and cooperation on trade exhibitions.

The *Pulp and Paper Industry Federation of SR* (with 11 members) is an independent, voluntary organization. It joins the legal and physical business subjects of the pulp and paper industry and related industries. It is business and employment representation of industry for production and processing of pulp, paper, board, card boxes, tissue and sanitary products and print in Slovakia.

*Agriculture related actors*

Around 49% of Slovakia's surface is agricultural land; which totals to 2.4 million ha (in 2016). Out of this land is approximately 1.4 million ha arable land. The current trend set in 2010 causes decrease of agricultural land area (including arable land) and slight increase of forest land (Geodesy, Cartography and Cadaster Authority of the SR, 2016). More precisely 7 230 ha of agricultural land (including 768 ha of arable land) had been affected in 2015. In the same year, the area of the forest land increased by 2 926 ha.

The agricultural actors in Slovakia focus on plant and animal production. Their interests represent various associations, unions, or businesses. Some of them are very specialized such as *Slovak Holstein Association*, *Association of Pinzgauer Livestock in Slovakia, Association of Sugar-beet Producers, Association of corn producers and manufacturers, Slovak Association of Beekeepers, Slovak Flour-Milling Manufacturers* among others. In Slovakia also interests of various agricultural sectors are organized in associations (e.g*., Association of Winegrowers in Slovakia*, *Slovak Association of Farmers*, *Slovak Canned Food Industry Association*, or *Slovak Vegetable Union*). The cooperatives and businesses are associated in *Slovak Association of Agricultural Cooperatives and Companies*.

The largest aggregation is *Slovak Agriculture and Food Chamber*, which organizes its work via central office and also via 37 regional workstations. In the chamber are associated various entrepreneurs with special focus on agriculture, food or even on services for agriculture-food processing sector. Almost 63% owners of agricultural land, owners of 70% of beef-cattle and sheep are represented in addition to individual farmers. The main task of the chamber is preparation of national and sustainable conception to support sale of Slovakian articles of food.

*Other actors*

The governmental actors and even in some cases also (environmental) non-governmental actors have been to certain degree overtaken by businesses rather than politics. In other words, key companies (including financial groups) influence governance in Slovakia.



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To the large and strategic businesses in Slovakia belong state-owned enterprise *Slovak Water Management Enterprise*; *VEOLIA Waters of the SR, Ltd*.; *Slovak Power plants, Inc*.; *Slovak Gas Industry, Inc*.; *Slovnaft, Inc*.; *Mondi SCP, Ltd*.; etc. (Appendix 39).

Administration of waterways and reservoirs is in jurisdiction of state-owned enterprise *Slovak Water Management Enterprise*. Particularly, company's four branches administer together approximately 49 000 km$^2$ of basins. Additionally governed are 33 000 km of waterways, 287 water reservoirs, almost 3 000 km of protection dams and 2 000 km long network of canals (Slovak Water Management Enterprise, 2015). Construction and management of water structures (approximately 350 water, hydroelectric and engineering structures build in span of 60 years) is done via state-owned enterprise *Water Management Construction*. This enterprise also produces electric energy from water.

However, in Slovakia water supply to natural or juridical persons is organized via private companies. For instance, the *VEOLIA Waters of the SR, Ltd.* is leading supplier of water management services in Slovakia. It consists of various enterprises such as *Central Slovakian Water Management Enterprise, Ltd.*; *Undertatras Water Management Enterprise, Ltd*., and *ČOVspol, Ltd*.

Water management companies are grouped in *Association of Water Companies* (Appendix 38) with the common aim to look for solutions, find the right communication and to enforce interests of their members.

The *Slovak Power plants, Inc.* (2015) is the largest electric power producer in Slovakia. Its main focus is on production and sale of electric energy. This company runs 31 water power plants, two nuclear power plants, two thermal power and two photovoltaic power stations, all together generating 4 300 MWe. Distribution of electric energy is mediated mainly via three private companies such as: *West Slovakian Distribution, Inc.*; *Central Slovakian Power Energetics, Inc*.; and *East Slovakian Distribution, Inc.* Also small companies such as *Twinlogy Ltd.*; *BCF Ltd*; or *ELGAS Ltd*. are part of this specialized market.

From the year of 2014, the state became the owner of the largest supplier of energy in Slovakia- the *Slovak Gas Industry, Inc.* According to *Slovak Gas Industry, Inc.* (2015), from the year of 2012 the company is operating also on the market with electric energy. As a result, it is the largest supplier of energy in Slovakia focusing on all customer segments and active in all regions.

However, the distribution of the gas is conducted via private company *SPP – Distribution, Inc.*, which is the largest company in Slovakia governing gas infrastructure.

## 33.2 Interest of actors: Slovakia (national level)

Interests are understood as being *"based on action orientation, adhered to by individuals or groups, and they designate the benefits the individual or group can receive from a certain object, such as a forest"* (Krott, 2005).

An assessment of interest of actors is thus based on their forest use and advocated positions up to present. In order to assess these interests in Slovakia (national level) two steps are conducted: iden-



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tification of the main actors, and valuation of actors' forest use and advocated positions. This is accomplished via desktop research and data collection (primary and secondary data). Primary data are collected with the help of focus group and in-person interviews with purposefully selected stakeholders and experts. As a source of secondary data are used data collected during project INTEGRAL[11] (e.g., Navrátil et al., 2013; Tuček et al., 2015; Brodrechtova et al., 2016; Navrátil et al., 2016) or other (e.g., Dobšinská, 2013; Dobšinská et al., 2013; Šálka et al., 2015).

At national level two groups of actors are formed: (1) market & civil society actors (Appendix 38), and (2) governmental actors (Appendix 39). First group consists of various organizations, associations, and businesses representing forestry, timber processing industry, tourism, agriculture, environmental, nature, and landscape conservation among others. These actors are grouped and characterized by their common interests (e.g., in forestry, timber processing, tourism, water). In contrast, the second group is made up of governmental actors representing Slovak government and organizations in their jurisdiction.

Interests and preferences for ecosystem services of selected actor groups in Slovakia at national level area are assessed with the help of actor-centered power approach (*in sensu* Hubo & Krott, 2015) (Table 70). It is obvious that actors representing forestry and wood industry at the national level are mainly interested in provisioning ecosystem services, particularly timber production. As the main source of income is timber production for forestry sector, the general goal is sustainable forest management at maximum allowable economic yield (Sedmák et al., 2013). Additionally, timber processing industry prefer even flow and high harvesting intensity (e.g., certain three species such as spruce).

The position of agricultural sector and its actors in Slovak economy prevails in comparison to forestry sector. In other words, the central government places priority on agriculture before forestry, especially in respect to available financial resources. Additionally, agriculture related actors try to lobby not only on national but also on EU level (e.g., to match amount of subsidies with EU level; to obtain subsidies for damages caused by biotic influences).

*Table 70: Interests of selected actor groups in Slovakia (national level) in ecosystem services*

| Ecosystem services\ Actors & their areas of interests | **Forestry** | **Forestry - govern-mental** | **Timber trade & pro-cessing** | **Recrea-tion, tourism** | **Hunting, fishing** | **Water** | **Nature, environ-ment NGOs** | **Nature, Environ-ment-govern-mental** | **Agricul-ture** |
|---|---|---|---|---|---|---|---|---|---|
| ***Provisioning ES*** | | | | | | | | | |
| Wood provision | **+++** | **+++** | **+++** | **0** | **0** | **0** | **0** | **+** | **+** |
| Game provision | **+** | **++** | **0** | **+** | **+++** | **0** | **0** | **+** | **0** |
| Other (e.g., mushrooms, berries) | **+** | **++** | **0** | **++** | **+** | **0** | **++** | **++** | **0** |
| ***Supporting ES*** | | | | | | | | | |

[11] INTEGRAL project - Future oriented integrated management of European forest landscapes – FP-7 project



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| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Biodiversity | + | ++ | 0 | + | +++ | 0 | +++ | +++ | + |
| Habitats | + | ++ | 0 | 0 | +++ | 0 | +++ | +++ | + |
| ***Regulating ES*** | | | | | | | | | |
| Carbon sequestra-tion | 0 | ++ | + | 0 | 0 | 0 | + | +++ | 0 |
| Climate regulation | 0 | ++ | + | 0 | 0 | + | ++ | +++ | + |
| Water qual-ity | ++ | ++ | 0 | ++ | ++ | +++ | + | +++ | ++ |
| Pest control | + | ++ | + | 0 | ++ | + | + | +++ | ++ |
| ***Cultural ES*** | | | | | | | | | |
| Outdoor recreation | 0 | + | 0 | +++ | + | 0 | + | + | 0 |
| Aesthetics | 0 | + | 0 | +++ | + | 0 | ++ | + | 0 |
| Tourism | 0 | + | 0 | +++ | + | 0 | + | + | 0 |

*Note: Low impact + Medium impact ++ Strong impact +++ 0 some strength*

## 33.3 Power of actors: Slovakia (national level)

Power is defined as *"capability of an actor to influence other actors"* (Krott et al., 2014: 35). Based on the actor-centered power approach (Krott et al. 2014) the assessment of power is based on the criteria coercion, incentives, and dominant information sources. Thus, the observable facts are linked to obvious action, threat of action, and sources of action that could be possible sources of power. Additionally, these power elements (**coercion, incentives, dominant information**) could be attributed to one actor or distributed among number of actors (Krott et al., 2014).

Following the actor-centered power approach, for each actor group it has been evaluated if power resources have a strong impact (+++), a medium impact (++), or a low impact (+) on forest management (Hubo & Krott 2015). Overview of power resources of different interests on forest politics and thus also on forest management in Slovakia is provided in Table 71.

Governmental actors interested in forestry, hunting/fishing, and nature/environment have the highest and formal impact on forest politics and thus also on forest management. This is mainly due to fact that these actors directly impact and form formal rules such as legally binding laws or soft instruments (Table 71). Also they informally influence forest policy arena via clientelism, networking or personal patronage. This way so called power relationships are formed.

Actors interested in forestry and recreation/tourism represented via various associations and organizations have rather low impact on forest politics. For instance, although associations of non-state forest owners try to have effect (e.g., participating in forest policy formulation processes), their negotiation position is weak. This is due various reasons: fragmented ownership structure, not all non-state forest owners are members of associations, weak cooperation between state and non-state forest owners, strong power of agriculture related actors, etc.

In contrast, actors representing nature/environment via various (environmental) non-governmental organizations exercise medium power in forest politics in Slovakia. Their power at the national level



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is mainly based on unverified information, which is spread within lobbying processes, in public relations, contribution to research projects and general participation in the public discourse (e.g., media). Their standpoint is often reinforced via funding activities or presents from various interest groups.

Actors interested in timber processing, water and production of energy from renewable resources associated in various associations or organizations have medium impact on forest politics. They use mainly lobbying processes and sometimes participate in the public discourse (e.g., media) to exercise their power at the national level.

From outside the forestry related network, forest politics is also directly or indirectly influenced by agriculture related actors and various businesses (including financial groups). In comparison to forestry sector, for instance agriculture sector attracts more attention in terms of financial or not-financial incentives within politics and via various policies.

Furthermore, the governmental actors and even in some cases also (environmental) non-governmental actors have been influenced by businesses rather than politics. The power is increasingly being taken by businesses, which either formally (e.g., associations, non-governmental organizations) or informally influence forest politics and thus also forest management related matters. In that case, the government in their decision-making considers their interests in exchange of funding of political parties.

*Table 71: Overview about power resources of different interests on forest politics and/or forest management (SR)*

| Actor's interests | Power resources | | | |
|---|---|---|---|---|
| | Means of coercion | Incentives | Dominant information | Power resources of the interest |
| Forestry | + | + | ++ | Low |
| Forestry - governmental | +++ | +++ | + | Strong |
| Timber trade & processing | + | ++ | + | Medium |
| Recreation, tourism | + | + | 0 | Low |
| Hunting, fishing | +++ | + | ++ | Medium |
| Water | ++ | 0 | + | Medium |
| Nature, environment - NGOs | ++ | ++ | +++ | Strong |
| Nature, environment- governmental | +++ | +++ | ++ | Strong |
| Businesses | +++ | +++ | 0 | Strong |
| Agriculture | ++ | + | 0 | Medium |

*Note: Low impact + Medium impact ++ Strong impact +++ 0 some strength*

## 33.4 Power of actors versus ecosystem services: Slovakia (national level)

At the national level, the most powerful are actors with interests in timber provision, game management and also actors interested in ecosystem functions such as biodiversity and habitats for species (Table 72). In the case of regulating forest ecosystem services, the actors power vary between low to strong concerning their impact on forest politics and/or forest management at the national level.



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Actors interested in cultural ecosystem services have low power resources and only marginal impact on forest politics.

*Table 72: Overview about power resources of interests in different ecosystem services (SR, national level)*

| Interest in ecosystem services: | Overall power resources | Means of coercion | Incentives | Dominant information |
|---|---|---|---|---|
| ***Provisioning services*** | | | | |
| Wood | **Strong** | **+++** | **++** | **++** |
| Game | **Medium** | **+++** | **+** | **+** |
| Other (e.g., mushrooms, berries) | **Low** | **0** | **+** | **+** |
| ***Supporting services*** | | | | |
| Biodiversity | **Strong** | **+++** | **++** | **++** |
| Habitat for species | **Strong** | **+++** | **++** | **++** |
| ***Regulating services*** | | | | |
| Carbon sequestration | **Low** | **0** | **0** | **+** |
| Climate regulation | **Medium** | **++** | **++** | **+** |
| Water quality | **Strong** | **+++** | **0** | **+** |
| Pest control | **Strong** | **+++** | **++** | **+** |
| ***Cultural services*** | | | | |
| Outdoor recreation | **Low** | **0** | **+** | **+** |
| Aesthetic values | **Low** | **0** | **0** | **0** |
| Tourism | **Low** | **+** | **+** | **+** |

*Note: Low impact + Medium impact ++ Strong impact +++ 0 some strength*

At the national level, especially governmental actors but also businesses have rather strong resources to impact forest politics and/or forest management. In contrast, to market & civil society actors are available low power resources (Table 73). Various reasons behind this could be identified (e.g., fragmented ownership structure, hierarchical power distribution, large volume of legally binding laws and regulations, incoherent policies, absent cooperation between sectors, absent financial incentives, etc.)

*Table 73: Overview about power resources of different actor groups in Slovakia (national level)*

| | Means of coercion | Incentives | Dominant information | |
|---|---|---|---|---|
| **Market & civil society actors** | **+** | **+** | **+++** | **Low** |
| **Businesses** | **+++** | **++** | **+** | **Strong** |
| **Governmental actors** | **+++** | **+++** | **++** | **Strong** |

*Note: Low impact + Medium impact ++ Strong impact +++ 0 some strength*



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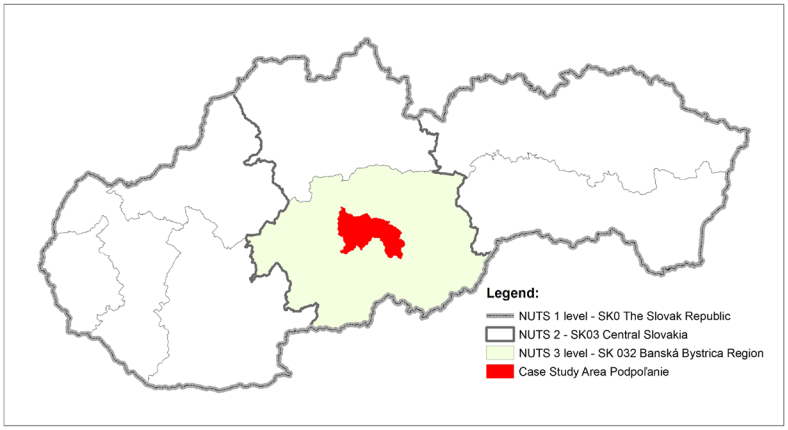
# 34. General CSA information: *Podpoľanie*

## 34.1 Basic socio-economic characteristics of CSA

The CSA *Podpoľanie* is located in the central part of Slovakia (48° 34'N, 19° 28'E) (Figure 14) and largely within county of Banská Bystrica (Figure 15).

*Figure 14: Map of Slovakia and location of CSA Podpoľanie within NUTS classification*




The location of the CSA Podpoľanie within NUTS classification is as follows:
NUTS 1 SK0 - The Slovak Republic (republic = republika)
NUTS 2 SK03 - Central Slovakia (area = oblasť)
NUTS 3 SK032 - Banská Bystrica County (county/region = kraj)

The specific percentage coverage of CSA Podpoľanie within Banská Bystrica County is captured in Table 74. Particularly, within CSA Podpoľanie and Banská Bystrica County are located four districts such as Banská Bystrica, Detva, Poltár and Zvolen (Figure 15).

*Table 74: Percentage coverage of four districts located within Banská Bystrica County and in CSA Podpoľanie*

| District | % of district |
|---|---|
| Banská Bystrica | 9.1 |
| Detva | 79.6 |
| Poltár | 26.3 |
| Zvolen | 14.8 |

Banská Bystrica district has one town Banská Bystrica and 41 municipalities with population of around 111 000 residents (population density is 137 persons per km$^2$). Unemployment rate is 6.64%.



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In Detva district are located two towns– Detva and Hriňová and 15 municipalities with population of around 33 000 residents (population density is 73 persons per km$^2$). Unemployment rate is 11.32%. Poltár district has one town Poltár and 21 municipalities with population of around 22 000 residents (population density is 46 persons per km$^2$). Unemployment rate in this district is 18.19%. Zvolen district consists of two towns- Zvolen and Sliač, and 24 municipalities with population of around 69 000 residents (population density is 91 persons per km$^2$). Unemployment rate in this district is 8.18%. In summary, the Banská Bystrica County is region with the highest unemployment rate (13.17%) in Slovakia (unemployment rate for whole Slovakia is 9.08%).

## 34.2 Basic characteristics of CSA in terms of cultural landscape and structure

CSA Podpoľanie could be characterized as a region with a specific cultural landscape consisting of dispersed rural settlements and traditional land use. Additionally, it is a highland territory with different land-use patterns.

Especially the area around the town of Hriňová (Figure 15) is characterized by dispersed settlements and forest (approximately 70% of the cadastral area). The agricultural landscape is distinguished by a mosaic of arable land, grasslands and non-forest vegetation. Since the collectivization from 1950s did not apply to this area, the parcels remained relatively small and traditional use of the land by individual farmers persisted. In this respect, even nowadays the agricultural land is used in traditional way by families and/or by the local associations of individual farmers. In other words, "terraces and balks with trees and bushes create part of the agricultural landscape to the present day, with correspondingly high biodiversity values (species diversity and abundance of rare and threatened species) in comparison with surrounding agricultural area" (Petrovič and Mojzes, 2011). Detailed information considering this area could be obtained from publications of Ira et al. (2008); Petrovič & Mojzes (2011); Mojzes & Petrovič (2013); Bezák & Mitcheley (2014); or Lieskovský et al. (2015).



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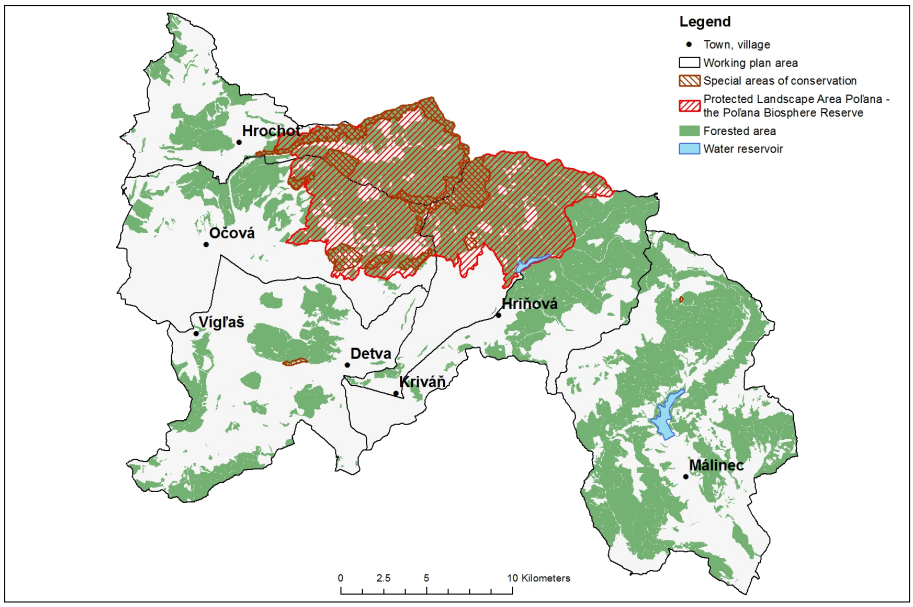
*Figure 15: Map of CSA Podpoľanie*




## 34.3 Physical description of CSA in terms of land use, ownership, etc.

In the land use proportion of CSA dominate forests (Table 75 and Figure 16). Particularly, the CSA' upper part is covered by beech and beech-fir forests in the north, whereas in lower parts of CSA prevail oak-hornbeam forests. The southern part of CSA is rather agricultural land with low to less fertile grasslands and arable lands.

*Table 75: Land use proportion in CSA Podpoľanie*

| **CSA Podpoľanie** | **Area** [ha] | **%** |
|---|---|---|
| Forest area | 30 040 | 44.5 |
| Water area (lakes) | 221 | 0.3 |
| Urban area | 1 540 | 2.3 |
| Other land | 35 731 | 52.9 |
| **Total area** | 67 532 | 100 |

CSA Podpoľanie is covered by commercial deciduous and mixed coniferous-deciduous forests, meadows, pastures, arable land and areas with non-forest woody vegetation. Some parts of the mountain pastures and meadows are abandoned and overgrown. Elevation ranges from 232 to 1458 m. a.s.l.



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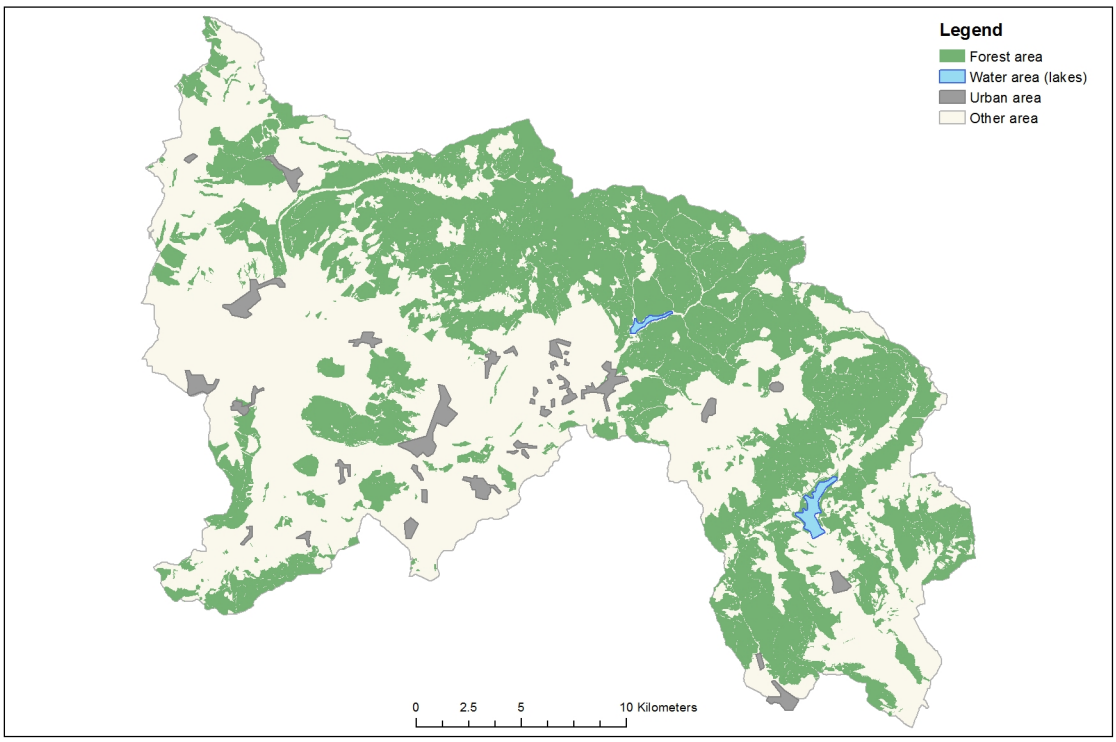
The area is characterized by the highest volcanic mountain range in Slovakia with its altitude of 1458 m a.s.l. This mountain range is considered to be one of the biggest no active volcanos in Europe. The whole mountain is part of the Carpathian Arch. Owing to its elevation range of almost 1000 m (the lowest point at an altitude of 232 m. a.s.l. and the highest at 1458 m. a.s.l.), there is a great presence of thermophilous and mountainous species of plants growing and animals living on a relatively small area. As a result, the northern part of the CSA Podpoľanie is under nature protection (*Protected Landscape Area Poľana - the Poľana Biosphere Reserve*).

Within the CSA Podpoľanie are located two water reservoirs- Hriňová and Málinec, which are an important source of drinking water for the surrounding regions. The recreational function of the area is also significant. The forest is used widely by public for mushrooms, forests' fruits and nuts picking. To the outdoor activities mainly belong summer activities as tourism, ecotourism and various sports. The area is especially well-known for its hunting/game management activities. In this respect, in the area was set up *Protected game area of Poľana*. On the area of almost 21 000 ha is provided a coordinated ecological and large-scale game management, particularly of red deer population.

*Figure 16: Map of land cover structure in CSA Podpoľanie*




*Basic characteristics of CSA forests*

The CSA Podpoľanie represents 67 532 ha out of which 30 040 ha is forested (45%). Forests consist of mixed coniferous and broad-leaved species, which composition is similar to the original. The three species composition consists of 56% deciduous trees (beech 34.6%, sycamore 5.2%, oak 5.5%, ash



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3.4%, hornbeam 3.2%, elm 0.4%) and 44 % of conifers (Norway spruce 38.5%, silver fir 2.4%, European larch 1.7%, Scots pine 1.7%).

*Characteristics of protected areas located in CSA*

North part of the CSA Podpoľanie (almost forest) is under nature protection (Figure 15 and Table 76). Generally, nature protection and landscape conservation in Slovakia is coordinated by the Act No. 543/2002 of the Coll. on the Nature and Land Protection. According to this act the following system of complex nature and landscape protection categories is used: 1st level of protection (Normal management allowed following the forest management plan), 2nd level of protection (Protected Landscape Area), 3rd level of protection (National Park), 4th level of protection (Protected Site), and 5th level of protection (Nature Reserve, Nature Monument, National Nature Reserve, and National Nature Monument).

Part of CSA Podpoľanie, called the *Protected Landscape Area Poľana - the Poľana Biosphere Reserve* (Figure 15) is currently under 2nd level of protection and thus holds the national legal status of Protected Landscape Area (Table 76). The total area represents 20 360 ha out of which 17 287 ha is forested (85%). According to Act No 31/2001 of the Coll. of Laws of the *Ministry of Environment of SR* the total area of the *Protected Landscape Area Poľana - the Poľana Biosphere Reserve* consists of core zone with six cores (1 178 ha), the buffer zone (9 183 ha), and the transition zone (9 999 ha). The area was established to protect inanimate nature, plant and animal communities as well as a special landscape character. Despite recultivation activities that to some degree changed the original floristic composition of the grasslands in recent years, large number of animal communities and various plants still exists. Within area have been identified 19 types of mammals and 174 types of birds, in addition to various reptiles, bugs and butterflies. Furthermore, due to elevation range in a relatively small area (20 360 ha) are found numerous mountain and thermophile species of plants. For instance, 1 200 species of higher plants exists. While the entire southern part of the Poľana Mountain is under influence of warmer climate some thermophile plants occur, whereas in the low lying inversion valleys are present psychrophilic mountain species.

Additionally the area is acknowledged as biosphere reserve without legal establishment and delimitation within the Programme UNESCO Man and Biosphere. The biosphere reserve is not protected area but rather a model area, where protection of natural values is supported by management of the area.

Although *Protected Landscape Area Poľana - the Poľana Biosphere Reserve* is categorized under 2nd level of protection (Protected Landscape Area), 24 smaller protected areas (in total 1 350 ha/6.5% of the area) with more strict regulations (4th level of protection and 5th level of protection) exists.

More information concerning *Protected Landscape Area Poľana - the Poľana Biosphere Reserve* are available in publications of Bublinec and Pichler (2001); Janišová et al. (2004, 2005); Slámová et al. (2015, 2016) among others.



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*Table 76: Proportion of various protected areas in the CSA Podpoľanie (overlaps exists)*

| **Protected areas within Case Study Area Podpoľanie** | **Area** [ha] | **% of CSA** |
|---|---|---|
| Protected Landscape Area (CHKO) | 12 443 | 18.4 |
| Special protection areas (CHVÚ) | 21 687 | 32.1 |
| Special areas of conservation (ÚEV) | 2 082 | 3.1 |
| Small protected areas (MCHÚ) | 898 | 1.3 |
| Total area of CSA | 67 532 | |

*Basics on hunting in CSA*

The *Protected game area of Poľana* is acknowledged and serves as exemplary area for game management and protection of deer population in addition to hoofed game and scarce game. This is based on principles of large-area management having regard to demands of integrated forest management, to principles of nature protection in preserving biodiversity of *Protected Landscape Area Poľana - the Poľana Biosphere Reserve,* to protection and preservation of gene pool of *Poľana's deer* (*Cervus elaphus*), to selective harvest of trophy deer, to research on deer population biology and large beasts, among others. The *Protected game area of Poľana* almost overlaps with the *Protected Landscape Area Poľana - the Poľana Biosphere Reserve.*

According the latest game census in the area exist 459 pieces of red deer game. For the last season of 2014/2015 was planned harvest of 180 pieces according to game plan; however, only 25 pieces were actually caught. The strongest trophy in the hunting season of 2014/2015 had value of 252.2 points CIC (International Council for Game and Wildlife Conservation). Planned harvest of roe deer game was fulfilled by 50% due to high natural loss in the case of doe deer and their offspring caused by large beasts. From planned population of 16 roe buck, only 50% was harvested according to the plan.

Furthermore, in the season of 2014/2015 were caught 71 pieces of boar game, and in the case of large beasts were caught only five wolfs. For bear harvest was not given exception despite the fact that forest worker had been attacked in this season (Nôžka & Rakyta, 2015).

## 34.4 Forest ownership structure and forest management in CSA

In CSA Podpoľanie forest covers over 44%. The ownership structure is grasped in Table 77. Accordingly, the largest forest owner is state with almost 51%. From non-state forest owners the biggest share has communal ownership (over 8%). Private owners own over 2% of forest land and church only 0.05%. Very small part of forest land is in municipal and agricultural cooperatives ownership (Table 77). Forest land whose owners are unknown is managed by the state-owned enterprise *Forests of the SR,* branch plant Kriváň (Table 77 and 78).



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*Table 77: Forest ownership structure in CSA Podpoľanie (% of forest land)*

| | **Area** [ha] | **% of CSA forests** |
|---|---|---|
| **State** | 15 269.1 | 50.8 |
| **Private** | 646.0 | 2.2 |
| **Communal** | 2 496.1 | 8.3 |
| **Church** | 16.8 | 0.05 |
| **Agricultural coopera-tives** | 47.7 | 0.15 |
| **Municipal** | 66.4 | 0.2 |
| **Unknown** | 11 497.9 | 38.3 |

*Source: National Forest Centre – Forest Research Institute Zvolen*

*Table 78: Forests managed according to ownership structure in CSA Podpoľanie (% of forest land)*

| | **Area** [ha] | **% of CSA forests** |
|---|---|---|
| **State** | 22 899.0 | 76.2 |
| **Private** | 1 210.8 | 4.0 |
| **Communal** | 5 790.7 | 19.3 |
| **Agricultural coopera-tives** | 75.7 | 0.3 |
| **Municipal** | 63.9 | 0.2 |

*Source: Cadastral and forest division, District authorities Zvolen, 2016*

*State-owned enterprise Forests of the SR, branch Kriváň*

From the state-owned forest enterprises in Slovakia, the largest one is the state-owned enterprise *Forests of the SR*. Its hierarchical organization consists of three levels: directory in Banská Bystrica, their 23 branches and two specialized branches (*Branch of the Enterprise for Forestry Technology Banská Bystrica* and Branch of the Enterprise- Semenoles Liptovský Hrádok), and almost 137 forest districts. Together, the state-owned enterprise *Forests of the SR* manages 902 00 ha of the forests in Slovakia.

The majority of the CSA Podpoľanie is owned by the state and managed by the state-owned enterprise *Forests of the SR* and its branch *Kriváň* (Table 77 and 78). This is also due to the fact that *Forests of the SR, branch Kriváň* manage also unknown forests- forests still in ongoing restitution process (Table 78). This causes many challenges (e.g., absent investment activities in these forest lands).

The cadastral area of the branch *Kriváň*, distinguished by the variety of fauna and flora practically in all vegetation zones, is approximately 158 000 ha. However, this branch manages only forest land that totals to 52 000 ha. These forests consist of coniferous (29%) and broadleaved (71%) species. One of most significant areas located on the area of the forest enterprise is the *Protected Landscape*



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*Area Poľana - the Poľana Biosphere Reserve* (see Characteristics of protected areas located in CSA). Such natural conditions are also a predisposition for development of game management. In seven hunting reserves of the state-owned enterprise *Forests of the SR, branch Kriváň* is possible feather game as well as deer hunting. Game management is supported by existing network of various hunting cabins. However, the main source of income is the sale of timber. Generally, the annual net income of the state-owned enterprise *Forests of the SR, branch Kriváň* is around 1 million EUR.

The state-owned enterprise *Forests of the SR, branch Kriváň* runs six forest districts and three expedition depots. In 2002, this branch went through organizational changes accompanied by the reduction of the employees. Nowadays the forest work is done mainly via subcontractors.

## 34.5 Non-state forest owners

The non-state forest ownership structure is captured in Table 78. The non-state forest owners associate on national but also on regional level in various associations. The main regional forest owners' association is the *Association of Private and Cooperative Forest Owners in Banska Bystrica County.* This regional organization with legal identity has over 160 members. For instance, ten communal forest communities in Detva District are members of the association. The association provides consulting, legal, technical and service support to its members. It organizes specialized seminars about the actual legislation issues in the field of forestry, hunting and environment.

## 34.6 Current forest policy conflicts and problems

Generally, problems or particular conflicts at national level (Table 67) are mirrored at local level. Particularly, the incoherent objectives of various forestry related policies are the main source of the conflicts.

However, the conflicts between nature conservation and forestry are described as having a low intensity within the CSA Podpoľanie. Especially the governmental actors in CSA Podpoľanie (Appendix 41) try to find common language and seek cooperation in problem solving related to policy incoherency. More precisely, the professional cooperation between the state-owned enterprise *Forests of the SR, branch Kriváň* and *Protected Landscape Area Poľana - the Poľana Biosphere Reserve* could be used as an example in nowadays tensions between forestry and nature protection. Yet, this cooperation is identified to be rather exclusive in Slovakia. The reason behind is attributed to the relatively small size of protected areas, professional experience of workers in this sector and especially to their will to cooperate (human factor) to overcome the legislation chaos among others.

Regardless of this progress, certain environmental non-governmental organizations enter or try to influence the ongoing cooperation by following their particular goals (e.g., game management versus game protection in respect to big beasts, intervention in cultural services development, intervention in forest management plan elaboration processes, interference in forest management in the case of calamities in protected areas).



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Other problems related CSA are mainly result of (1) fragmented ownership structure (both, forest and land ownership), and/or (2) decreasing quality of various practices. These practices concern forest management (e.g., quality of forest management plan, quality of subcontractor's technology), climate change related risks (e.g., absent plans on how to deal with climate changes– problems related to beech), or risks concerning possible determination of agricultural or forest management activities, among others.

### 34.7 Instruments and legal competences in CSA *Podpoľanie* forest politics

No differences to national level (Table 69).

## 35. Actor analysis: CSA *Podpoľanie*

The key (forestry related) governmental, civil society & market actors are identified according to the snowball system in combination of information obtained from previous studies done on Podpoľanie (e.g., INTEGRAL project) or a web search. Important actors in the CSA Podpoľanie are forest and nature conservation authorities, forest owning municipalities, small-scale forest owners, a few large-scale forest owners, various regional or local associations, non-governmental organizations, recreationists who use forests for biking or hiking, hunters, or few timber processing companies (Appendix 41).

The state-owned enterprise *Forests of the SR, branch Kriváň* is the most important forestry player in the CSA Podpoľanie. Manages almost 23 000 ha of forest land in the CSA, which is almost 76% forest land of the whole CSA. Non-state forest owners or their legal entities manage about 7 100 ha (24% of forest land in CSA Podpoľanie). Many of them are active members of regional forestry owner association- *Association of Private and Cooperative Forest Owners in Banska Bystrica County*.

The agricultural sector in the CSA is represented via local agricultural cooperatives or individual farmers, which are very active in cultivation and stock breeding activities. Due to their activities they have immediate contact with forest managers, hunting associations or actors representing nature protection. In order to voice their interest, they form various associations, or unions among others (see Agriculture related actors). These associations are also presented in the CSA via their local work stations (e.g., Slovak Agriculture and Food Chamber in Zvolen and Lučenec).

### 35.1 Interest of actors: CSA *Podpoľanie*

An assessment of interest of actors is thus based on their forest use and advocated positions up to present. In order to assess these interests in Slovakia (in CSA Podpoľanie) two steps are conducted: identification of the main actors, and valuation of actors' forest use and advocated positions. This is accomplished via desktop research and data collection (primary and secondary data). Primary data



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are collected with the help of focus group and in-person interviews with purposefully selected stakeholders and experts. As a source of secondary data are used also results of INTEGRAL project (e.g., Navrátil et al., 2013; Tuček et al., 2015; Brodrechtova et al., 2016; Navrátil et al., 2016).

At case study level two groups of actors are formed: (1) market & civil society actors, and (2) governmental actors (Appendix 41). The first group consists of various organizations, associations, or businesses representing forestry, timber processing industry, tourism, agriculture, environmental, nature, and landscape conservation in CSA Podpoľanie. These actors are grouped and characterized by their common interests (e.g., in forestry, timber processing, tourism, water). In contrast, the second group is made up of governmental actors representing Slovak government, and organizations in their jurisdiction and located in CSA Podpoľanie.

Interests and preferences for ecosystem services of selected actor groups in Slovakia in CSA Podpoľanie are assessed with the help of actor-centered power approach (*in sensu* Hubo & Krott, 2015) (Table 79). Mainly actors representing forestry and wood industry in CSA Podpoľanie are interested in provisioning ecosystem services as timber production is their main source of income.

*Table 79: Interests of selected actor groups in Slovakia (CSA Podpoľanie) in ecosystem services*

| Ecosystem services\ Actors & their areas of interests | **Forestry** | **Forestry** - governental | **Timber trade, processing** | **Recreation, tourism** | **Hunting, fishing** | **Water** | **Nature, environment NGOs** | **Nature, Environment** – governmental | **Agriculture** |
|---|---|---|---|---|---|---|---|---|---|
| ***Provisioning ES*** | | | | | | | | | |
| Wood provision | +++ | +++ | +++ | 0 | 0 | 0 | 0 | + | 0 |
| Game provision | + | +++ | 0 | + | +++ | 0 | 0 | + | 0 |
| Other (e.g., mushrooms, berries) | + | ++ | 0 | +++ | ++ | 0 | ++ | ++ | 0 |
| ***Supporting ES*** | | | | | | | | | |
| Biodiversity | ++ | +++ | 0 | + | +++ | + | +++ | +++ | 0 |
| Habitats | + | ++ | 0 | + | +++ | + | +++ | +++ | + |
| ***Regulating ES*** | | | | | | | | | |
| Carbon sequestration | 0 | ++ | 0 | 0 | 0 | 0 | ++ | +++ | 0 |
| Climate regulation | + | ++ | 0 | + | + | + | ++ | +++ | + |
| Water quality | ++ | ++ | 0 | ++ | +++ | +++ | ++ | +++ | + |
| Pest control | ++ | ++ | + | + | +++ | ++ | ++ | +++ | ++ |
| ***Cultural ES*** | | | | | | | | | |
| Outdoor recreation | + | + | 0 | +++ | ++ | 0 | ++ | +++ | 0 |
| Aesthetics | + | + | 0 | +++ | + | 0 | ++ | +++ | + |
| Tourism | 0 | + | 0 | +++ | + | 0 | ++ | +++ | 0 |

*Note: Low impact + Medium impact ++ Strong impact +++ 0 some strength*



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## 35.2 Power of actors: CSA *Podpoľanie*

Power is defined as *"capability of an actor to influence other actors"* (Krott et al., 2014: 35). Based on the actor-centered power approach (Krott et al., 2014) the assessment of power is based on the criteria coercion, incentives, and dominant information sources. Thus, the observable facts are linked to obvious action, threat of action, and sources of action that could be possible sources of power. Additionally, these power elements (**coercion, incentives, dominant information**) could be attributed to one actor or distributed among number of actors (Krott et al., 2014).

Following the actor-centered power approach, for each actor group it has been evaluated if power resources have a strong impact (+++), a medium impact (++), or a low impact (+) on forest management (Hubo & Krott 2015). Overview of power resources of different interests on forest politics and thus also on forest management in Slovakia in CSA Podpoľanie is provided in Table 80.

The governmental actors interested in forestry, hunting/fishing, and nature/environment have the highest impact on forest politics and thus also on forest management in CSA. This is mainly due to fact that these actors not only enforce formal rules but also physically implement them (in forest) on daily basis.

Additionally, the forest owners and managers have also highest power resources to exercise their power concerning forest management. This is based on their private property rights on forests and the legal competence to council forest management of state and non-state forest owners or their legal entities.

Nevertheless, their power in CSA Podpoľanie concerning forest politics is relatively low. Thus, the results need to be interpreted with some caution and power related to forest management and to forest politics needs to be distinguished.

*Table 80: Overview about power resources of different interests on forest politics, especially forest management in CSA Podpoľanie*

| Actor's interests | Power resources | | | |
|---|---|---|---|---|
| | Means of coercion | Incentives | Dominant information | Power resources of the interest |
| Forestry | +++ | ++ | 0 | Strong |
| Forestry (Governmental) | +++ | +++ | + | Strong |
| Timber processing | 0 | + | 0 | Low |
| Recreation, tourism | 0 | + | 0 | Low |
| Hunting, fishing | +++ | + | ++ | Medium |
| Water | + | + | + | Low |
| Nature, environment - NGOs | ++ | ++ | ++ | Medium |
| Nature, environment - Governmental | +++ | +++ | ++ | Strong |
| Businesses | 0 | ++ | 0 | Medium |
| Agriculture | + | 0 | 0 | Low |

*Note: Low impact + Medium impact ++ Strong impact +++ 0 some strength*



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Actors interested in forests or nature protection are also the most powerful to impact the forest management within the CSA Podpoľanie. The reasoning behind this is twofold. Firstly, this is attributed to the private property rights on forests in the case of forest owners. Secondly, it is attributed to the legal competence of forestry authorities to council forest management of state and non-state forest owners or their legal entities (Table 80). Additionally, also nature conservation authorities have some legal competence concerning the forests.

Nevertheless, the power of actors interested in forests or nature protection in CSA Podpoľanie concerning forest politics is relatively low. Thus, the results need to be interpreted with some caution and power resources related to forest management and to forest politics need to be differentiated.

Generally, also other actors interested in nature (non-governmental), in timber processing, in water, or in agriculture possess various power resources of interests in different ecosystem services in CSA Podpoľanie, which are rather weaker in comparison to above groups' power resources.

*Table 81: Overview about power resources of interests in different ecosystem services in CSA Podpoľanie*

| **Interest in ecosystem services:** | **0verall power resources** | **Means of coercion** | **Incentives** | **Dominant information** |
|---|---|---|---|---|
| ***Provisioning services*** | | | | |
| Wood | **Strong** | **+++** | **++** | **+** |
| Game | **Medium** | **+++** | **+** | **+** |
| Other (e.g., mushrooms, berries) | **Medium** | **+** | **++** | **+** |
| ***Supporting services*** | | | | |
| Biodiversity | **Strong** | **+++** | **+** | **++** |
| Habitat for species | **Medium** | **+++** | **+** | **+** |
| ***Regulating services*** | | | | |
| Carbon sequestration | **Low** | **0** | **0** | **+** |
| Climate regulation | **Medium** | **++** | **++** | **+** |
| Water quality | **Strong** | **+++** | **0** | **++** |
| Pest control | **Strong** | **+++** | **++** | **+** |
| ***Cultural services*** | | | | |
| Outdoor recreation | **Low** | **0** | **++** | **++** |
| Aesthetic values | **Low** | **0** | **+** | **+** |
| Tourism | **Medium** | **+** | **++** | **++** |

*Note: Low impact + Medium impact ++ Strong impact +++ 0 some strength*

The strongest power resources to impact forest management in CSA Podpoľanie have only forest owners/managers and governmental actors. However, non-governmental actors, especially environmental are trying to have impact on forest management (e.g., media, public activities) (Table 82). In summary, considering forest management the power of forestry related actors is relatively strong.



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At the level of CSA Podpoľanie the power of various actors concerning forest politics is relatively low. Thus, the results need be interpreted with caution.

*Table 82: Overview of power resources of different actor groups in CSA Podpoľanie*

| | Means of coercion | Incentives | Dominant information | |
|---|---|---|---|---|
| **Market & civil society actors** | **+++** | **++** | **++** | **Strong** |
| **Businesses** | **+** | **+** | **+** | **Low** |
| **Governmental actors** | **+++** | **+++** | **++** | **Strong** |

*Note: Low impact + Medium impact ++ Strong impact +++ 0 some strength*

## 36. Conclusions

The main goal of the WP4 research is to assess actor's power as driving force in forestry. Power is usually defined as the capability of an actor to affect other actor or actors. If someone can better understand what power is and how it could be manipulated, various ways to deal with it could be found.

As a first step, it is important to identify key actors and their link to power. Subsequently, the identified actors at national and CSA Podpoľanie level are split into two groups of actors: (1) market & civil society actors, and (2) governmental actors. First group consists of various organizations, associations, and businesses representing forestry, timber processing industry, tourism, agriculture, environment and nature, and landscape conservation among others. These actors are grouped and characterized by their common interests (e.g., in forestry, timber processing, tourism, water). In contrast, the second group is made up of governmental actors representing Slovak government and organizations in their jurisdiction at national and CSA Podpoľanie level. The main conflicts among these actors are predominantly result of inconsistent objectives of forestry related policies (e.g., forestry, nature protection, water, energy from renewable resources, agriculture). Such "legislation chaos" is fertile land for various actors to benefit from resulting conflicts. Furthermore, conflicts exist also because of struggle between industrial and energetic wood use, differences between forest owners' wants and general societal demands, available financial resources, among others.

Generally, the power concerning forest politics and/or forest management at national level is split among actors from and outside forestry arena. Governmental actors interested in forestry, hunting/fishing, and nature/environment have the highest and formal impact on forest politics and thus also on forest management. This is mainly due to fact that these actors directly impact and form formal rules such as legally binding laws or soft instruments. From outside the forestry arena, the forest politics is also strongly formally or informally influenced by an agriculture related actors. In comparison to forestry sector, for instance agriculture sector attracts more attention in terms of financial or not-financial incentives within politics and via various policies. Similar attention is given to energy sector, especially in the case of production of energy from renewable resources. Furthermore, the governmental actors and even in some cases also (environmental) non-governmental actors are influenced by businesses rather than politics. The power is increasingly being taken by businesses, which either formally (e.g., associations, non-governmental organizations) or informally influence forest politics and thus also forest management related matters. In the latter case, the government



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in their decision-making considers their interests in exchange of funding of political parties among others.

Actors at national level interested in forestry and recreation/tourism represented via various associations and organizations have rather low impact on forest politics. For instance, although associations of non-state forest owners try to have effect (e.g., participating in forest policy formulation processes), their negotiation position is weak. In contrast, actors representing nature/environment via various (environmental) non-governmental organizations exercise medium power in forest politics in Slovakia. Their power at the national level is mainly based on unverified information, which is spread within lobbying processes, in public relations, contribution to research projects and general participation in the public discourse (e.g., media). Actors interested in timber processing, water and production of energy from renewable resources associated in various associations or organizations have also medium impact on forest politics. They use mainly lobbying processes and sometimes participate in the public discourse to exercise their power at the national level.

The power of the actors in CSA Podpoľanie concerning forest politics is relatively low. Various reasons behind it are identified. Firstly, as for Slovakia also for CSA Podpoľanie is typical forest owners' fragmented ownership structure. Fragmented ownership structure, reinforced by existence of many small-scale forest owners or unknown owners, causes many problems and demands. Especially small-scale forest owners are predominantly interested in fuel-wood from their forests. The forest owners organized in commons are interested in regularly receiving their dividends. If their wants are fulfilled then they are not concerned with solving problems related to forestry sector or forest policy. Secondly, many owners who do not have expertise in forestry or who live in the cities are often detached from their forest land. There are mostly interested in financial benefits associated with forest ownership. Thirdly, many forest owners are not formally organized. More precisely, not all non-state forest owners are associated in associations or unions that could represent their interests and demands at national level in organized manner. Finally, similarly to national level also in CSA Podpoľanie are active actors representing agricultural sector or actors at local level representing (national or international) businesses that could possess various power resources in respect to forest policy. As a consequence, the power of non-state forest owners in forest politics is relatively low.

In contrast, especially the power of forestry related actors (forest owners or their legal entities, governmental actors) in the CSA Podpoľanie concerning forest management is rather strong. This is due to their private property rights on forests and the legal competence of forestry authorities to perform, organize and oversee the forest management. Additionally governmental actors interested in nature protection and conservation are relevant, but are less powerful concerning the forest management CSA Podpoľanie. Nevertheless, the governmental actors seek dialog and balanced cooperation with various forest owners or their legal entities. In contrast, environmental non-governmental actors in general and in CSA Podpoľanie particularly not always agree with the cooperation results or forest management practices among others. Thus, their activities often sabotage cooperation between forestry and nature protection, and are rather contra productive not only for forest owners but also environmental governmental actors (e.g., cultural services development). Environmental governmental actors in CSA Podpoľanie would in actuality also welcome improvement in quality of forest management plans and forest management that was formerly common. Moreover, the symbiosis between forestry and agriculture that also existed in the past is necessary in order to protect the traditional way of living and forest management in CSA Podpoľanie.



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The timber processing companies, hunting associations, water associations, and recreationalists have also some impact on forest management in the CSA Podpoľanie. These actors have different preferences for forest management practices, favoring various ecosystem functions.

As interviews at national and CSA Podpoľanie level are still ongoing (January, February), we expect even more insights from forestry and outside forestry arena concerning identification of key actors, their interests and especially use of their power resources in forest politics and forest management.



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# Sweden- Case study Kronoberg County

Isak Lodin

*Summary*

- In Sweden the forest sector has been, and still is, a sector of big economic importance, contributing with 11 % of the export value and being an important source of employment. Forest management is oriented towards producing conifer timber and pulpwood for domestic industrial use. Since the 1950s clear cutting has been the totally dominant FMM.

- The current forest policy orientation was established in 1993, after a major revision of the forest act. It stipulates that production goals and environmental goals are equally important and policy implementation is characterised by soft policy tools rather than strict regulation. The policy shift in 1993 implied that the government lost their possibility to enforce production-oriented forest management ideals through coercion. Simultaneously, the stronger emphasis on environmental issues has increased the power resources of governmental actors in nature conservation. In short, the national forest policy is characterised by the balancing act between different forest functions, where wood production and nature conservation are most important. The SFA and CAB are the governmental agencies in charge of implementing these policies. Overall, they have medium power resources.

- Market actors interested in wood production constitutes the most dominant interest group at both national and case study level. The current forest policy characterised by the principle "Freedom with responsibility" enable them to utilise their power resources to promote production-oriented ideals upon forest owners in the local setting. The internal composition of this group deviates between different regions. In Kronoberg County, the industrialised forest owner organisation Södra constitutes the most important market actor.

- Civil society actors can overall be regarded as the weakest actor group. They often lack the power resources to influence forest management in the local setting where forest management is conducted in practice. Instead they are mainly confined to the national level where they try to promote their interests in the policy making process. However, there are large differences between different interest groups. Environmental NGOs are powerful at the national level and have been successful in their efforts to protect areas of high conservation value in the case study area.

- Most conflicts in the Swedish forest sector are results of wood production interests that collide with other interests.

- Hunting has long tradition in the Swedish culture, and is especially popular among private forest owners and professional foresters. However, especially in southern Sweden the high populations of ungulates is problematic for forest management, causing large damages and making forest owners reluctant to reforest with the preferred forage species.



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## 37. Sweden general overview

Sweden is largely forested country with a forest cover of 69 % (SLU, 2016). The two native conifers, Scots pine and Norway spruce, dominate the forest in both southern and northern Sweden, along with a substantial proportion of birch. Scots pine is more dominant in northern Sweden whereas Norway spruce dominates in the south. Southern Sweden is situated in a transition zone towards a temperate climate and thus hosts a wider range of broadleaved species (e.g. oak, beech, ash and lime). The large amplitude in latitude implies that the site productivity, and thus the conditions for forestry show big regional differences. For example, the average site productivity is 11.2 $m^3$/ha/year in the most southern county (Skåne) compared with 2.9 $m^3$/ha/year in the most northern one (Norrbotten).

Sweden is among the leaders on the global wood-market, being the third biggest exporter of sawn and planed soft wood (conifers) and the fifth biggest exporter of pulp and paper/paperboard (SFA, 2014). The industry is heavily oriented towards the native conifers (spruce and pine), that constitute 89 % of the annual consumption of industrial round wood. Forest management has up until present been oriented towards supplying the forest industry with raw material and the dominant forest management model (FMM) since the 1950s has been the clearcutting system, oriented towards establishing conifer monocultures. Compared with many other European countries Swedish forest management puts greater emphasis on economic aspects, and profitability has been included as a guiding principle in the Forest Act since 1948 (Brukas and Weber, 2009; Ekelund and Hamilton, 2001).

The ownership structure for the entire country is shown in Table 83, but there are large regional differences. Non-industrial private forest ownership dominates in southern Sweden whereas forestland controlled by the state (e.g. Sveaskog) and private forest companies is concentrated to middle and northern Sweden.

*Table 83: The ownership structure of Sweden's forests. Proportion of productive forestland owned by the public (mainly Sveaskog but also other state forests and municipalities), non-industrial private forest owners, private forest companies and others*

| Category | % of productive forestland |
|---|---|
| Public | 19 |
| Non-industrial private forest owners | 50 |
| Private forest companies | 25 |
| Others | 6 |

Source: SFA, 2014

### 37.1 Instruments and legal competencies in Swedish forest policy

The legislation of major importance for forest management is the Forest Act, which stipulates legal requirements in the practical management. In addition, the Environmental Code deals with the creation and management of protected areas, threatened species and some special activities related to



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forestry (e.g. ditching). The Swedish forest agency (hereafter SFA) is the main public body in charge of implementing the forest policy stipulated by the parliament. Country Administrative Boards (CABs), mandated through the Swedish Environmental Protection Agency (SEPA), are involved in some forest related topics that are regulated in the Environmental Code (e.g. ditching, nature reserves), as well as other policy fields that indirectly influence forest management (e.g. hunting). Finally, Sweden has generous public rights of access (Allemansrätten). Being mainly based on customary right it gives the public free rights to enter any forest for recreational purposes.

The current forest policy orientation often referred to as the Swedish forestry model was put into place in 1993 after a major revision of the Swedish Forestry Act (Beland Lindahl et al. 2015). The revision was characterised by two major changes in the overall forest policy. Firstly, stimulated by the conference in Rio in 1992 and domestic tension with environmental interests the highly production-focused policies of the 1980s were abandoned. The production objective was complemented with an environmental objective that should be regarded as equally important (Appelstand, 2012). Secondly, subsidies and detailed regulations were abandoned in favour of "softer" means of steering, guided by the core principle "Freedom with responsibility". This implies that the current forest policy is implemented through a framework regulation, complemented with soft policy instruments such as information, advice and education. In practice this implies that forest owners have a large freedom in the management of their forests.

The principle "Freedom with responsibility" is tightly connected to a strong sectoral responsibility (Appelstrand, 2012, Beland Lindahl et al., 2015), were the SFA together with the forestry actors are supposed to promote forest management practices that exceed the threshold in the Forestry act i.e. beyond compliance outcomes. In line with the sectoral responsibility, dialogue between the SFA and major forest related actors is seen crucial to achieve policy objectives. This dialogue has been institutionalised in the National Sectorial Advisory Board, where 20 organisations representing different interests meet four times a year to discuss overall policy issues with the Director General of the SFA. There also exist advisory boards addressing more specific areas, as well as advisory boards on regional level.

There are however some subsidies and "hard law" elements remaining in the current policies, reflecting areas of special concern. The importance of a sustained yield of timber at national level is reflected in strict regulations regarding the minimum age of final felling and the obligation to reforest after the final felling (SFA, 2016a). Environmental concerns are reflected in the obligation to retain trees and other structures for nature conservation purposes at final felling. In addition, there are subsidies available to support active nature conservation measures that partly are financed by the Rural Development Program of the European Union. Finally, on areas dominated by noble broadleaves[12] it is mandatory to regenerate with these species after the final felling. Since these species are expensive to establish, the regulation is complemented with a system of subsidies.

[12] Noble broadleaves includes the following species or native species groups: Elm (*Ulmus* spp.), Lime (*Tilia Cordata*), Ash (*Fraxinus excelsior*), Hornbeam (*Carpinus Betulus*), Beech (*Fagus sylvatica*), Oak (*Quercus* spp.), Cherry (*Prunus avium*) and Norway maple (*Acer platanoides*).



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Beyond the national forest policy there is also a parallel process of governance through voluntary certification standards. In 1997, the first Swedish FSC (Forest Stewardship Council) standard emerged, after a process of negotiations between the forest industry, environmental NGOs and other stakeholders (Johansson et al. 2012). In 2000 a competing standard named PEFC (Programe for the endorsement of forest certification Schemes) was adopted, initiated by the forest owner associations. Today both these standards are widespread in Sweden, with 12 and 11.5 million hectares certified according to FSC and PEFC respectively. These standards have environmental considerations that go beyond the stipulations in the forest act (Brukas et al., 2013), the most prominent being the requirement to set aside >5 % of the productive forestland for nature conservation purposes (FSC, 2010; PEFC, 2012). The FSC standard has stricter requirements than PEFC, reflecting a representation of environmental interests among the members.

In 1999 the Swedish parliament adopted 16 Environmental Quality Objectives to be met by 2020, one of them "Levande Skogar" was focused on forests (SEPA, 2016). The goals are complemented with indicators and interim targets and the SFA is the main authority in charge. One important measure to reach these targets is to expand the forest area formally set-aside from timber production. The task of creating protected areas is shared among the SFA and the CABs. The former are in charge of nature conservation agreements and habitat protection and the later for the creation of nature reserves. Forest owners that lose the authority of their forest due to formal protection need to be economically compensated (SFA, 2016a). This implies that increasing the share of protected forest is a slow process that is restricted by budgetary constraints. Currently approximately 4 % of the productive forestland is formally protected (SFA, 2014).

A hot topic in forest policy is the ongoing work within the National Forest Program, which was initiated after a decision by the government in 2014 (Johansson, 2016). By providing a forum for dialog among major stakeholders, it aims to foster collaboration and consensus making, thereby resolving conflicts and provide suggestions that will increase the sustainability of the Swedish forest sector. The program has a program board with 20 major stakeholders and four thematic working groups with stakeholder participation. As this is a recent initiative, it is too early to say what its impact on forest policy would be. According to the assessment of the initial phases of the National Forest Programme (Johansson, 2016), there is a risk that the program would reiterate the established power (im)balances thus having a limited value as a tool to increase the transparency of participatory processes in Swedish forest policy.

Finally, the shift to softer means of steering, decentralization and the emergence of market based instruments that's taken place in Swedish forest policy over the last decades are expressions of a larger global trend in forest policy (Agrawal et al., 2008), often labelled the move from government to governance (Appelstrand, 2012). Regarding its content a recent analysis labelled the Swedish forestry model as the "more of everything pathway" to address sustainability challenges (Beland Lindahl et al., 2015). Since the inclusion of the environmental objective in the Forest Act in 1993 new objectives and concepts have emerged to address upcoming challenges (e.g. climate change, bio-economy, ecosystem services). However, in practical implementation the deeply rooted production orientation that promotes the economic aspects of forest management still prevails.



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### 37.2 Conflicts in forest management

The major conflicts that exist in forest management in Sweden can be categorized according to the six broad categories (Table 84). Almost exclusively, they concern areas where the strong emphasis on wood production in the Swedish forest sector creates tension with other interests groups.

*Table 84: Areas of conflict at the national level*

| |
|---|
| Production vs Environmental interest |
| Production vs The Sami |
| Climate change mitigation strategies |
| Production vs Hunting |
| Production vs Social values |
| Production vs Cultural Heritage |

## 38. Actor Analysis: Sweden, national level

Many different actors have a stake in the forest policy process in Sweden and how forest management is conducted in practice. To make a proper analysis feasible it is necessary to focus on the most important stakeholders. This report therefore spotlights the major actors participating in the national sectorial advisory board and the program board in the ongoing National Forest program.

To enable triangulation, the analysis of actors' interests and power resources was based in a multitude of sources. The organizations' webpages were scrutinized for forest related policies and statements. The management methods of the actors involved in practical forestry were assessed based on the author's expert knowledge of the Swedish forestry. The analysis also relied on a report from INTEGRAL (Edwards et al., 2013), as well as peer-reviewed papers that have mapped the interests of individual actors and coalitions (Hysing and Olsson, 2008, Beland Lindahl and Westerholm, 2012; Beland Lindahl, 2015; Sanström et al., 2016, Stens et al., 2016). Comments from individual actors and/or lobby groups regarding preliminary proposals for forestry legislation have been used as a complement. The assessment of the interests of public authorities in charge of implementing national policies was based on a recent analysis of the Swedish forestry model (Beland Lindahl et al., 2015). Finally, the analysis of power resources relied heavily upon all references provided in section 37.1.

### 38.1 Interests of actors

Interests are understood as being *"based on action orientation, adhered to by individuals or groups, and they designate the benefits the individual or group can receive from a certain object, such as a forest"* (Krott 2005). The assessment of interests is based the actor's forest use and advocated positions up to present.



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The forest sector in Sweden has for long time been characterized by conflicts between production (wood provisioning) and environmental interests. Actors interested in wood provision are found in various sectors, unified by the fact that they all benefit from the harvest of wood. This includes the private forest owners (represented on the political arena by the forest owner federation LRF Skogsägarna; also around half of forest owners belong to powerful forest owner associations), industrial actors with/without their own forestland (organized through the Swedish Forest Industries Federation), the state forest company Sveaskog, the church, forest entrepreneurs (organized through the Swedish Association of Forestry Contractors) and employees in the forest industry (organized through the labor union GS). The main environmental NGOs are the World Wide Fund (WWF) and the Swedish Society for Nature Conservation (SSNC). The main conflicts that still prevail, concern forest protection and forest management methods. The environmental interests promote increased level of forest protection and changed management methods (e.g. continuous cover forestry (CCF), prolonged rotations, no or less exotic trees, better conservation measures at final felling), whereas the actors interested in wood production want to retain the status quo (i.e. the Swedish forestry model that promotes the economic aspects of forest management).

However, the picture is not black and white and there are some nuances in this long-standing conflict. Firstly, the private forest owner organisations that overall promote profit oriented forest management methods, only organize half of the area owned by private forest owners (SFA, 2014, p. 37). Earlier studies have also shown that private forest owners are not solely driven by a desire to yield profits from wood production (Hugosson and Ingemarson, 2004; Ingemarson et al., 2006). Secondly, the state forest company Sveaskog has a nature conservation policy with a higher ambition than the certification standard, reflecting the influence of steering by the government. Finally, through their participation in the Swedish FSC, WWF have taken a more pragmatic pathway, providing legitimacy to the Swedish forest sector in exchange for a higher level of ambition in nature conservation among certified owners and companies.

Climate change has emerged as a hot topic during recent decades. Both production and environmental interests use “climate arguments”, but frame them in line with their underlying interests. Actors interested in wood production stress that forest need to be managed actively and harvested, thereby mitigating climate change through substitution and carbon sequestration in wood based products (i.e. climate is primary an “instrumental” interests, used as a strategy to frame forestry as environmentally friendly). In contrast, although the SSNC sees wood as an important renewable resource they do not agree that climate change can be used to legitimize a production-oriented forestry. Their standpoint is grounded in the belief that it is important to consider the “natural borders of nature” and that consumption needs to be reduced (e.g. increasing the availability of bioenergy by reducing the consumption of paper). Instead, they put greater emphasis on changed forest management methods (e.g. prolonged rotations, forest protection) as tools to mitigate climate change through increased carbon sequestration in the forest.

Besides the two dominant interest groups, there are several other stakeholders with specific interest in ecosystem services provided by forests. The Sami people breed reindeer in the forests of northern Sweden. The availability of ground and tree lichens for the reindeers during the winter is crucial for the sustainability of their traditional lifestyle. Many of the widely adopted forest management practices in northern Sweden negatively influence the availability of forage for the reindeers. The main Sami lobby group (National Association of Swedish Sami) therefore advocate for such management



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practices as: reduced scarification and fertilisation, no plantation of *Pinus contorta* (widely used exotic species in northern Sweden), reduced stand density through more intensive pre-commercial/commercial thinning and continuous cover forestry.

In Sweden hunting is widespread and has very long traditions. The high population of browsers (especially moose) in many parts of Sweden is problematic for many of the actors involved in forest management and they therefore stress that populations need to be better adapted to reduce the level of damage (i.e. reducing populations through increased hunting). The major hunting NGO (the Swedish Hunting Organisation) gathers 2/3 of the 300,000 hunters in Sweden. They are interested in maintaining high populations of ungulates, and stress that the amount of damage also reflects the fact that current forest management practices are poor in creating available forage. They therefore advocate increased utilization of management techniques that increase the availability of forage (e.g. changes in pre-commercial thinning technique, increased reforestation with pine, production of forage along forest roads, increased use of CCF).

The interests in cultural services are mainly found among lobby groups (Swedish Outdoor Life, Swedish Outdoor Association) gathering civil society actors involved in recreation and tourism. Their main interest related to forests is to safeguard the generous public access rights (Allemansrätten). However, they also advocate for an increased consideration to the "social values" of forests. This includes an increased use of forest zoning, thereby adapting the management practices to the increased recreation pressure around cities (i.e. urban forestry). They also advocate for an increased diversity of forest management practices, such as an increased use of CCF, and a better consideration to recreational facilities when planning and conducting management activities. Up until recently the forest debate was almost exclusively centred around different environmental issues. However, in 2012, spurred by a series of articles in one of the biggest national wide newspapers (Dagens Nyheter) the social dimension of forest, as well as its relation to forest management and nature conservation was brought up on the agenda. This triggered a big debate among forest related actors and a subsequent investigation initiated by the government. Finally, one civil society lobby group (Swedish Cultural Heritage Federation) organise 2050 local organisations involved in different activities related to cultural heritage. Their main interests in forestry is to safe-guard that historical and cultural remnants not are destroyed in forest operations, which recently has been highlighted as a major problem. They therefore advocate for better planning and increased consideration to cultural remnants.

The interest of governmental organisations in ecosystem services is an expression of the overall forest policy orientation. In the Forest Act, wood production and environmental consideration are weighted as equally important. There is also an interest in other ecosystem services but they are treated as secondary to production and nature conservation objectives. Recently wood was labelled as an important renewable resource in the Forest Act, which is based on national policies that emphasise the import role of active forestry in mitigation climate change (i.e. it supports substitution rather than sequestration in the forest).

To summarize, the Swedish forestry is characterised by conflicts between actors emphasising wood production and those actors interested in other ecosystem services. Many of the actors with interests other than wood production share similar ideas on how forest management need to be modified to fulfil their primary interests. This overlap implies that there is some room for collaboration, and especially environmental NGOs nowadays argue for increased consideration of cultural ES.



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Finally, I will just add a remark regarding the interpretation of table 85 (based on the instructions that we got in Göttingen). The interpretation of **(+)** (interests in the ecosystem service) and **(0)** (no interests in the ecosystem service) is straightforward. However, the interpretation of **(–)** is a bit more complex. This can indicate that an actor group want to have less of an ecosystem service (**Type 1**), or alternatively, that the activities of the actor group have a negative impact on the ecosystem service (**Type 2**). An example, most of the minuses for the actor groups "forest management" and "timber industries" reflect that the current production oriented forestry has a negative impact on other forest function (**Type 2**). However the double minus for game provisioning indicate that want to reduce the population of ungulates (**Type 1**).

*Table 85: Interests in ecosystem services of selected actor groups (national level). Forest management and Timber industries largely overlap due to the involvement of industrial actors in practical forest management.*

| | **Forest management** (forest owner organizations, forestry companies, the church) | **Timber industries** (sawmills, paper mills) | **NGOs representing employment in forests** (labor unions, forest entrepreneurs) | **Outdoor recreation and tourism NGOs** | **Hunting NGOs** | **Sami NGOs** | **Environmental NGOs** | **Cultural Heritage NGOs** | **Governmental Organizations*** |
|---|---|---|---|---|---|---|---|---|---|
| *Provisioning ES* | | | | | | | | | |
| Wood provision | +++ | +++ | +++ | 0 | 0 | 0 | + | 0 | +++ |
| Game provision | -- | -- | 0 | ++ | +++ | ++ | 0 | 0 | + |
| Reindeer forage | - | - | 0 | + | 0 | +++ | + | 0 | + |
| *Supporting ES* | | | | | | | | | |
| Biodiversity | -- | -- | 0 | + | + | + | +++ | 0 | +++ |
| Habitats | -- | -- | 0 | + | + | + | +++ | 0 | +++ |
| *Regulating ES* | | | | | | | | | |
| Carbon Sequestration (forest) | -- | -- | -- | 0 | 0 | 0 | +++ | 0 | 0 |
| $C0^2$ substitution | + | + | + | 0 | 0 | 0 | + | 0 | ++ |
| Water quality | 0 | 0 | 0 | + | 0 | 0 | ++ | 0 | ++ |
| Pest control | +++ | +++ | 0 | 0 | 0 | 0 | 0 | 0 | +++ |
| *Cultural ES* | | | | | | | | | |
| Outdoor recreation | - | - | 0 | +++ | ++ | 0 | + | + | + |
| Aesthetics | - | - | 0 | +++ | + | 0 | + | + | + |
| Tourism | - | - | 0 | +++ | + | + | + | + | + |
| Cultural heritage | -- | -- | 0 | ++ | 0 | ++ | + | +++ | + |

*Interests expressed in the overall forest policy, implemented by SFA and CAB.



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## 38.2 Power of actors

Power is defined as "*capability of an actor to influence other actors*" (Krott et al. 2014, p.35). Based on the actor-centred power approach (Krott et al. 2014) the assessment of power is based on to which degree actors through coercion, incentives, and dominant information sources have an impact on forest management.

Coercion is defined as altering behaviour with force, including the threat of force and even bluffing about force that does not really exist.

Incentives are defined as altering behaviour with advantages or disadvantages. Material and immaterial (dis)incentives can be distinguished. Material incentives are money and also all technical sources, e.g. machines, plants, food or support in labour. Immaterial incentives offer social or psychological advantages, e.g. social conventions, morals.

Dominant information sources are defined as altering behaviour by supplying unverified information trusted by the subordinate, e.g. within ideologies or based on superior expert knowledge.

Even though the environmental and production objectives in theory should be equally important, the interest of wood production is more powerful in shaping forest management in practice. The core principles "freedom with responsibility" and "sectoral responsibility" gives industrial actors (companies or forest owner associations) a great deal of influence in shaping forest management by providing incentives (e.g. buy timber, entrepreneurs to conduct forestry measures, price premiums through certification) and information (e.g. forest management plans, advice and recommendations). Hence despite the fact that half of the forest area in Sweden is owned by small-scale private forest owners, that overall are not dependent on incomes from harvesting to support their livelihood, the annual harvest ratio (harvest/increment) in Sweden is approximately 80 %. This implies that the lack of strict policies obligating forest owners to harvest is substituted for by effective steering through market forces (the only strict policies directly favouring wood production is the obligatory reforestation after the final felling). The two major lobby groups interested in wood production, i.e. representing the private forest owners (LRF skogsägarna) and the forest industry (Swedish Forest Industries Federation), are powerful in the forest policy process on the national level. This is not surprising considering the current strong ownership rights and the importance of wood as a national export commodity (11 % of the export value) and source of employment. The SFA with their more balanced views regarding the trade-offs between wood production and other interests are also involved in consulting private forest owners. However, they have problems to compete with the industrial actors due to budget cuts and less time for field advisory services (Lidskog and Löfmarck, 2016).

The revision of the Forest Act in 1993 and the adoption of the national environmental quality objectives in 1999 imply that nature conservation has a strong position in the national forest policy. This has also induced real changes in forest management practices over the last decades. However, with strong ownership rights forest owners cannot be obliged to take conservations measures above the minimum level in the Forest Act without financial compensation. For example, the SFA and the CABs can use their authority to create a protected area despite the forest owners' resistance (i.e. through coercion). However, the restrictions imposed upon the property rights requires generous financial compensation. The SFA also relies on incentive-based tools such as subsidies, nature conservation



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agreements (e.g. with a lower level of financial compensation) and information to promote nature conservation. In practice much of the nature conservation measures are governed by voluntary certification standards. Through their participation in FSC, the WWF provide moral incentives for the forest industry in exchange for an increased level of nature conservation. The SSNC have chosen a different strategy to promote their interests. They left the Swedish FSC in 2010, stating that the standard was too weak from an environmental perspective and that their low level of influence could not legitimise their continued participation. In general SSNC advocates for radical changes of the current dominant forest management practices and with their 224,000 members they constitute a powerful "environmental watchdog" and dominant provider of information. To summarize, the environmental interests have become substantially more powerful and influential in shaping forest management over the recent decades. Their influence in practice is however partly restrained by: the strong ownership rights, lack of sufficient financial resources for forest protection, the strong forest industry and the legacy from the even stronger production oriented forestry of the past.

Hunting has a strong position in the Swedish culture, especially on the countryside and among forest owners and foresters. Leasing fees give forest owners some income and the meat has a financial value. The Swedish Hunting Association is a powerful organisation in transferring information that has a double role. It has been assigned a formal role by the parliament to act as a neutral provider of information to decision makers and politicians about questions related to wild animals. In addition, the organisation also acts as a lobby group for hunters. Overall, game as an ecosystem service upholds medium power resources. However, it is important to note that the impact comes from indirect rather than indirect influence. The overall uptake of measures that aim to create more forage is limited (e.g. direct influence). Instead, the forest sector and forest owners have for long had to accept damages on their forest because of an overall national interest to have population feasible for large-scale hunting. There has recently been a larger consensus about the importance of reducing damages through hunting. However, it is still evident that forest management practices for long been heavily influenced by the high populations of ungulates and the problem largely remains unresolved. For example, the game damages have heavily affected tree species choice in southern Sweden in favour of spruce.

Stakeholders with primary interests in other ecosystem services have a marginal influence on forest management practices even though their lobby groups are involved in the policymaking at national level. The importance of consideration to both the aboriginal Sami people and various cultural ecosystem services is included in the Forest Act but are treated as secondary to production and nature conservation objectives (Beland Lindahl et al., 2015). Reindeers are allowed to forage on public and private forestland in the reindeer management zone. The Forest Act also requires from larger owners (i.e. forest companies) to engage in a continuous consultation process with the Sami people in northern Sweden. By being members in the FSC the Sami lobby groups provide moral incentives and legitimacy for the forest industry in exchange for some special considerations, related to forage for the reindeers (FSC, 2010). Recreational and aesthetical values have a very minor influence on forest management at national level. However, stimulated by the recent debate regarding the social values, SFA now has the possibility to create conservation agreements for forests with high social values, providing financial compensation to forest owners that agree to save their forest from final-felling. To summarize, other ecosystem services than those related to wood production and biodiversity have a limited impact on forest management. This is largely a result of the content of the major conflicts of the past (conservation vs. production) but also reflects the strong property rights of forest owners. The



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later implies that the threshold for obligatory consideration to other ecosystem services (other than timber) in harvest operations is limited (2-10 % of the timber value depending on the size of the stand) and so far biodiversity has been the ecosystem service prioritized.

*Table 86: Overview of power resources of different interests (national level)*

| **Actor's interests** | **Power resources** | | | |
|---|---|---|---|---|
| | **Means of coercion** | **Incentives** | **Dominant information** | **Power resources of the interest** |
| Forest management | **+** | **+++** | **+++** | **Strong** |
| Timber processing | **+** | **+++** | **+++** | **Strong** |
| Employment in forests | **++** | **++** | **++** | **Medium** |
| Recreation and tourism | **+** | **++** | **+** | **Weak** |
| Hunting | **+** | **++** | **++** | **Medium** |
| Reindeer forage | **+** | **++** | **++** | **Weak** |
| Nature conservation | **++** | **++** | **+++** | **Medium/Strong** |
| Cultural heritage | **++** | **+** | **+** | **Weak** |

Table 87 present the power resources of various interests more in detail and will only be described shortly. Wood production is put forward by those actors also interested in pest control and $CO_2$ substitution. There are quite detailed regulations in the Forest Act regarding the removal of wood after storm fellings to reduce the risk of bark-beetle attacks. After a major storm industrial actors and the SFA engage in information campaigns, stressing the importance of removing the felled timber. In addition, forest companies often stop their normal activities to prioritise the storm-felled timber. Regarding climate change mitigation the Swedish government strategy seems to reflect the alternative that is put forward by the actors involved in forest management. This is the reflected in the widespread promotion of wood as a renewable resource and in recent policy statements.

Water quality is in practice closely connected to conservation measures conducted at final felling. Stipulations in both the Forest Act and certification standards imply that buffer zones along streams often are prioritized when conducting final felling.

As previously stated actors interested in cultural services have weak power resources, which implies that they have a low influence on how forest management is conducted. However, cultural heritage sites, and especially those dating prior to 1850 are protected in the legislation. The effectiveness of the legislation in practice is however questionable since approximately half of the cultural heritages are damaged or negatively affected during harvest operations (in 2013).



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*Table 87: Overview of power resources of interests in different ecosystem services (national level)*

| Interest in | 0verall power resources | Means of coercion | Incentives | Dominant information |
|---|---|---|---|---|
| ***Provisioning services*** | | | | |
| Wood | **Strong** | + | +++ | +++ |
| Game | **Medium** | + | ++ | ++ |
| Reindeer forage | **Weak** | + | ++ | ++ |
| ***Supporting services*** | | | | |
| Biodiversity | **Medium/Strong** | ++ | ++ | +++ |
| Habitat for species | **Medium/Strong** | ++ | ++ | +++ |
| ***Regulating services*** | | | | |
| Carbon sequestration (forests) | **Weak** | + | + | + |
| $C0^2$ substitution | **Medium** | + | ++ | +++ |
| Water quality | **Medium** | ++ | ++ | ++ |
| Pest control | **Medium** | ++ | ++ | +++ |
| ***Cultural services*** | | | | |
| Outdoor recreation | **Weak** | + | ++ | + |
| Aesthetic values | **Weak** | + | ++ | + |
| Tourism | **Weak** | + | + | + |
| Cultural heritage | **Weak** | ++ | + | + |

Table 88 provides an overview of the power resources of different actor types. Sweden has a large forest industry that has been and still is of great national importance. As previously stated, the current policy orientation enables them to utilise their power resources to strongly influence forest management (Table 88). In Sweden market actors are not only represented by private companies. Because trough their membership in forest owner associations, private forest owners also control substantial industrial resources.

The governmental actors are in charge of implementing the national forest policy, characterised by the balancing act between production and environmental interests. After the revision of the Forest



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Act in 1993 the SFA lost their mandate to enforce production oriented ideals upon forest owners. However, the CABs and the SFA have gradually been mandated stronger power resources in nature conservation (i.e. creation of forest reserves and various incentives) which implies that their overall power resources can be classified as medium (Table 88).

Civil society actors can be divided into two groups. Organisations representing environmental interests and hunting and those representing other special interests (e.g. cultural ecosystem services, Sami people). The environmental interests and hunting has up until present had a stronger influence on forest management. Civil society actors are most influential as lobby groups at the national level, where they gradually can influence forest management by participating in the design of new policies. Meanwhile they often lack power resources to substantially influence forest management in the practical forestry setting.

*Table 88: Overview of power resources of different actor types (national level)*

| | Means of coercion | Incentives | Dominant information | |
|---|---|---|---|---|
| **Market actors** | **+** | **+++** | **+++** | **Strong** |
| **Civil society actors** | **+** | **+** | **++** | **Weak/ Medium** |
| **Governmental actors** | **++** | **++** | **++** | **Medium** |

# 39. Case study area: Kronoberg County

## 39.1 General overview

Kronoberg County constitutes an administrative unit in southern Sweden with total area of 840,000 hectares and a population of 192,000 inhabitants. The biggest city Växjö is situated in the central parts of the county and has a population of approximately 60,000. The area of productive forestland is 676,000 hectares (SLU, 2016), which implies that county has a forest coverage above the average for southern Sweden.

In line with the overall latitudinal trends in Sweden, the forests in Kronoberg County is dominated by Norway spruce (49% of total volume), together with a substantial proportion of Scots pine (31%) and birch (12%) (SFA, 2014). However, since Kronoberg County is situated in the nemoboreal region, a transition zone between boreal and temperate climate conditions, there is also a small share of nemoral broadleaves such as oak and beech. The current tree species composition is to a large extent an outcome of human activity. Increased dominance of spruce at the expense of other species has been a major trend over the last century, linked to the abandonment of traditional land-uses in the early twentieth century (forest grazing, slash-and-burn cultivation) and the more recent large-scale application of modern forestry (Lindbladh et al., 2014).

The overall forest management practices in Kronoberg County are in line with the current Swedish management paradigm i.e. clearcutting system with conifers. However, forest management in



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Kronoberg County (and southern Sweden at large) is especially focused on Norway spruce. This orientation can largely be explained by the high volume production of spruce combined with a big market demand, that overall implies that Norway spruce is financially superior. In addition**,** the high browsing pressure favours reforestation with Norway spruce at the expense of Scots pine (SLU, 2016a; SFA, 2016b). In 2005, Kronoberg County was hit by the Gudrun storm that felled 18.3 % of the standing stock (Svensson et al 2001). 80 % of the felled volume was Norway spruce, thereby exposing the risk with the current spruce oriented forestry. Despite efforts by the Swedish forest agency to promote alternatives through reforestation grants the previous practices remained intact (Wallstedt et al. 2013). In 2007, Kronoberg County was hit by another storm that caused substantial damages and further expanded the regeneration areas created two years earlier. Overall, this implies that the age class distribution in Kronoberg County is uneven, with a lot of forest < 20 years.

The ownership structure is representative for southern Sweden, with private forest owners controlling 78.4 % of the productive forestland (SFA, 2014). There are also some larger forest owners, such as Sveaskog with 58,900 ha, and the Växjö parish (regional affiliation of the Swedish church) with 48,000 ha (approximately half this area in the Kronoberg County). The regional forest sector is characterised by high competition among a diversity of industrial actors for the wood resources controlled by private forest owners. The forest owner association Södra has the strongest position at a county level, which is not surprising considering that Södra members (SFA, 2014) control approximately half of the forest area in southern Sweden. Södra is a big industrial actor that own sawmills and represents one of the largest pulp producers globally. However, at micro level other actors often have a stronger position than Södra, and owners belonging to Södra are not obliged to sell their timber to the cooperative. The second most dominant actor is Sydved, a wood buying organisation that is controlled by Stora enso and the paper producer Munksjö. In addition, there exist a number of smaller sawmills companies in Kronoberg that source wood locally (e.g. Vida, ATA-timber, Derome, Bergs Timber, Rörvik timber, JGA). Växjö parish and Sveaskog are not involved in buying timber and providing services to owners in Kronoberg County.

## 39.2 Instruments and legal competencies in Kronoberg County

The forest policy at national level is valid for all different regions in Sweden, including Kronoberg County. However, some regional characteristics are still worth mentioning.

With five offices the SFA in Kronoberg is less centralized compared with other regions in Sweden (Edwards et al., 2013). In the INTEGRAL case study report, this was stated to express an explicit strategy to improve local presence and personal communication. However, due to recent budget cuts the SFA has changed their strategy. Outreaching activities such as “forest evenings” have been abandoned, and in addition the agency has prioritised more resource efficient pathway to influence the behaviour of private forest owners. Rather than contacting forest owners directly they now focus on providing information and guidance to forest consultants from the industrial actors, thereby reaching private forest owners indirectly. They are also often invited and participate in the “forest evenings” organised by industrial actors such as Södra and Sydved. Meanwhile, the change in government have



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increased the strength of the CAB, situated in Växjö. Due to increased state funding for environmental issues their financial resources have expanded, which has resulted in employment of new staff and an increased possibility to create protected areas.

The SFA and the CAB collaborate in issues related to forest protection and management of protected areas. The Kronoberg County represented one of the five regions in Sweden that took part in a pilot project in nature conservation called "Komet". The project has recently been institutionalised as a complementary pathway to work with nature protection in the entire country. Komet implies that, in addition to forest protection initiated by the SFA or the CAB, forest owners can themselves notify these agencies of areas that they want to set-aside for nature conservation. If the area is considered to be of sufficient conservation value, a protected area is established and the owner receives financial compensation. To market the program to private forest owners the SFA and CAB have worked together with LRF skogsägarna and Södra. The working group has recently been expanded by inclusion of Vida and SSNC. In the Kronoberg County protection of noble broadleaved is the top priority, but forest protection is not at all restricted to this forest type.

The SFA are involved in organising the forest sector advisory boards on regional level. There is one advisory board covering southern Sweden as well as one for Kronoberg County. A wide range of actors usually participate in the advisory board meetings (e.g. governmental agencies, actors involved in forest management, SSNC and the Swedish outdoor association). The aim is to inform the stakeholders about current issues relating to policy and/or management, to foster a dialog and to receive valuable input from stakeholders.

Certification according to FSC and PEFC is widespread in Kronoberg County. Beyond the set-aside requirement (5 % of the productive forestland), the certifications standards also restrict the area where exotic species can be planted (FSC 5 %/PEFC 25 % of the productive forestland per forest holding). This is of some relevance in Kronoberg, since there are many exotic species that potentially can be utilized (e.g. poplar, Hybrid aspen, hybrid larch, Sitka spruce, Douglas fir, Grand fir).

To conclude, the institutional setting and legal competencies in Kronoberg County is an expression of the Swedish forestry model put into practice in a regional setting. This implies a policy implementation the put emphasis on dialog and collaboration with relevant stakeholders to meet policy objectives.

## 39.3 Hot topics, conflicts and problems in forest management

The conflict between production and environmental interests is currently on the agenda in the Kronoberg County due to a high activity of the regional branch of SSNC (source: almost all of the stakeholders interviews, webpages, the forestry journal "Skogen"). SSNC Kronoberg has a group called "Mångfaldsgruppen" (the diversity group) that has, and still is, performing inventories of stands planned for final-felling. Forest owners need to notify the SFA prior to final-felling, which implies that the location of the stands becomes available for the public. After the SFA has received the notification the owner need to wait six weeks before the final-felling can start. By prioritising poten-



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tially valuable forest types (e.g. forests with broadleaves) and using their expert knowledge, the diversity group has been able to locate stands planned for felling hosting endangered species. In many cases, this caused the SFA to classify stands as key habitats. Harvest operations have therefore been stopped (since harvesting in key-habitats not is allowed according to the certification standards), which caused frustration among many of the private forest owners affected. In addition, the method of the group has caused some tension, since the group has performed the inventories without notifying the owners in advance. Beyond stopping harvest operations, the input from the diversity group has sometimes resulted in the modification of harvesting plans (i.e. some additional nature consideration). The SSNC has not acted entirely alone, there has been some members from the bird-watching organisation (the ornithology association of Kronoberg) participating in the inventories.

As already indicated the high browsing pressure is problematic for forest management in Kronoberg, and highlighted as the number one concern among all the forestry stakeholders interviewed. Firstly, due to the high browsing pressure private forest owners are reluctant to plant Scots pine, and Norway spruce is therefore currently planted one more than half of the sites were Scots pine is considered to be the most suitable species (SFA, 2016a). Secondly, small and large owners[13] that still regenerate with pine have additional costs due to browsing repellents and supplementary planting. Finally, the browsing pressure also makes planting and natural regeneration of broadleaves problematic and therefore fencing is often required. To find suitable measures to address this issue a pilot project called “More pine” have been conducted in Uppvidinge in Kronoberg County during the last five years. The project has been led by the SFA and several forestry actors have participated (e.g. Södra, Sveaskog, Vida, the church). The project can be regarded as a success, increasing the area planted with pine as well as reducing the browsing damages. However, among the actors involved in forest management there is a consensus that the population of moose needs to be reduced. Södra and LRF Skogsägarna are the organizations most active in promoting this standpoint at the local level. Meanwhile, the local branch of the Swedish hunting organization stresses the importance of increased diversity in management (i.e. less spruce and more broadleaves/pine) and other measures that creates more forage (e.g. favoring broadleaves in pre-commercial thinnings, harvesting pine during winter, creating border zones to produce forage) as suitable strategies to reduce damage. The question is therefore which one to blame, the forest sector for producing forests low in forage, or the game management leading to excessive populations of the ungulate.

With a high share of private forest owners, industrial actors and the SFA tries to steer private forest owners in a direction that is in line with their interests. After the mandatory pre-commercial thinning was abandoned in 1993, pre-commercial thinning has been a recurring topic of concern in the forest sector. This is especially relevant in Kronoberg, where the devastating storms in 2005 and 2007 imply that there is a high proportion of young forest. In the Swedish clearcutting system, pre-commercial thinning in young forest stands is crucial for the economic revenue is subsequent harvesting operations. However, both the SFA and industrial actors (Södra, Sydved) state that the level of activity in pre-commercial thinning among private forest owners is lower than desired.

[13] Sveaskog and Växjö parish have a policy to plant pine on suitable soils.



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# 40. Actor analysis: Case study Kronoberg County

The situation at the national level constitutes a frame for interactions at the regional level. This implies that interests and power of different actors groups at national and regional shows a good conformance, and the assessment has therefore partly relied on the national assessment. To better depict the local context interviews over phone has been performed with 10 actors in Kronoberg County, and webpages of relevant regional actors has been scrutinised. In addition, the analysis has relied upon a number of peer-reviewed papers (Hugosson and Ingemarson, 2004; Ingemarson et al., 2006; Nordlund and Westin, 2010; Guillen et al. 2015; Brukas and Sallnäs, 2012) and reports (Edwards et al., 2013) that are especially relevant for an actor assessment in Kronoberg. Finally, the author has also relied on own expert knowledge, based on previous research (Lodin et al. upcoming) and earlier efforts within ALTERFOR (FMM mapping in WP 1).

At case study level the different interest groups are represented by specific forest companies, local branches of NGOs etc. The Sami people has been excluded since reindeer herding is confined to northern Sweden. The two other groups, cultural and employment NGOs have also been excluded since they overall are of minor relevance for forest management in Kronoberg County.

## 40.1 Interests of actors

With some exceptions (e.g. Växjö parish, Sveaskog), the major actors involved in forest management source wood to their own (e.g. Södra, various sawmill companies) or partner organisations wood industries (e.g. Sydved). This implies that there overall is no clear distinction between the group "forest management" and "timber processing". The major actors manage their own forests, or provide services to private forest owners, in line with the dominant forest management methods in Sweden (e.g. mainly clearcutting or seed-tree method with conifers). The two large forest owners, Sveaskog and Växjö parish, are both certified. Meanwhile the industrial actors promote certification in their contact with private forest owners. However, similar to the national level, Sveaskog has an ambition in nature conservation that exceeds the certification standards. Regarding alternative forest management methods, the two most dominant actors, Södra and Sydved, have very similar standpoints. They both perform CCF harvest operations instead of clearcutting if private forest owners are interested. However, giving forest owners a good net-revenue is crucial due to the harsh competition for timber and pulp. They therefore always inform the private forest owners about the lower revenues that are associated with CCF, which mainly is due to higher costs of harvesting. Hence, they say that there are not against the method as such, but its associated drawbacks imply that they in practice promote clear-cutting. However, sticking with the clearcutting system is of course comfortable for the major forestry actors. A major increase of CCF would probably require them to invest substantially in education of their own staff as well as the entrepreneurs responsible for harvesting.

The relevant environmental ENGOs in Kronoberg County are the local branches of the SSNC and the Ornithology Association. The WWF is a centralised organisation, not represented in Kronoberg. The interests of the environmental NGOs active in Kronoberg is evident considering their work within the



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diversity group (see above). In line with their interest in conservation, they think that forest management in Kronoberg is too intensive and that many valuable areas have been lost. They subsequently argue for increasing the share of protected areas. At local levels the opinions and activities of environmental ENGOs becomes heavily dependent on single individuals. For example, the main representative of the diversity group does not share the positive attitude towards CCF that SSNC express at national level. He believes that production and nature conservation is hard to combine in practice and therefore argues for a segregated conservation approach, where larger areas can be set-aside from production based on landscape level planning.

Hunting of animals such as moose, wild boar, roe deer is popular in Kronoberg County. The Swedish Hunting Association in Kronoberg has 5,200 members, thereby organising more than half of the registered hunters in the county. Their main interest is to maintain high populations of ungulates, stressing that the current population of moose in Kronoberg not is high from a national perspective. The organisation emphasises hunting as a valuable recreational activity of economic importance (i.e. the meat, incomes from leasing for forest owners). Their ideal is a forest landscape were management activities to a much greater extent take the wild animals into consideration (e.g. create forage). They stress that this would imply an increased diversity in forest management and associated forest composition, that would reduce the conflict with forestry (i.e. less browsing damages) and be beneficial for nature conservation (e.g. more broadleaves).

The only national outdoor NGO that is active regionally in Kronoberg County is the Swedish Outdoor Association Region East (covers a larger region than the county). Their overall interests are the same as those at national level (e.g. promoting public access rights, the social values of forest, and special consideration in forests close to cities). However, in Kronoberg their activities foremost involves organising outdoor activities rather than lobbying. Moreover, at the local level their activities, actions and interests are often based on single individuals, which implies that there is a large variation at micro level.

The interests of the governmental actors (i.e. the SFA and CAB) are guided by national policies. However, their work in the Kronoberg County is of course modified by the special problems (e.g. the SFA trying to promote pre-commercial thinning), characteristics and priorities at regional level (e.g. CAB prioritising protection of noble broadleaves in line with the national strategy).

Due to the strong dominance of private forest ownership in Kronoberg County, I have included them as a separate actor group. Their interest profile highlights the results of previous studies that have shown that this group manage their forest based on multiple-objectives (Hugosson and Ingemarson, 2004; Ingemarson et al., 2006, Nordlund and Westin, 2010). It is also important to keep in mind that the interests and/or activities of the forest owner association Södra, and the national lobby group LRF not always conforms with the interests of the forest owners. This has been shown in a local case study in Kronoberg County that was performed within the frames of INTEGRAL (Guillen et al. 2015). However, even though Södra can be said to be skewed towards representing the production interests of private forest owners, the high activity in harvesting in southern Sweden still suggests that incomes from wood overall is the most important service that forest owners derive from their forest. Finally, it is very common that forest owners' hunt, which implies that there sometimes can be internal goal conflicts relating to hunting (i.e. good hunting vs undamaged forests).



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*Table 89: Interests in ecosystem services of selected actor groups (case study)*

| | Forest management | Timber Industries | Private forest owners | Outdoor recreation NGOs | Hunting NGOs | Environmental NGOs | Governmental Organizations* |
|---|---|---|---|---|---|---|---|
| *Provisioning ES* | | | | | | | |
| Wood provision | +++ | +++ | ++ | 0 | + | - | +++ |
| Game provision | -- | -- | + | ++ | +++ | 0 | + |
| *Supporting ES* | | | | | | | |
| Biodiversity | -- | -- | + | + | + | +++ | +++ |
| Habitats | -- | -- | + | + | + | +++ | +++ |
| *Regulating ES* | | | | | | | |
| Carbon sequestration | --- | --- | 0 | 0 | 0 | ++ | 0 |
| $CO_2$ substitution | ++ | ++ | 0 | 0 | 0 | + | ++ |
| Water quality | 0 | 0 | + | + | 0 | ++ | ++ |
| Pest control | +++ | +++ | ++ | 0 | 0 | 0 | +++ |
| *Cultural ES* | | | | | | | |
| Outdoor recreation | - | - | + | +++ | ++ | + | + |
| Aesthetics | - | - | + | +++ | + | + | + |
| Tourism | - | - | 0 | ++ | + | + | + |
| Cultural heritage | -- | -- | + | ++ | 0 | + | + |

*Interests expressed in the overall forest policy, implemented by SFA and CAB.

## 40.2 Power of actors

The forest legislation at the national level also applies to the Kronoberg County and with some minor deviation (especially close to the mountains in the north), entire Sweden is characterized by rather intensive forest management. Altogether, this implies that the power resources of the different interest in Kronoberg reflect the situation at the national level. They will therefore only be described shortly.

Wood production is the strongest interest in the Kronoberg County. Production is highly prioritized by a diverse set of industrial actors, complemented by the more nuanced view of the SFA. The large forest owners, Växjö parish and Sveaskog, cannot be regarded as powerful with our definition, since they only work within their own forests and therefore have a limited ability to influence others.

Nature conservation is the second most powerful interest. It is promoted by the governmental agencies (SFA and in particular CAB) and two environmental NGOs (SSNC and the ornithology association of Kronoberg). Expert knowledge of red-listed species is a decisive power resource in the Swedish forest sector. Red-listed species constitute the key priority in forest protection and by supplying the SFA with information regarding their locations, harvesting can be effectively stopped. However, the



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inventories have only been carried out in stands planned for final felling, of which a small sample is visited. This implies that the overall effect of these activities for forest management in Kronoberg is limited.

Hunting and its influence over forest management is a very complicated issue. The uptake of the measures to increase forage that are put forward by the Swedish Hunting Association is limited. Hunting has rather an indirect effect on forest management, since the high browsing pressure makes forest owners reluctant to plant the preferred forage species. The actual hunting quotas are formally decided by the CAB, but involve actual decision-making power of various actors at different levels. In summary, the overall direction for the population of a hunting species is decided in management group at county level, where various interests participate (politicians, local business, forest sector, forest owners, hunting, police, fishing). Guided by the overall direction, shooting quotas for moose are decided at lower spatial levels through collaboration between local hunters and forest owners and then formally approved by the CAB. The power resources of this interest can overall be classified as medium. Hunting offers incentives since owners get approximately 100 SEK/ha when they lease their land for hunting. The Swedish Hunting Association in Kronoberg has permanent staffs that provide information during various forest related activities (e.g. the SFAs local and regional advisory boards) and in their contact with the local management groups of moose. Once again, it is important to keep in mind that many hunters also are forest owners, and at least can accept minor/moderate damages on their forest for the joy of good hunting.

Forest companies and Södra mention that they sometimes modify harvesting plans according to input from different stakeholders (e.g. scouts, local residents, municipalities). However, this is very case specific and not organised at a regional level. Beyond SSNC, forestry actors mention few or no other actors that in practice are of importance for forest management in Kronoberg. This implies a lack of influential organisations representing cultural ecosystem services beyond the governmental agencies.

*Table 90: Overview about power resources of actors with different interests (case study level)*

| **Interest in** | **Power resources** | | | |
|---|---|---|---|---|
| | **Means of coercion** | **Incentives** | **Dominant information** | |
| Forest management | + | +++ | +++ | **Strong** |
| Timber processing | + | +++ | +++ | **Strong** |
| Recreation and tourism | + | + | + | **Weak** |
| Hunting | + | ++ | ++ | **Medium** |
| Nature conservation | ++ | ++ | +++ | **Medium/strong** |
| Cultural heritage | ++ | ++ | + | **Weak** |

Table 91 provides the power resources of the different interests in more detail. They have already been covered in the national analysis and will not be further described, with one exception. The debate regarding climate mitigation strategies (carbon sequestration in the forest vs $CO_2$ substitution) is not influential for forest management in the Kronoberg County. This is rather a question that can



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be influential for the overall forest policy orientation at national level, especially in the ongoing work with the National Forest Program.

*Table 91: Overview of power resources of different interests in ecosystem services (case study level)*

| Interest in | | Means of coercion | Incentives | Dominant information |
|---|---|---|---|---|
| ***Provisioning services*** | | | | |
| Wood | **Strong** | **+** | **+++** | **+++** |
| Game | **Medium** | **+** | **+** | **++** |
| ***Supporting services*** | | | | |
| Biodiversity | **Strong/medium** | **++** | **++** | **+++** |
| Habitat for species | **Strong/medium** | **++** | **++** | **+++** |
| ***Regulating services*** | | | | |
| Carbon sequestration (forests) | **Weak** | **+** | **+** | **+** |
| $CO_2$ substitution | **Weak** | **+** | **+** | **+** |
| Water quality | **Medium** | **++** | **++** | **++** |
| Pest control | **Medium** | **++** | **++** | **+++** |
| ***Cultural services*** | | | | |
| Outdoor recreation | **Weak** | **+** | **+** | **+** |
| Aesthetic values | **Weak** | **+** | **+** | **+** |
| Tourism | **Weak** | **+** | **+** | **+** |
| Cultural heritage | **Weak** | **++** | **+** | **+** |

Table 92 provides an overview over the power resources of the different actor types in Kronoberg County. By providing incentives and information to private forest owners, market actors position themselves as the most powerful actor group in the Kronoberg County. This is evident by looking into the current forest management practices, which overall are characterised by a high utilisation intensity (compared with other European countries), and are oriented towards producing conifer timber and pulpwood for industrial use. The power of market actors has also been strengthened by the recent budget cutbacks at the SFA. Because rather than approaching the private forest owners directly, information from the SFA is now to a higher degree funnelled through the market actors, giving them the possibilities to modify the information in line with their interests. Regarding the power resources within this group, the situation partly deviates from other parts of Sweden (especially the north). The larger forest owners (e.g. Sveaskog, the church) in Kronoberg are not actively working



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with private forest owners. This differs from the overall situation in Sweden, where large forest companies with own forests (e.g. Holmen, SCA and Sveaskog) also buy timber/pulp and provide services to private forest owners. The market actors that in practice steer private forest owners management behaviour in Kronoberg Country are the cooperative Södra, wood buying companies (e.g. Sydved) and sawmill companies (e.g. VIDA, ATA-timber etc.).

The most powerful civil society actors in the Kronoberg County are the SNCC and the Swedish Hunting Organisation, who both rely on information to promote their interests. Several organisations representing the civil society are not active in Kronoberg County (e.g. WWF, Swedish Outdoor Life and of course National Association of Swedish Sami national level) or have less resources (e.g. very dependent upon individuals). Overall, this implies that civil society actors are less powerful in the Kronoberg County compared with the situation at the national level.

The power resources of governmental actors will not be further elaborated, but they are in line with the situation at the national level.

*Table 92: Overview about power resources of different actor types (case study)*

| | Means of coercion | Incentives | Dominant information | |
|---|---|---|---|---|
| **Market actors** | **+** | **+++** | **+++** | **Strong** |
| **Civil society actors** | **+** | **+** | **++** | **Weak** |
| **Governmental actors** | **++** | **++** | **++** | **Medium** |



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## 41. Conclusion, with special emphasis on future steps

Market actors interested in the provision of wood, represent the strongest actor group at both national and case study level. The internal composition of this interest group deviates between different regions in Sweden. In the Kronoberg County, the well-organised and industrialised cooperative Södra constitutes the most important industrial player. Since these actors have strong power resources, they constitute the most important partners to utilise when facilitating the implementation of new FMMs in practical utilisation. However, since the current forest management practices in Sweden already enable them to fulfil their interests, they might be against changes that imply increased consideration to other ecosystem services (e.g. trough more set asides) and probably be reluctant to promote FMMs that imply producing wood in a more complicated manner (e.g. CCF). This group will therefore be interested in FMMs that depart from the current dominant management practices (i.e. production-oriented clearcutting). However, from this point of departure, strategies to address future challenges such as climate change mitigation (e.g. modifications to increase wood production for $CO_2$ substitution), and different risks (e.g. shorter rotations to reduce the risk of storm damages) can be further investigated.

By implementing the national forest policy, governmental actors are in charge of regulating the balance between the different functions provided by forests, as well as the associated conflicts between different interests. The new forest policy in 1993 implied less power to governmental actor's in forest management, simultaneously their resources to act in nature conservation has increased during recent decades. Working with balancing trade-offs, they will be interested in getting knowledge about the implications of future major changes in forest management (e.g. increased production orientation, much more set-asides) on the full-basket of ES-services. Moreover, since the Swedish forestry model partly relies on an integrative approach, they will probably also be interested in strategies that to a larger degree emphasise multi-functionality i.e. FMMs that provide various ecosystem services at stand-level.

Civil society actors' interested in other ecosystem services than wood constitutes the weakest actor group. These actors represent a wide set of interest, where nature conservation and hunting are strongest. In a forest sector largely ruled by market forces and with the strong property rights, they often lack key power resources to promote their interests in the practical forest management. Even though having different primary interests they often share similar ideas on how forest management need to be modified. This overlap is beneficial for the purpose of ALTERFOR, because if they will support similar FMMs the "power of numbers" might partly substitute for their lack of power resources. Their lowest-common denominator is that forest management need to be more varied and less production oriented. This implies that there can be an interest in various CCF approaches and increased use of broadleaves. In addition, the nature conservation NGOs will of course be interested in a higher share of set-asides. These actors are stronger at national level, where they are better organised (e.g. lobby groups) and participate in the policymaking processes and forest management debate. This implies that to empower these actors in ALTERFOR it is probably important to invite representatives from the national level also to case study workshops.



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# Turkey- Case Study Gölcük

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*Summary*

Forest management philosophy in Turkey has moved towards the ecosystem based multiple use management concept, accounting for ecological, economic and socio-cultural values in an integrated and sustainable basis since 2008. The necessary regulations for the new approach were also prepared accordingly and are in operational across the country. Almost all actors acknowledged the approach that considers the harmonization of both the conservation and production of ecosystem services. However, conflicts between different actors exist in setting priorities for different forest ecosystem services and about how to exactly implement ecosystem based multiple use forest management concept on the ground.

Most important current conflicts about forest management planning in Turkey are:

1. Stratification of forest lands and/or forest ecosystems to various forest uses
2. Being conservative in determining the annual allowable cut levels in various forest use areas particularly in timber oriented forest use areas
3. Determining management interventions without any decision making techniques
4. Ultimate power of state, less room for the structured participation of other stakeholders

Most important current conflicts about silvicultural management of forests in Turkey are:

5. Unknown or undefined silvicultural models for each forest use/function area, aside from timber production
6. Continuous cover forest model vs even-aged management vs uneven-aged management
7. Industrial plantations vs natural regeneration
8. Optimal stand structure for each forest value or objective
9. Amount of deadwoods shares
10. Thinning intensities for each forest use areas
11. Modeling the development of various stand types (no growth and yield models exist for understocked stands, empirical yield tables exits for only pure and fully stocked stands)

The actors in Turkey have recently started to pronounce their interests and power in the management of forest landscape. State forest actors still play the dominant/key role in forest policies. As the forests are owned and managed by the state, the state actors are the primary decision making authority with a direct relationship with the ministry of forest and water works. In the meantime, however, nature conservation actors in association with the state nature conservation authority have become increasingly important players in forest policies and have certain influence on forest management over the last couple of decades. Actors from private timber industries have certain impact on forest management by increasing lobby activities in favor of timber oriented forest management by market as well as indirect political forces from the government. Actors representing recreation and hunting have little indirect influence related to the initial forest land allocation to the appropriate forest uses in management planning. Furthermore, actors from the water supply and renewable energy sector became increasingly important for forest management because of the construction of



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dams for both energy and water supply in forest watersheds and the construction of wind turbines within forests. Actors representing employment (e.g., villagers and cooperatives) in forests have certain influence on forest policy processes as they have certain legislative rights on forestry workforces (e.g., Forest law articles 30 and 31). Actors with the interests of non-wood forest products are currently almost uninfluential in the formulation of forest policies at the national level.

As far as silvicultural management is concerned, the case study area has very good growing conditions and wood provision is considered as the most important forest value by the private industries and the state forest industries. One big company and few other small wood processing establishments from timber industries are located in the area and demand mainly wood. The big timber company has high demand of wood that the case study area cannot even supply. Thus intensive silvicultural management model is requested from the case study area to provide as much wood as possible, instead of being conservative, a regular policy of state forest industries. The case study area is important for the provision of drinking water, thus the impacts of silvicultural prescriptions/models on water quality and water quantity need to be considered. Furthermore, the area is quite attractive for recreation and aesthetic values with currently operational 30 small sized promenade areas, because of the close proximity to the industrial area and large metropole (e.g., İstanbul, Adapazarı and Bursa). Protecting forests from insect, illegal cutting and forest fires is also an important issue (yet not the primary issue) in the case study area. Chestnut and mushroom are two important non wood forest products within the study area and the associated actors have limited influence in the management of forests.

The conflicts within the case study area are almost similar to the condition at national level due mainly to the ownership structure. Actors from forestry sector are not quite powerful in the government and within the case study area due to a little contribution (0,8%) of forest sector to GDP (Anonymous, 2014). It is quite obvious that the public sectors are the key actors for forest management both in the country and the case study area. Actors from nature conservation are increasingly powerful in forest policies. While water provision in the case study area is gradually increasing, the private water companies have currently weak influence of forest management practices. Actors from timber industries have still strong influence of forest management strategies by setting regulations and market conditions. Cooperatives and villagers are the influential local actors in forest management operations due to their legislative rights on the forest workforce, yet have limited influence in forest management design and planning.



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## 42. General country information Turkey

Forest of Turkey cover 22.3 million ha (28% of the landbase) with almost half is degraded. High forests account for 88% of total forest land, and coppice forests for 12%. High forests contain 97% of Turkey's standing tree volume, and coppice forests only 3%. The per area productivity of forest resources is about 2.0 $m^3$ and the yield is around 100$m^3$ (Anonymous, 2015)

The forest management planning process has evolved and remarkably changed over the last few decades in Turkey. From the first management plan, prepared in 1917, to the late 1990's, forests were managed for principally wood production according to classical planning approach. By 1960s, forests were managed mostly with a single-tree selection silvicultural system regardless of the biological characteristics of existing commercial trees. Realizing the detrimental consequences of inappropriate management actions of the time, even-aged management practices were introduced immediately after 1963. It was after 1971 that both uneven-aged management methods for tolerant trees dominated forests and even-aged for the rest of the forests were implemented across the country. Modern management initiatives were undertaken later in 1990s. Since 2008, the planning process in Turkey has completely turned to an ecosystem based forest management concept accommodating biodiversity conservation, participation, multiple uses, and information technologies (Başkent et. al., 2008).

The planning process is centralized, with the planning teams formed each year by the Forest Management Department and assigned to prepare a management plan for a planning unit. The plans are prepared for every 10 years based on management guidelines. Area, increment, and growing stocks of each stand type (identified by species mix, development stage, and crown closure) are measured in forest inventory. The production capacity is determined according to age and dominant height of stands. The current age or size class distribution is determined based on the forest inventory and the future forest structure is determined by the empirical yield tables. Using the area/ size regulation method, a harvest schedule is determined to maximize wood production in a single period, leaving other periods unplanned until the rotation period (Başkent et. al., 2005).

The main actors or the stakeholders in forest resources are the state along with local communities, private industries and NGOs. More than 99 percent of forest resources are owned by the State, with the remainder private entities. While, the first organization of forestry extends back to 1839, during rule of Ottoman Empire, the development of the forest legislation gained momentum after the Forest Law No. 3116 enacted in 1937 made first legal definition of forest and introduced the first set of forest policies. After the experience with private national and foreign contractors of forests for management, all forests were nationalized in 1945 and managed by the General Directorate of Forestry (GDF). Some of the functions of forests, such as national parks, protected areas, wild-life and game, have been taken to the responsibility of the "Nature Conservation and National Parks". Protected areas are cover nearly 10% of the forested lands. Thus, forest resources are planned and implemented by the GDF on a sustainable basis, with some activities carried out by local people and private investors, such as afforestation and collection of NWFPs by private investors, and harvesting activities by forest villagers and forest village development cooperatives, according to relevant laws (Köse and Başkent 1996).

Participatory planning, ecosystem based multiple use planning, high forests, mixed stands, intensive silviculture and best allocation of forest to various uses are generally accepted approaches. Although



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forests are mainly owned and managed by the state, there are some apparent conflicts among stakeholders. Most of the conflicts are related to ownership problem and the use of forest resources (Barli et al., 2006). The major conflicts arise among the key stakeholders on the allocation of forests to other uses and how to exactly implement ecosystem-based multiple use forestry. Most apparent conflicts is summarized in Table 93. The most legal conflict is the definition of "forests" and thus the implementational bottlenecks in cadastral issues. Some of the prevailing causes or topics of conflicts are insufficient income level in villages, land tenure conflicts, absence of negotiators and collaborations, overlapping interests, unconsciousness in environmental issues and lack of full participatory management structure. Among them, the use of the forest land and its resource is the most apparent and complex one to concentrate on the management of forest resources. In terms of conflict resolution, the state continuously attempts to modernize forest legislations to ease the strong pressure on forest resources and provide some incentives for villagers as well as the private initiatives to lessen the conflicts. However there are still some problems relating to the fact that the politicians do not usually hold on their promises and the forestry in general seems to be of less interest to the politicians. There are not any lobby organizations to act as a mediator in developing forest policies and resolving the conflicts. However, some NGOs on nature protection such as WWFTurkey, TEMA, Nature Conservation Centre are lobbying to increase the protected areas across the country and private forest industries are also pushing the state to provide more industrial wood with relatively affordable prices. Therefore state forest service (GDF) is in dilemma to harmonize the conflicting demands for sustainable management of forest resources in Turkey with well-developed forest policies.

As the forest resources are manged by the solo owner of State, almost always the governmental mandate drives and leads the development of any forest management policies across the country. Thus the political culture in forestry is immature. However, starting from the 2008 with the enforcement of new forest management approach (ecosystem based multiple use forest management planning) "participation" is adopted as one of the new forest management principles. As such, forest development plan, long term national forestry programme and strategic planning that set up the situation for developing future forest policies are all prepared based on a participatory approach involving all interested stakeholders in the country (Anonymous, 2004, Anonymous 2012). As a result, the overall political culture is gaining momentum to be received and realized in forestry sector. In any case, it should be bear in mind that the state is the major stakeholder and often influences the political environment and there is a less room for the contribution of other stakeholders in the management of forest resources in Turkey.

*Table 93:Overview of current conflicts in Turkish forest politics*

| ***Conflict category*** | ***Conflict*** |
|---|---|
| **General guidelines** | Even-age management vs. continuous cover forests |
| | Debate between conservation, economic, social interests on the allocation of forests to various uses |
| | Who sets up management objectives? |
| | Conversion of forest areas to residential/buildings (such as roads, universities, etc) |
| | Allocation of best sites to industrial plantation vs. agriculture |
| | Allocation of state owned "degraded forest areas" to rural people for forest uses such as NWFP |
| **Nature conservation** | Strict protection vs sustainable management |



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| | |
|---|---|
| | Management of protected forest areas. Who is responsible for? |
| | More areas for biodiversity conservation! |
| | |
| **Energy transition** | Coppice for energy vs. high forests |
| | Wind energy projects in forests vs. other uses |
| | Expansion of power grids above forests |
| | Pipeline construction through forests |
| | |
| **Climate change** | Debate on rotation periods |
| | Effects of intensified silvicultural practices |
| | Best climate adaptation strategy |
| | |
| **Recreation** | Increased interests of recreational users vs. conservation/management |
| | Tourism areas vs forest uses |
| | Costs of recreational areas vs free uses (for public areas) |
| | |
| **Hunting** | Allocation of hunting areas |
| | Prices of hunting and the penalties |
| | Hunting/game management plans |
| | Annual regulations by "central hunting commission" |
| | |
| **Work in forests** | Safety of forest workers |
| | Minimum wages for forest workers |
| | |

There are important policy instruments that lead the forestry in Turkey. The legally binding instruments are ***forest law*** and the associated ***regulations, instructions*** and ***action plans*** in each different field of forestry. For instance, in forest management planning there is a set of regulation and instruction called *"forest management planning guidelines and its associated ground rules"* to help manage and prepare forest management plans across the country. There are also non-binding or so called soft policy instruments in forestry too. These are "forest development plan" prepared for every 7 years, long term "national forestry programme" prepared for 20 years and "strategic plan" prepared for 3 years into the future (Anonymous 2015, Anonymous 2014, Anonymous 2012, anonymous 2004). There are also other soft instruments in the form of actions plans prepared for a specific forest issue such as "afforestation action plans", specific "non wood forest products action plans". Other than those instruments, the principles and guiding rules of FSC forest certification systems towards sustainable forest management can also be accepted as a soft forest policy instrument in Turkey as certain forest areas are certified by FSC.

*Table 94: Overview of legally-binding law and soft instruments in Turkey*

| **Legally-binding law** |
|---|
| • The Forest Law (No:6831)<br>• The National Parks Law (No:2878)<br>• The National Afforestation and Erosion Control Mobilisation Law (No: 4122)<br>• The Law on Supporting Development of the Forest Villagers (No : 2924) |



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- The Organic Law of the General Directorate of Forestry (No: 3234, date passed 31.10.1985)
- Hunting Law (No: 3167, dated passed 13.05.1937)
- The Environment Law (No:2872, date passed 9.8.1983 )
- The Law on Protection of Cultural and Natural Assets (No:2863, date passed 21.7.1983)
- Forest management planning regulation (2008)
- Various other forest instructions (No: 290 – 302) particularly Instruction No:299 and 295 about the preparation and implementation rules of forest management planning
- Various other actions plans

**Soft instruments**

- Sustainable Forest Management Plan 2023 (2014-2018) under 10th National Development Plan
- National Forestry Program (2004-2023)
- GDF- Forest Strategy Plan 2020 (2013-2017)

## 43. Actor analysis: Turkey, national level

While the state is almost the solo owner of the forests in Turkey, there are a number of actors or stakeholders who have both interests and relative power in managing forest resources at a national level. In fact, there are quite a lot of actors who have certain interest for a specific forest value and for a specific region in Turkey. We will focus only on the actors showing great interest and power across the country. The actors are grouped in state actors, non-governmental organizations (NGOs) or civil society actors and private initiatives or market actors. The key ***state actors*** are general directorate (GD) of forestry, Gölcük state forest industry, GD of nature protection and national parks, state water works, GD of agricultural management, universities (KTU, Faculty of Forestry) and the GD of Cultural Heritage and Museum. The prevailing NGOs/***civil society actors*** are mainly TEMA, Chambers of forest engineers, WWFTurkey, ORKOOP, nature conservation center and hunters clubs. The private initiatives or ***market actors*** are Kastamonu Integrated, Eagen export associations and small sized forestry initiatives. There are other civil and market actors that act an important stakeholder yet those are small in size and operate in specific areas with a specific target market product. Thus we did not account them all within this study as it becomes quite complex to analyze them at the end.

### 43.1 Interest of actors: Turkey, national level

The interests in the ecosystem services and the preferences of forest management planning approach are assessed based the actor's forest use and the current positions. The information sources to identify actor's forest use and advocated positions are qualitative data from website, document analysis and long terms observations

There is not an apparent grouping of actors in the interests of forest use and ecosystem services, particularly for the governmental actors. As forests of Turkey are owned and managed by the state, most of the governmental actors do present various other interest in forest use and almost all ES. For example, as expected, GDF (the General Directorate of Forestry) shows great interest in all aspect of ES and forest uses. Thus we did not attempt to group the actors on the use and ES as well as the preference for forest management approaches.



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First of all, almost all dominant actors show interest on the ecosystem based multiple use of forest management approach, providing various ES to the society across the country. The approach has been supported by the participatory planning concept where actors are invited or asked for the active participation in both the planning and management of forest resources. The second prevailing point in the analysis indicate that market actors that are interested in provisioning ecosystem services of timber prefer high harvesting intensities based on the demand of timber industries. The GDF is also responsive to the market tying to increase timber harvest level over the last decade to satisfy the demand coming from the timber industries. Here employment generation, rural development and economic vitality of the country are the basic driving factors for the governmental actors to be responsive to high timber demand by the market actors. On the other hand, civil society groups promoting nature conservation and other ES such as high biodiversity conservation, set asides, high deadwood shares, and mixed forests focus on mainly the natural development of resources and the protection of forest areas from unsustainable uses. While the civil societies are not against the economical use of the forests, they favor and superimpose the conservationist management of forest resources based on sustainable management of multiple use concept. One other point that was apparent in the interest analysis is that most of the civil society actors along with a nature protection governmental actor, would like to implement multiple use forest management approach with natural structure promoted and without clear-cutting.

While the market and civil society actors are not in major conflict with the basic governmental actors in provisioning forest ecosystem services and protection of supporting and regulating forest ecosystem services, they are in conflict about the ***priorities*** of forest managements and the deliberation between ecologic and economic interests in forests (Table 95).

*Table 95: Preferences/priorities of interests in ecosystem services of actor groups (national level)*

| | **Forest management** (e.g. governmental actors) | **Timber Industries** (e.g., market actors) | **NGOs representing employment in forests** (e.g. ORKOOP) | **NGOs representing eco-tourism and recreation and** | **Water and soil protection** | **NGOs + Government actors representing nature conservation in forests** |
|---|---|---|---|---|---|---|
| ***Provisioning ES*** | | | | | | |
| Wood provision | +++ | +++ | ++ | - | - | + |
| Game provision | 0 | --- | - | ++ | 0 | + |
| Mushrooms | + | 0 | + | +++ | 0 | +++ |
| Berries | + | - | 0 | +++ | 0 | ++ |
| Medical plants | +++ | 0 | + | + | 0 | + |
| *Supporting ES* | | | | | | |
| Biodiversity | ++ | --- | - | ++ | ++ | +++ |
| Habitats | ++ | --- | - | ++ | ++ | +++ |
| ***Regulating ES*** | | | | | | |
| Carbon sequestration | + | -- | - | 0 | 0 | +++ |
| Climate regulation | + | 0 | 0 | 0 | 0 | +++ |
| Water quality | ++ | - | - | - | +++ | +++ |
| Soil protection | ++ | --- | --- | + | +++ | +++ |



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| | | | | | | |
|---|---|---|---|---|---|---|
| Pest control | +++ | +++ | + | + | + | +++ |
| ***Cultural ES*** | | | | | | |
| Outdoor recreation | + | - | - | +++ | - | 0 |
| Aesthetics | + | - | 0 | +++ | - | + |
| Tourism | + | - | 0 | +++ | - | - |

Strong impact (+++), a medium impact (++),a low impact (+) ,

## 43.2 Power of actors: Turkey, national level

As expected, the analysis of the power resources of actors at national level clearly indicated that governmental actors are the most powerful in developing and implementing forest policy instruments. Other actors involved in nature conservation, timber processing and professional forest association have some power resources in affecting forest policy formulation in the country. Actors interested in recreation, hunting, water and soil provision, and employment in forests have only marginal power resources to impact forest policy processes at the national level.

It was apparent that the main power resource of governmental actors is coercion based on executive power of legislations by the (state) general directorates and their subordinated organizations. The General Directorate of Forestry as well as GD of nature parks and nature conservation set immaterial incentives by appealing to morals and values when demanding ecosystem services and particularly higher nature conservation standards. Civil societies focusing on nature conservation do provide some immaterial incentives towards more nature conservation. On the other hand, however, actors mostly interested in commodities such as timber and non-timber products along with nature conservation have the highest impact on forest management formulation. Actors interested in timber industries, water provision, soil protection, employment have medium impact on forest management. Actors interested in recreation, renewable energy and hunting have only low impact on forest management in national forest policy processes (Table 96).

*Table 96: Overview of power resources of different interests*

| **Actor's interests** | **Power resources** | | | |
|---|---|---|---|---|
| | **Means of coercion** | **Incentives** | **Dominant information** | **Power resources of the interest** |
| Forest management | +++ | ++ | +++ | **Strong** |
| Timber processing | + | ++ | ++ | **Medium** |
| Employment in forests | + | + | + | **Medium** |
| Renewable energy regeneration | + | + | + | **Low** |
| Recreation | + | + | + | **Low** |
| Hunting | + | + | + | **Low** |
| Water provision | ++ | + | + | **Medium** |
| Soil protection | ++ | + | ++ | **Medium** |
| Environmental, nature, and landscape conservation | +++ | +++ | +++ | **Strong** |



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The actors with interests in timber provision, soil protection and biodiversity and habitats conservation are the most powerful ones at the national level (Table 97). Actors interested in regulating forest ecosystem services as well as providing medicinal and aromatic plants have medium power resources to impact forest management at the national level. Actors interested in cultural ecosystem services, fish and wind energy have low power resources and only marginal impact on forest policy processes.

*Table 97: Overview of power resources of interests in different ecosystem services, national level*

| Interest in | Overall power resources | Means of coercion | Incentives | Dominant information |
|---|---|---|---|---|
| ***Provisioning services*** | | | | |
| Wood | **Strong** | **+++** | **+++** | **+++** |
| Mushrooms | **Low** | **+** | **+** | **+** |
| Berries | **Low** | **+** | **+** | **+** |
| Game | **Low** | **+** | **+** | **+** |
| Medical&Aromatic plants | **Medium** | **++** | **++** | **+++** |
| Other(s):Fish&Wind energy | **Low** | **+** | **+** | **++** |
| ***Supporting services*** | | | | |
| Biodiversity | **Strong** | **+++** | **++** | **+++** |
| Habitat for species | **Strong** | **+++** | **++** | **+++** |
| ***Regulating services*** | | | | |
| Carbon sequestration | **Medium** | **++** | **++** | **+++** |
| Climate regulation | **Medium** | **++** | **++** | **+++** |
| Water quality | **Medium** | **++** | **+++** | **++** |
| Soil protection | **Strong** | **+++** | **++** | **+++** |
| Pest control | **Medium** | **++** | **+** | **++** |
| ***Cultural services*** | | | | |
| Outdoor recreation | **Low** | **+** | **+** | **+** |
| Aesthetic values | **Low** | **+** | **+** | **+** |
| Tourism | **Medium** | **+** | **++** | **++** |

At the national level, market actors have low power resources to impact forest management. Civil society actors have medium power resources to impact forest management (Table 98). Governmental actors at the national level in Turkey are quite strong in forest policy formulation because decision-making authority is almost always allocated in the responsibility of the states. Power of market and civil society actors in forest policy at the national level is mainly based on second hand contribution to the development of new legislation in forestry and unverified information which is spread within lobbying processes, in public relations, contribution to research projects and general participation in the public discourse.

*Table 98: Overview of power resources of different actor types*

| | Means of coercion | Incentives | Dominant information | |
|---|---|---|---|---|
| **Market actors** | **+** | **+** | **+** | **Low** |
| **Civil society actors** | **++** | **++** | **++** | **Medium** |
| **Governmental actors** | **+++** | **+++** | **+++** | **High** |



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## 44. General case study information: Gölcük State Forest Industry

The Gölcük study area is located in the Marmara region dominated mainly by the broadleaved (generally mixed) productive forests when compared to other regions of Turkey. The case study area is within the most industrialized region of Turkey, showing a strong economy. Several big companies have their headquarters in Adapazarı-Gölcük. Important economic sectors are automobile industries, sugar, oil and wood based industries. The total land base of the case study area is about 81,808.5 ha, of which 40,493.5 ha is of forests (49.5%). Climatic condition is very convenient for continuity and viability of forests and forestry activities such as regeneration or planting. Gölcük State Forest Industry (GFI) was established in 1990 and owns nearly 91% of the total forest area that is relatively less when compared to other parts of Turkey. This characteristic is prominent when compared with other regions of Turkey. However, forest owners are not willing to produce timber and private forests generally managed for other forest values such as aesthetics, recreation and chestnut fruit as a non-wood forest product as most of them have heritage problems and owned by many people. Forests having dense, medium and loose crown closure (>10%) comprises nearly 93%, which is quite higher than the Turkish average (nearly 53%). All forests within the CSA managed for even-aged forest management model/system. The annual increment is also nearly 4.7 $m^3$/ha within the CSA, which is two times higher than country average (2 $m^3$/ha).

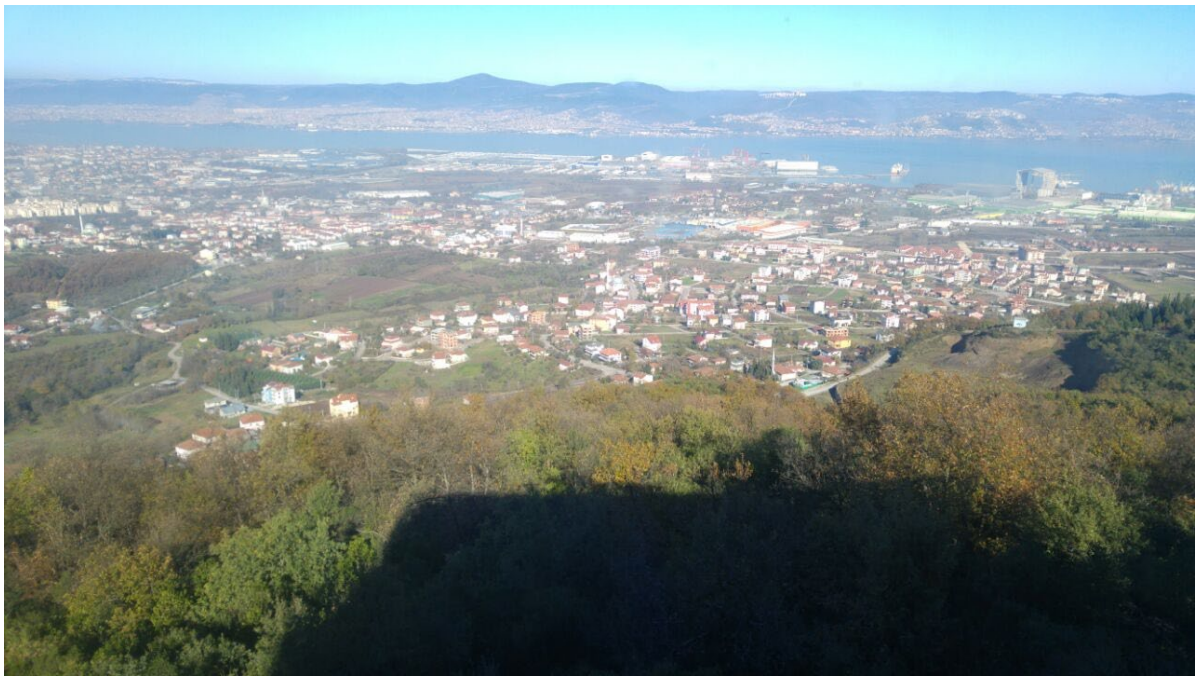

*Figure 17: Part of Gölcük city and the industries along the İzmit bay*

According to the forest inventory conducted in 2015 and the ecosystem based multiple use forest management guidelines, forest suitable for solo economic purpose is about 27,422.8 ha (67.7%), for ecological value is nearly 10,574.2 ha (26.1%) and the rest can be managed for socio-cultural values (3,659.1 ha (6.2%). There are six planning units having six different technical foresters responsible for each in the GFI. Two different nature parks as “Beşkayalar Nature Park” and “Suadiye Nature



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Park" besides several recreational sites exist in the GFI. The protected area corresponds to nearly 10.7% of the area.

## 45. Actor analysis: Case study Gölcük State Forest Industry

There are several actors in both serving and receiving forest goods and services in Gölcük. The main and dominant actor is the Gölcük State Forest Industry (GFI), a governmental local enterprise responsible for all kinds of forest management activities. GFI works under "Sakarya Regional Directorate of Forestry" as one of the seven state forest industries within the region. Another important governmental actor within the case study area is the "National Park" service, responsible for nature parks, national parks, nature monuments, wild life reserves and hunting.


*Figure 18: Turkish ALTERFOR team members (on the left) with the vice director of Gölcük State Forest Industry (on the right) as the main actor of the study area*

The study area is also within the domain of large timber processing mills producing particle boards. Therefore, there are "big players" besides small sized with low capacity wood processing enterprises. All the wood processing companies demand high amount of timber from GFI.

In Turkey, forest villagers have some rights in the timber production process. The forest law (article 31) provides the priority to the forest villagers via forest cooperatives in harvesting, timber extraction and transportation processes. Therefore, local people working in forestry related works have certain rights in the timber production process from public forests via forestry cooperatives. The contractors that work with the villagers are accepted as another actor too. The manufacturer of chair furniture



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produced by chestnut tree is standing as another actor that has become a famous sector on the country for the last 60 years. The indigenous people with this interesting sector produce typical hand-made chairs from 4-5-year Chestnut shoots growing in the local case study area.

Chestnut and mushroom are two important non wood forest products within the study area. However, there are some problems associated with the local people to pay the tariff (stumpage fee) for collecting NWFP in the state forest for commercial use and the other people coming from outside region to collect the NWFP without paying any money to the government. GFI tries to increase its income from non-wood forest products and some forest areas (526.8 ha) are allocated for chestnut fruit management unit according to new forest management plans for the period of 2015-2034. In fact, there is a "Chestnut festival" been organised by local people for the last 13 years and celebrated by nearly 1,000 inhabitants each year. Therefore, local people collecting especially chestnut and mushroom are considered as another interest group.

*Figure 19: Preparations of the 13th chestnut festival and one of the Chestnut fruit collectors (also headman of the Hamidiye village) within the study area*

There are four different water bottling plants constructed in recent years and there are thirteen of them operating within the CSA. Outdoor picnic areas and recreation facilities reached to nearly 30 within the case study area. Those areas are within the forest land and belong to the government. Contractors operating these facilities have also certain influence on the management of the forest resources within the SCA. Besides, there are nearly 50 small private forests within the Gölcük Forest Enterprise and nearly all of them have forest management plans. However, silvicultural activities in terms of regeneration and thinning are very limited and have not been undertaken because of the multi ownership and long-standing property rights / heritage problems. Additionally, private forest owners have to get permission for all kind of operations within their forests including infrastructure or construction demands as well as forestry activities.

## 45.1. Interest of actors: Case study Gölcük State Industry

As indicated previously, Gölcük State Industry is a key actor and dominates all other actors within the study area. The vast majority of the CSA is owned and managed by the state forest industry serving timber, water and recreational values to the public. GFI is responsible for protecting forest resources



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against all kinds of risks and threats and develops a nature-friendly holistic approach for the management of forest resources for multi-purpose sustainable outcomes focusing on the balance of economic profits, ecological integrity and resilience, and the social awareness and stewardship. Therefore, the main duties of GFI are, to manage forest resources together with its flora and fauna in an ecological integrity by taking into account all forest values, to protect forests against any illegal interventions, natural disasters and fires within the CSA. GFI is also responsible for enlarging the forest area and the associated services provided from forests, rehabilitating forests, designating recreational areas, carrying out all other forest management activities. Besides, GFI have forest nurseries to grow seeds and seedlings of commercial trees, shrubs and other plants of forests, carry out vaccination tasks with its recruited staff or through contractors. Furthermore, GFI is responsible for the supervision of private forests.

There are some apparent forest problems encountered within the SCA. Shrinking of forest areas with the permission for establishment of mining areas, electricity lines, hydropower dams are pronounced by the actors as the prevailing problems of the CSA. Within the scope of GFI, ownership and border problems can be considered as a major conflicts and forestry problems. GFI states that silvicultural activities such as regeneration and thinning are the most important treatments to measure the performance of the state forest administration. In the last ten years, for example, regeneration activities have been seen as a crucial forestry activity. In fact, GFI earns most of its income from timber production based on those activities. Furthermore, biodiversity, genetic resources and the other species that have not been discovered yet are considered as the most important ecosystem values by the GFI.

Timber processing companies directly affect the production and management activities within the CSA. The private forest companies include particle board mills, saw mills (there are many of them with low capacity of production) and paper mills. There is a great increase of market in particle board industry. For the last couple of years, for example, some plants were either bought or constructed. The state forest service harvests nearly 8.4 million $m^3$ of timber products per year which would be insufficient for only one particle board mill. According to the timber companies, the annual production of wood is insufficient as Turkish forest service (GDF) complains about lack of technical persons. Furthermore, forest road networks are poor and GDF is slow to construct new roads. The timber processing sector would like to transport timber with large trucks, yet can only transport 10% with 10-wheel trucks. Here, the fuel is the significant parameter of the cost. Therefore, the timber-processing sector cannot compete with European counterparts. Wood buyers are also concerning about the governmental subsidies given to the forest villagers as part of the Turkish Forest Law. This subsidy leads deceleration in timber production and also increases the costs. On the other hand, this particle board sector does not need products over 20 cm in diameter because of increasing unit prices.



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*Figure 20: The interview of the Gebze mill of Kastamonu Entegre wood processing company*

Timber processing companies appreciate the importance of other forest values such as biodiversity, water production and nature protection although they give high priority to timber production. GDF sells timber to the market, yet provides the wood to the industry with a "dedicated sale" procedure which is considered unfavorable or not appropriate. One of the mills of Kastamonu Integrated Company, for example, consumes nearly 4,200 $m^3$ of wood per day! Gölcük state forest industry harvests about 14,000 $m^3$ of wood per year. The annual production capacity of Gölcük can only supply 3.5 days demand of this factory! Although GDF planned to sell wood from the forest as "standing volume" for timber companies with the capacity over 25,000$m^3$, the Forest Law (Article number 30 and 31) did not allow such procedure. Besides, the timber companies pay considerable amount of additional fee to the state almost equaling to the salaries of personals.

Nature protection and national parks (NP) is in charge of planning, managing and improving the protected areas such as national parks, natural parks, wetlands, natural monuments, wildlife reserves, recreation areas in addition to the conservation of biodiversity within the CSA. The main duties of the NP service are, to perform the functions such as designation, organization, protection, development, management and advertisement of all protected areas. NP service is also responsible for protecting and enhancing wild animals, forest game hunting resources and water resources in forests as



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well as brook, pond and river, wetlands and vulnerable areas, plan and manage hunting resources and control studies such as inventory, planning, projects, implementation and monitoring, and establish facilities for these services. Besides, NP observes sensitive areas, and carry out the related works and procedures for regulating forest game hunting.

*Figure 21: Director of the nature conservation and national parks of the study area*

NP administration stated that there are some problems in the selection of suitable areas for conservation or protection. Although there are some criteria for establishing protected areas, there must be sound study and field visits before the declaration of protected areas to have a clear idea. There is also a discussion whether to allow wild life to feed on trees or shrubs during the silvicultural interventions. There are not enough facilities to feed the animals for survival. Moreover, there is a lack of general management plan to set and achieve the conservation targets in the protected areas. In fact, each protected area should have a general management plan that sets the targets and guides all developments within the park accordingly. The absence of general management plans jeopardizes the strategic level policies to protect natural and historical values, maintain the distinctive characteristics of the park, provide opportunities for recreation within the park, and to provide an adequate range of goods, services and facilities for local people and visitors within the CSA.

Forest cooperatives and contractors are another important actors within the CSA. GFI contracts out the timber production activities to the cooperatives according to the Forest Law. However, they are not organised well and do not have the appropriate financial and technical capacity to finish the work on time. On the contrary, the cooperatives generally complain about the low payments, road maintenance or construction as the GFI responsibility. In the meantime, forestry cooperatives are not comfortable with the slow control process that GFI is in charge with marking the trees, shipping permissions or controls, shifting timber production from summer to winter seasons. The size of standing timber sale with “auctions” are considered to be high and GFI is not willing to divide the compartments into smaller sale packages according to the desire of forestry cooperatives as they would like



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to attend the bids. Additionally, the forest villagers want to use their “ramp sale rights” coming from The Forest Law. However, the forest administration is looking for alternatives not to exercise these rights to increase the net income. In brief, the cooperatives would like the forest operations divided into smaller pieces while the GFI desires a coherent work, thus the conflict arises.

*Figure 22: The cooperative members and the local people from the study area*

NWFP stakeholders are also another interesting actors within the CSA. For example, there are hand-made chair producers who generally demand 3-4-years old Chestnut shoots. However, the sector has some problems with GFI in acquiring raw material as there is not enough timber production with the desired standards. The sector either imports the required material from China or get from private forest owners at high costs. What the sector demand is a special cutting rights given to the villages as part of the regulations with a governmental subsidies (i.e., a subsidy sale) as they used to exercise before. The sector demand from GFI to apply precommercial thinning to supply the small sized (3-4 years shoots) material for the chair sector.



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*Figure 23: Handmade furniture chairs made from fresh Chestnut shoots*

The fresh water supply of the residences within the CSA comes from the water bottling plants established nearly 10 km away from the forests and is bottled within the Gölcük city center. Although the fresh water comes from the forest, GFI has no income from these bottling plants as they pay to the municipalities. The management of the bottling plants is quite aware of their dependence on forest ecosystems for sustainable water supply. They concern about harvesting activities that sometimes destroy the water pipes delivering the water from forest to bottling plants. Most of the plants were established in recent years and the companies have limited knowledge about the effects of silviculture activities on the quality and the quantity of fresh water supply. They have just seen the water protection as an essential forest value for the forest ecosystems. According to the regulations, the governance of the municipality is responsible for leasing the forested lands (thus resources) with the due monetary transactions to the others. However, the forest service is responsible for issuing the permissions for the water pipe route and easements. So, there appears to be a great conflict about the water management.

*Figure 24: Water bottling plant within the study area*



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There are several recreational areas such as picnic areas and fish farming leased from GFI based on a bidding approach. Maintenance of recreational forest areas is a crucial problem in terms of silvicultural activities that are not carried out appropriately according to the manager of Kadırga promenade leased from GFI near Gölcük. Moreover, people coming to those areas for nature walking, resting, outdoor recreation or scenic beauty would like to see a clean environment. GFI is, however, responsible for maintenance and its field personnel do not act responsibly. Since the private companies do not own the areas, they generally hesitate to invest more and would like to prolong the leasing term to amortise the investment.


*Figure 25: The Kadırga picnic area and its facilities within the study area*

Owners of the private forests are also crucial actors within the CSA. Based on the regulations, the private forests owners should have a responsible manager, yet currently they do not have any. The absence of a responsible manager leads the delay of appropriate interventions in terms of regeneration or cutting. Moreover, the owners apply to the state forest service for establishing certain facilities in the private forests, yet the forest service is very slow and reluctant in responding to those requests because of the lack of technical staff.

The interests of the actors within the case study generally match with the general interests within Turkish forest politics (Table 99). As expected, actors from forestry and timber industries prefer high harvesting intensities. Most actors from forestry suggest multiple use forest management at the whole area with a priority on timber production. Actors from NWFP prefers small material for harvesting. Actors in employments and local job creation prefer small pieces of works given to them. This interest is in conflict with the interests of state forest actors who prefer an integrated work. Actors in regulating services have high concerns on harvesting activities that are considered detrimental to water supply. Recreational forest users have no specific ideas about preferred forest management concepts but demand a well maintained landscapes within forest.



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*Table 99: Interests in ecosystem services of selected actor groups (case study)*

| | **Forest management** (e.g. governmental actors) | **Timber and WFP Industries** (e.g., market actors) | **NGOs representing employment in forests** (e.g. cooperatives) | **NGOs representing eco-tourism and recreation** | **Water and soil protection** | **NGOs + Government actors representing nature conservation in forests** |
|---|---|---|---|---|---|---|
| ***Provisioning ES*** | | | | | | |
| Wood provision | +++ | +++ | +++ | - | - | + |
| NWFP -Chestnut | + | +++ | + | +++ | 0 | ++ |
| *Supporting ES* | | | | | | |
| Biodiversity | ++ | --- | - | ++ | ++ | +++ |
| ***Regulating ES*** | | | | | | |
| Carbon sequestration | + | -- | - | 0 | 0 | +++ |
| Climate regulation | + | 0 | 0 | 0 | 0 | +++ |
| Water quality | ++ | - | - | - | +++ | +++ |
| Soil protection | ++ | --- | --- | + | +++ | +++ |
| ***Cultural ES*** | | | | | | |
| Outdoor recreation | + | + | - | +++ | - | + |
| Aesthetics | + | - | 0 | +++ | - | + |

## 45.2 Power of actors: Case study Gölcük State Forest Industry

Gölcük State Forest Industry is the primary actor within the CSA. Private forest industry producing particleboard comes after. Timber processing companies influence the market and the firms such as sawmills and pellet producers took the advantage of the crises in 2013-2014. Ayazlar Company buys 150,000 $m^3$ of wood over 18 cm in diameter and Kastamonu Entegre Company uses the rest. If Kastamonu Entegre does not buy from them they cannot utilize the rest! So they depend on each other. All sectors including timber processing companies, Chestnut collectors, chair producers and water bottling plants have associations and have regular meetings with GFI. They have both written communications and on site visit with their delegates. However, most of the suggestions provided are not taken into account by the General Directorate of Forestry due to the central or dominant management approach. For instance, the sale prices of timber are directly determined by the forest service.

Most of the wood processing companies use importing mechanism to sustain their own production. Timber sector prefers certain coniferous trees such as Pines and Firs and exclude deciduous trees such as Oak and Chestnut because of tannin. However, forest service insists on (has the power) harvesting trees like Chestnut and Poplar with the same price as Beech tree with a “dedicated sale”, creating conflict on the unit prices. Thus the sector demands more flexible prices. In addition, wood processing sector pay different kinds of fees such as referral fee (brokerage), ministerial fee and other additional fee to the government. However, the mechanism is so slow and local forestry service has no rights to change the prices as the prices are determined by the General Directorate of Forestry.

The local forest administration thinks of a limited central management mechanism and different occupational groups such as information technology, business marketing, road construction may have to be hired. It is understand that tourism sector, hunting sector, water sector, energy sector and



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others do not cause big problem to the forest administration. However, hunters often do not obey the rules. The actors in regulating services such as water management think that they have no effect on the management of forest resources and local forest service is responsible all the activities within the forest. Local people are always in contact with the foresters and feel that they don' t have any effect in forest management decisions. They see privatizing of forests as a solution. Ccooperatives are weak and not organized well within the CSA. The NWFP sector like chair production does not have much effect on the management of forests either. As a result, most of the sectors think that they have no authorization in the decision making process of forestry activities.

The primary power resource is the state forest service to dominate the forest management design and implementation in the CSA. The private timber industries is gaining certain power in forest policies as they are big companies and operate at international level. The nature conservation actors are mostly interested in nature and biodiversity conservation that have the strong impact on forest management formulation. Actors generating employment opportunities have medium impact on forest management. Actors interested in recreation and hunting have only low impact on forest management in national forest policy processes. Although not powerful yet, the market and the civil society actors interested in the provision of clean drinking water impact forest management by prohibiting certain forest management activities (Table 100).

*Table 100: Overview about power resources of actors with different interests in the case study*

| **Actor's interests** | **Power resources** | | | |
|---|---|---|---|---|
| | **Means of coercion** | **Incentives** | **Dominant information** | **Power resources of the interest** |
| Forest management | **+++** | **++** | **+++** | **Strong** |
| Timber-NWFP processing | **+** | **++** | **++** | **Medium** |
| Employment in forests | **++** | **+** | **+** | **Medium** |
| Recreation | **+** | **+** | **+** | **Low** |
| Hunting | **+** | **+** | **+** | **Low** |
| Water provision | **++** | **+** | **+** | **Low** |
| Soil protection | **++** | **+** | **++** | **Medium** |
| Environmental, nature, and landscape conservation | **+++** | **+++** | **+++** | **Strong** |

The actors with interests in timber provision, supporting services and soil protection are the most powerful ones at the case study level (Table 101). Actors interested in regulating forest ecosystem services have medium power resources to impact forest management at the case study level. Actors interested in cultural ecosystem services, NWFP, fish and recreation have low power resources and only marginal impact on forest policy processes.

*Table 101: Overview about power resources of different interests in ecosystem services (case study)*

| **Interest in** | **0verall power resources** | **Means of coercion** | **Incentives** | **Dominant information** |
|---|---|---|---|---|
| ***Provisioning services*** | | | | |
| Wood | **Strong** | **+++** | **+++** | **+++** |
| Game | **Low** | **+** | **+** | **+** |
| NWFP – Chestnut shoot | **Low** | **+** | **+** | **+** |
| Other(s):Fishing | **Low** | **+** | **+** | **++** |



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| | | | | |
|---|---|---|---|---|
| ***Supporting services*** | | | | |
| Biodiversity | **Strong** | **+++** | **++** | **+++** |
| Habitat for species | **Strong** | **+++** | **++** | **+++** |
| ***Regulating services*** | | | | |
| Carbon sequestration | **Medium** | **++** | **++** | **+++** |
| Climate regulation | **Medium** | **++** | **++** | **+++** |
| Water quality | **Medium** | **++** | **+++** | **++** |
| Soil protection | **Strong** | **+++** | **++** | **+++** |
| ***Cultural services*** | | | | |
| Outdoor recreation | **Low** | **+** | **+** | **+** |
| Aesthetic values | **Low** | **+** | **+** | **+** |
| Tourism | **Medium** | **+** | **++** | **++** |

Market actors have medium power resources to impact forest management in the case study area. However, governmental actors have the strongest power resources to impact forest management. Civil society actors are medium powerful to impact on forest management in the case study (Table 102).

*Table 102: Overview about power resources of different actor types in the case study*

| | **Means of coercion** | **Incentives** | **Dominant information** | |
|---|---|---|---|---|
| **Market actors** | **++** | **+** | **++** | **Medium** |
| **Civil society actors** | **++** | **++** | **++** | **Medium** |
| **Governmental actors** | **+++** | **++** | **+++** | **Strong** |

## 46. Conclusions

The forests of Turkey is owned and manged by the state forest authority. The state has the ultimate power in policy setting and management of forest resources. The case study area is a subset of national forest landscape, with almost the similar power and interests of actors across the country. Actors focusing on forest management and timber provision are still more powerful than the actors interested in nature conservation and other ecosystem services. Although all actors appreciate the design and implementation of ecosystem based multiple use forest management concept across the country, they have different preferences and priorities for forest management practices, favouring various ecosystem services. Aside from the state forest, to a lesser degree, private timber and non-timber product industries, cooperatives, water provision companies, nature conservation associations, and recreationalists impact forest management in the case study area.

Some conflicts exists between the state and the other actors. Specifically, conflicts exists between actors interested in the provision of wood and sustainable management of forests (state) because of high demand of wood by the private timber industries. Although not greatly pronounced, partial conflicts arise between actors interested in nature conservation and timber provision due to limitation of areas for timber management. One important concern raised by the timber industries is the re-formulation of solo state based management of forests in the country. Based on the actor analysis, ecosystem based multiple use forest management concept seems to be the prevailing approach



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given the fact that better communication and structured participation of all relevant actors are critical in prioritizing various ecosystem services during the design, planning and implementation of the concept across the country.



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# Conclusions and future steps

This report presented the results of the analysis of actors are driving forest management by WP4 in the ten ALTERFOR case studies. Knowledge about the actors interested in various forest ecosystem services and their power resources to impact forest management are necessary to develop a pluralistic, foresighted integration strategy to reach utilization of ALTERFOR research results in practice based on the RIU-model (Böcher and Krott 2016).

The policy context of forest management is very diverse within Europe. Some case studies have a sectoral forest policy, in other cases (e.g. the Netherlands) forests are governed by an integrated forest and nature conservation governance approach. Uncoherent legislations and unclear relationship of goals from legislations by different sectors ("legislative chaos") cause problems in some case studies (e.g. Portugal, Slovakia). In some other case studies (e.g. Italy) the competing responsibilities of different vertical levels are an import issue in forest policy.

All case studies showed that forest management challenges in the 21st century might require the adaptation of new forest management models that optimize the ecosystem service basket provided by forests. The challenges of climate change adaptation and the increasing importance of renewable energies provided by forests (timber for energetic use, wind turbines within forests, large-scale solar panel farms within forests) impact forest management in the CSAs. Related to climate change, catastrophic events (forest fires, windfalls) constitute a major forest management challenge in several cases. In most countries the provision of timber is one of the most important ecosystem services. However, exceptions exist (e.g. Italy, the Netherlands). Trade-offs between the provision of timber and biodiversity protection exist in all case studies. Insect infestations and browsing damages substantially reduce the amount of timber in several cases. Furthermore, in all cases, society has increasing demands for cultural ecosystem services provided by forests. Thus, new forest management models are needed, taking these diverse forest management challenges into account. Furthermore, the presentation of alternative forest management models to the stakeholders should be linked to the identified current forest policy conflicts in all case studies.

According to the RIU-model new forest management models need to provide science-based solutions for the identified forest management challenges and the support of powerful actors to reach implementation by practitioners (Böcher and Krott 2016). Therefore, the development of alternative forest management models needs to take the identified interests of actors in the case studies into account. Specifically, the interests of the powerful actors need to be considered to reach implementation of alternative forest management models to be developed within ALTERFOR. Powerful actors can force the implementation of new forest management models. However, if a forest management model aligns with the interests of many less powerful actors there are chances of implementation as well.

Differences exist between power resources of actors with interest in specific forest ecosystem services between cases. In most cases, actors with a prior interest in timber provision, biodiversity, and habitats for species have the strongest power resources to impact forest management. Furthermore, differences in power relations exist within most countries between national level and CSA level. These different power relations need to be taken into account in the development of communication strategies to foster implementation of alternative forest management models by practitioners.



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Public and private forest owners are driving forest management in all case studies. However, important differences between the case studies exist concerning the property rights of private forest owners in their forests. In some case studies (for example Sweden or the Netherlands), the property rights of owners in forests are very strong, allowing forest owners far reaching freedom of choice in forest management. In other case studies (for example Ireland, Lithuania, Slovakia), the property rights of private forest owners are more limited by the legal forest policy frameworks of the countries.

Differences also exist between power relations of governmental, market, and civil society actors to impact forest management between the case studies. In most cases, governmental actors are most powerful actors to impact forest management. Some case studies are more market driven than others. In Portugal and Sweden, pulp and timber industries are very powerful and impact forest management practices. Civil society has only low power resources to impact forest management in almost all cases. The Netherlands are an exception in this regard because civil society has comparable power resources as market actors. This particularity relates to the low economic importance of domestically produced timber within the Netherlands. In contrast, in Sweden domestically produced timber is an important part of the economy and market actors have strongest impact on forest management practices.

The actor analysis in all cases is only a first step to foster knowledge transfer and implementation of alternative forest management models by practice. The next step of WP4 will be the contribution to the development of alternative forest management scenarios for all case studies, based on the interests of relevant actors. Next, stakeholder workshops will present the results of the work by WP1, WP2, and WP3 in the CSAs. These stakeholder workshops need to relate to important forest policy problems and conflicts in the CSAs to inspire politicians and practitioners.



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## References

AFN. 2011. Relatório anual de áreas ardidas e ocorrências em 2011. 1 de Janeiro a 31 de Dezembro. Direcção de Unidade de Defesa da Floresta. Lisboa: Autoridade Florestal Nacional.

AFVS. 2012. Cartografia de uso e ocupação do solo (informação geográfica). Associação Florestal do Vale do Sousa.

Agrawal, A., Chatre, A., Hardin, R., 2008. Changing governance of the world's forests. Science 320, 1460-1462.

ALTERFOR (2016). ALTERFOR Alternative Models for Future Forest Management. https://www.alterfor-project.eu/home.html. Date of access: 23rd of November, 2016.

Ambrušová, L., Dobšinská, Z., Sarvašová, Z., Hricová, Z., Šálka, J., 2015. *Forest Land Ownership Change in Slovakia*. Cost Action FP1201 FACESMAP Country Report. European Forest Insitute Central-East and South-East European Regional Office, Vienna. 35p.

Andersson, L., Kriukelis, R., Skuja, S. 2005. Woodland Key Habitat inventory in Lithuania. Lithuanian Forest Inventory and Management Institute and Regional Forestry Board of Östra Götalan, Vilnius (In Lithuanian).

Anonymous, 2015. Türkiye orman varlığı 2015 (State of Turkish Forests),T.C. Oman ve Su İşleri Bakanlığı, Orman Genel Müdürlüğü Yayınları Ankara.

Anonymous, 2014. Sürdürülebilir Orman Yönetimi, Özel İhtisas Komisyon raporu 2023 (Sustainable forest management, the specialized commission report) T.C. Kalkınma Bakanlığı, 10. Kalkınma Planı (2014-2018), Ankara.

Anonymous, 2012. Strategic Plan of General Directorate of Forestry (OGM Stratejik plan) 2013-2017. T.C. Oman ve Su İşleri Bakanlığı, Orman Genel Müdürlüğü Yayınları Ankara.

Anonymous, 2004. Türkiye Ulusal Ormancılık Programı (National forest programme),T.C. Oman ve Su İşleri Bakanlığı, Orman Genel Müdürlüğü Yayınları Ankara.

Appelstrand, M., 2012. Developments in Swedish forest policy and administration – from a "policy of restriction" toward a "policy of cooperation". Scandinavian Journal of Forest Research 27, 186-199.

Arts B., M. Appelstrand, D. Kleinschmit, H. Pülzl, I. Visseren-Hamakers et al. (2010). Discourses, actors and instruments in international forest governance, in: J. Raynor, A. Buck and P. Katila (eds.), Embracing Complexity: Meeting the Challenges of International Forest Governance. IUFRO World Series Vol. 28, pp. 57-74.

AVIH (2016a). About AVIH. http://www.avih.nl/english/. Date of access: 28th of November, 2016.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 676754.

AVIH (2016b). Houtprijzen. http://www.avih.nl/bosbasics/kennis-a-z/hout-prijzen/. Date of access: 6th of December, 2016. In Dutch.

Banca d'Italia, 2016. Economie regionali. L'economia delle regioni italiane nel 2015. N. 21. Banca d'Italia, Roma.

Baptista, F.; Santos, R. 2005. Os Proprietários Florestais: Resultados de um Inquérito. Celta, Oeiras.

Başkent EZ, Köse S and Keleş S (2005). The forest management planning system of Turkey: constructive criticism towards the sustainable management of forest ecosystems, *International Forestry Review* 7(3),208-217.

Başkent EZ, Terzioğlu S and Başkaya Ş (2008). Developing and implementing multiple-use forest management planning in Turkey, *Environmental Management* 42, 37-48.

Barlı Ö, Başkent EZ and Türker M (2006). Analytical Approach for Analyzing and Providing Solutions for the Conflicts among Forest Stakeholders across, *Forest Policy and Economics*, 9, 219-236

Bavlšík, J., Antal, P., Kočik, L., Komina, V., Kučera, J., Machanský, M., Ruman, K., Szarka, P., Valach, Ľ., Žabka, Ľ. 2009. *Pracovné postupy Hospodárskej úpravy lesov 2008*. Národné lesnícke centrum, Zvolen. 147 p. (in Slovak)

Bavlšík, J., Kučera, J., Ruman, K., 2010. *Hospodársko-úpravnícke plánovanie a trvalo udržateľné hospodárenie v lesoch*. Bratislava, MP SR, Európsky poľnohospodársky fond pre rozvoj vidieka, Národné Lesnícke Centrum Zvolen, 128 p. (in Slovak)

Beland, Lindahl, K., 2015. Actors perceptions and strategies: Forests and pathways to sustainability. In: The future use of Nordic forests: A global perspective. Ed Westerholm, E., Beland Lindahl, K., Kraxner F. 11-124. Cham:springer.

Beland Lindahl, K., Sténs, A., Sandström, C., Lidskog, R., Ranius, T., Roberge J-M., 2015. The Swedish forestry model: More of everything? Forest Policy and Economics. DOI: 10.1016/j.forpol.2015.10.012

Beland Lindahl, K., Westerholm, E., 2012. Future forests: Perceptions and strategies of key actors. Scandinavian Journal of Forest Research 27 (2), 154-163.

Bennet, E., Peterson, G., Gordon, L., 2009. Understanding relationships among multiple ecosystem services. Ecology Letters 12, 1–11.

Berlin Institut, 2007. Gutachten zum demographischen Wandel im Land Brandenburg. Berlin-institut.org/fileadmin/user_upload/Veroeffentlichungen/Gutachten_Brandenburg_final.pdf. Date of access: 27th of November 2017.

Bezák, P., Mitchley, J., 2014. Drivers of change in mountain farming in Slovakia: from socialist collectivisation to the common agricultural policy. *Reg. Environ. Change* 1e14. http://dx.doi.org/10.1007/s10113-013-0580-x.

Böcher, M., Krott, M., 2016. Science makes the world go round. Succesful scientific knowledge transfer for the environment. Springer, Switzerland.

Bonsu, N. O., Dhubháin, Á. N. and O'Connor, D., 2015. Understanding forest resource conflicts in Ireland: A case study approach. Land Use Policy.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 676754.

Borges, J.G.; Marques, S.; Garcia-Gonzalo, J.; Rahman, A.U.; Bushenkov, V.; Sottomayor, M.; Carvalho, P.O.; Nordström, E.-M. 2016. A Multiple Criteria Approach for Negotiation Ecosystem Services Supply Targets and Forest Owners' Programs. Forest Science http://dx.doi.org/10.5849/forsci.2016-035.

Bosschap (2013). Groene waterschapsbestuurders. http://bosschap.nl/bedrijfsvoering/detail/detail.php?Groene-waterschapsbestuurders-9. Date of access: 24th of November, 2016.

Brodrechtová, Y., Bahýľ, J., Bošela, M., Sedmák, R., Smreček, R., Tuček, J., (in prep.): Policy intentions and outcome of forest management planning in Slovakia.

Brodrechtová, Y., Navrátil, R., Sedmák, R., Tuček, J., 2016. Using the politicized IAD framework to assess integrated forest management decision-making in Slovakia. *Land Use Policy* (in press)

Brodrechtova, Y., Trenčiansky, M., Halaj, D., 2014. Dynamics of Slovakian timber market in retrospect. In: SWST 2014 International Convention, June 23-27, 2014 in Zvolen, Slovakia

Brukas, A. 2003. Miškų ekonomika ir finansai tarpukario Lietuvoje [Forest economics and finances in the interwar Lithuania]. In: Verbyla V, Brukas A, Kairiūkštis L (eds) Lietuvos miškų metraštis XX amžius [The chronicle of Lithuanian forests XX century]. Aplinkos Ministerija, Vilnius, pp 371-374 (in Lithuanian).

Brukas, V. 2015. New World, Old Ideas—A Narrative of the Lithuanian Forestry Transition. *Journal of Environmental Policy & Planning* 17(4): 495-515.

Brukas, V., Činga, G., Kavaliauskas, M., Mozgeris, G., Stanislovaitis, A. 2013a. ŽEMAITIJA: INTEGRAL WP 3.1 Case Study Report, 108 p.

Brukas, V., Felton, A., Lindbladh, M., Sallnäs, O. 2013b. Linking forest management, policy and biodiversity indicators – A comparison of Lithuania and Southern Sweden. *Forest Ecol Manag* 291:181-189. doi:10.1016/j.foreco.2012.11.034

Brukas, V., Mizaras, S. and Mizaraitė, D. 2014. Economic forest sustainability: comparison between Lithuania and Sweden. *Forests* 6: 47-64.

Brukas, V., Sallnäs, O., 2012. Forest management plan as a policy instrument: Carrot, stick or sermon? Land Use Policy 29, 605-613.

Brukas, V., Weber. N., 2009. Forest management after the economic transition-at the crossroads between German and Scandinavian traditions. Forest Policy and Economics 11, 586-592.

Bublinec, E., Pichler, V. et al. 2001. *Slovenské pralesy, diverzita a ochrana – Slovak Primeval Forests, Diversity and Conservation*. Institute of Forest Ecology, Slovak Academy of Sciences, Zvolen, pp. 200

Buijs, A., Mattijssen, T., & Arts, B. (2014). "The man, the administration and the counter-discourse": An analysis of the sudden turn in Dutch nature conservation policy. Land Use Policy, 38, 676-684.

Bundesagentur für Arbeit, 2016. Statistik.arbeitsagentur.de/Navigation/Statistik/Statistik-nach-Regionen/Politische-Gebietsstruktur/Brandenburg-Nav.html. Date of acess: 27th of January 2017.

BWI 3, 2012. Online available: https://bwi.info/, last accessed 07.09.2016.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 676754.

Cadastral and forest division, District authorities Zvolen, 2016. Data provision from authority in November 2016.

Canadas, M. J.; Novais, A.; Marques, M. 2016. Wildfires, forest management and landowners' collective action: A comparative approach at the local level. Land Use Policy Vol. 56, 179-188 pp.

Caner, F., 2016. Il turismo in Veneto nel 2015. Venice, 18th February 2016. http://statistica.regione.veneto.it/Pubblicazioni/convegno_turismoVeneto2015/presentazione_turismo_18_febbraio_2016.pdf, last accessed 23.12.2016.

Carbone, F., Savelli, S., 2009. Forestry programmes and the contribution of the forestry research community to the Italy experience. Forest Policy and Economics 11, 508-515.

Central Statistics Office ( 2011). "Small Area Population Statistics." Retrieved 07062016, 2016, from http://census.cso.ie/sapmap/.

Černiauskas, G. and Dobrovolskas, A. 2011. Emerging of Market Economy in Lithuania (1990-2010). *Intellectual Economics* Vol. 5, No. 3(11): 371–387

CFS, 2015. Stime preliminari basate sui risultati della sola fotointerpretazione di INFC2015 e sui risultati di INFC2005. Corpo Forestale dello Stato. www.corpoforestale.it, last accessed 23.12.2016.

Ciancio, O., 2010. Selvicoltura, assestamento, epistemiologia ed etica. Dibattito scientifico o discussione da bar dello sport? Forest@, 7: 111-119.

Ciancio, O., 2011. La teoria della Selvicoltura Sistemica, I razionalisti e gli antirazionalisti, le "sterili disquisizioni" e il sonnambulismo dell'intellighenzia forestale. Accademia Italiana di Scienze Forestali, Florence.

Ciccarese, L., Pettenella, D., Pellegrino, P., 2014. A new principle of the European Union forest policy: the cascading use of wood products. L'Italia Forestale e Montana/Italian Journal of Forest and Mountain Environments, 69 (5), 285-290, DOI: 10.4129/ifm.2014.5.01

CICES, 2016. Common International Classification of Ecosystem Services (CICES) Version 4.3. http://cices.eu, last accessed 23.12.2016.

Coillte (2009). Forest Management Plan - Cloosh Forest 2011-2015 v.2.

Colanzi T., Sidorini L., 2016. Gli interventi forestali nei nuovi PSR. L'Informatore Agrario, 13: 33-36.

Corrado, G., Merlo, M., 1999. The state of art of National Forest Programmes in Italy. In: Glück, P., Oesten, G., Schanz, H., Volz, K.R. (eds.), Formulation and Implementation of National Forest Programmes. Vol II: State of the Art in Europe. EFI Proceedings No. 30, Vol. II, Joensuu, Finland, 157-175.

DAFF (1996). Growing For The Future - A Strategic Plan for the Development of the Forestry Sector in Ireland. Department of Agriculture Food and Forestry. Dublin, Ireland, Stationery office.

De Savornin Lohman, A.F. (2000). Overheidsbeleid en particulier boseigendom; Het kop-hals-romp-model. Den Haag, LEI. In Dutch.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 676754.

Den Boon, L., Schuurman, S. (2008). De Natuurschoonwet: Borger van Nederlands natuurschoon? Vakblad Natuur Bos Landschap, vol. 5 (10), pp. 18-19. In Dutch.

Dobšinská, Z., 2013. *Hierarchická a sieťová koordinácia v relevantných politikách pre lesníctvo: aktéri, vzťahy a procesy.* Bratislava: Fakulta ekonomických a sociálnych vied, Univerzita Komenského. Dissertation thesis. (in Slovak)

Dobšinská, Z., Sarvašová, Z., 2012. Združenia vlastníkov lesov v strednej a východnej Európe. In: *Aktuálne otázky ekonomiky a politiky lesného hospodárstva Slovenskej republiky*. Zborník z odborného seminára, Národné Lesnícke Centrum, Zvolen. p. 111-120 (in Slovak)

Dobšinská, Z., Šálka, J., Sarvašová, Z., Lásková, J., 2013. Rural developement policy in the context of actor-centered institutionalism. *Journal of Forest Science* 59 (1): 34-40.

Drents Landschap (2016). Dit zijn wij. http://www.drentslandschap.nl/dit-zijn-wij. Date of access: 17th of November, 2016. In Dutch.

EC, 2016. Internal Market, Industry, Entrepreneurship and SMEs - Veneto. https://ec.europa.eu/growth/tools-databases/regional-innovation-monitor/base-profile/veneto, last accessed 23.12.2016.

Edwards, P., Wallin, I,. Carlsson, J., Jonsson, R., Sallnäs, O., Brukas, W., 2013. WP 3.1 Case Study Report – Helge Ån, Sweden. INTEGRAL.

Ekelund, H., Hamilton, G., 2001. Skogspolitisk Historia (History of forest policy). Swedish Forest Agency, Jönköping (In Swedish).

ENF. 2015. Estratégia Nacional para as Florestas. Resolução do Conselho de Ministros n.º 6-B/2015, de 4 de fevereiro.

Enviroportal, Information portal of Ministry of Environment of the SR, 2016. URL <https://www.enviroportal.sk/indicator/detail?id=1103> Accessed November, 2016.

Eurostat, 2016. GDP at regional level (March 2016). http://ec.europa.eu/eurostat/statistics-explained/index.php/GDP_at_regional_level, last accessed 23.12.2016.

FAO (1998). Stakeholder groups. http://www.fao.org/docrep/003/w8623e/w8623e05.htm. Date of access: 23rd of November, 2016.

Fares, S., Scarascia Mugnozza, G., Corona, P., Palahí, M., 2015. Five steps for managing Europe's forests. Nature 519, 407-409.

Feliciano, D. 2008. Avaliação de Eficácia de Organizações de Produtores Florestais no Norte e Centro de Portugal. Master Thesis in Economics submitted to the Faculty of Economics and Management of the Catholic University of Portugal, in Porto.

Feliciano, D.; Alves, R.; Mendes, A. C.; Ribeiro, M.; Sottomayor, M. 2015. Forest Land Ownership Change in Portugal. COST Action FP1201 FACESMAP Country Report, European Forest Institute Central-East and South-East European Regional Office, Vienna. 50 pages [Online publication].

Forest Service (2000). Irish National Forest Standard. Dublin 2, Ireland, Forest Service, Department of the Marine and Natural Resources.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 676754.

Forest Service (2008). Irish Forests - A Brief History. Johnstown Castle Estate, Wexford, Ireland, Department of Agriculture Fisheries and Food.

Forest Service (2013). National Forest Inventory – Republic of Ireland – Results. Johnstown Castle Estate, Wexford, Ireland, Forest Service.

Forest Service (2015a). Afforestation Statistics 2014 Derived from the Forest Service Payment Database; IFORIS (Integrated Forestry Information System). Johnstown Castle Estate, Wexford, Ireland.

Forest Service (2015b). Forestry Standards Manual. Johnstown Castle Estate, Co. Wexford, Ireland, Forest Service, Department of Agriculture, Food and the Marine.

Forest Service (2015c). Ireland's Forests - Annual Sector Statistics. Johnstown Castle Estate, Co. Wexford, Ireland, Forest Service, Department of Agriculture, Food and the Marine.

Freeman, R. E. (2010). Strategic management: A stakeholder approach. Cambride: Cambridge University Press. First published in 1984.

Fryske Gea (2016). Wie zijn wij? http://www.itfryskegea.nl/Over-ons/Wie-zijn-wij/. Date of access: 17th of November, 2016. In Dutch.

FSC (Forest Stewardship Council), 2010. Swedish FSC standard for Forest certification including SLIMF indicators. FSC-STD-SWE-02-02-2010. FSC Sweden, Uppsala.

FSC, 2016. Certificate holder databse. https://info.fsc.org, last accessed 23.12.2016.

Geldersch Landschap & Kasteelen (2016). Who we are. https://www.glk.nl/english/who-we-are. Date of access: 17th of November, 2016. In Dutch.

Griffits, P., Kuemmerle, T., Baumann, M., Radeloff, V.C., Abrudan, I.V., Lieskovský, J., Munteanu, C., Ostapowicz, K., Hostert, P., 2014. Forest disturbances, forest recovery, and changes in forest types across the Carpathian ecoregion from 1985 to 2010 based on Landsat image composites. *Remote Sensing of Environment* 151: 72-88.

Gubka, A., Christo, N., Gubka, K., Galko, J., Vakula, J., Kunca, A., Leontovyč, R., 2013. History, present and expected future of forests in Slovakia. *American Journal of Plant Sciences* 4: 711-716.

Guillén, L.A., Wallin, I., Brukas, V., 2015. Social capital in small-scale forestry: A local case study in Southern Sweden. Forest Policy and Economics 53, 21-28.

Hellström, E., Welp, M., 1996. Environmental Forest Conflicts in Germany. From National to International Concern. European Forest Institute, Working Paper 11.

Hladík, M, Herich, I., Chorvát, P., Švec, M., Žihľavník, A., 1995. *Hospodárska úprava lesov. Ústav pre výchovu a vzdelávanie pracovníkov LVH SR*. Zvolen pre Lesnícku Fakultu Technickej univerzity vo Zvolene, 148 p. (in Slovak)

Hlásny, T., Sitková, Z.(Eds). 2010. *Spruce forests decline in the Beskids.* National Forest Centre – Forest Research Institute Zvolen & Czech University of Life Sciences Prague & Forestry and Game Management Research Institute Jíloviště – Strnady. Zvolen 2010, 182 p.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 676754.

Hlásny, T., Turčáni, M. 2013. Persisting bark beetle outbreak indicates the unsustainability of secondary Norway spruce forests: case study from Central Europe. *Annals of Forest Science* 70 (5): 481 – 491.

Hofmann, F. et al., 2000. Waldnutzung in Deutschland: Bestandsaufnahme, Handlungsbedarf und Maßnahmen zur Umsetzung des Leitbildes einer nachhaltigen Entwicklung. Metzler-Poeschel. Stuttgart.

Hoogstra-Klein, M.A., Arts, B., De Bruin, J. & De Jong, R. (2013). Factors influencing Dutch forest management decision-making. Wageningen: Forest and Nature Conservation Policy group, Wageningen University. Case study description South-East Veluwe. Deliverable INTEGRAL D 3.1-2.

Hoogstra, M., & Willems, A. (2005). The Netherlands. Country Report. In: Jáger, L.(ed.), Economic integration of urban consumers demand and rural forestry production. Forest sector entrepreneurship in Europe country studies, p. 467-482.

Horgan, T., Keane, M., McCarthy, R., Lally, M. and Thompson, D. (2003). A Guide to Forest Tree Species Selection and Silviculture in Ireland. Dublin, Ireland, COFORD.

Hricová**, Z.,** Ambrušová, L., Sarvašová, Z., Dobšinská, Z., Kajba, M., Šálka, J., 2015. *Politická moc združení neštátnych vlastníkov lesov***.** Národné Lesnícke Centrum, Zvolen. 174 p. (in Slovak)

Hubo, C., Krott, M., 2015. Macht von Politiksektoren als Chance für Wandel am Beispiel Waldnaturschutz. In: Macht und Wandel in der Umweltpolitik. Zeitschrift für Politikwissenschaft. Sonderband 2015 II. Nomos.

Humphreys, D., 2004. Redefining the Issues: NGO Influence on International Forest Negotiations. Global Environmental Politics 4 (2), 51-74.

Hugosson, M., Ingemarson, F., 2004. Objectives and motivations of small-scale forest owners; theoretical modelling and qualitative assessment. Silva Fennica 38, 217-231.

Hysing, E., Olsson, J., 2008. Contextualising the advocacy coalition framework: theorizing change in Swedish forest policy. Enviromental Politics, 17 (5), 730-748.

ICNF. 2013. IFN6 - Áreas dos usos do solo e das espécies florestais em Portugal continental. Resultados preliminares [pdf]. Lisboa: Instituto da Conservação da Natureza e das Florestas.

ICNF. 2016a. 9º Relatório provisório de incêndios florestais -2016. 01 de Janeiro a 15 de Outubro. Informação estatística sobre áreas ardidas e ocorrências. Sistema de Gestão de Informação de Incêndios Florestais. Departamento de Gestão de Áreas Públicas e de Proteção Florestal. Lisboa: Instituto da Conservação da Natureza e das Florestas.

ICNF. 2016b. Incêndios Florestais. Instituto da Conservação da Natureza e das Florestas. Online available: http://www.icnf.pt/portal/florestas/dfci/inc, last accessed 22.12.2016.

ICNF. 2016c. Zonas de Intervenção Florestal. Instituto da Conservação da Natureza e das Florestas. Online available: www.icnf.pt/portal/florestas/gf/zif, last accessed 20.12.2016.

Ilavský, J., Longauer, R., 2003. The role of research and education in forest policy during the period of transition in Slovakia. In: Jansky, L., Tikkanen, I., Pelkonen, P. (Eds), *Forests in transition: The role*



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 676754.

*of research and higher education in developing national forest programmes in countries with economies in transition*. United Nations University, pp. 44-62.

INFC, 2005. *Inventario Nazionale delle Foreste e dei Serbatoi Forestali di Carbonio*. Ministero delle Politiche Agricole, Alimentari e Forestali/Corpo Forestale dello Stato/Consiglio per la Ricerca e la Sperimentazione in Agricoltura. www.sian.it/inventarioforestale, last accessed 23.12.2016.

Ingemarson, F., Lindhagen, A., Eriksson, L., 2006. A typology of small-scale private forest owners in Sweden. Scandinavian Journal of Forest Research 21, 249-259.

Integral Future-Oriented Integrated Management of European Forest Landscapes. 2015. Reference to reports and research papers available in: http://www.integral-project.eu/project-outcomes.html

Ira, V., Huba, M., Podolak, P., 2008. Quality of life of population living in a protected area and its sustainable development (Examples of the Protected Landscape Area Polana), *Geographia Slovaca* 25: 97-122 (in Slovak)

Istat, 2011a. La superficie dei comuni, delle province e delle regioni italiane. Dati al 9 ottobre 2011. www.istat.it/it/files/2015/04/Superfici-delle-unità-amministrative-Testo-integrale.pdf, last accessed 23. 11.2016.

Istat, 2011b. Censimento della popolazione e delle abitazioni. http://dati-censimentopopolazione.istat.it/Index.aspx, last accessed 23.12.2016.

Istat, 2016a. Popolazione al 1 gennaio 2016. http://dati.istat.it/Index.aspx?DataSetCode=DCIS_POPRES1, last accessed 23.12.2016.

Istat, 2016b. Tasso di disoccupazione – Livello regionale. http://dati.istat.it/Index.aspx?DataSetCode=DCCV_TAXDISOCCU, last accessed 23.12.2016.

Janišová, M., Ujházy, K., Uhliarová, E., Rajtárová, N., 2004: Contemporary flora of grassland communities in the Protected Landscape Area Poľana – evaluation of vascular plants frequency. *Bull. Slov. Bot.Spoločn.,Bratislava,* 26 (10): 140–144.

Janišová, M., Uhliarová, E., Ujházy, K., Rajtárová, N., 2005: Vascular plants of non-forest communities in the Protected Landscape area and Biosphere Reserve Poľana. *Bull. Slov. Bot. Spoločn., Bratislava,* 27 (13): 1–200.

Janssen, J. (2009). Protected landscapes in the Netherlands: changing ideas and approaches. Planning Perspectives, 24(4), 435-455.

Johansson, J., 2012. Challenges to the legitimacy of private governance – the development of forest certification in Sweden. Environmental Policy and Governance 19, 424-436.

Juerges, N., Newig, J., 2015a. How interest groups adapt to the changing forest governance landscape in the EU: A case study from Germany. Forest Policy and Economics 50, 228-235.

Juerges, N., Newig, J., 2015b. What role for frames in scalar conflicts? Land Use Policy 49, 426-434.

Juknelienė, D., Mozgeris, G. 2015. The spatial pattern of forest cover changes in Lithuania during the second half of the twentieth century. *Žemės ūkio mokslai* [Agricultural Sciences] 22(4):209-215. doi10.6001/zemesukiomokslai.v22i4.3215



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 676754.

Jürges, N., 2016. Forest conflicts in the face of energy transition and climate change- Actor-centered analysis from a multi-level governance perspective. Leuphana University Lüneburg, Dissertation. Online available: http://opus.uni-lueneburg.de/opus3/frontdoor.php?source_opus=14388&la=de.

Kairiūkštis, L. 2003. Lietuviškos miškininkystės atsiradimas ir būdingesni jos bruožai [Emergence of Lithuanian forestry and its key features]. In: Verbyla V, Brukas A, Kairiūkštis L (eds) *Lietuvos miškų metraštis XX amžius* [The chronicle of Lithuanian forests XX century]. Aplinkos Ministerija, Vilnius, pp 478-480 (in Lithuanian).

Kandziora, M., Burkhard, B., Müller, F., 2013. Interactions of ecosystem properties, ecosystem integrity and ecosystem service indicators – A theoretical matrix exercise. Ecological Indicators 28, 54-78.

Kaputa, V., Paluš, H., Vlosky, R., 2016. Barriers for wood processing companies to enter foreign markets: a case study in Slovakia. *European Journal of Wood and Wood Products* 74 (1): 109-122.

Kavuljak, A., 1942. *Dejiny lesníctva a drevárstva na Slovensku*. Lesnícka a Drevárska Ústredňa Bratislava. 245 p. (in Slovak)

Kenstavičius, J., Brukas, A. 2003. Lietuvos miškingumas, miškų plotai ir jų išsidėstymas [Forest cover proportion in Lithuania, forest areas and their distribution]. In: Verbyla V, Brukas A, Kairiūkštis L (eds) *Lietuvos miškų metraštis XX amžius* [The chronicle of Lithuanian forests XX century]. Aplinkos Ministerija, Vilnius, pp 110-120 (in Lithuanian).

Köse S and Başkent EZ (1996). Thirty year history of even-aged management: What have we learned from turkey? *Journal of Sustainable Forestry* 5(3/4), 15-26.

Kremers, J. (2016). Interactie in de Nederlandse bossector. Wederzijdse beinvloeding? Wageningen, Wageningen University. MSc thesis. In Dutch.

Krott, M., 2005. Forest Policy Analysis. Springer, Netherland.

Krott, M., Bader, A., Devkota, R., Maryudi, A., Giessen, L., Aurenhammer, H., 2014. Actor-centred power: The driving force in decentralised community based forest governance. Forest Policy and Economics 49, 34-42.

Konôpka, J., Bavlšík, J., Greppel, E., Fisher, M., Kamenský, M., Kunca, A., Moravčík, M., Oravec, M., Sarvaš, M., Sušková, M., Štulajter, F., Zúbrik, M., 2010. *Príručka vlastníka a obhospodarovateľa lesa*. Národné Lesnícke Centrum Zvolen, 212 p. (in Slovak)

Konôpka, J., 2004. Erneuerung der Privatforstwirtschaft in der Slowakischen Republik. *Lesnícky Časopis-Forestry Journal* 50 (2): 183-194. (in German)

Konôpka, J., et al. 1999. *Analýza vývoja a súčasného stavu lesného hospodárstva Slovenskej republiky (1990-1998)*. Bratislava, Príroda a.s. 268 p. (in Slovak)

Köpf, E., 2002. Forstpolitik. Ulmer. Stuttgart.

Kovalčík, M., 2012. Financial and socio-economic impacts of nature conservation on forestry in Slovakia. *Journal of Forest Science* 58 (10): 425-435.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 676754.

Kulla, L., Bošeľa, M., Burgan, K., 2010. Potreba a možnosti inovácie rámcového plánovania HÚL na Slovensku. In: Bortel, S., Bavlšík, J. (Eds) *Súčasnosť a budúcnosť hospodárskej úpravy lesov na Slovensku*. 27. 10. 2010, National Forest Centre Zvolen, Slovak republic, pp. 42-49. (in Slovak)

Kulla, L., Sitková, S., 2012. *Rekonštrukcie nepôvodných smrekových lesov: poznatky, skúsenosti, odporúčania*. Národné lesnícke centrum, Zvolen, 208 p. (in Slovak)

Kunca, A. (Eds) 2010. Výskyt škodlivých činiteľov v lesoch Slovenska za rok 2009 a ich prognóza na rok 2010. Národné lesnícke centrum - Lesnícky výskumný ústav, Zvolen. (in Slovak)

Kunca, A. (Eds) 2011. Výskyt škodlivých činiteľov v lesoch Slovenska za rok 2010 a ich prognóza na rok 2011. Národné lesnícke centrum - Lesnícky výskumný ústav, Zvolen. (in Slovak)

Kunca, A. (Eds) 2012. Výskyt škodlivých činiteľov v lesoch Slovenska za rok 2011 a ich prognóza na rok 2012. Národné lesnícke centrum - Lesnícky výskumný ústav, Zvolen, 134 pp. (in Slovak)

Kunca, A. (Eds) 2013. Výskyt škodlivých činiteľov v lesoch Slovenska za rok 2012 a ich prognóza na rok 2013. Národné lesnícke centrum - Lesnícky výskumný ústav, Zvolen, 120 pp. (in Slovak)

Kunca, A. (Eds) 2014. Výskyt škodlivých činiteľov v lesoch Slovenska za rok 2013 a ich prognóza na rok 2014. Národné lesnícke centrum - Lesnícky výskumný ústav, Zvolen, 89 pp. (in Slovak)

Kunca, A. (Eds) 2015. *Výskyt škodlivých činiteľov v lesoch Slovenska za rok 2014 a ich prognóza na rok 2015*. Národné lesnícke centrum - Lesnícky výskumný ústav Zvolen, Zvolen, 92 pp. (in Slovak)

LBV 2010. Durchschnittliche Niederschlagsmenge für das Land Brandenburg. Lbv-brandenburg.de. Date of access: 27th of January 2017.

Lidskog, R., Löfmarck, E., 2016. Fostering a flexible forest: Challenges and strategies in the advisory practice of a deregulated forest management system. Forest Policy and Economics 62, 177-183.

Lieskovský, J., Bezák, P., Špulerová, J., Lieskovský, T., Koleda, P., Dobrovodská, M., Bürgi, M., Gimmi, U., 2015. The abandonment of traditional agricultural landscape in Slovakia - Analysis of extent and driving forces. *Journal of Rural Studies* 37: 75-84.

Lietuvos miškų ūkio statistika [Lithuanian statistical yearbook of forestry]. 2003. Aplinkos ministerija, Valstybinė miškų tarnyba. Kaunas, Lututė, p 112

Lietuvos miškų ūkio statistika. [Lithuanian statistical yearbook of forestry]. 2015. Aplinkos ministerija, Valstybinė miškų tarnyba. Kaunas, Lututė, p 184

Lindbladh, M., Axelsson A-L., Hultberg, T., Brunet, J., Felton. A., 2014. From broadleaves to spruce - the borealization of southern Sweden. Scandinavian Journal of Forest Research 29 (7), 686-696.

LNV-Loket (2012). The Netherlands. Informatie bij aanvraag SNL Natuur: www.hetlnvloket.nl/txmpub/files/?p_file_id=2201519*, Date accessed: 6th of December, 2016. In Dutch.*

Londo, G. (1991). Natuurbeheer in Nederland. Deel 4. Natuurtechnisch bosbeheer. Wageningen, Pudoc. In Dutch.

Louro, V. 2016. A floresta em Portugal. Um apelo à inquietação cívica. Lisboa: Gradiva Publicações. 2.ª edição. 268 pages.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 676754.

Machanský, M., 2013. Vymedzenie úrovní hospodársko-úpravníckeho plánovania a ich možných výstupov pre lesnícku prax na Slovensku. *Lesnícky Časopis-Forestry Journal* 59 (1): 50-58. (in Slovak)

Maetzke, F.G., Cullotta, S., 2016. Environmental and forest planning in Italy: conflicts and opportunities. Agriculture and Agricultural Science Procedia 8, 332-338.

Mankus, R. 2003. Lietuvos miškai Rusijos imperijos sudėtyje (1795–1915 m.). Miškų ūkis vokiečių okupacijos metais (1915–2018 m.) [Lithuanian forests within the Russia empire (1795–1915). Forestry during the years of German occupation (1915–2018)]. In: Verbyla V, Brukas A, Kairiūkštis L (eds) *Lietuvos miškų metraštis XX amžius* [The chronicle of Lithuanian forests XX century]. Aplinkos Ministerija, Vilnius, pp 29-41 (in Lithuanian)

Mann, S.-H., 1998. Konflikte in der deutschen Forstwirtschaft – Konflikttheoretische Analyse der forstpolitischen Diskussion über die Krise der Forstwirtschaft. Shaker. Aachen

Memmler, M., Schraml, U., 2008. Bericht über die Analyse relevanter Akteure der Waldpolitik in Deutschland im Rahmen des Projekts Zukünfte und Visionen Wald 2100.

Mendes, A. 2008. Política florestal em Portugal depois de 2003. In: Silva, J.S., Deus, E. and Saldanha, L. (eds.) Incêndios Florestais, 5 anos depois de 2003. Liga para a Proteção da Natureza, Autoridade Florestal Nacional, Coimbra, 67-76 pp.

Mendes, Américo M.S. C.; Feliciano, D.; Tavares, M.; Dias, Rafael. 2004. The Portuguese Forests. Country level report delivered to the EFFE Project, Evaluating Financing of Forestry in Europe. Porto: Faculty of Economics and Management, Catholic University of Portugal.

Midriak, R. 1981. *Diferencované obhospodarovanie lesa podľa integrovaných funkcií*. Príroda. Príroda, Bratislava, 224 p. (in Slovak)

Ministerium für Infrastruktur und Landwirtschaft des Landes Brandenburg (MIL), 2011a. Waldprogramm 2011. Gemeinsames Handeln zum Schutz und Nutzen ländlicher Räume.

Ministerium für Infrastruktur und Landwirtschaft des Landes Brandenburg (MIL), 2011b. Waldvision 2030. Eine neue Sicht für den Wald der Bürgerinnen und Bürger.

Millennium Ecosystem Assessment (2005). Ecosystems and human well-being: Synthesis. Online available: http://www.millenniumassessment.org/documents/document.356.aspx.pdf.

Minďáš, J., Škvareninová, J. 2016. Biodiversity and clomate change: consequences for upper tree line in Slovakia. *Lesn Cas. For. J.* 62: 181-185.

Ministry of Agriculture and Rural Development of the SR, 2014. *Správa o lesnom hospodárstve v Slovenskej Republike za rok 2013*. Zelená správa, Bratislava. (in Slovak).

Ministry of Agriculture and Rural Development of the SR, 2015. *Správa o lesnom hospodárstve v Slovenskej Republike za rok 2014*. Zelená správa, Bratislava. (in Slovak).

Ministry of Agriculture and Rural Development of the SR, National Forest Centre Zvolen, 2007. *Národný lesnícky program Slovenskej republiky*. Natinal forest programme of the Slovak Republic. Národné Lesnícke Centrum, Zvolen. 63 p. (in Slovak).

Ministry of Environment. 2010. Forest cutting rules. Valstybės žinios No.14-676.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 676754.

Ministry of LNV (2008). Natura 2000 profielendocument, Versie 1 september 2008. Ede, Ministerie van LNV, Directie Kennis. In Dutch.

Ministry of Infrastructure and the Environment (2013). Sixth Netherlands National Communication under the United Nations Framework Convention on Climate Change. The Hague: Ministry of Infrastructure and the Environment.

Mizaras, S. 2017. Šešėliai miškų politikoje [Shadows in forest policy], https://forest.lt/index.php?3858216424

Mizaras, S. 1993. Economic aspects of forest policy in Lithuania. *Miškų ūkis*. Lietuvos miškų instituto moksliniai darbai vol. 33: 80-85.

Ministry of rural development, environment, and agriculture (MLUL), 2015. Wälder Brandenburgs. Ergebnisse der ersten landesweiten Waldinventur.

Ministry of rural development, environment, and agriculture (MLUL), 2017. Mlul.brandenburg.de/cms/detail.php/bb1.c.295361.de. Date of access: 27th of January 2017.

Mojses, M., Petrovič, F. (2013). Land use changes of historical structures in the agricultural landscape at the local level—Hriňová case study. *Ekológia* (Bratislava) 32: 1–12

Mori, P., 2011. La BABELE della selvicoltua. Sherwood - Foreste Ed Alberi Oggi, 171, 4-7.

MPaRV SR 2016. URL: http://www.mpsr.sk/index.php?navID=1&navID2=1&sID=40&id=10858 (in Slovak)

Natuurmonumenten (2016a). Jaarverslag 2015. http://jaarverslag.natuurmonumenten.nl/nl/natuurmonumenten-2015/cover.html. Date of access: 17th of November, 2016. In Dutch.

Natuurmonumenten, (2016b) We protect nature. https://www.natuurmonumenten.nl/we-protect-nature. Date of access: 17th of November, 2016.

Navrátil, R., Brodrechtova, Y., Sedmák, R., Smreček, R., Tuček, J., 2016. Structural analysis of the drivers and barriers to forest management in the Slovak regions of Podpoľanie and Kysuce. *Forestry Journal* 62: 152–163.

Navrátil, R., Šálka, J., Sedmák, R., Pôbiš, I., Tuček, J., Hricová, Z., 2013. *Integral project WP 3.1 Case study report. Cuntry: Slovak Republic. Case study area: Podpoľanie*. INTEGRAL 282887. Technical Universitz in Zvolen 2013. 68p.

Netherlands Enterprise Agency (2015). SDE+ sustainability requirements for co-firing and large scale heat production. http://english.rvo.nl/sites/default/files/2015/04/SDE%2B%20sustainability%20requirements%20for%20co-firing%20and%20large%20scale%20heat%20production.pdf. Date of access: 14th of December, 2015.

Nordlund, A., Westin K., 2010. Forest values and forest management attitutes among private forest owners in Sweden. Forests 2 (1), 30-50.

Nôžka, J., Rakyta E. 2015. *Katalóg trofejí CHPO Poľana: Chovateľská prehliadka za poľovníck sezónu 2014/2015*. Lesy SR, Banská Bystrica, 29 p. (in Slovak)



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 676754.

Orts, E. W., & Strudler, A. (2009). Putting a stake in stakeholder theory. Journal of Business Ethics, 88(4), 605-615.

Ostrom, E., 2005. *Understanding Institutional Diversity*. Princeton University Press, USA. 349 p.

Paneghel, M., 2014. The identification of the High Conservation Values as a requirement for the FSC certification process: the Associazione Forestale del Veneto Orientale case study (NE-Italy). MSc thesis in Forestry and Environmental Technologies, University of Padova.

Papánek, F. 1978. *Teória a prax funkčne integrovaného lesného hospodárstva*. Príroda, Bratislava, 218 p. (in Slovak)

Papánek, F. 1978. *Teória a prax funkčne integrovaného lesného hospodárstva*. Príroda,Bratislava, 218 p. (in Slovak).

Parobek, J., Paluš, H., 2008. Modelling of wood and wood products flow in the Slovak Republic. *A European Wood Processing Strategy: Future Resources Matching Products and Innovations*, 93-99

Parobek, J., Paluš, H., Kaputa, V., Šupín, M., 2014. Analysis of Wood Flows in Slovakia. *BioResources* 9 (4): 6453-6462.

PEFC (Ireland) Ltd ( 2014). PEFC Irish Forest Certification Ireland - Second Edition. Old Mallow Road, Cork, Ireland, PEFC (Ireland) Ltd.

PEFC, 2016. PEFC Fact and Figures. www.pefc.org/about-pefc/who-we-are/facts-a-figures, last accessed 23.12.2016.

PEFC (Programme for the Endorsement of Forest Certification Schemes), 2012. Svensk PEFC skogsstandard (Swedish PEFC forest standard). PEFC SWE 002:3. PEFC Sweden (In Swedish).

Pereira, J.S. 2014. O futuro da floresta em Portugal. Fundação Francisco Manuel dos Santos. Lisboa, Portugal. nº 42 da série Ensaios da Fundação.

Petrovič, F., Mojses, M. (2011). *Strategy for conservation and management of historical structures of agricultural landscape in study area of Hriňová*. Institute of Landscape Ecology, Slovak Academy of Sciences, Bratislava. (in Slovak)

Pettenella, D., 1994. Institutional changes in forestry administrative structures: The Italian experience. Unasylva - No. 178 - The changing role of forestry institutions. www.fao.org/3/a-t3350e/t3350e00.htm#Contents, last accessed 23.12.2016.

Pettenella, D., Romano, D., 2010. Silviculture: forest and environmental policies. In: Proceedings of the 3rd Silviculture National Congress. L'Italia Forestale e Montana/Italian Journal of Forest and Mountain Environments 65 (2), 255-263. DOI: 10.4129/ifm.2010.2.18.

Pinho, J. 2014. Forest Planning in Portugal. In F. Reboredo (ed.). Forest Context and Policies in Portugal. Present and Future Challenges. Springer, World Forests, Volume 19. pp.155-183.

Potsdamer Neue Nachrichten, 2011. Braune Kohle, rotes Kupfer und schwarzes Gold. Pnn.de/brandenburg-berlin/600540. Date of access: 27th of January 2017.

PQSF (2008). Programma Quadro per il Settore Forestale. www.reterurale.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/2826, last accessed 23.12.2016.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 676754.

Probos (2014). Kerngegevens Bos en Hout in Nederland. Wageningen: Probos. In Dutch.

Province of Limburg (2003). Handboek Streefbeelden voor Natuur en Water in Limburg, 2e gewijzigde druk. Nijmegen, Natuurbalans-Limes Divergens. In Dutch.

Rasera, R., 2016. Piano Sommario dei beni dell'Associazione Forestale di Pianura. Periodo di validità 2016-2025. http://static.forestedipianura.it/media/uploads/Piano_sommario_dellAssociazione_Forestale_di_Pianura_PDF.pdf, last accessed 23.12.2016.

Reboredo, F. and Pais, J. 2014. Evolution of forest cover in Portugal: from Miocene to the present. In: Reboredo, F. (ed.). Forest Context and Policies in Portugal. Present and Future Challenges. Springer, World Forests, Vol. 19, 1-38 pp.

Regione Veneto, 2010. Il settore agricolo regionale. Verso un'agricoltura professionale e globalizzata? www.regione.veneto.it/static/www/agricoltura-e-foreste/schede_informative.pdf, last accessed 23.12.2016.

Renou, F. and Farrell, E. P. (2005). Reclaiming peatlands for forestry: the Irish experience. Restoration of Boreal and Temperate Forests. J. A. Stanturf. Boca Raton, Florida, USA, CRC Press: 541-557.

Rietbergen-McCracken, J., & Narayan-Parker, D. (Eds.). (1998). Participation and social assessment: tools and techniques (Vol. 1). Washington, the World Bank. World Bank Publications.

Rojas-Briales, E., 2005. Decentralization and Participation: Key Challenges for Mediterranean Public Forest Policy. Chapter 24 In: Merlo, M., Croitoru, L. (eds), Valuing Mediterranean Forests: Towards Total Economic Value. CABI Publishing, CAB International, UK: 373-390.

Romano, R., 2015. Oral presentation on "Le misure forestali nel nuovo PSR, passi indietro o nuove opportunità?" at the conference "Gestione forestale e produzione di biomasse: il mercato e gli operatori cambiano. Cambiano anche le istituzioni?" (in Italian), Italia Legno Energia, Arezzo 13-15 February 2015.

Romano R., Marandola D., Cesaro L., Marchetti M., 2012. Politiche forestali in Europa e scenari 2020: tra sostenibilità e sviluppo rurale. L'Italia Forestale e Montana 67 (3), 221-236, http://dx.doi.org/10.4129/ifm.2012.3.01.

Rupf, H., 1961. Wald und Mensch im Geschehen der Gegenwart. Allgemeine Forstzeitschrift – Der Wald 16, 545–546.

Saccone, L., Secco, L., Pettenella, D., 2013. Istituzioni forestali del Nord Italia. Razionalizzazione o destrutturazione? Sherwood - Foreste Ed Alberi Oggi, 194, 5-10.

Sandström, C., Carlsson-Kanyama, A., Beland-Lindahl, K., Mossberg-Sonnek, K., Mossing, A., Nordin, A., Nordström, E-M., Räty, R. 2016. Understanding consistencies and gaps between desired forest futures: An analysis of visions from stakeholder groups in Sweden. Ambio (45)2: 100-108.

Sarvašová, Z., Dobšinská Z., Šálka J., December 2014. Public participation in sustainable forestry: the case of forest planning in Slovakia. *iForest-Biogeosciences and Forestry* 7: 414-422.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 676754.

Sarvašová, Z., Šálka J., Dobšinská, Z., 2013. Mechanism of cross-sectoral coordination between nature protection and forestry in the Natura 2000 formulation process in Slovakia. *Journal of Environmental Management* 127: 65-72.

Sarvašová, Z., Šiška, P., 2009. Slovakia: Returning the forests to their original owners. In: Carter, J., Voloshyna, N., (Eds). *How communities manage forests: selected examples from around the world*. pp.36-40.

Sarvašová, Z., Tutka, J., 2005. *Change in the ownership and management of forests in Slovakia. Small-scale Forestry in a Changing Environment*. Lithuanian Forest Research Institute. pp.200-207.

Sarvašová, Z., Zivojinovic, I., Weiss, G., Dobšinská, Z., Drăgoi, M., Gál, J., Jarský, V., Mizaraite, D., Põllumäe, P., Šálka, J., Schiberna, E., Šišák, L., Wolfslehner, B., Zalite, Z., Zalitis, T., 2015. Forest owners associations in the Central and Eastern European Region. *Small-scale Forestry* 14 (2): 217-232.

Schanz, H., & Ottitsch, A. (2004). Netherlands–forest policy paragon or NFP failure. Forests for the future: national forest programmes in Europe—country reports from COST Action E19, 193-206.

Schelhaas, M., Clerkx, A. P. P. M., Daamen, W. P., Oldenburger, J. F., Velema, G., Schnitger, P., ... & Kramer, H. (2014). Zesde Nederlandse bosinventarisatie: methoden en basisresultaten (No. 2545). Wageningen, Alterra Wageningen UR. In Dutch.

Schmidt, P., Kuiler, E., Wiersum, F., Filius, B., Bommel, S. van (2003). The Netherlands. http://gis.joensuu.fi/silva/News/Files/Publications/Updates/Netherlands%20Update.pdf. Date of access: December 12, 2012.

Schusser, C., 2013. Who determines biodiversity? An analysis of actors' power and interests in community forestry in Namibia. Forest Policy and Economics 36, 42-51.

Secco, L., Favero, M., Masiero, M., Pettenella, D. (2017). Failures of political decentralization in promoting network governance in the forest sector: observations from Italy. Land Use Policy 62, 79-100.

Secco, L., Pettenella, D., Gatto, P., 2011. Forestry governance and collective learning process in Italy: Likelihood or utopia? Forest Policy and Economics 13, 104-112.

Sedmák, R., Fabrika, M., Bahýľ, J., Pôbiš, I., Tuček, J., 2013. Application of simulation and optimization tools for developing forest management plans in the Slovak natural and management conditions. In: Tuček, J., Majlingová, A., Garcia-Gonzalo, J. (Eds), *Implementation of DSS tools into the forestry practice*. Technical University in Zvolen, pp. 139-152.

SEPA (Swedish Environmental Protection Agency) 2016. (2016-04-22) Levande skogar. http://www.miljomal.se/sv/Miljomalen/12-Levande-skogar/ (accessed: 2016-10-25).

SFA (Swedish Forest Agency), 2014. Statistical Yearbook of Forestry 2014. Swedish Forest Agency, Jönköping.

SFA (Swedish Forest Agency), 2016a. Skogsvårdslagstiftningen. Gällande regler 1 Januari 2016 (Swedish Forest Act. Valid rules January 1 2016). Swedish Forest Agency, Jönköping (In Swedish).



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 676754.

SFA (Swedish Forest Agency), 2016b. Älgbetesinventering och foderprognos Kronobergs län 2015/2016 (Inventory of moose browsing and forage prognosis Kronoberg County 2015/2016). Swedish Forest Agency, Jönköping (In Swedish).

Siry, J., 2003. Today and tomorrow of private forestry in Central and Eastern Europe. In: Teeter, L., Cashore, B., Zhang, D. (Eds), *Forest Policy for Private Forestry*. CABI Publishing. pp. 81-91.

Slámová, M., Beláček, B., Jančura, P., Prídavková, Z., 2015. Relevance of the historical catchwork szstem for sustainabilty of the traditional agricultural landscape in the southern Podpolanie region. *Agriculture and Agricultural Science Procedia* 4: 10-19.

Slámová, M., Jančura, P., Fabriciusová, V., Beláček, B., Zrníková, K., Prídavková, Z., 2016. Traditional agricultural practices, land cover diversity and biodiversity in the southern Podpolanie Region. In: Agnoletti, M., Emanueli, F. (Eds) Biocultural Diversity in Europe. p.249-268.

Slovak Gas Industry, Inc., 2015. *Annual report 2015*, Slovenský plynárenský priemysel. a.s. 17 p. (in Slovak)

Slovak Poweplants, Inc., 2015. *Annual report 2015*, Slovenské elektrárne, a.s. 111 p. (in Slovak)

Slovak Water Management Enterprise, 2015, URL:< http://www.svp.sk>

SLU (Swedish University of Agricultural Sciences), 2016. Skogsdata 2016 (Forest data 2016). Department of Forest Resource Management, Umeå (In Swedish).

Soares, J. and Oliveira, T. 2006. Políticas públicas recentes para a protecção da floresta. In: Pereira, J. S.; Pereira, J. M. C.; Rego, F. C.; Silva, J. M. N.; Silva, T. P. (ed.). Incêndios Florestais em Portugal. Caracterização, Impactes e Prevenção. Instituto Superior de Agronomia. Lisboa. 495-510 pp.

Soares, J. M. A. 2015. Petróleo verde: floresta de equívocos. Lisboa : Ex-libris. Vol. I, 584 pages.

Sottomayor, M.; Ribeiro, M.; Carvalho, P. O. 2013. INTEGRAL: WP3.1 Portuguese Case Study Report. Vale do Sousa Area, North Western Portugal.

Staatsbosbeheer (2015). Corporate plan 2016-2020. Driebergen, Staatsbosbeheer.

Staatsbosbeheer (2016). https://www.staatsbosbeheer.nl/over-staatsbosbeheer/dossiers /bos-en-hout/feiten-en-cijfers. Date of access: 28th of November, 2016. In Dutch.

Sténs, A., Bjärstig, T., Nordström, E-M., Sandström, C., Fries, C., Johansson, J. 2016. In the eye of the stakeholder: The challanges of governing social forest values. Ambio (45)2: 87-99.

Stiftung Naturlandschaften Brandenburg, 2016. Zur Stiftungsfläche Lieberose. Stiftung-nlb.de. Date of access: 27th of January 2017.

Stockmann, V., 2016. *Dejiny lesníctva na Slovensku*. Lesy Slovenskej republiky, š.p., Banská Bystrica. 1022 p. (in Slovak)

Svensson, S.A., Bohlin, F., Bäcke, J-O., Hultåker, O., Ingemarson, F., Karlsson, S., Malmhäll, J., 2011. Ekonomiska och sociala konsekvenser i skogsbruket av stormen Gudrun (Economic and social consequences for forestry of the storm Gudrun). Rapport 12-2006. Swedish Forest Agency, Jönköping (In Swedish).



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 676754.

Šálka, J., Dobšinská, Z., Hricová, Z., 2016. Factors of political power - The example of forest owners associations in Slovakia. *Forest Policy and Economics* 68: 88-98.

Šálka, J., Sarvašová, Z., Ambrušová, L., Dobšinská, Z., Hricová, Z., Kajba, M., Schwarz, M., 2015. *Procesný model pre záujmové združenia vlastníkov lesov*. Národné Lesnícke Centrum, Zvolen. 166 p. (in Slovak)

Šmelko, Š., Šebeň, V., Bošeľa, M., Merganič, J., Jankovič, J. 2008. *National forest inventory and monitoring of the Slovak republic 2005-2006: Basic concept and selected summary information*. National Forest Centre, Zvolen, 16 p.

Šmelko, Š., Šebeň, V., Bošeľa, M., Sačkov, Iv., Kulla, L. 2014: *Nové varianty metód na viacúčelové zisťovanie a monitorovanie stavu lesných ekosystémov progresívnymi technológiami*. Národné lesnícke centrum – Lesnícky výskumný ústav, Zvolen 368 p. (in Slovak)

Šulek, R., 2006. *Common-pool resources in Central Europe: Case study of forestry in the Slovak Republic*. IASCP Europe Regional Meeting. Building the European Commons: from Open Fields to Open Source. Brescia, Italy. pp. 23-25.

Tuček, J., Navrátil, R., Sedmák, R., Brodrechtová, Y., Smreček, R. 2015. *Participatívne scenáre a backcasting pri strategickom plánovaní obhospodarovania lesov*. Technická univerzita vo Zvolene, 332 p. (in Slovak)

Tuček, J., Navrátil, R., Sedmák, R., Brodrechtová, Y., Smreček, R. 2015. *Participatívne scenáre a backcasting pri strategickom plánovaní obhospodarovania lesov*. Technická univerzita vo Zvolene, 332 p. (in Slovak)

ÚGKK SR 2016. *Štatistická ročenka o pôdnom fonde SR: podľa údajov katastra nehnuteľností k 1. januáru 2016*. Úrad geodézie, kartografie a katastra SR. 130 p. ISBN 978-89831-02-9
Vencúrik, J., 2016. *Návody na cvičenia z dejín lesníctva*. Technická Univerzita vo Zvolene. 71 p. (in Slovak)

UNECE/FAO, 2015. Forest Products Statistics. UNECE/FAO Forestry and Timber Section. www.unece.org/forests/forestsfpmonlinedata/forest-products-statistics/production-and-trade-tables-2010-2014.html, last accessed 23.12.2016.

Uva, J. S. 2014. The Portuguese National Forest Inventory. Applicability in semiarid areas monitoring. Lisbon: Training on indicators of desertification: early warning signs. COST Action ES1104. University of Lisbon. 19 May 2014.

Valente, S.; Coelho, C.; Ribeiro, C.; Marsh, G. 2015. Sustainable Forest Management in Portugal: transition from global policies to local participatory strategies. International Forestry Review Vol. 17(3), 368-383 pp.

Valente, S.; Coelho, C.; Ribeiro, C.; Marsh, G. 2015. Sustainable Forest Management in Portugal: transition from global policies to local participatory strategies. International Forestry Review Vol. 17 (3), 368-383 pp.

Van Blitterswijk, H., van Vliet, C. J. M., & Schulting, R. (2001). Analyse uitvoering geïntegreerd bosbeheer: resultaten van een onderzoek naar de praktijk van geïntegreerd bosbeheer in Nederland. Wageningen, Alterra. In Dutch.



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Van der Maaten-Theunissen, M. & Schuck, A. (2013.) Integration of Nature Protection in Forest Policy in the Netherlands. INTEGRATE Country Report. Freiburg, EFICENT-OEF.

Van Wijk, M.N., Van Vliet, C.J.M., De Klein, J.P.G., Lusink, M., Van Blitterswijk, H., Aertsen, E.J.M., 2005. Evaluating the financing of forestry in Europe. Country level report – The Netherlands. http://www.efi.int/files/attachments/effe_countryreport_netherlands.pdf. Alterra report 1140. Wageningen, Alterra.

VBNE (2016a). Notitie nieuwe aanslagen waterschapsheffingen. http://www.vbne.nl/product/notitie-nieuwe-aanslagen-waterschapsheffing. Date of access: 24th of November, 2016. In Dutch.

VBNE (2016b). Veldwerkplaatsen. https://www.veldwerkplaatsen.nl. Date of access: 29th of November, 2016. In Dutch.

Veer, M.M., Abma, R., Duinhoven, G. Van (2006). Openstelling van bos en natuur. Vakblad Natuur Bos Landschap, 2006, vol. 3, pp. 2-8. In Dutch.

Veenman, S., Liefferink, D., Arts, B., 2009. A short history of Dutch forest policy: The 'de-institutionalisation' of a policy arrangement. Forest Policy and Economics, vol. 11, pp. 202-208.

Vidale, E., Pettenella, D., Gatto, P., Secco, L., 2012). What can we sell behind timber production? The role of forest externalities in the eastern Alps and the implementation of payment for environmental service schemes. Scandinavian Forest Economics 44, 168-179.

Venzi, L., 2008. Outlines of Forest Policy in Italy: Past Experiences and Recent Developments. In: Cesaro, L., Gatto, P., Pettenella, D. (eds.). The Multifunctional Role of Forests – Policies, Methods and Case Studies. EFI Proceedings No. 55, 2008: 39-36.

VVNH (2016). Missie en gedragscode. http://www.vvnh.nl/missie. Date of access: 28th of November, 2016. In Dutch.

Wagner, K.,2006. Die politische Landschaft nach der Forstreform in Bayern. AFZ-Der Wald 11, 569.

Wallstedt, A., 2013. Återväxtstödet efter stormen Gudrun (The reforestation grants after the Gudrun storm). Rapport 1-2013. Swedish Forest Agency, Jönköping (In Swedish).

Wang, S., Fu, B., 2013. Trade-offs between forest ecosystem services. Forest Policy and Economics 26, 145-146.

Weber, N., et al., 2000. Forstpolitische Aktivitäten von Umweltverbänden in Deutschland- eine vorläufige Bestandsaufnahme. Allgemeine Forst- und Jagdzeitung, 171 (8), 144-153.

Winkel, G., Sotirov, M., 2011. An obituary for national forest programmes? Analyzing and learning from the strategic use of "new modes of governance" in Germany and Bulgaria. Forest Policy and Economics 13, 143–154.

Zdycha, P., Ďurčík, V., Urgela, J., 2002. *Dejiny lesníctva*. Technická Univerzita vo Zvolene. 143 p. (in Slovak)

Zdycha, P., Valtýni, J., Kodrík, M., Urgela, J., Ďurčík, V., 2008. *Dejiny lesníctva*. Technická Univerzita vo Zvolene. 134 p. (in Slovak)



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## Appendix 1: Market and civil society actors in German forest politics (national level)

| Identified Actor (Organizations)<br><br>[in country language] | Identified Actor (Organizations)<br><br>[English translation] | Website |
|---|---|---|
| ***Market actors*** | | |
| **Forest management**<br><br>• Deutscher Forstwirtschaftsrat<br>• Arbeitsgemeinschaft Deutscher Waldbesitzerverbände (AGDW)<br>• Deutscher Forstverein<br>• DLG (Ausschuss für Forstwirtschaft)<br>• Arbeitsgemeinschaft Naturgemäße Waldwirtschaft<br>• Kuratorium für Waldarbeit und Forsttechnik<br>• Deutscher Bauernverband<br>• Verband Deutscher Forstbaumschulen<br>• Deutscher Forstunternehmer-Verband<br>• Fachgruppe Forstwirtschaftliche Lohnunternehmer<br>• Bundesverband Freiberuflicher Forstsachverständiger<br>• Bundesverband Deutscher Berufsjäger | • German Forestry Council<br>• German Forest Owner Association<br>• German Forestry Association<br>• German Agricultural Society (Committee for Forestry)<br>• Working group on natural forestry<br>• Advisory board for work in forestry and forest technology<br>• German Association of Forest Tree Nurseries<br>• German Farmer Association<br>• German Association of Forestry Entrepreneurs<br>• Expert group forestry contractors within the association of the companies within the agricultural sector<br>• Federal association of free-lancing forestry experts<br>• Federal Association of German Professional Hunters | • www.dfwr.de<br>• www.waldeigentuemer.de<br>• www.forstverein.de<br>• www.dlg.org<br>• www.anw-deutschland.de<br>• www.kfw-online.de<br>• www.bauernverband.de<br>• www.vfd-online.org<br>• http://dfuv.eu<br>• www.lohnunternehmen.de<br>• www.bvff-ev.de<br>• www.revierjaeger.de |
| • PEFC<br>• RAL Gütezeichen | • PEFC<br>• RAL Certification | • pefc.de<br>• www.ral-guetezeichen.de |
| **Timber trade and processing**<br><br>• Deutscher Holzwirtschaftsrat<br>• Gesamtverband Deutscher Holzhandel<br>• Hauptverband der der Deutschen Holz und Kunststoff verarbeitenden Industrie und verwandter Industriezweige<br>• Verband der Deutschen Holzwerkstoffindustrie<br>• Vereinigung Deutscher Sägewerksverbände<br>• Arbeitsgemeinschaft der Rohholzverbraucher | • German Timber Industries Council<br>• German Timber Trade Federation<br>• Central Association of the German timber and plastic material manufacturing industries and related industries<br>• German Association of derived timber products industries<br>• German Association of sawmill associations<br>• Working group of timber users<br>• German association of paper production | • www.dhwr.de<br>• www.gdholz.de<br>• www.holzindustrie.de<br>• nw.vhi.de/vhi/<br>• www.saegeindustrie.de<br>• www.rohholzverbraucher.de<br>• www.vdp-online.de |



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| | | |
|---|---|---|
| • Verband Deutscher Papierhersteller | | |
| **Renewable energy regeneration**<br>• Bundesverband für Erneuerbare Energien<br>• Bundesverband Bioenergie<br>• Bundesverband Windenergie<br>• Bundesverband für Brennholzhandel und Brennholzproduktion<br>• Deutscher Energieholz und Pellet Verband | • Federal Association for Renewable Energies<br>• Federal Association Bioenergy<br>• Federal Association Wind Energy<br>• Federal Association for Fuelwood Trade and Fuelwood Production<br>• German Association of Fuelwood and Pellets | • www.bee-ev.de<br>• www.bioenergie.de<br>• www.wind-energie.de<br>• www.bundesverband-brennholz.de<br>• www.depv.de |
| **Water provision**<br>• Deutscher Vereinigung für Wasserwirtschaft, Abwasser und Abfall<br>• Bundesverband der Energie und Wasserwirtschaft (BDEW) | • German association for water supply and distribution, waste water and management<br>• Federal association of energy and water management | • de.dwa.de<br>• www.bedew.de |
| **Tourism**<br>• Deutscher Tourismusverband | • German Association for Tourism | • www.deutschertourismusverband.de |
| ***Civil Society actors*** | | |
| **Employment in forests**<br>• Bund Deutscher Forstleute<br>• IG Bauen Agrar Umwelt | • German Association of Foresters<br>• Labor Union Construction, Agriculture, Environment | • www.bdf-online.de<br>• www.igbau.de |
| **Sustainable biomass use**<br>• Forum Umwelt und Entwicklung/Plattform nachhaltige Biomasse | • Forum Environment and Development/Platform sustainable biomass | • www.forumue.de |
| **Recreation**<br>• Deutscher Wanderverband<br>• Deutscher olympischer Sportbund<br>• Mountainbike Verband Deutschland<br>• Allgemeiner Deutscher Fahrradclub (ADFC)<br>• Vereinigung der Freizeitfahrer und Reiter in Deutschland e.V. (VFR)<br>• Kuratorium für Sport und Natur<br>• Deutsche Reiterliche Vereinigung<br>• Deutscher Imkerbund | • German Hiking Association<br>• German Sports Union<br>• German Association of Mountain Biking<br>• General German Bicycle Club<br>• German Union of non-professional riders and horse riders<br>• Expert committee for sports and nature<br>• German Horse Riding Union<br>• German beekeeping union | • www.wanderverband.de<br>• www.dosb.de<br>• www.dimb.de<br>• www.adfc.de<br>• www.vfdnet.de<br>• www.kuratorium-sport-natur.de<br>• www.pferd-aktuell.de<br>• www.deutscherimkerbund.de |



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| | | |
|---|---|---|
| **Hunting**<br><br>• Deutscher Jagdschutzverband e.V. (DJV)<br>• Ökologischer Jagdverband<br>• Schutzgemeinschaft Deutsches Wild<br><br>**Certification**<br><br>• FSC | • German Hunting Association<br>• Ecological Hunting Association<br>• Associations for the Protection of German Wild Game<br><br>• FSC | • www.jagdverband.de<br>• www.oejv.org<br>• www.sdwi.de<br><br>• www.fsc-deutschland.de |
| **Environmental, nature, and landscape conservation**<br><br>• Vereinigung Deutscher Gewässer-schutz<br>• NABU<br>• BUND<br>• WWF<br>• Greenpeace<br>• Robin Wood<br>• Schutzgemeinschaft Deutscher Wald<br>• Deutscher Naturschutzring<br>• PrimaKlima<br>• Verband Deutscher Naturparke<br>• NaturFreunde Deutschland<br>• EuroNatur Stiftung<br>• DBU Naturerbe GmbH/Projekt Wald in Not<br>• Deutscher Verband für Landespflege (DVL)<br>• Deutsche Landeskulturgesellschaft (DLKG)<br>• Bund Heimat und Umwelt in Deutschland e.V. (BHU) | • German inshore waters protection union<br>• German Chapter of Birdlife Interna-tional<br>• German Chapter of Friends of the Earth<br>• WWF<br>• Greenpeace<br>• Robin Wood<br>• Association for the Protection of German Forests<br>• Association of German Nature Parks<br>• Friends of Nature Germany<br>• EuroNature Foundation<br>• German Federal Foundation for the Environment Natural Heritage inc./ Project Forests in Danger<br>• German Association for Landscape Planning<br>• German Society for Land Improve-ment<br>• Union for Homeland and Environ-ment in Germany | • www.vdg-online.de<br>• www.nabu.de<br>• www.bund.net<br>• www.wwf.de<br>• www.greenpeace.de<br>• www.robinwood.de<br>• www.sdw.org<br>• www.dnr.de<br>• www.prima-klima.weltweit.de<br>• www.naturparke.de<br>• www.naturfreunde.de<br>• www.euronatur.org<br>• www.dbu.de<br>• www.lpv.de<br>• www.dlkg.de<br>• www.bhu.de |



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## Appendix 2: Governmental actors in German forest politics (national level)

| *Original name* | *Name translated into English* | *Website* |
|---|---|---|
| • Bundesministerium für Ernährung und Landwirtschaft<br>• Bundesministerium für Wirtschaft und Energie<br>• Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit<br>• Bundesamt für Naturschutz<br>• Umweltbundesamt<br>• Bundesanstalt für Immobilienaufgaben, Geschäftsbereich Bundesforst<br>• Deutscher Landkreistag<br>• Deutscher Städte- und Gemeindebund | • Federal Ministry for Nutrition and Agriculture<br>• Federal Ministry of Economic Affairs and Energy<br>• Federal Ministry for the Environment, Nature Conservation, Building, and Nuclear Safety<br>• Federal Agency for Nature Conservation<br>• Federal Environmental Agency<br>• Institute for Federal Real Estate Operational Division Federal Forests<br>• German District Association<br>• German Association of Towns and Municipalities | • www.bmel.de<br>• www.bmwi.de<br>• www.bmub.bund.de<br>• www.bfn.de<br>• www.umweltbundesamt.de<br>• www.bundesimmobilien.de<br>• www.landkreistag.de<br>• www.dstgb.de |



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## Appendix 3: Interests in different ecosystem services (Germany, national level)

| **Interest in** |
|---|
| ***Provisioning services*** |
| Wood |
| Mushrooms |
| Berries |



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| |
|---|
| Game |
| Medical plants |
| Other(s) |
| ***Supporting services*** |
| Biodiversity |
| Habitat for species |
| Other(s) |
| ***Regulating services*** |
| Carbon sequestration |

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| |
|---|
| Climate regulation |
| Water quality |
| Pest control |
| Other(s) |
| ***Cultural services*** |
| Outdoor recreation |
| Aesthetic values |
| Tourism |
| Other(s) |



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# Appendix 4: Actors in the case study Bavaria (Germany)

| Stakeholder Category | Identified Stakeholder (Organizations)<br><br>[Name in country language] | Identified Stakeholder (Organizations)<br><br>[Name translated into English] |
|---|---|---|
| ***Market actors*** | | |
| Forest owners | • Bayerischer Waldbesitzerverband e.V.<br>• Verband der Bayrischen Grundbesitzer e.V.<br>• Bayrischer Bauernverband e.V.<br>• Bayrischer Forstverein e.V.<br>• Forstliche Vereinigung Schwaben e.V.<br>  ○ FBG Augsburg-West<br>  ○ FBG Augsburg-Nord<br>  ○ FBG Isar-Lech<br>  ○ FBG Memmingen<br>  ○ FBG Oberallgäu<br>  ○ FBG Schwabmünchen<br>  ○ WBG Region Augsburg<br>• Fürstlich und Gräfliches Fuggersches Stiftungsforstamt<br>• Privatwald Fugger-Babenhausen<br>• Individuelle, unorganisierte Kleinprivatwaldeigentümer<br>• Individuelle Großprivatwaldeigentümer | • Bavarian forest owner association<br>• Bavarian association of privately owned land<br>• Bavarian farmer association<br>• Bavarian forest association<br>• Union of Swabian forest management associations<br>  ○ Forest management association Augsburg-West<br>  ○ Forest management association Augsburg-Nord<br>  ○ Forest management association Isar-Lech<br>  ○ Forest management association Memmingen<br>  ○ Forest management association Oberallgäu<br>  ○ Forest management association Oberallgäu<br>  ○ Forest management association Schwabmünchen<br>  ○ Forest management association Augsburg Region<br>• Baronial and Comital forestry office of the Fugger Foundation<br>• Private forest Fugger-Babenhausen<br>• Individual, unorganized small-scale forest owners<br>• Individual large-scale forest owners |
| Timber processing | • Verband der Holzwirtschaft und Kunststoffverarbeitung Bayern/Thüringen<br>• Landesinnungsverband des Bayerischen Zimmererhandwerks<br>• Verband Bayrischer Papierfabriken<br>• Netzwerk Holzbau Augsburg<br>• UPM<br>• Pfeifer Sägewerk<br>• Ilim Timber<br>• Diverse lokale Sägewerke, Holzhandel, etc. | • Timber industries and synthetic material processing association Bavaria/Thuringia<br>• State guild association of Bavarian carpentry<br>• Association of Bavarian paper mills<br>• Network timber construction Augsburg<br>• UPM<br>• Pfeifer sawmill<br>• Ilim Timber<br>• Diverse local sawmills, timber trade companies,etc. |
| Renewable energy provision | • Bundesverband Windenergie-Regionalverband Schwaben<br>• Lokale, regionale und andere Windenergieunternehmen | • Wind energy association- Regional subchapter Schwabia<br>• Local, regional, and other wind energy companies |



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| | | |
|---|---|---|
| | • Holzpellet- und Hackschnitzelunternehmen | • Wood pellet and woodchips companies |
| Work in forests | • Forstsachverständige<br>• Forstwirte<br>• Forstliche Lohnunternehmer | • Forestry experts<br>• Forest workers<br>• Forestry work contractors |
| **Civil Society** | | |
| Employment in forests | • BDF - Bund Deutscher Forstleute Landesverband Bayern e.V.<br>• Bayrischer Beamtenbund e.V.<br>• DGB Bayern<br>• Förster | • Bavarian state association of the German forester association<br>• Bavarian association of public officers<br>• German labor union Bavaria<br>• Forester |
| Recreation | • Verein zur Sicherstellung überörtlicher Erholungsgebiete für die Region Augsburg e. V. (EVA)<br>• Pilzverein Augsburg Königsbrunn e.V.<br>• Wanderer<br>• Geo-cacher<br>• Pilz- und Beerensammler<br>• Radfahrer<br>• Mountainbiker<br>• Motor-cross Fahrer<br>• Quad Fahrer | • Association for the regional securing of recreational areas in Augsburg<br>• Mushroom association Augsburg Königsbrunn<br>• Individual hikers<br>• Individual geo-cachers<br>• Mushroom and berry pickers<br>• Individual bikers<br>• Individual mountain bikers<br>• Individual motor-cross riders<br>• Individual off-road vehicle (quad) drivers |
| Hunting | • Jägervereinigung Augsburg e.V., Jagdverband Kreisgruppe Augsburg<br>• Jagdagenda 21<br>• Ökologischer Jagdverein<br>• Jagdpächter<br>• Jagderlaubnisscheininhaber<br>• Jagdverpächter<br>• Berufsjäger | • Hunting association Augsburg<br>• Hunting agenda 21<br>• Ecological hunting association<br>• Tenants of a hunt<br>• Hunters with permission to hunt within the state forest<br>• Landlords of a hunt<br>• Professional hunters |
| Fishing | • Fischereiverband Schwaben e.V. | • Fishing association Augsburg |
| Environmental, nature, and landscape conservation | • Naturschutzallianz<br>• Naturpark Augsburg Westliche Wälder e.V.<br>• Landschaftspflegeverband Stadt Augsburg e.V.<br>• Bund Naturschutz Bayern<br>• Bund Naturschutz Kreisgruppe Augsburg<br>• Bund für Vogelschutz Bayern<br>• Bund für Vogelschutz Kreisgruppe Augsburg<br>• Schutzgemeinschaft Deutscher Wald Bayern<br>• Individuelle Naturschützer | • Nature conservation alliance<br>• Nature park Augsburg Western forests association<br>• Landscape architecture association of the city of Augsburg<br>• Friends of the Earth Bavaria<br>• Friends of the Earth subgroup Augsburg<br>• Birdlife Bavaria<br>• Birdlife Augsburg<br>• Association for the protection of the German forest Bavaria<br>• Individual nature conservationists |
| ***Governmental-Actors*** | | |
| Forest management | • Bayrische Staatsforsten AöR<br>  ○ FB Zusmarshausen<br>  ○ FB Ottobeuren<br>• Amt für Ernährung, Landwirtschaft und Forsten Augsburg | • Bavarian State forest administration<br>  ○ District Zusmarshausen<br>  ○ District Ottobeuren<br>• Office for Nutrition, Agriculture, and Forestry Augsburg |



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| | | |
|---|---|---|
| | • Bayerisches Staatsministerium für Ernährung, Landwirtschaft und Forsten<br>• Zentrum Wald-Forst-Holz Weihenstephan<br>• Bayerische Landesanstalt für Wald und Forstwirtschaft (LWF) | • Bavarian State Ministry for Nutrition, Agriculture, and Forestry<br>• Centre Forest-Forestry-Timber Weihenstephan<br>• Bavarian Regional office for forests and forestry |
| Environmental, nature, and landscape conservation | • Bayerische Staatsministerium für Umwelt und Verbraucherschutz (StMUV)<br>• Landesamt für Vogelschutz<br>• Landratsamt Augsburg | • Bavarian State Ministry for the Environment and Consumer Protection<br>• State office for bird protection<br>• District office Augsburg |
| Water provision | • Stadtwerke Augsburg<br>• Diverse kommunale Wasserzweckverbände | • Public utility company Augsburg<br>• Several municipal public utility companies |



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## Appendix 5: Actors in the case study/Contacts (Bavaria, Germany)

| **Identified Stakeholder (Organizations)**<br><br>**[Name translated into English]** | **Website or physical address/contact** |
|---|---|
| **Market actors** | |
| • Bavarian forest owner association<br>• Bavarian association of privately owned land<br>• Bavarian farmer association<br>• Bavarian forest association<br>• Union of Swabian forest management associations<br>• Baronial and Comital forestry office of the Fugger Foundation | • http://www.bayer-waldbesitzerverband.de/<br>• www.bwe-online.de<br>• www.bayerischerbauernverband.de<br>• http://www.fvschwaben.de<br>• http://www.fugger.de/stiftungen.html |
| • Timber industries and synthetic material processing association Bavaria/Thuringia<br>• State guild association of Bavarian carpentry<br>• Association of Bavarian paper mills<br>• Network timber construction Augsburg<br>• UPM<br>• Pfeifer sawmill<br>• Ilim Timber | • www.holzverband.de/verband/verband-der-holzwirtschaft-und-kunststoffverarbeitung-bayernthueringen-ev<br>• www.zimmerer-bayern.com<br>• www.baypapier.com/<br>• www.netzwerkholzbau.de<br>• www.upm.de<br>• www.pfeifergroup.com<br>• www.ilimtimber.com |
| • Wind energy association- Regional subchapter Schwabia | • www.wind-energie.de/verband/landes-und-regional-verbaende/bayern/regionalverbaende |
| **Civil Society** | |
| • Bavarian state association of the German forester association<br>• Bavarian association of public officers<br>• German labor union Bavaria | • www.forstverein.de/bayfv/profil.html<br>• bbb-bayern.de<br>• bayern.dgb.de |
| • Association for the regional securing of recreational areas in Augsburg<br>• Mushroom association Augsburg Königsbrunn | • www.eva-augsburg.de<br>• http://pilzeaugsburg.de/ |
| • Hunting association Augsburg<br>• Hunting agenda 21<br>• Ecological hunting association | • www.jagd-augsburg.de<br>• www.jagdagenda.de<br>• www.oejv-bayern.de |
| • Fishing association Augsburg | • www.fva-ev.de |
| • Nature conservation alliance<br>• Nature park Augsburg Western forests association<br>• Landscape architecture association of the city of Augsburg<br>• Friends of the Earth Bavaria<br>• Birdlife Bavaria<br>• Birdlife Augsburg<br>• Association for the protection of the German forest Bavaria | • www.naturschutzallianz.de<br>• www.naturpark-augsburg.de<br>• lpv-augsburg.de<br>• www.bund-naturschutz.de<br>• www.lbv.de<br>• http://augsburg.lbv.de/lbv-augsburg.html<br>• www.sdw-bayern.de |
| ***Governmental actors*** | |
| • Bavarian State forest administration<br>• Office for Nutrition, Agriculture, and Forestry Augsburg<br>• Bavarian State Ministry for Nutrition, Agriculture, and Forestry<br>• Centre Forest-Forestry-Timber Weihenstephan<br>• Bavarian Regional office for forests and forestry | • http://www.baysf.de/de.html<br>• www.aelf-au.bayern.de<br>• www.stmelf.bayern.de<br>• www.forstzentrum.de<br>• www.lwf.bayern.de |
| • Bavarian State Ministry for the Environment and Consumer Protection | • www.stmuv.bayern.de |



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| | |
|---|---|
| • State office for bird protection<br>• District office Augsburg | • http://www.lfu.bayern.de/natur/vogelschutzwarte/index.htm<br>• www.landkreis-augsburg.de |
| • Public utility company Augsburg | • www.sw-augsburg.de |



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## Appendix 6: Actors in Bavaria interested in different ecosystem services

| **Interest in** | **Identified Stakeholder (Organizations)**<br><br>**[Name translated into English]** |
|---|---|
| ***Provisioning services*** | |
| Wood | • Bavarian forest owner association<br>• Bavarian association of privately owned land<br>• Bavarian farmer association<br>• Bavarian forest association<br>• Union of Swabian forest management associations<br>  ○ Forest management association Augsburg-West<br>  ○ Forest management association Augsburg-Nord<br>  ○ Forest management association Isar-Lech<br>  ○ Forest management association Memmingen<br>  ○ Forest management association Oberallgäu<br>  ○ Forest management association Oberallgäu<br>  ○ Forest management association Schwabmünchen<br>  ○ Forest management association Augsburg Region<br>• Baronial and Comital forestry office of the Fugger Foundation<br>• Private forest Fugger-Babenhausen<br>• Individual, unorganized small-scale forest owners<br>• Individual large-scale forest owners<br>• Timber industries and synthetic material processing association Bavaria/Thuringia<br>• State guild association of Bavarian carpentry<br>• Association of Bavarian paper mills<br>• Network timber construction Augsburg<br>• UPM<br>• Pfeifer sawmill<br>• Ilim Timber<br>• Diverse local sawmills, timber trade companies, etc.<br>• Wood pellet and woodchips companies<br>• Forest workers<br>• Forestry work contractors<br>• Bavarian state association of the German forester association<br>• Bavarian association of public officers<br>• German labor union Bavaria<br>• Forester<br>• Bavarian State forest administration<br>  ○ District Zusmarshausen<br>  ○ District Ottobeuren<br>• Office for Nutrition, Agriculture, and Forestry Augsburg<br>• Bavarian State Ministry for Nutrition, Agriculture, and Forestry<br>• Centre Forest-Forestry-Timber Weihenstephan<br>• Bavarian Regional office for forests and forestry |
| Mushrooms | • Individual mushroom pickers (recreational)<br>• Mushroom association Augsburg Königsbrunn |
| Berries | • Individual berry pickers (recreational) |
| Game | • Hunting association Augsburg<br>• Hunting agenda 21<br>• Ecological hunting association |



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| | |
|---|---|
| | • Tenants of a hunt<br>• Hunters with permission to hunt within the state forest<br>• Landlords of a hunt<br>• Professional hunters |
| Medical plants | - |
| Other(s) | Fish from ponds within the forest:<br>• Fishing association Augsburg<br>• Individual fishermen (recreational)<br>Energy provision by wind turbines within forests<br>• Wind energy association- Regional subchapter Schwabia<br>• Local, regional, and other wind energy companies |
| ***Supporting services*** | |
| Biodiversity | • Nature conservation alliance<br>• Nature park Augsburg Western forests association<br>• Landscape architecture association of the city of Augsburg<br>• Friends of the Earth Bavaria<br>• Friends of the Earth subgroup Augsburg<br>• Birdlife Bavaria<br>• Birdlife Augsburg<br>• Association for the protection of the German forest Bavaria<br>• Individual nature conservationists |
| Habitat for species | • Nature conservation alliance<br>• Nature park Augsburg Western forests association<br>• Landscape architecture association of the city of Augsburg<br>• Friends of the Earth Bavaria<br>• Friends of the Earth subgroup Augsburg<br>• Birdlife Bavaria<br>• Birdlife Augsburg<br>• Association for the protection of the German forest Bavaria<br>• Individual nature conservationists |
| Other(s) | - |
| ***Regulating services*** | |
| Carbon sequestration | • Nature conservation alliance<br>• Landscape architecture association of the city of Augsburg<br>• Friends of the Earth Bavaria<br>• Friends of the Earth subgroup Augsburg<br>• Birdlife Bavaria<br>• Birdlife Augsburg<br>• Association for the protection of the German forest Bavaria<br>• Individual nature conservationists |
| Climate regulation | • Nature conservation alliance<br>• Landscape architecture association of the city of Augsburg<br>• Friends of the Earth Bavaria<br>• Friends of the Earth subgroup Augsburg<br>• Birdlife Bavaria<br>• Birdlife Augsburg<br>• Association for the protection of the German forest Bavaria<br>• Individual nature conservationists |
| Water quality | • Public utility company Augsburg |



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| | |
|---|---|
| | • Several municipal public utility companies |
| Pest control | • Bavarian State forest administration<br>  ○ District Zusmarshausen<br>  ○ District Ottobeuren<br>• Office for Nutrition, Agriculture, and Forestry Augsburg<br>• Bavarian State Ministry for Nutrition, Agriculture, and Forestry<br>• Bavarian Regional office for forests and forestry<br>• Centre Forest-Forestry-Timber Weihenstephan<br>• Bavarian forest owner association<br>• Bavarian association of privately owned land<br>• Bavarian farmer association<br>• Bavarian forest association<br>• Union of Swabian forest management associations<br>  ○ Forest management association Augsburg-West<br>  ○ Forest management association Augsburg-Nord<br>  ○ Forest management association Isar-Lech<br>  ○ Forest management association Memmingen<br>  ○ Forest management association Oberallgäu<br>  ○ Forest management association Oberallgäu<br>  ○ Forest management association Schwabmünchen<br>  ○ Forest management association Augsburg Region<br>• Baronial and Comital forestry office of the Fugger Foundation<br>• Private forest Fugger-Babenhausen<br>• Individual, unorganized small-scale forest owners<br>• Individual large-scale forest owners<br>• Association for the protection of the German forest Bavaria |
| Other(s) | - |
| ***Cultural services*** | |
| Outdoor recreation | • Association for the regional securing of recreational areas in Augsburg<br>• Mushroom association Augsburg Königsbrunn<br>• Individual hikers<br>• Individual geo-cachers<br>• Mushroom and berry pickers<br>• Individual bikers<br>• Individual mountain bikers<br>• Individual motor-cross riders<br>• Individual off-road vehicle (quad) drivers<br>• Nature park Augsburg Western forests association |
| Aesthetic values | • Landscape architecture association of the city of Augsburg<br>• Nature park Augsburg Western forests association |
| Tourism | • Nature park Augsburg Western forests association |
| Other(s) | - |



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# Appendix 7: Actors in the case study Brandenburg (Lieberose/Schlaubetal)

| Stakeholder Category | Identified Stakeholder (Organizations)<br><br>[Name in country language] | Identified Stakeholder (Organizations)<br><br>[Name translated into English] |
|---|---|---|
| ***Market actors*** | | |
| Forest management | • Waldbesitzer Verband Brandenburg<br>• Waldbauernverband Brandenburg<br>• Forum Natur<br>• Stiftung Stift Neuzelle<br>• Stadtwald Lieberose<br>• Individuelle, unorganisierte Kleinprivatwaldeigentümer<br>• Individuelle Großprivatwaldeigentümer | • Forest Owner Association Brandenburg<br>• Small-scale Forest Owner Association Brandenburg<br>• Forum for Nature<br>• Foundation of Monastery Neuzelle<br>• Municipal-owned forest Lieberose<br>• Individual, unorganized small-scale forest owner<br>• Individual large-scale forest owner |
| Timber processing | • Robeta<br>• Klenk Holz AG<br>• Kiefern Bohm GmbH & Co. KG<br>• Holzhandel Templin<br>• Hans Henning Fritzsche Holzhandel und Forstbetrieb<br>• Sven Wiernowolski Forstbetrieb Holzhandel | • Robeta<br>• Klenk Holz AG<br>• Kiefern Bohm GmbH & Co. KG<br>• Holzhandel Templin<br>• Hans Henning Fritzsche Holzhandel und Forstbetrieb<br>• Sven Wiernowolski Forstbetrieb Holzhandel |
| Renewable energy provision | • Juwi<br>• Bundesverband Windenergie Berlin/Brandenburg<br>• Holzpellet- und Hackschnitzelunternehmen | • Juwi<br>• Wind energy association Berlin/Brandenburg<br>• Wood pellet and wood chips companies |
| Work in forests | • Forstliche Lohnunternehmen<br>• Forsteinrichtung<br>• Berufsjäger | • Forestry work contractors<br>• Forestry experts<br>• Professional hunters |
| Tourism | • Tourismus-Marketing Schlaubetal e.V.<br>• Tourismus-Entwicklungsgesellschaft (TEG) Lieberose/Oberspreewald mbH<br>• Internationale Naturausstellung (I.N.A.) Lieberoser Heide/AG I.N.A. Lieberoser Heide | • Tourism-Marketing Schlaubetal<br>• Association for Touristic Development Lieberose/Oberspreewald<br>• International Nature Exibition Lieberose Heather Land |
| **Civil Society** | | |
| Employment in forests | • Bund deutscher Forstleute Brandenburg<br>• IG Bau Agrar Umwelt Brandenburg | • Brandenburg state association of the German forester association<br>• German labor union Brandenburg |
| Recreation | • Hundespaziergänger<br>• Wanderer<br>• Geo-cacher<br>• Pilz- und Beerensammler<br>• Radfahrer<br>• Mountainbiker<br>• Motor-cross Fahrer<br>• Quad Fahrer | • Recreationists with dogs<br>• Individual hikers<br>• Individual geo-cachers<br>• Mushroom and berry pickers<br>• Individual bikers<br>• Individual mountain bikers<br>• Individual motor-cross riders<br>• Individual off-road vehicle (quad) drivers |



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| | | |
|---|---|---|
| Hunting | • Landesjagdverband Brandenburg<br>• Ökologischer Jagdverein Brandenburg<br>• Jagdpächter<br>• Jagderlaubnisscheininhaber<br>• Jagdverpächter | • Hunting association Brandenburg<br>• Ecological hunting association Brandenburg<br>• Tenants of a hunt<br>• Hunters with permission to hunt within the state forest<br>• Landlords of a hunt |
| Environmental, nature, and landscape conservation | • NABU Brandenburg<br>• BUND Brandenburg<br>• Stiftung Naturlandschaften Brandenburg<br>• Arbeitsgemeinschaft naturgemäße Waldwirtschaft | • Birdlife Brandenburg<br>• Friends of the Earth Brandenburg<br>• Brandenburg Wilderness Foundation<br>• Working group for ecologically-sound forest management |
| ***Governmental-Actors*** | | |
| Forest management | • Forstbetrieb Brandenburg<br>• Brandenburgisches Ministerium für Ländliche Entwicklung Umwelt und Landwirtschaft | • State-owned forest enterprise Brandenburg<br>• Ministry for rural development, the environment, and agriculture |
| Environmental, nature, and landscape conservation | • Brandenburgisches Ministerium für Ländliche Entwicklung, Umwelt und Landwirtschaft<br>• Landesamt für Umwelt Brandenburg | • Ministry for rural development, the environment, and agriculture<br>• Authorities for the Environment Brandenburg |



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# Appendix 8: Websites of actors in Brandenburg (Lieberose/Schlaubetal)

| **Identified Stakeholder (Organizations)**<br><br>**[Name translated into English]** | **Website** |
|---|---|
| **Market actors** | |
| Forest management:<br><br>• Forest Owner Association Brandenburg<br>• Small-scale Forest Owner Association Brandenburg<br>• Forum for Nature<br>• Foundation of Monastery Neuzelle | www.waldbesitzerverband-brandenburg.de<br>www.waldbauern-info.de<br>www.forum-natur-brandenburg.de<br>www.stift-neuzelle.de |
| Timber industries:<br><br>• Robeta<br>• Klenk Holz AG<br>• Kiefern Bohm GmbH & Co. KG<br>• Holzindustrie Templin<br>• Hans Henning Fritzsche Holzhandel und Forstbetrieb | www.robeta.de<br>www.klenk.de<br>www.kiefernbohm.de<br>www.hitemplin.com<br>www.forstdienstleistungen-fritzsche.de |
| Energy sector:<br><br>• Juwi<br>• Wind energy association Berlin/Brandenburg | www.juwi.de<br>https://www.wind-energie.de/verband/landes-und-regionalver-baende/berlin-brandenburg |
| Touristic sector:<br><br>• Tourismus-Marketing Schlaubetal<br>• Association for Touristic Development Lieberose/Ober-spreewald<br>• International Nature Exibition Lieberose Hether Land | www.schlaubetal-online.de<br>www.teg-lds.de<br>www.ina-lieberose.de |
| **Civil Society** | |
| Employment in forests:<br><br>• Brandenburg state association of the German forester association<br>• German labor union Brandenburg | www.bdf-online.de<br>www.igbau.de |
| Hunting:<br><br>• Hunting association Brandenburg<br>• Ecological hunting association | www.ljv-brandenburg.de<br>www.oejv-brandenburg.de |
| Environment, nature and landscape conservation:<br><br>• Birdlife Brandenburg<br>• Friends of the Earth Brandenburg<br>• Brandenburg Wilderness Foundation<br>• Working group for ecologically-sound forest management | https://brandenburg.nabu.de<br>www.bund-brandenburg.de<br>www.stiftung-nlb.de<br>www.anw-brandenburg.de |
| **Governmental actors** | |



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| | |
|---|---|
| • State-owned forest enterprise Brandenburg<br>• Ministry for rural development, the environment, and agriculture | http://forst.brandenburg.de<br><br>www.mlul.brandenburg.de |



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## Appendix 9: Actors in the case study interested in different ecosystem services in Brandenburg (Lieberose/Schlaubetal)

| **Interest in** |
|---|
| ***Provisioning services*** |
| Wood |
| Mushrooms |
| Berries |
| Game |
| Medical plants |
| ***Supporting services*** |
| Biodiversity |
| Habitat for species |



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| |
|---|
| ***Regulating services*** |
| Carbon sequestration |
| Climate regulation |
| Water quality |
| Pest control |
| ***Cultural services*** |
| Outdoor recreation |
| Aesthetic values |
| Tourism |



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## Appendix 10. Governmental actors in Ireland (national level)

| Name | English translation of Irish words | Website |
|---|---|---|
| Forest Service | | https://www.agriculture.gov.ie/forestservice/ |
| National Park and Wildlife Services (NPWS) | | https://www.npws.ie/ |
| Environmental Protection Agency (EPA) | | http://www.epa.ie/ |
| Inland fisheries | | http://www.fisheriesireland.ie/ |
| Duchas and Dept. if Arts, Heritage, Regional, Rural and Gaeltacht Affairs | Duchas = heritage<br>Gaeltacht = Gaelic speaking - word used to denote regions in Ireland with many Irish speakers | http://www.ahrrga.gov.ie/en/ |
| National Heritage Council | | http://www.heritagecouncil.ie/home/ |
| Sustainable Energy Authority Ireland (SEAI) | | http://www.seai.ie/ |
| Coillte Forest | Coillte = Forests/Woods | http://www.coillte.ie/coillteforest/ |
| Coillte Panel Products | Coillte = Forests/Woods | http://www.coillte.ie/medite_smartply/ |
| Coillte Enterprise (Wind Energy Projects) | Coillte = Forests/Woods | http://www.coillte.ie/coillteenterprise/ |
| Council for Forest Research and Development (COFORD) | | http://www.coford.ie/ |
| Teagasc | Teagasc = instruction | https://www.teagasc.ie/crops/forestry/ |

## Appendix 11. Market actors in Ireland (national level)

| Name | English translation of Irish words | Website |
|---|---|---|
| **Forest Management** | | |
| Coillte Forest | Coillte = Forests/Woods | http://www.coillte.ie/coillteforest/ |
| Irish Timber Growers' Association (ITGA) | | http://www.itga.ie/ |
| Irish Forestry and Forest Products Association (IFFPA) | | http://www.iffpa.ie/Sectors/IFFPA/IFFPA.nsf/vPages/Home?OpenDocument |
| Irish Farmers' Association (IFA) | | http://www.ifa.ie/sectors/forestry/ |
| Private Forest owners | | |
| Association of Irish Forestry Consultants | | http://www.aifc.ie/ |
| Veon Ltd. | | http://www.veon.ie/ |
| Commercial Forestry Services Ltd. | | http://www.forests.ie/index.htm |
| Green Belt | | http://www.greenbelt.ie/ |
| ProSilva Ireland | | https://prosilvaireland.wordpress.com/ |
| **Wood processing sector** | | |
| Coillte Panel Products | Coillte = Forests/Woods | http://www.coillte.ie/medite_smartply/ |
| Irish Forestry and Forest Products Association (IFFPA) | | http://www.iffpa.ie/Sectors/IFFPA/IFFPA.nsf/vPages/Home?OpenDocument |
| Wood Marketing Federation | | http://www.wood.ie/ |
| Irish Timber Council | | |
| Masonite Ireland | | http://www.masonite.com/ |
| Balcas Ltd | | https://www.balcas.com/ |
| ECC Timber Products Ltd. | | http://www.ecc.ie/ |
| Glennon Brothers Ltd. | | http://www.glennonbrothers.ie/ |
| Grainer Sawmills Ltd. | | http://gpwood.ie/ |



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| | | |
|---|---|---|
| Murray Timber Group Ltd. | | http://www.mtg.ie/ |
| Coolrain Sawmills Ltd. | | http://www.gardenliving.ie/ |
| Laois Sawmill Ltd. | | http://www.laoissawmills.com/ |
| Medium Palfab Ltd. | | http://www.palfab.com/ |
| Woodfab Timber Ltd. | | http://www.woodfabtimber.ie/ |
| **Wind farm development** | | |
| Coillte Enterprise (Wind Energy Projects) | Coillte = Forests/Woods | http://www.coillte.ie/coillteenterprise/ |
| Irish Wind Energy Association (IWEA) | | http://www.iwea.com/ |
| Scottish and Southern Energy (SSE) | | http://sse.com/ |

## Appendix 12. Civil society actors in Ireland (national level)

| Name | English translation of Irish words | Website |
|---|---|---|
| **Nature and environment protection** | | |
| An Taisce - The National Trust for Ireland | An Taisce = The treasure | http://www.antaisce.org/ |
| Irish Peatland Conservation Council (IPCC) | | http://www.ipcc.ie/ |
| Crann | Crann = Tree | https://crann.ie/ |
| Woodlands of Ireland | | http://www.woodlandsofireland.com/ |
| Tree Council of Ireland | | http://treecouncil.ie/ |
| Environmental Pillar | | http://environmentalpillar.ie/ |
| **Recreation** | | |
| Mountaineering Ireland | | http://www.mountaineering.ie/ |
| Angling Council Ireland | | http://www.anglingcouncil.ie/ |
| National Association of Regional Game Councils | | http://nargc.ie/ |

## Appendix 13. Interest in different ecosystem services (national level)

| Interest in | Identified Stakeholder (Organizations) |
|---|---|
| ***Provisioning services*** | |
| Wood | • Forest Service<br>• Council for Forest Research and Development (COFORD)<br>• Teagasc<br>• Coillte Forest<br>• Irish Timber Growers' Association (ITGA)<br>• Irish Forestry and Forest Products Association (IFFPA)<br>• Irish Farmers' Association (IFA)<br>• Private Forest owners<br>• Association of Irish Forestry Consultants<br>• Veon Ltd.<br>• Commercial Forestry Services Ltd.<br>• Green Belt<br>• ProSilva Ireland<br>• Coillte Panel Products<br>• Irish Forestry and Forest Products Association (IFFPA)<br>• Wood Marketing Federation<br>• Irish Timber Council<br>• Masonite Ireland<br>• Balcas Ltd<br>• ECC Timber Products Ltd. |



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| | |
|---|---|
| | • Glennon Brothers Ltd.<br>• Grainer Sawmills Ltd.<br>• Murray Timber Group Ltd.<br>• Coolrain Sawmills Ltd.<br>• Laois Sawmill Ltd.<br>• Medium Palfab Ltd.<br>• Woodfab Timber Ltd. |
| Mushrooms | - |
| Berries | - |
| Game | • National Association of Regional Game Councils |
| Medical plants | - |
| Other(s) | - |
| ***Supporting services*** | |
| Biodiversity | • National Park and Wildlife Services (NPWS)<br>• Inland fisheries<br>• An Taisce - The National Trust for Ireland<br>• Irish Peatland Conservation Council (IPCC)<br>• Crann<br>• Woodlands of Ireland<br>• Tree Council of Ireland<br>• Environmental Pillar |
| Habitat for species | • National Park and Wildlife Services (NPWS)<br>• Inland fisheries<br>• An Taisce - The National Trust for Ireland<br>• Irish Peatland Conservation Council (IPCC)<br>• Crann<br>• Woodlands of Ireland<br>• Tree Council of Ireland<br>• Environmental Pillar<br>• Angling Council Ireland |
| Other(s) | - |
| ***Regulating services*** | |
| Carbon sequestration | • Forest Service<br>• Coillte Forestry<br>• Environmental Protection Agency<br>• Irish Peatland Conservation Council (IPCC)<br>• An Taisce - The National Trust for Ireland<br>• Environmental Pillar |
| Climate regulation | • Forest Service<br>• Coillte Forest<br>• Coillte Enterprise<br>• An Taisce - The National Trust for Ireland<br>• Irish Peatland Conservation Council (IPCC)<br>• Environmental Pillar |



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| | |
|---|---|
| Water quality | • Inland Fisheries<br>• Environmental Protection Agency<br>• Angling Council Ireland |
| Pest control | • Forest Service<br>• National Park and Wildlife Services (NPWS)<br>• Inland fisheries<br>• Coillte Forest<br>• An Taisce - The National Trust for Ireland<br>• Irish Peatland Conservation Council (IPCC)<br>• Environmental Pillar |
| Other(s) | - |
| ***Cultural services*** | |
| Outdoor recreation | • Mountaineering Ireland<br>• Angling Association Ireland<br>• National Association of Regional Game Councils<br>• Tree Council of Ireland |
| Aesthetic values | • Forest Service<br>• Mountaineering Ireland<br>• Angling Association Ireland<br>• National Association of Regional Game Councils<br>• An Taisce |
| Tourism | - |
| Other(s) | - |

## Appendix 14. Governmental actors in the barony of Moycullen

| Name | English translation of Irish words | Website |
|---|---|---|
| Forest Service | | https://www.agriculture.gov.ie/forestservice/ |
| National Park and Wildlife Services (NPWS) | | https://www.npws.ie/ |
| Environmental Protection Agency (EPA) | | http://www.epa.ie/ |
| Inland fisheries | | http://www.fisheriesireland.ie/ |
| Duchas and Dept. if Arts, Heritage, Regional, Rural and Gaeltacht Affairs | Duchas = heritage<br>Gaeltacht = Gaelic speaking - word used to denote regions in Ireland with many Irish speakers | http://www.ahrrga.gov.ie/en/ |
| Coillte Forest | Coillte = Forests/Woods | http://www.coillte.ie/coillteforest/ |
| Coillte Panel Products | Coillte = Forests/Woods | http://www.coillte.ie/medite_smartply/ |
| Coillte Enterprise (Wind Energy Projects) | Coillte = Forests/Woods | http://www.coillte.ie/coillteenterprise/ |
| Teagasc | Teagasc = instruction | https://www.teagasc.ie/crops/forestry/ |



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## Appendix 15. Market actors in the barony of Moycullen (case study level)

| Name |
|---|
| **Forest Management** |
| Coillte Forest |
| Irish Farmers' Association (IFA) |
| Private Forest owners |
| **Wood processing sector** |
| Coillte Panel Products |
| ECC Timber Products Ltd. |
| **Wind farm development** |
| Coillte Enterprise (Wind Energy Projects) |
| Scottish and Southern Energy (SSE) |

## Appendix 16. Civil society actors in the barony of Moycullen (case study level)

| Name | English translation of Irish words | Website |
|---|---|---|
| **Nature and environment protection** | | |
| An Taisce - The National Trust for Ireland | An Taisce = The treasure | http://www.antaisce.org/ |
| Irish Peatland Conservation Council (IPCC) | | http://www.ipcc.ie/ |
| **Recreation** | | |
| Mountaineering Ireland | | http://www.mountaineering.ie/ |
| Oughterard Anglers and Boatmen's Association | Oughterard is a place name | http://www.oughterardanglers.com/ |



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## Appendix 17. Interest in different ecosystem services (CSA Ireland)

| Interest in | Identified Stakeholder (Organizations) |
|---|---|
| ***Provisioning services*** | |
| Wood | • Forest Service<br>• Teagasc<br>• Coillte Forest<br>• Irish Farmers' Association (IFA)<br>• Private Forest owners<br>• Coillte Panel Products<br>• ECC Timber Products Ltd. |
| Mushrooms | - |
| Berries | - |
| Game | - |
| Medical plants | - |
| Other(s) | - |
| ***Supporting services*** | |
| Biodiversity | • National Park and Wildlife Services (NPWS)<br>• Inland fisheries<br>• An Taisce - The National Trust for Ireland<br>• Irish Peatland Conservation Council (IPCC) |
| Habitat for species | • National Park and Wildlife Services (NPWS)<br>• Inland fisheries<br>• An Taisce - The National Trust for Ireland<br>• Irish Peatland Conservation Council (IPCC)<br>• Oughterard Anglers and Boatmen's Association |
| Other(s) | - |
| ***Regulating services*** | |
| Carbon sequestration | • Forest Service<br>• Coillte Forestry<br>• Environmental Protection Agency<br>• Irish Peatland Conservation Council (IPCC)<br>• An Taisce - The National Trust for Ireland |
| Climate regulation | • Forest Service<br>• Coillte Forest<br>• Coillte Enterprise<br>• An Taisce - The National Trust for Ireland<br>• Irish Peatland Conservation Council (IPCC) |



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| | |
|---|---|
| Water quality | • Inland Fisheries<br>• Environmental Protection Agency<br>• Oughterard Anglers and Boatmen's Association |
| Pest control | • Forest Service<br>• National Park and Wildlife Services (NPWS)<br>• Inland fisheries<br>• Coillte Forest<br>• An Taisce - The National Trust for Ireland<br>• Irish Peatland Conservation Council (IPCC) |
| Other(s) | - |
| ***Cultural services*** | |
| Outdoor recreation | • Mountaineering Ireland<br>• Oughterard Anglers and Boatmen's Association |
| Aesthetic values | • Forest Service<br>• Mountaineering Ireland<br>• Oughterard Anglers and Boatmen's Association<br>• An Taisce |
| Tourism | - |
| Other(s) | - |



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## Appendix 18: Non-public actors in Italian forest politics (national level)

| Identified Actor (Organizations)<br><br>[in country language] | Identified Actor (Organizations)<br><br>[English translation] | Website |
|---|---|---|
| ***Private*** | | |
| **Forest owners**<br><br>• Private owners: No national-wide association<br>• Multiple private owners (farms, companies, individuals, etc.): extreme fragmentation and lack of representativity | • Private owners: No national-wide association | |
| *Farmer associations*<br><br>• Coldiretti<br>• Confederazione Italiana Agricoltori (CIA)<br>• Confagricoltura | • Direct Farmer Association<br>• Italian Farmer Confederation<br>• Agriculture Confederation | • www.coldiretti .it<br>• www.cia.it<br>• www.confagricoltura.it |
| **Forest enterprises and their associations**<br><br>• Alleanza delle Cooperative Italiane – Settore Agroalimentare<br>• Coordinamento Nazionale Imprese Boschive (Conaibo) | • Alliance of Agro and Agro-food Cooperatives<br>• National Forest Enterprise Consortium | • www.alleanzacooperative.it/acroalimentare |
| **Timber/Paper trade and processing (including bioenergy)**<br><br>• Federazione Italiana delle Industrie del Legno, del Sughero, del Mobile e dell'Arredamento (Federlegno)<br>• Confederazione Nazionale dell'Artigianato e della Piccola e Media Impresa (CNA)<br>• Associazione Italiana delle Industrie della Carta, Cartoni e Paste per Carta (Assocarta)<br>• Federazione Italiana Produttori di Energia da Fonti Rinnovabili (Fiper) | • Italian Federation of wood, cork and furniture industries<br>• National Confederation of Handicraft and Small-Medium Enterprises<br>• Italian Federation of pulp, paper and paperboard industries<br>• Italian Renewable Energy Producer Federation | • www.federlegno.it<br>• www.cna.it<br>• www.assocarta.it<br>• www.fiper.it |
| **Chartered Agronomists and Foresters**<br><br>• Consiglio dell'Ordine Nazionale dei Dottori Agronomi e Dottori Forestali (CONAF) | • National Association of Chartered Agronomists and Foresters | • www.conaf.it |
| ***Civil Society actors*** | | |
| **Employment in forests** | | • www.filcacisl.it<br>• www.fenealuil.it |



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| | | |
|---|---|---|
| • Federazione Italiana Lavoratori Costruzioni e Affini (Filca-Cisl)<br>• Federazione Nazionale Lavoratori Edili, affini e del legno (Feneal-Uil) | • Italian Federation of the Building and Construction Sector Workers<br>• National Federation of Construction and Wood Workers | |
| **Sustainable biomass use** | | • www.aiel.cia.it |
| • Associazione Italiana Energie Agroforestali (AIEL) | • Italian Agroforestry Energy Association | |
| **Hunting** | | • www.federcaccia.org |
| • Federazione Italiana della Caccia (Federcaccia) | • Italian Hunting Association | |
| **Certification** | | • https://it.fsc.org/it-it<br>• www.pefc.it |
| • FSC Italia (Associazione Italiana per la Gestione Forestale Responsabile)<br>• PEFC Italia | • FSC Italy<br>• PEFC Italy | |
| **Tourism and recreation** | | • www.fie.org<br>• www.fitetrec-ante.it<br>• www.fiab-onlus.it<br>• www.aitn.org<br>• www.fiso.it<br>• www.amionlus.it |
| • Federazione Italiana Escursionismo (FIE)<br>• Federazione Italiana Turismo Equestre e TREC<br>• Federazione Italiana Amici della Bicicletta (FIAB)<br>• Associazione Italiana Turismo Natura (AITN)<br>• Federazione Italiana Sport Orientamento (FISO)<br>• Associazione Montagnaterapia Italiana Onlus | • Italian hiking and outdoor Federation<br>• Italian Horse Tourism Federation<br>• Italian Bike Federation<br>• Italian Association for Nature Tourism<br>• Italian Orienteering Sport Federation<br>• Italian Mountain Therapy Association | |
| **Wild forest products (Truffle)** | | • www.assotartufai.it<br>• www.fnati.it |
| • Associazione Nazionale Tartufai Italiani (ANTI)<br>• Federazione Nazionale delle Associazioni Tartufai Italiani (FNATI)<br>• Many regional/local mushroom, truffle, chestnut, wild herbs…associations | • Italian Truffle Picker Association<br>• National Federation of Italian Truffle Picker Associations<br>• Many regional/local mushroom, truffle, chestnut, wild herbs…associations | |
| **Environmental, nature, and landscape conservation** | | |
| • WWF<br>• Greenpeace<br>• Legambiente<br>• Lega Italiana Protezione Uccelli (Lipu)<br>• Terra!<br>• Amici della Terra<br>• Fondo Ambiente Italiano (FAI) | • WWF<br>• Greenpeace<br>• Legambiente (Environment League)<br>• Italian Association for Bird Protection (Lipu)<br>• Terra! (Earth!)<br>• Friends of the Earth<br>• Italian Environment Fund | • www.wwf.it<br>• www.greenpeace.it<br>• www.legambiente.it<br>• www.lipu.it<br>• www.terraonlus.it<br>• www.amicidellaterra.it<br>• www.fondoambiente.it |



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## Appendix 19: Public actors in Italian forest politics (national level)

| ***Original name*** | ***Name translated into English*** | ***Website*** |
|---|---|---|
| • Ministero delle Politiche Agricole, Alimentari e Forestali (Mipaaf)<br>• Ministero dell'Ambiente e della Tutela del Territorio e del Mare (Mattm)<br>• Ministero dei Beni Culturali<br>• Corpo Forestale dello Stato (CFS)<br>• Conferenza Stato Regioni<br>• Dipartimenti Forestali Regionali<br>• Istituto Superiore per la Protezione e la Ricerca Ambientale (ISPRA)<br>• Consiglio per la Ricerca in Agricoltura (CREA)<br>• Università e altri enti di ricerca | • Ministry of Agriculture, Forestry and Food Policies<br>• Ministry of Environment<br>• Ministry of Cultural Heritage<br>• State Forest Service<br>• State-Regions Conference<br>• Regional Forest Departments<br>• Italian National Institute for Environmental Protection and research<br>• National Research Council for Agriculture<br>• Universities and other research institutes | • www.politicheagricole.it<br>• www.minambiente.it<br>• www.beniculturali.it<br>• www.isprambiente.gov.it<br>• www.crea.gov.it<br>• www.corpoforestale.it<br>• www.statoregioni.it |
| Public forest owners and their associations (note: form a legal point of view these associations are private entities, however they represent interests of public bodies):<br>• Associazione Nazionale (ANARF)<br>• Federazione Italiana Comunità Forestali (Federforeste) | • National Association of Regional Forest Administration<br>• Italian Federation of Forest Communities and Municipalities | • www.anarf.org<br>• www.federforeste.it |
| Protected and Natural Areas:<br>• Federparchi Europarc Italia | • Italian Federation of Parks and Natural Areas | • www.parks.it |



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## Appendix 20: Interests in different ecosystem services (national level)

| Interest in | Identified Stakeholder (Organizations)<br><br>[Name translated into English] |
|---|---|
| ***Provisioning services*** | |
| Wood | • Ministry of Agriculture, Forestry and Food Policies<br>• State Forest Service<br>• Italian National Institute for Environmental Protection and research<br>• National Research Council for Agriculture<br>• Universities and other research institutes<br>• National Association of Regional Forest Administration<br>• Italian Federation of Forest Communities and Municipalities<br>• Regional Forest Departments<br>• Farmer Associations<br>• Alliance of Agro and Agro-food Cooperatives<br>• National Forest Enterprise Consortium<br>• Italian Federation of wood, cork and furniture industries<br>• National Confederation of Handicraft and Small-Medium Enterprises<br>• Italian Federation of pulp, paper and paperboard industries<br>• Italian Renewable Energy Producer Federation<br>• National Association of Chartered Agronomists and Foresters<br>• Italian Federation of the Building and Construction Sector Workers<br>• National Federation of Construction and Wood Workers<br>• Italian Agroforestry Energy Association<br>• FSC Italy<br>• PEFC Italy<br>• WWF<br>• Greenpeace<br>• Legambiente<br>• Terra!<br>• Friends of the Earth |
| Wild forest products | • Ministry of Environment<br>• State Forest Service<br>• Regional Forest Departments<br>• Italian National Institute for Environmental Protection and research<br>• Universities and other research institutes<br>• Italian Federation of Parks and Natural Areas (Federparchi Europarc Italia)<br>• Farmer Associations<br>• National Association of Chartered Agronomists and Foresters<br>• FSC Italy<br>• PEFC Italy<br>• WWF<br>• Legambiente<br>• Italian Truffle Picker Association<br>• National Federation of Italian Truffle Picker Associations |
| Game | • Italian Hunting Association |
| ***Supporting services*** | |
| Biodiversity | • Ministry of Environment |



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| | |
|---|---|
| | • State Forest Service<br>• Regional Forest Departments<br>• Italian National Institute for Environmental Protection and research<br>• Universities and other research institutes<br>• Italian Federation of Parks and Natural Areas (Federparchi Europarc Italia)<br>• National Association of Chartered Agronomists and Foresters<br>• FSC Italy<br>• PEFC Italy<br>• WWF<br>• Legambiente<br>• Italian Association for Bird Protection<br>• Italian Environment Fund |
| Habitat for species | • Ministry of Environment<br>• State Forest Service<br>• Regional Forest Departments<br>• Italian National Institute for Environmental Protection and research<br>• Universities and other research institutes<br>• Italian Federation of Parks and Natural Areas (Federparchi Europarc Italia)<br>• National Association of Chartered Agronomists and Foresters<br>• FSC Italy<br>• PEFC Italy<br>• WWF<br>• Legambiente<br>• Italian Association for Bird Protection<br>• Italian Environment Fund |
| ***Regulating services*** | |
| Carbon sequestra-tion | • Ministry of Environment<br>• State Forest Service<br>• Italian National Institute for Environmental Protection and research<br>• National Research Council for Agriculture<br>• Universities and other research institutes<br>• National Association of Regional Forest Administration<br>• Italian Federation of Forest Communities and Municipalities<br>• Legambiente<br>• FSC Italy<br>• PEFC Italy<br>• Carbon credit brokers/traders |
| Water quality | • Ministry of Environment<br>• Regional Forest Departments<br>• Italian National Institute for Environmental Protection and research<br>• Universities and other research institutes<br>• FSC Italy<br>• Legambiente |
| Hydrogeological pro-tection | • Ministry of Environment<br>• State Forest Service<br>• Italian National Institute for Environmental Protection and research |
| ***Cultural services*** | |
| Outdoor recreation | • Italian hiking and outdoor Federation<br>• Italian Horse Tourism Federation |



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| | |
|---|---|
| | • Italian Bike Federation<br>• Italian Association for Nature Tourism<br>• Italian Orienteering Sport Federation<br>• Italian Sport Federation/Unions<br>• Italian Mountain Therapy Association |
| Aesthetic values | • Ministry of Cultural Heritage<br>• State Forest Service<br>• WWF<br>• Legambiente<br>• Italian Environment Fund |
| Tourism | • Italian Association for Nature Tourism<br>• Italian Tourism Federation |

## Appendix 21: Non-public actors in the case study (CSA Veneto)

| **Identified Actor (Organizations)**<br><br>**[in country language]** | **Identified Actor (Organizations)**<br><br>**[English translation]** | **Website** |
|---|---|---|
| ***Private*** | | |
| **Forest owners**<br><br>Several farmers (as well as companies and individuals) owning forest areas<br><br>*Farmer associations*<br><br>• Coldiretti Veneto e Venezia<br>• Confederazione Italiana Agricoltori (CIA) Veneto e Venezia<br>• Confagricoltura Veneto e Venezia | • Direct Farmer Association - Veneto and Venice offices<br>• Italian Farmer Confederation -Veneto and Venice offices<br>• Agriculture Confederation - Veneto and Venice offices | • www.venetocoldiretti .it<br>• www.veneziacoldiretti.it<br>• www.ciaveneto.it<br>• www.ciavenezia.it<br>• www.confagricolturaveneto.it<br>• www.confagricolturave.it |
| **Forest enterprises**<br><br>Several ones, among them:<br><br>• Waldplus<br>• De Luca<br>• Il Bozzolo Verde<br>• Valorizzazione Biomasse snc | Several ones, among them:<br><br>• Waldplus<br>• De Luca<br>• Il Bozzolo Verde<br>• Valorizzazione Biomasse snc | • www.waldplus.it<br>• www.deluca-woodenergy.it<br>• www.ilbozzoloverde.it<br>• www.woodvab.it |
| **Wood/Firewood trade companies**<br><br>Several ones, among them:<br><br>• Bozza Cav. Rainieri<br>• Bortolato<br>• FB Calor Srl | Several ones, among them:<br><br>• Bozza Cav. Rainieri<br>• Bortolato<br>• FB Calor Srl | • www.bozzacavrainieri.it<br>• www.bortolato.eu<br>• www.fbcalor.com |



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| | | |
|---|---|---|
| **Chartered Agronomists and Foresters**<br><br>• Ordine Provinciale dei Dottori Agronomi e Dottori Forestali (Venezia)<br><br>**Other companies (sponsorship, C-offsetting)**<br><br>Several ones, including retailers, companies operating in the energy sector, mineral water companies etc.<br><br>Among them a national-wide carbon project broker looking for areas for afforestation/reforestation initiatives:<br><br>• Azzeroco2<br><br>**Hotels and camping-sites**<br><br>• Associazione Albergatori Bibionesi<br>• Associazione Albergatori Caorle<br>• Associazione Albergatori Eraclea<br>• Associazione Albergatori Venezia<br>• Camping Santa Margherita (Caorle)<br>• Several hotel managers | • Province Association of Chartered Agronomists and Foresters (Venice)<br><br>Several ones, including retailers, companies operating in the energy sector, mineral water companies etc.<br><br>Among them a national-wide carbon project broker looking for areas for afforestation/reforestation initiatives:<br><br>• Azzeroco2<br><br>• Bibione Hotel Association<br>• Caorle Hotel Association<br>• Eraclea Hotel Association<br>• Venice Hotel Association<br>• Santa Margherita Camping (Caorle)<br>• Several hotel managers | • www.agronomiforestalivenezia.it<br><br>• www.azzeroco2.it<br><br>• www.bibionehotels.it<br>• www.caorlehotel.com<br>• www.hotel-association.com/eraclea-mare.htm<br>• www.caorlecamping.it |
| ***Civil Society actors*** | | |
| **Hunting**<br><br>• Associazione Cacciatori Veneti<br>• Federazione Italiana della Caccia (Federcaccia) - Veneto<br><br>**Tourism and recreation**<br><br>• Federazione Italiana Escursionismo (FIE) - Veneto<br>• Federazione Italiana Turismo Equestre e TREC - Veneto<br>• Federazione Italiana Amici della Bicicletta (FIAB) - Mestre (Venice)<br>• Federazione Italiana Sport Orientamento (FISO) - Veneto<br>• Nordic Walking Lignano<br>• ASD Maratoneti Eraclea<br>• ASD Ambiente e Salute – Nordic Walking Eraclea<br>• Associazione Vivilabici<br><br>**Wild forest products**<br><br>• Associazione Tartufai Friuli Venezia Giulia<br>• Gruppo Amici Micologi Mirano<br>• Gruppo Micologico Culturale Sandonatese | • Veneto Hunting Association<br>• Italian Hunting Association – Veneto office<br><br>• Italian hiking and outdoor Federation - Veneto office<br>• Italian Horse Tourism Federation - Veneto office<br>• Italian Bike Federation - Mestre (Venice) office<br>• Italian Orienteering Sport Federation - Veneto office<br>• Nordic Walking Lignano<br>• Non Professioonal Marathon runner Association<br>• Environment and Health - Nordic Walking<br>• Live bike Association<br><br>• Friuli Venezia GiuliaTruffle Picker Association<br>• Mirano Mycologist Friends Group<br>• Sandonatese Mycologist Cultural Group | • www.associazionecacciatoriveneti.it<br>• www.federcaccia.org<br><br>• www.fieveneto.it<br>• www.veneto.fitetrec-ante.it<br>• www.fiabmestre.it<br>• www.fisoveneto.it<br>• www.nordicwalkinglignano.it<br>• https://facebook.com/Maratoneti-Ercalea-120249241326874/<br>• www.nordicwalkingeraclea.altervista.org<br>• www.vivilabici.it<br><br>• www.lnxtartufaifvg.it<br>• www.https://m.facebook.com/micologia.sandonatese/?locale2=it_IT |



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| | | |
|---|---|---|
| • Società Veneziana di Micologia<br><br>**Environmental, nature, and landscape conservation**<br><br>• WWF Veneto Orientale<br>• Legambiente Veneto Orientale<br>• Lega Italiana Protezione Uccelli (Lipu) - Venezia<br>• Associazione Naturalistica Sandonatese<br>• Associazione Culturale Naturalistica Sagittaria<br>• Associazione Tegliese Prati delle Pars<br>• Centro di Educazione Ambientale di Eraclea<br>• Associazione Verdi Acque<br>• Associazione Naturalistica Bosco di San Stino | • Venice Mycology Society<br><br>• WWF Eastern Veneto<br>• Legambiente Eastern Veneto<br>• Italian Association for Bird Protection - Venice office<br>• San Dona Nature Association<br>• Concordia Sagittaria Nature Association<br>• Pars Meadows Association<br>• Eraclea Environmental Education Centre<br>• Verdi Acque Association<br>Bosco di San Stino Nature Association | • digilander.libero.it/wwfvenetoorientale/associazione/<br>• www.legambientevenetorientale.it<br>• www.lipuvenezia.it<br>• www.associazionenaturalistica.it<br>• www.associazionesagittaria.it<br>• www.pratidellepars.it<br>• verdiacque.tumblr.com<br>• www.boscodisanstino.ilbello.com |

## Appendix 22: Public actors in the case study (CSA Veneto)

| *Original name* | *Name translated into English* | *Website* |
|---|---|---|
| • Regione Veneto, Direzione AdG FEASR Parchi e Foreste<br>• Regione Veneto, Direzione Turismo, Sezione Economia e Sviluppo montano<br>• Regione Veneto, Dipartimento Agricoltura, Sezione Parchi biodiversità programmazione silvopastorale e tutela dei consumatori<br>• Regione Veneto, Dipartimento Difesa del suolo e Foreste<br>• Regione Veneto, Dipartimento Ambiente, Sezione Tutela Ambiente<br>• Servizi Forestali Veneto<br>• Agenzia Veneta per i Pagamenti in Agricoltura (AVEPA)<br>• Veneto Agricoltura<br>• Uffici locali Informazioni e Accoglienza Turistica (IAT)<br><br>Public forest owners:<br><br>• Provincia di Venezia<br>• Comune di Quarto d'Altino<br>• Ente Parco Regionale del fiume Sile<br>• Comune di San Donà di Piave<br>• Comune di Torre di Mosto | • Veneto Region, Department of Rural Development, Parks and Forests<br>• Veneto Region, Department of Tourism, Economy and mountain development Unit<br>• Veneto Region, Department of Agriculture, Park and biodiversity Unit<br>• Veneto Region, Department of Soil protection and Forests<br>• Veneto Region, Department of Environment, Environment Protection Unit<br>• Regional Forest Service<br>• Regional Authority in charge of managing Rural Development and Agriculture Payments (AVEPA)<br>• Regional Agency for technical extension and assistance in Agriculture (Veneto Agricoltura)<br>• Local Tourism Information and Welcome offices<br><br>• Venice Province<br>• Quarto d'Altino Municipality<br>• Sile River Regional Park<br>• San Donà di Piave Municipality<br>• Torre di Mosto Municipality<br>• Concordia Sagittaria Municipality | • www.regioneveneto.it/web/guest/direzione-adg-feasr-parchi-e-foreste<br>• www.regioneveneto.it/web/guest/sezione-economia-e-sviluppo-montano<br>• www.regioneveneto.it/web/guest/sezione-parchi-biodiversita-programamzione-silvopastorale-e-tutela-dei-consumatori<br>• www.regioneveneto.it/web/guest/dipartimento-del-suolo-e-foreste<br>• www.regioneveneto.it/web/guest/sezione-tutela-ambiente<br>• www.regioneveneto.it/web/agricltura-e-foreste/servizi-forestali<br>• www.avepa.it<br>• www.venetoagricoltura.org<br>• www. altinumwelcomecard.it<br>• www.visitcaorle.com<br>• www.cavallino.info |



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| | | |
|---|---|---|
| • Comune di Concordia Sagittaria<br>• Comune di Eraclea<br>• Comune di San Stino di Livenza<br>• Comune di San Michele al Tagliamento<br>• Comune di Caorle<br><br>The formers are coordinated by the:<br><br>• Associazione Forestale di Pianura (AFP) [*note: AFP is not a forest owner itself. From a legal point of view it is a stand-alone body operating as an association of lowland forest owners]* | • Eraclea Municipality<br>• San Stino di Livenza Municipality<br>• San Michele al Tagliamento Municipality<br>• Caorle Municipality<br><br>The formers are coordinated by the:<br><br>• Lowland Forest Association (AFP) | • www.provincia.venezia.it<br>• www.comune.quartodaltino.ve.it<br>• www.parcosile.it<br>• www.sandonadipiave.net<br>• www.torredimosto.it<br>• www.comune.concordiasagittaria.ve.it<br>• www.comune.eraclea.ve.it<br>• www.sanstino.it<br>• www.comunesanmichele.it<br>• www.comune.caorle.ve.it<br><br>• www.afvo.it |

## Appendix 23: Interests in different ecosystem services (CSA Veneto)

| **Interest in** | **Identified Stakeholder (Organizations)**<br><br>**[Name translated into English]** |
|---|---|
| ***Provisioning services*** | |
| Wood | • Veneto Region, Department of Rural Development, Parks and Forests<br>• Veneto Region, Department of Agriculture, Park and biodiversity Unit<br>• Veneto Region, Department of Environment, Environment Protection Unit (→ focus on bioenergy)<br>• Regional Forest Service<br>• Regional Authority in charge of managing Rural Development Payments (AVEPA)<br>• Regional Agency for technical extension and assistance in Agriculture (Veneto Agricoltura)<br>• Private forest owners<br>• Farmer Associations<br>• Lowland Forest Association (AFP)<br>• Public owners (AFP members):<br>• Venice Province<br>• Quarto d'Altino Municipality<br>• Sile River Regional Park<br>• San Donà di Piave Municipality<br>• Torre di Mosto Municipality<br>• Concordia Sagittaria Municipality<br>• Eraclea Municipality<br>• San Stino di Livenza Municipality<br>• San Michele al Tagliamento Municipality<br>• Caorle Municipality<br>• (Local) Forest enterprises<br>• Wood/Firewood trade companies<br>• Chartered Agronomists and Foresters<br>• Other companies/Investors |



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| | |
|---|---|
| Wild forest products | Veneto Region, Department of Rural Development, Parks and Forests<br>Veneto Region, Department of Tourism, Economy and mountain development Unit<br>Regional Forest Service<br>Regional Authority in charge of managing Rural Development Payments (AVEPA)<br>Regional Agency for technical extension and assistance in Agriculture (Veneto Agricoltura)<br>Private forest owners<br>Farmer Associations<br>Lowland Forest Association (AFP)<br>Public owners (AFP members):<br>Venice Province<br>Quarto d'Altino Municipality<br>Sile River Regional Park<br>San Donà di Piave Municipality<br>Torre di Mosto Municipality<br>Concordia Sagittaria Municipality<br>Eraclea Municipality<br>San Stino di Livenza Municipality<br>San Michele al Tagliamento Municipality<br>Caorle Municipality<br>(Local) Forest enterprises<br>Other companies/Investors<br>Friuli Venezia GiuliaTruffle Picker Association<br>Mirano Mycologist Friends Group<br>Sandonatese Mycologist Cultural Group<br>Venice Mycology Society |
| Game | • Venetian Hunting Association<br>• Italian Hunting Association – Veneto office<br>• Other companies/Investors<br>• Private forest owners |
| ***Supporting services*** | |
| Biodiversity | Veneto Region, Department of Agriculture, Park and biodiversity Unit<br>State Forest Service<br>Regional Authority in charge of managing Rural Development Payments (AVEPA)<br>Regional Agency for technical extension and assistance in Agriculture (Veneto Agricoltura)<br>Lowland Forest Association (AFP)<br>Public owners (AFP members):<br>Venice Province<br>Quarto d'Altino Municipality<br>Sile River Regional Park<br>San Donà di Piave Municipality<br>Torre di Mosto Municipality<br>Concordia Sagittaria Municipality<br>Eraclea Municipality<br>San Stino di Livenza Municipality<br>San Michele al Tagliamento Municipality<br>Caorle Municipality<br>Other companies/Investors<br>WWF Eastern Veneto<br>Legambiente Eastern Veneto<br>Italian Association for Bird Protection - Venice office<br>San Dona Nature Association<br>Concordia Sagittaria Nature Association<br>Pars Meadows Association |



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| | |
|---|---|
| | Eraclea Environmental Education Centre<br>Associazione Verdi Acque<br>Associazione Naturalistica Bosco di San Stino<br>Tourists<br>Local population |
| Habitat for species | Veneto Region, Department of Agriculture, Park and biodiversity Unit<br>State Forest Service<br>Regional Authority in charge of managing Rural Development Payments (AVEPA)<br>Regional Agency for technical extension and assistance in Agriculture (Veneto Agricoltura)<br>Lowland Forest Association (AFP)<br>Public owners (AFP members):<br>Venice Province<br>Quarto d'Altino Municipality<br>Sile River Regional Park<br>San Donà di Piave Municipality<br>Torre di Mosto Municipality<br>Concordia Sagittaria Municipality<br>Eraclea Municipality<br>San Stino di Livenza Municipality<br>San Michele al Tagliamento Municipality<br>Caorle Municipality<br>Other companies/Investors<br>WWF Eastern Veneto<br>Legambiente Eastern Veneto<br>Italian Association for Bird Protection - Venice office<br>San Dona Nature Association<br>Concordia Sagittaria Nature Association<br>Pars Meadows Association<br>Eraclea Environmental Education Centre<br>• Verdi Acque Association<br>Bosco di San Stino Nature Association<br>Tourists<br>Local population |
| ***Regulating services*** | |
| Carbon sequestration | • Veneto Region, Department of Rural Development, Parks and Forests<br>• Veneto Region, Department of Environment, Environment Protection Unit<br>• Regional Agency for technical extension and assistance in Agriculture (Veneto Agricoltura)<br>• Private forest owners<br>• Farmer Associations<br>• Lowland Forest Association (AFP)<br>• Public owners (AFP members):<br>  • Venice Province<br>  • Quarto d'Altino Municipality<br>  • Sile River Regional Park<br>  • San Donà di Piave Municipality<br>  • Torre di Mosto Municipality<br>  • Concordia Sagittaria Municipality<br>  • Eraclea Municipality<br>  • San Stino di Livenza Municipality<br>  • San Michele al Tagliamento Municipality<br>  • Caorle Municipality<br>• Other companies/Investors<br>• WWF Eastern Veneto |



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| | |
|---|---|
| | • Legambiente Eastern Veneto<br>• Tourists<br>• Local population |
| Water quality | Veneto Region, Department of Rural Development, Parks and Forests<br>Veneto Region, Department of Environment, Environment Protection Unit<br>Veneto Region, Department of Soil protection and Forests<br>Regional Agency for technical extension and assistance in Agriculture (Veneto Agricoltura)<br>Private forest owners<br>Farmer Associations<br>Lowland Forest Association (AFP)<br>Public owners (AFP members):<br>Venice Province<br>Quarto d'Altino Municipality<br>Sile River Regional Park<br>San Donà di Piave Municipality<br>Torre di Mosto Municipality<br>Concordia Sagittaria Municipality<br>Eraclea Municipality<br>San Stino di Livenza Municipality<br>San Michele al Tagliamento Municipality<br>Caorle Municipality<br>Other companies/Investors<br>Tourists<br>Local population |
| Hydrogeological protection | • Veneto Region, Department of Soil protection and Forests<br>• Regional Forest Service<br>• Lowland Forest Association (AFP)<br>• Public owners (AFP members):<br>  • Venice Province<br>  • Quarto d'Altino Municipality<br>  • Sile River Regional Park<br>  • San Donà di Piave Municipality<br>  • Torre di Mosto Municipality<br>  • Concordia Sagittaria Municipality<br>  • Eraclea Municipality<br>  • San Stino di Livenza Municipality<br>  • San Michele al Tagliamento Municipality<br>  • Caorle Municipality<br>• Local population |
| ***Cultural services*** | |
| Outdoor recreation | • Veneto Region, Department of Tourism, Economy and mountain development Unit<br>• Italian hiking and outdoor Federation - Veneto office<br>• Italian Horse Tourism Federation - Veneto office<br>• Italian Bike Federation - Mestre (Venice) office<br>• Italian Orienteering Sport Federation - Veneto office<br>• Nordic Walking Lignano<br>• Non Professioonal Marathon runner Association<br>• Environment and Heath - Nordic Walking<br>• Live bike Association<br>• Local population<br>• Other companies/investors<br>• Lowland Forest Association (AFP) |



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| | |
|---|---|
| | • Public owners (AFP members):<br>  • Venice Province<br>  • Quarto d'Altino Municipality<br>  • Sile River Regional Park<br>  • San Donà di Piave Municipality<br>  • Torre di Mosto Municipality<br>  • Concordia Sagittaria Municipality<br>  • Eraclea Municipality<br>  • San Stino di Livenza Municipality<br>  • San Michele al Tagliamento Municipality<br>  • Caorle Municipality |
| Aesthetic values | • Veneto Region, Department of Tourism, Economy and mountain development Unit<br>• Regional Forest Service<br>• WWF Eastern Veneto<br>• Legambiente Eastern Veneto<br>• San Dona Nature Association<br>• Concordia Sagittaria Nature Association<br>• Verdi Acque Association<br>• Lowland Forest Association (AFP)<br>• Public owners (AFP members):<br>• Venice Province<br>• Quarto d'Altino Municipality<br>• Sile River Regional Park<br>• San Donà di Piave Municipality<br>• Torre di Mosto Municipality<br>• Concordia Sagittaria Municipality<br>• Eraclea Municipality<br>• San Stino di Livenza Municipality<br>• San Michele al Tagliamento Municipality<br>• Caorle Municipality |
| Tourism | Veneto Region, Department of Tourism, Economy and mountain development Unit<br>Local Tourism Information and Welcome Offices<br>Bibione Hotel Association<br>Caorle Hotel Association<br>Eraclea Hotel Association<br>Venice Hotel Association<br>Santa Margherita Camping (Caorle)<br>Verdi Acque Association<br>Tourists<br>Lowland Forest Association (AFP)<br>Public owners (AFP members):<br>Venice Province<br>Quarto d'Altino Municipality<br>Sile River Regional Park<br>San Donà di Piave Municipality<br>Torre di Mosto Municipality<br>Concordia Sagittaria Municipality<br>Eraclea Municipality<br>San Stino di Livenza Municipality<br>San Michele al Tagliamento Municipality<br>Caorle Municipality |



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## Appendix 24: Market and civil society actors in Lithuanian forest politics (national level)

| Identified Actor (Organizations) [in country language] | Identified Actor (Organizations) [English translation] | Website |
|---|---|---|
| ***Market actors*** | | |
| **Forest management** | | |
| **State forest management** | | |
| Generalinė miškų urėdija | Directorate general of state forests | http://www.gmu.lt/en/ |
| Miškotvarkos mokslinė techninė taryba | Scientific and technical council for forest management planning | |
| VĮ Valstybinis miškotvarkos institutas | SC State forest inventory and management planning institute | http://www.lvmi.lt/ |
| 42 miškų urėdijų administracijos | Administrations of 42 State forest enterprises | |
| 4 nacionalinių parkų direkcijos | Directions of 4 national parks | |
| 30 regioninių parkų direkcijos | Directions of 30 regional parks | |
| **Private forest management** | | |
| Lietuvos miško savininkų asociacija | Forest owner association of Lithuania | https://forest.lt/ |
| Privačių miškų savininkų asociacija | Association of private forest owners | http://www.pmsa.lt/ |
| Ikea | Ikea | http://www.ikea.com/lt/lt/ |
| UAB Greengold Management | JSC Greengold Management | http://www.greengold.se |
| Euroforest | Euroforest | http://www.euroforest.se |
| UAB "TIMBEX" | JSC "TIMBEX" | http://www.timbex.lt |
| UAB Dzūkijos mediena | JSC Dzūkijos mediena | http://www.dzukijosmediena.lt/ |
| UAB Dzūkijos miškas | JSC Dzūkijos miškas | http://www.dzukijosmiskas.lt/ |
| UAB Bangenės miškas | JSC Bangenės miškas | http://www.bangenesmiskas.lt/ |
| UAB HD Forest | JSC HD Forest | http://www.hdforest.lt/ |
| **Timber trade and processing** | | |
| Asociacija "Lietuvos mediena" | Association "Lithuanian wood" | http://www.lietuvosmediena.lt/ |
| Lietuvos nepriklausomų medienos matuotojų asociacija | Lithuanian association of impartial timber scalers | http://lnmma.lt/ |
| UAB "KLAIPĖDOS MEDIENA" | JSC "KLAIPĖDOS MEDIENA" | http://www.klaipedos.mediena.lt/en/index.html |
| UAB "STORA ENSO LIETUVA" | JSC "STORA ENSO LIETUVA" | http://storaensomiskas.lt/ |
| UAB "LIKMERĖ" | JSC "LIKMERĖ" | http://www.likmere.lt/ |
| UAB "SVEASKOG BALTFOR" | JSC "SVEASKOG BALTFOR" | |
| UAB „GKF" | JSC „GKF" | http://www.gkf.lt |
| UAB MMC forest | JSC MMC forest | http://www.mmc.lt/ |
| Šilalės mediena | Šilalės mediena (Šilalė wood) | http://www.silalesmediena.eu/ |
| UAB Renostera | JSC Renostera | http://www.renostera.lt/ |
| UAB Laurama | JSC Laurama | http://laurama.medis.lt/ |
| UAB Litforina | JSC Litforina | http://www.litforina.lt |
| **Water provision** | | |
| Lietuvos vandens tiekėjų asociacija | Lithuanian association of water providers | http://www.lvta.lt/ |
| **Biomass for energy** | | |
| Lietuvos biomasės energetikos asociacija LITBIOMA | Lithuanian Biomass Energy Association LITBIOMA | http://www.biokuras.lt |
| UAB „Klasmann-Deilmann Bioenergy" | JSC „Klasmann-Deilmann Bioenergy" | http://www.bioenergija.lt |
| **Mushrooms and berries** | | |
| Lietuvos Miško Grybų ir Uogų Verslininkų Asociacija | Association of Lithuanian Entrepreneurs of Forest Mushrooms and Berries | - |



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| | | |
|---|---|---|
| UAB Fudo | JSC Fudo | http://www.fudo.lt/ |
| **Medical plants** | | |
| Lietuvos liaudies medicinos asociacija | Lithuanian folk medicine association | http://www.llma.lt/en/ |
| UAB Švenčionių vaistažolės | JSC „Švenčionių vaistažolės“ | http://www.etnoarbata.lt/en/about-us.html |
| ***Civil Society actors*** | | |
| **Employment in forests** | | |
| Lietuvos miškininkų sąjunga | Lithuanian foresters' union | http://www.misksajunga.lt/ |
| Lietuvos miško ir miško pramonės darbuotojų profesinių sąjungų federacija | Federation of Lithuanian Forest and Wood Worker Trade Unions | http://www.lmpf.lt/ |
| Lietuvos aplinkos apsaugos sistemos darbuotojų profesinė sąjunga | The trade union of nature protection workers of Lithuania | http://www.aplinkos-profsajunga.lt/ |
| **Recreation and tourism** | | |
| Lietuvos kaimo turizmo asociacija | Lithuanian association for rural tourism | http://www.atostogoskaime.lt/ |
| Lietuvos turizmo asociacija | Lithuanian Tourism Association | http://www.ltas.lt/ |
| Nacionalinė turizmo verslo asociacija | National Tourism Business Association | http://www.ntva.lt/lt/ |
| Lietuvos turizmo informacijos centrų asociacija | Lithuanian tourism information centres association | www.ltica.lt |
| Lietuvos nacionalinė kelionių vadovų asociacija | Lithuanian national travel guides association | www.kiveda.lt |
| Lietuvos turizmo rūmai | Lithuanian tourism chamber | www.turizmorumai.lt |
| **Hunting** | | |
| Lietuvos medžiotojų sąjunga Gamta | Lithuanian Hunter Union "Gamta" (Nature) | http://www.medziokles.lt/ |
| Lietuvos medžiotojų ir žvejų draugija | Lithuanian hunter and fishermen association | http://www.lmzd.lt/ |
| Lietuvos meškeriotojų sąjunga | Lithuanian fishermen association | www.meskeriotojusajunga.lt |
| **Certification** | | |
| UAB NEPCon LT | JSC NEPCon LT | http://www.nepcon.org/ |
| **Environmental, nature, and landscape conservation** | | |
| Lietuvos entomologų draugija | Lithuanian Entomologist society | www.entomologai.lt |
| Lietuvos ornitologų draugija | Lithuanian Ornithologist society | www.birdlife.lt |
| Žaliųjų judėjimas | The Lithuanian Green Movement | http://www.zalieji.lt/ |
| Baltijos aplinkos forumas | Baltic Environmental Forum | http://www.bef.lt/ |
| Gamtos paveldo fondas | Lithuania Natural heritage fund | http://www.gpf.lt/ |
| Lietuvos gamtos fondas | Lithuanian fund for nature | http://www.glis.lt/ |
| Aplinkos apsaugos politikos centras | Center for environmental policy | www.aapc.lt |
| Bendrija „Atgaja“ | Community "Atgaja" | www.atgaja.lt |
| Darnaus vystymo iniciatyvos | Sustainable Development Initiatives | www.dvi.lt |
| Gamtos apsaugos asociacija „Baltijos vilkas“ | Nature protection organization "Baltijos vilkas" ("Baltic wolf") | www.vilkai.lt |
| Judėjimas „Už gamtą“ | Movement "For the nature" | http://www.uzgamta.net/ |
| Lietuvos dendrologų draugija | Lithuanian dendrologists society | www.dendrologai.lt |
| **Science and education** | | |
| Aleksandro Stulginskio Universitetas | Aleksandras Stulginskis University | http://www.asu.lt/ |
| LAMMC Miškų institutas | Lithuanian Research Centre for Agriculture and Forestry, Forest Research Institute | http://www.mi.lt/ |
| Kauno Miškų ir Aplinkos Inžinerijos kolegija | Kaunas Forestry and Environmental Engineering college | http://www.kmaik.lt/ |
| Gamtos tyrimų centras | Nature research centre | http://www.gamtostyrimai.lt/en/ |
| Vytauto Didžiojo universitetas | Vytautas Magnus University | http://www.vdu.lt/en/ |
| Kauno technologijos universitetas | Kaunas University of Technology | http://www.ktu.edu |



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| | | |
|---|---|---|
| Vilniaus universitetas | Vilnius University | http://www.vu.lt |
| Lietuvos edukologijos universitetas | Lithuanian University of Educational Sciences | http://www.leu.lt |
| Lietuvos sveikatos mokslų universitetas | Lithuanian University of Health Sciences | http://www.lsmuni.lt/ |
| Mykolo Romerio universitetas | Mykolas Romeris University | https://www.mruni.eu/en/ |
| Šiaulių universitetas | Šiauliai University | http://www.su.lt |
| Lietuvos energetikos institutas | Lithuanian Energy Institute | http://www.lei.lt/ |
| Lietuvos agrarinės ekonomikos institutas | Lithuanian Institute of Agrarian Economics | http://www.laei.lt/ |
| **Other** | | |
| Lietuvos žemėtvarkos ir hidrotechnikos inžinierių sąjunga | Lithuanian union of land management and hydrotechnics engineers | http://lzhis.lt/ |
| Lietuvos matininku asociacija | The Lithuanian Association of Surveyors | http://www.matininkuasociacija.lt/ |
| VŠĮ Lietuvos žemės ūkio konsultavimo tarnyba | Lithuanian Agriculture Advisory Service | http://www.lzukt.lt/ |
| VĮ Valstybės žemės fondas | SC State land fund | http://www.vzf.lt/ |
| UAB Aerogeodezijos institutas | JSC Institute of Aerial Geodesy | http://www.agi.lt/ |
| AB „Lietuvos geležinkeliai“ | SC Lithuanian Railways | http://www.litrail.lt/ |



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## Appendix 25: Governmental actors in forest politics (national level)

| ***Original name*** | ***Name translated into English*** | ***Website*** |
|---|---|---|
| Aplinkos ministerija | Ministry of Environment | https://www.am.lt/ |
| Valstybinė miškų tarnyba | Forest Department | http://www.amvmt.lt/ |
| Valstybinė saugomujų teritorijų tarnyba | State Service for Protected Areas | http://www.vstt.lt/ |
| Lietuvos geologijos tarnyba | Lithuanian Geology Survey | https://www.lgt.lt/ |
| Valstybinė teritorijų planavimo ir statybos inspekcija | State Territorial Planning and Construction Inspectorate under the Ministry of Environment | http://www.vtpsi.lt/ |
| Aplinkos projektų valdymo agentūra | Environmental Project Management Agency | http://www.apva.lt/ |
| Aplinkos apsaugos agentūra | The Environmental Protection Agency | http://www.gamta.lt/ |
| Valstybinė aplinkos apsaugos tarnyba | State Environmental Protection Authority | http://www.vaat.am.lt/ |
| Lietuvos hidrometeorologijos tarnyba | Lithuanian Hydrometeorological Service | http://www.meteo.lt/ |
| Žemės ūkio ministerija | Ministry of Agriculture | http://www.zum.lrv.lt/ |
| Nacionalinė mokėjimo agentūra | National paying agency | https://www.nma.lt/ |
| Nacionalinė žemės tarnyba prie ŽŪM | National Land Service Under the Ministry of Agriculture | http://www.nzt.lt/ |
| Valstybinė augalininkystės tarnyba | State plant service | http://www.vatzum.lt/ |
| Ūkio ministerija | Ministry of Economy | http://www.ukmin.lrv.lt/ |
| Valstybinis turizmo departamentas | State department of tourism | http://www.tourism.lt/ |
| Mokslo, inovacijų ir technologijų agentūra | Agency for Science, Innovation and Technology | http://www.mita.lt/ |
| Lietuvos standartizacijos departamentas | Lithuanian Standards Board | http://www.lsd.lt/ |
| Lietuvos automobilių kelių direkcija prie Susisiekimo ministerijos | Lithuanian Road Administration under the ministry of transport and communications | http://www.lakd.lt/ |
| Valstybinė kelių transporto inspekcija prie Susisiekimo ministerijos | State Road Transport Inspectorate under the Ministry of Transport and Communications | https://www.vkti.gov.lt/ |
| Krašto apsaugos ministerija | Ministry of National Defence | http://www.kam.lt/ |
| Vidaus reikalų ministerija | Ministry of the Interior | http://www.vrm.lrv.lt/ |
| Kultūros ministerija | Ministry of Culture | http://www.lrkm.lrv.lt/ |
| Kultūros paveldo departamentas | Cultural Heritage Department | http://www.kpd.lt/ |
| Energetikos ministerija | Ministry of Energy | http://www.enmin.lrv.lt/ |
| Finansų ministerija | Ministry of Finance | http://www.finmin.lrv.lt/ |
| Lietuvos mokslo taryba | Research Council of Lithuania | http://www.lmt.lt |



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## Appendix 26: Interests in different ecosystem services (national level)

| Interest in | Identified Stakeholder (Organizations)<br>[Name translated into English] |
|---|---|
| ***Near all services*** | |
| | • Ministry of Environment (excluding the Forest Management)<br>• Forest Department of the Ministry of Environment<br>• State Forest Service |
| ***Provisioning services*** | |
| Wood | • Directorate General of State Forests<br>• Scientific and technical council for forest management planning<br>• SC State Forest Inventory and Management Planning Institute<br>• Administrations of 42 state forest enterprises<br>• Forest Owner Association of Lithuania<br>• Association of Private Forest Owners<br>• Ikea<br>• JSC Greengold Management<br>• Euroforest<br>• JSC "TIMBEX"<br>• JSC Dzūkijos mediena<br>• JSC Dzūkijos miškas<br>• JSC Bangenės miškas<br>• JSC HD Forest<br>• Association "Lithuanian wood"<br>• Lithuanian Association of Impartial Timber Scalers<br>• JSC "Klaipėdos Mediena"<br>• JSC "Stora Enso Lietuva"<br>• JSC "Likmerė"<br>• JSC "Sveaskog Baltfor"<br>• JSC „GKF"<br>• JSC MMC forest<br>• JSC Šilalės mediena (Šilalė wood)<br>• JSC Renostera<br>• JSC Laurama<br>• JSC Bangenė<br>• JSC Litforina<br>• Lithuanian Biomass Energy Association LITBIOMA<br>• JSC „Klasmann-Deilmann Bioenergy"<br>• Lithuanian foresters' union<br>• JSC NEPCon LT<br>• Ministry of Economy<br>• Ministry of Energy<br>• State Road Transport Inspectorate under the Ministry of Transport and Communications |
| Mushrooms | • Association of Lithuanian Entrepreneurs of Forest Mushrooms and Berries<br>• JSC Fudo |
| Berries | • Association of Lithuanian Entrepreneurs of Forest Mushrooms and Berries<br>• JSC Fudo |
| Game | • Directorate general of state forests<br>• SC State forest inventory and management planning institute<br>• Lithuanian Hunter Union "Gamta" (Nature)<br>• Lithuanian hunter and fishermen association<br>• Lithuanian fishermen association |
| Medical plants | • Lithuanian folk medicine association<br>• JSC „Švenčionių vaistažolės" |
| Other(s) | • The Lithuanian Association of Surveyors<br>• SC State Land Fund<br>• JSC Institute of Aerial Geodesy<br>• SC Lithuanian Railways<br>• National Paying Agency<br>• National Land Service Under the Ministry of Agriculture<br>• Lithuanian Road Administration |



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| | |
|---|---|
| | • Ministry of National Defense<br>• Ministry of the Interior<br>• Ministry of Finance<br>• State Plant Service<br>• State Territorial Planning and Construction Inspectorate under the Ministry of Environment |
| ***Supporting services*** | |
| Biodiversity | • SC State Forest Inventory and Management Planning Institute<br>• Directions of 4 national parks<br>• Directions of 30 regional parks<br>• JSC "Stora Enso Lietuva"<br>• Lithuanian Hunter Union "Gamta" (Nature)<br>• JSC NEPCon LT<br>• Lithuanian Entomologist Society<br>• Lithuanian Ornithologist Society<br>• The Lithuanian Green Movement<br>• Baltic Environmental Forum<br>• Lithuania Natural heritage fund<br>• Lithuanian fund for nature<br>• Center for environmental policy<br>• Sustainable Development Initiatives<br>• Ministry of Agriculture<br>• State Service of Protected Areas |
| Habitat for species | • Directions of 4 national parks<br>• Directions of 30 regional parks<br>• JSC NEPCon LT<br>• Lithuanian Ornithologist Society<br>• The Lithuanian Green Movement<br>• Baltic Environmental Forum<br>• Lithuanian Fund for Nature<br>• Community "Atgaja"<br>• Nature protection organization "Baltijos vilkas" ("Baltic wolf")<br>• Movement "For the nature"<br>• Lithuanian Dendrologists Society<br>• State Service of Protected Areas |
| Employment in forests | • Directorate General of STATE FORESTS<br>• Forest Owner Association of Lithuania<br>• Federation of Lithuanian Forest and Wood Worker Trade Unions<br>• The Trade Union of Nature Protection Workers of Lithuania<br>• Lithuanian Foresters' Union<br>• Ministry of Economy |
| Other | • National Paying Agency |
| ***Regulating services*** | |
| Carbon sequestration | • Directorate General of State Forests<br>• SC State Forest Inventory and Management Planning Institute<br>• Lithuanian Biomass Energy Association LITBIOMA<br>• Center for Environmental Policy<br>• Lithuanian Energy Institute<br>• Ministry of Agriculture<br>• Ministry of Energy<br>• The Environmental Protection Agency |
| Climate regulation | • Ministry of Agriculture<br>• The Environmental Protection Agency<br>• Lithuanian Hydrometeorological Service |
| Water quality | • Lithuanian Association of Water Providers<br>• Lithuanian Union of Land Management and Hydrotechnics Engineers<br>• Lithuanian Geology Survey |
| Pest control | • Directorate General of State Forests |
| Other(s) | • National Paying Agency |
| ***Cultural services*** | |
| Outdoor recreation | • Directorate general of state forests<br>• SC State forest inventory and management planning institute<br>• Directions of 4 national parks |



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| | |
|---|---|
| | • Directions of 30 regional parks<br>• Lithuanian association for rural tourism<br>• Lithuanian Tourism Association<br>• National Tourism Business Association<br>• Lithuanian Tourism Information Centres Association<br>• Lithuanian national travel guides association<br>• Lithuanian tourism chamber<br>• Lithuanian Ornithologist society<br>• Ministry of Agriculture<br>• State Department of Tourism<br>• State Service of Protected Areas |
| Aesthetic values | • Directorate General of State Forests<br>• Directions of 4 national parks<br>• Directions of 30 regional parks<br>• Lithuanian Association for Rural Tourism<br>• Lithuanian Tourism Association<br>• National Tourism Business Association<br>• Lithuanian Tourism Information Centres Association<br>• Lithuanian National Travel Guides Association<br>• Lithuanian Tourism Chamber<br>• State Department of Tourism<br>• State Service of Protected Areas |
| Tourism | • Directions of 4 national parks<br>• Directions of 30 regional parks<br>• Lithuanian Association for Rural Tourism<br>• Lithuanian Tourism Association<br>• National Tourism Business Association<br>• Lithuanian Tourism Information Centres Association<br>• Lithuanian National Travel Guides Association<br>• Lithuanian Tourism Chamber<br>• Lithuania Natural Heritage Fund<br>• State Department of Tourism<br>• State Service of Protected Areas |
| Science and education | • Scientific and technical council for forest management planning<br>• SC State Forest Inventory and Management Planning Institute<br>• Lithuanian Association of impartial Timber Scalers<br>• Lithuanian Foresters' Union<br>• Aleksandras Stulginskis University<br>• Lithuanian Research Centre for Agriculture and Forestry, Forest Research Institute<br>• Kaunas Forestry and Environmental Engineering college<br>• Nature Research Centre<br>• Vytautas Magnus University<br>• Kaunas University of Technology<br>• Vilnius University<br>• Lithuanian University of Educational Sciences<br>• Lithuanian University of Health Sciences<br>• Mykolas Romeris University<br>• Šiauliai University<br>• Lithuanian Energy Institute<br>• Lithuanian Institute of Agrarian Economics<br>• Lithuanian Agriculture Advisory Service<br>• Agency for Science, Innovation and Technology<br>• Research Council of Lithuania<br>• Environmental Project Management Agency |
| Natural heritage | • Directions of 4 national parks<br>• Directions of 30 regional parks<br>• Lithuanian Association for Rural Tourism<br>• Lithuanian Tourism Association<br>• National Tourism Business Association<br>• Lithuanian Tourism Information Centres Association<br>• Lithuanian National Travel Guides Association<br>• Lithuanian Tourism Chamber |



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| | |
|---|---|
| | • Lithuania Natural Heritage Fund<br>• State Department of Tourism<br>• State Service of Protected Areas<br>• Cultural Heritage Department |
| | • National Paying Agency |

## Appendix 27: Actors in the case study (Telšiai, Lithuania)

| Stakeholder Category | Identified Stakeholder (Organizations) [Name in country language] | Identified Stakeholder (Organizations) [Name translated into English] |
|---|---|---|
| ***Market actors*** | | |
| Forest owners | • Žemaitijos miškas<br>• Nepriklausomi smulkūs miškų savininkai<br>• Nepriklausomi stambūs miškų savininkai<br>• UAB Telmeda | • Žemaitija forest<br>• Independent small-scale forest owners<br>• Independent large-scale forest owners<br>• JSC Telmeda |
| Timber trade, processing and renewable energy provision | • UAB Kietasis biokuras<br>• UAB Robmona<br>• UAB Gilinis<br>• UAB Milašaičių lentpjūvė<br>• UAB Kertmedis<br>• UAB Babrūna | • JSC Kietasis biokuras (hard biofuel)<br>• JSC Robmona<br>• JSC Gilinis<br>• JSC Milašaičių lentpjūvė (Miličaičiai sawmill)<br>• JSC Kertmedis<br>• JSC Babruna |
| Water provision | • UAB Baltijos mineralinių vandenų kompanija<br>• UAB Telšių vandenys<br>• UAB Plungės vandenys | • JSC "Baltijos mineralinių vandenų kompanija" (Baltic mineral water company)<br>• JSC "Telšių vandenys" (Water of Telšiai)<br>• JSC Plungės vandenys (Water of Plungė) |
| Mushrooms and berries | • MB Miškona<br>• UAB Garvilė<br>• UAB Fudo | • MB Miškona<br>• UAB Garvilė<br>• UAB Fudo |
| Work in forests | • UAB Telšių Romanta<br>• UAB Eridaras<br>• UAB Valdo Ranga<br>• UAB Viršilita<br>• UAB VK Eglutė | • JSC Telšių Romanta<br>• JSC Eridaras<br>• JSC Valdo Ranga<br>• JSC Viršilita<br>• JSC VK Eglutė (Spruce) |
| **Civil Society** | | |
| Employment in forests | • VĮ Telšių miškų urėdijos profesinė sąjunga | • The trade union of Telšiai forest enterprise |
| Recreation | • Žemaitijos kaimo turizmo asociacija<br>• Telšių turizmo informacijos centras<br>• Vietiniai gyventojai<br>• Poilsiautojai | • Žemaitija Association for Rural Tourism<br>• Telšiai Centre for Touristic Information<br>• Locals<br>• Tourists |
| Hunting and fishing | • Telšių medžiotojų ir žvejų draugija | • Hunter and Fishermen Association of Telšiai |
| ***Governmental-Actors*** | | |
| Forest management | • VĮ Telšių miškų urėdija | • SC Telšiai State Forest Enterprise |
| | • Valstybinės miškų tarnybos Miškų kontrolės skyriaus Klaipėdos teritorinis poskyris | • Klaipėda regional branch of Forest Control Department of the State Forest Service |
| | • Nacionalinės mokėjimų agentūros Telšių skyrius | • Telšiai branch of the National Paying Agency |
| | • Nacionalinės žemės tarnybos Telšių skyrius | • Telšiai branch of the National Land Service |
| Environmental, nature, and landscape conservation | • Varnių regioninis parkas | • Varniai Regional Park |
| | • Žemaitijos nacionalinis parkas | • Žemaitija National Park |
| Local administration | • Telšių rajono savivaldybė | • Telšiai District Municipality |
| | • Plungės rajono savivaldybė | • Plungė District Municipality |



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| | | |
|---|---|---|
| | • Regioninės plėtros departamento prie vidaus reikalų ministerijos Telšių apskrities skyrius | • Telšiai branch of Regional Development Department under Ministry of the Interior of the Republic of Lithuania |



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## Appendix 28: Actors in the case study/Contacts (Telšiai, Lithuania)

| Identified Stakeholder (Organizations) [Name translated into English] | Website or physical address/contact |
|---|---|
| **Market actors** | |
| • Žemaitija forest | • http://www.zemaitijosmiskas.lt/ |
| • Independent small-scale forest owners | • - |
| • Independent large-scale forest owners | • - |
| • JSC Robmona | • http://robmona.lt/ |
| • JSC VK Eglutė (Spruce) | • - |
| • JSC Telmeda | • - |
| • JSC Kietasis biokuras (hard biofuel) | • http://www.kietasisbiokuras.lt/ |
| • JSC "Baltijos mineralinių vandenų kompanija" (Baltic mineral water company) | • http://www.tiche.lt/ |
| • JSC "Telšių vandenys" (Water of Telšiai) | • http://www.telsiuvandenys.lt/ |
| • JSC Plungės vandenys (Water of Plungė) | • http://www.plungesvandenys.lt/ |
| • MB Miškona | • - |
| • JSC Garvilė | • - |
| • JSC Fudo | • http://www.fudo.lt/ |
| • JSC Telšių Romanta | • - |
| • JSC Eridaras | • - |
| • JSC Valdo Ranga | • - |
| • JSC Viršilita | • - |
| • JSC Gilinis | • http://www.gilinis.lt/ |
| • JSC Milašaičių lentpjūvė (Miličaičiai sawmill) | • http://www.mlentpjuve.lt/ |
| • JSC Kertmedis | • http://www.kertmedis.lt/ |
| • JSC Babruna | • http://www.babruna.lt/ |
| **Civil Society** | |
| • Žemaitija Association for Rural Tourism | • http://www.poilsiszemaitijoje.lt/ |
| • Telšiai Centre for Touristic Information | • http://www.telsiaitic.lt/ |
| • The Trade Union of Telšiai SFE | • - |
| • Hunter and Fishermen Association of Telšiai | • http://www.lmzd.lt/ |
| **Governmental actors** | |
| • Telšiai SFE | • http://www.telsiuuredija.lt/ |
| • Varniai Regional Park | • http://www.varniurp.am.lt/ |
| • Žemaitija National Park | • http://www.zemaitijosnp.lt/ |
| • Telšiai District Municipality | • http://www.telsiai.lt/ |



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# Appendix 29: Actors in the case study interested in different ecosystem services (Telšiai, Lithuania)

| Interest in | Identified Stakeholder (Organizations)<br>[Name translated into English] |
|---|---|
| ***Provisioning services*** | |
| Wood | • Telšiai SFE<br>• JSC Gilinis<br>• JSC Babruna<br>• JSC Milašaičių lentpjūvė<br>• JSC Kertmedis<br>• JSC Robmona<br>• JSC Kietasis biokuras (hard biofuel)<br>• JSC VK Eglutė (Spruce)<br>• JSC Žemaitijos miškas (Žemaitija forest)<br>• JSC Telmeda<br>• Independent small-scale private forest owners<br>• Independent largel-scale private forest owners<br>• Locals |
| Mushrooms | • FA Miškona<br>• JSC Garvilė<br>• JSC Fudo<br>• Independent small-scale private forest owners<br>• Independent large-scale private forest owners<br>• Locals |
| Berries | • FA Miškona<br>• JSC Garvilė<br>• JSC Fudo<br>• Independent small-scale private forest owners<br>• Independent large-scale private forest owners<br>• Locals |
| Game | • Hunter and Fishermen Association of Telšiai |
| Medical plants | • Locals |
| ***Supporting services*** | |
| Biodiversity | • Telšiai SFE<br>• Varniai regional park<br>• Žemaitija national park |
| Habitat for species | • Telšiai SFE<br>• Varniai regional park<br>• Žemaitija national park |
| Employment in forests | • The Trade Union of Telšiai SFE<br>• JSC Žemaitijos miškas (Žemaitija forest)<br>• JSC Telšių Romanta<br>• JSC Eridaras<br>• JSC Valdo Ranga<br>• JSC Viršilita |
| ***Regulating services*** | |
| Carbon sequestration | • Telšiai SFE |
| Climate regulation | • Telšiai SFE |
| Water quality | • JSC "Baltijos mineralinių vandenų kompanija" (Baltic mineral water company)<br>• JSC "Telšių vandenys" (Water of Telšiai)<br>• JSC Plungės vandenys (Water of Plungė) |
| Pest control | • Telšiai SFE<br>• Varniai Regional Park |
| ***Cultural services*** | |
| Outdoor recreation | • Telšiai District Municipality<br>• Varniai Regional Park<br>• Žemaitija National Park<br>• Telšiai SFE |



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| | |
|---|---|
| | • Independent small-scale private forest owners<br>• Independent large-scale private forest owners<br>• Locals<br>• Tourists |
| Aesthetic values | • Telšiai District Municipality<br>• Independent small-scale private forest owners<br>• Independent large-scale private forest owners<br>• Locals<br>• Tourists |
| Tourism | • Telšiai District Municipality<br>• Varniai Regional Park<br>• Žemaitija National Park<br>• Žemaitija Association for Rural Tourism<br>• Telšiai Centre for Touristic Information<br>• Tourists |
| Natural heritage | • Telšiai District Municipality<br>• Telšiai SFE<br>• Varniai Regional Park<br>• Žemaitija National Park<br>• Locals<br>• Tourists |



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## Appendix 30: Actors' interests in different forest ecosystem services (The Netherlands)

| Interest in | Identified Stakeholder (Organizations) in Dutch language | Identified Stakeholder (Organizations) in English language | Website or physical address |
|---|---|---|---|
| **Provisioning services** | | | |
| Wood and raw material | Houtverwerkende industrie | Timber industry | |
| | Houthandel | Timber traders | |
| | Aannemers | Contractors | |
| | Transporteurs | Transport companies | |
| | Biomassa sector | Biomass sector | |
| | Beeldende kunstenaars | Artists | |
| | Algemene Vereniging Inlands Hout (AVIH) | General Association Home-grown Timber | www.avih.nl |
| | Koninklijke Vereniging Van Nederlandse Houtondernemingen (VVNH) | Royal Dutch Timber Company Association | www.vvnh.nl |
| | Platform Hout Nederland (PHN) | Dutch Timber Platform | www.probos.nl |
| | Nederlandse Emballage en Palletindustrie Vereniging (EPV) | Dutch Packaging and Pallet Industry Association | www.epv.nl |
| | Koninklijke Vereniging van Nederlandse Papier- en Kartonfabrieken (VNP) | Royal Association of Dutch Paper and Board | www.vpn.nl |
| | Nederlandse Branchevereniging voor de Timmerindustrie (NBvT) | Dutch Branch Association for the Carpentry Industry | www.nbvt.nl |
| | Nederlandse Vereniging voor Houtskeletbouwers (VHSB) | Association of Wood Skeleton Builders | www.bewustmethout.nl |
| | Vereniging van Bos- en Natuurterreineigenaren (VBNE) | Association of Forest and Nature Area Owners | www.vbne.nl |
| | Staatsbosbeheer | State Forest Service | www.staatsbosbeheer.nl |
| | Vereniging Natuurmonumenten | Natuurmonumenten | www.natuurmonumenten.nl |
| | De 12 Landschappen | Provincial Landscapes | www.landschappen.nl |
| | Federatie Particulier Grondbezit (FPG) | Federation of Private Landownership | www.fpg.nl |
| | Particuliere bos- en landgoedeigenaren | Individual private forest and estate owners | |
| | (Unie van) Bosgroepen | (Union of) Forest Groups | www.bosgroepen.nl |
| | Stichting Probos | Probos Foundation | www.probos.nl |
| | Koninklijke Nederlandse Bosbouwvereniging (KNBV) | Royal Dutch Forestry Association | www.knbv.nl |
| | Forest Steward Certification NL (FSC) | Forest Steward Certification NL | www.fsc.nl |
| | PEFC Nederland | Programme for the Endorsement of Forest Certification NL | www.pefcnederland.nl |
| | Nederlandse Vereniging van Rentmeesters | Dutch Steward Association | www.rentmeesternvr.nl |
| | Vereniging van Gemeentelijke Bos- en natuureigenaren (VGBNE) | Association of Municipal Forest and Nature Area Owners | |
| | Stichting Nationale Parken (SNP) | Foundation of Cooperating National Parks | www.nationaalpark.nl |
| | Vereniging Energie Nederland | Energy Netherlands | www.energie-nederland.nl |
| | Stichting Ecobouw Nederland | Ecobouw Netherlands Foundations | www.ecobouwnederland.nl |
| | Branche Vereniging Organische Reststoffen (BVOR) | Dutch Association of Biowaste processors | www.bvor.nl |
| | Stuurgroep Natuurterrein, bos, landschap en houtketen van RVO (NBLH) | Steering Group Nature, Forest, Landscape and Wood Chain | www.rvo.nl/onderwerpen/duurzaam-ondernemen |
| | Stichting Platform Bio-energie | Platform Bio-Energy | www.platformbioenergie.nl |
| | Coöperatie Biomassalland | Cooperative Biomassalland | http://www.biomassalland.nl |
| | Adviesbedrijven | Consultant companies | |



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| | | | |
|---|---|---|---|
| | Individuele burgers / bosgebruikers | Individual citizens / forest users | |
| Mushrooms | Individuele burgers / bosgebruikers | Individual citizens / forest users | |
| | Kleine bedrijven | Small enterprises | |
| | Culinaire sector | Culinary sector | |
| Berries | Individuele burgers / bosgebruikers | Individual citizens / forest users | |
| Game | Nederlandse Jagers Vereniging (NJV) | Dutch Hunters Association | www.jagersvereniging.nl |
| | Nederlandse Organisatie voor Jacht en Grondbeheer (NOJG) | Dutch Organisation for Hunting and Land Management | www.nojg.nl |
| | Vereniging Het Reewild | Roe deer Association | www.reewild.nl |
| | Vereniging Het Edelhert | Red deer Association | www.hetedelhert.nl |
| | Wildbeheereenheden (WBE's) | Game management Units | |
| | Fauna Beheer Eenheden (FBE's) | Fauna management Units | |
| | Kroondomein Het Loo | Royal Domain Het Loo | www.kroondomein.nl |
| | Stichting het Geldersch Landschap en Geldersche Kasteelen | Stichting het Geldersch Landschap en Geldersche Kasteelen | www.glk.nl |
| | Stichting NP Hoge Veluwe | Stichting NP Hoge Veluwe | www.hogeveluwe.nl |
| | Nederlandse Bond van Poeliers en Wildhandelaren (NPBW) | Advisory and advocacy for craft poultry and game companies | www.nbpw.nl |
| | Culinaire sector | Culinary sector | |
| | Consumenten | Consumers | |
| | Individuele burgers / bosgebruikers | Individual citizens / forest users | |
| Medical plants | - | | |
| Other(s) | - | | |
| **Supporting services** | | | |
| Biodiversity | Vogelbescherming | Bird Protection Assiociation | www.vogelbescherming.nl |
| | Vereniging Natuurmonumenten | Natuurmonumenten | www.natuurmonumenten.nl |
| | Provinciale Landschappen | Provincial Landscapes | |
| | Staatsbosbeheer | National Forest Service | www.staatsbosbeheer.nl |
| | Stichting Probos | Probos Foundation | www.probos.nl |
| | FSC/PEFC | FSC/PEFC | www.fsc.nl, www.pefcnederland.nl |
| | Stichting Kritisch Bosbeheer (SKB) | Foundation Critical Forest Management | www.nieuwe-wildernis.nl |
| | Zoogdierenvereniging | Mammal Society | www.zoogdiervereniging.nl |
| | Europese Commissie | European Commission | |
| | Ministeries and Parlement | Ministeries and Parliament | |
| | Provinciale overheden | Provincial governments | |
| | Nederlandse Jagers Vereniging (NJV) | Dutch Hunters Association | www.jagersvereniging.nl |
| | Nederlandse Organisatie voor Jacht en Grondbeheer | Dutch Organization for Hunting and Land Management | www.nojg.nl |
| | Vereniging Het Reewild | Roe deer Association | www.reewild.nl |
| | Vereniging Het Edelhert | Red deer Association | www.hetedelhert.nl |
| | Wildbeheereenheden (WBEs) | Game management Units | |
| | Stichting Beheer Landelijk Gebied (SBNL) | The Foundation for Nature and Rural Areas | www.sbnl.nl |
| | Das & Boom | Das & Boom | www.dasenboom.nl |
| | Vereniging Nederlands Cultuurlandschap (VNC) | | www.nederlandscultuurlandschap.nl |
| | Faunabescherming | Fauna Protection | www.faunabescherming.nl |
| | Adviesbedrijven | Consultant companies | |
| Habitat for species | Vogelbescherming | Bird Protection Assiociation | www.vogelbescherming.nl |
| | Vereniging Natuurmonumenten | Natuurmonumenten | www.natuurmonumenten.nl |
| | De 12 Landschappen | Provincial Landscapes | www.landschappen.nl |
| | Staatsbosbeheer | National Forest Service | www.staatsbosbeheer.nl |
| | Stichting Probos | Probos Foundation | www.probos.nl |
| | FSC/PEFC | FSC/PEFC | www.fsc.nl, www.pefcnederland.nl |



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| | | | |
|---|---|---|---|
| | Stichting Kritisch Bosbeheer (SKB) | Foundation Critical Forest Management | www.nieuwe-wildernis.nl |
| | Zoogdierenvereniging | Mammal Society | www.zoogdiervereniging.nl |
| | Europese Commissie | European Commission | |
| | Ministeries and Parlement | Ministeries and Parliament | |
| | Provincial governments | | |
| | Nederlandse Jagers Vereniging (NJV) | Dutch Hunters Association | www.jagersvereniging.nl |
| | Nederlandse Organisatie voor Jacht en Grondbeheer | Dutch Organization for Hunting and Land Management | www.nojg.nl |
| | Vereniging Het Reewild | Roe deer Association | www.reewild.nl |
| | Vereniging Het Edelhert | Red deer Association | www.hetedelhert.nl |
| | Wildbeheereenheden (WBEs) | Game management Units | |
| | Stichting Beheer Landelijk Gebied (SBNL) | The Foundation for Nature and Rural Areas | www.sbnl.nl |
| | Das & Boom | Das & Boom | www.dasenboom.nl |
| | Vereniging Nederlands Cultuurlandschap (VNC) | Association for Dutch Cultural landscapes | www.nederlandscultuurlandschap.nl |
| | Faunabescherming | Fauna Protection | www.faunabescherming.nl |
| | Adviesbedrijven | Consultant companies | |
| Other(s) | - | | |
| **Regulating services** | | | |
| Carbon sequestration | Europese Commissie | European Commission | |
| | Ministeries and Parlement | Ministeries and Parliament | |
| | Milieu-organisaties (Natuur en Milieu, Milieufederaties, Milieudefensie, Trees for all) | Environmental ngo's | www.treesforall.nl |
| | Groenfront | GroenFront | www.groenfront.nl |
| | Klimaatbureau | Climate Agency | www.klimaatbureau.nl |
| | Europese Commissie | European Commission | |
| Climate regulation | Ministeries and Parlement | Ministeries and Parliament | |
| | Europese Commissie | European Commission | |
| | Milieu-organisaties (Natuur en Milieu, Milieufederaties, Milieudefensie, Trees for all) | Environmental ngo's | www.treesforall.nl |
| | Groenfront | GroenFront | www.groenfront.nl |
| | Klimaatbureau | Climate Agency | www.klimaatbureau.nl |
| | Adviesbedrijven | Consultant companies | |
| Water quality | Waterleidingmaatschappijen | Water provision bodies | |
| | Unie van Waterschappen | Association of Water Boards | www.uvw.nl |
| | Milieu-organisaties (Natuur en Milieu, Milieufederaties, Milieudefensie) | Environmental ngo's | |
| | Vereniging Natuurmonumenten | Natuurmonumenten | www.natuurmonumenten.nl |
| | LandschappenNL | Provincial Landscapes | www.landschappen.nl |
| | Staatsbosbeheer | State Forest Service | www.staatsbosbeheer.nl |
| | Adviesbedrijven | Consultant companies | |
| Pest control | Staatsbosbeheer | State Forest Service | www.staatsbosbeheer.nl |
| | Vereniging Natuurmonumenten | Natuurmonumenten | www.natuurmonumenten.nl |
| | De 12 Landschappen | Provincial Landscapes | www.landschappen.nl |
| | Federatie Particulier Grondbezit | Federation of Private Landownership | www.fpg.nl |
| | Individuele particuliere bos- en landgoedeigenaren | Individual private forest and estate owners | |
| | (Unie van) Bosgroepen | (Unie van) Bosgroepen | www.bosgroepen.nl |
| | Stichting Probos | Probos Foundation | www.probos.nl |
| | Koninklijke Nederlandse Bosbouwvereniging (KNBV) | Royal Dutch Forestry Association | www.knbv.nl |
| | Kroondomein Het Loo | Royal Domain Het Loo | www.kroondomein.nl |
| | Stichting NP Hoge Veluwe | Stichting NP Hoge Veluwe | www.hogeveluwe.nl |
| | Nederlandse Jagersvereniging, Nederlandse Organisatie voor Jacht en Grondbeheer,Vereniging Het Reewild, Vereniging Het Edelhert, Wildbeheereenheden (WBEs) | Dutch Hunting Association, Dutch Organization for Hunting and Land Management, Roe deer Association, Red deer Association, Game Management Units | www.jagersvereniging.nl<br>www.nojg.nl<br>www.reewild.nl<br>www.hetedelhert.nl |



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| | | | |
|---|---|---|---|
| | Universiteiten/Wetenschap & Onderzoek (WU, VHL, WUR Environmental Research (Alterra)) | Institutions for academic education, science, applied research and higher vocational education | |
| | Adviesbedrijven | Consultant companies | |
| Other(s) | - | | |
| **Cultural services** | | | |
| Outdoor recreation | Tourism entrepreneurs ('Horeca' sector) | | |
| | Vereniging van Recreatieondernemers Nederland (RECRON) | Association of Recreation Entrepeneurs | www.recron.nl |
| | Provincial governments | | |
| | Municipalities | | |
| | Vereniging Natuurmonumenten | Natuurmonumenten | www.natuurmonumenten.nl |
| | De 12 Landschappen | Provincial Landscapes | www.landschappen.nl |
| | Staatsbosbeheer | State Forest Service | www.staatsbosbeheer.nl |
| | Stichting Nationale Parken (SNP) | Foundation of Cooperating National Parks | www.nationaalpark.nl |
| | NIVON Natuurvrienden NL | NIVON-Nature Friends NL | www.nivon.nl |
| | Volunteer groups | | |
| | Algemene Nederlandse Wielrijdersbond (ANWB) | Royal Dutch touring Club | www.anwb.nl |
| | Fietsersbond<br>Koninklijke Nederlandse Wielren Unie | Cyclist's Union<br>Royal Dutch Cycling Union | www.wielrijdersbond.nl<br>www.knwu.nl |
| | Koninklijke Wandelbond Nederland | | www.kwbn.nl/ |
| | Koninklijke Nederlandse Hippische Sportfederatie | Royal Dutch Equestrian Federation | www.knhs.nl |
| | Individual citizens | | |
| Aesthetic values | Vereniging Natuurmonumenten | Natuurmonumenten | www.natuurmonumenten.nl |
| | LandschappenNL | Provincial Landscapes | www.landschappen.nl |
| | Staatsbosbeheer | State Forest Service | www.staatsbosbeheer.nl |
| | Stichting Nationale Parken (SNP) | Foundation of Cooperating National Parks | www.nationaalpark.nl |
| | Landschapsbeheer Nederland (& provinciale stichtingen) | Landscape Management Netherlands & provincial foundations | www.landschappen.nl |
| | Koninklijke Nederlandse Natuurhistorische Vereniging (KNNV) | Royal Dutch Natural History Society | www.knnv.nl |
| | Instituut voor natuureducatie en duurzaamheid (IVN) | Institute for Nature and Sustainability | www.ivn.nl |
| | Bomenstichting | Tree Foundation | www.bomenstichting.nl |
| | Volunteer groups | | |
| | Kunstenaars en cineasten | | |
| | Individuele burgers / bosgebruikers | Individual citizens / forest users | |
| Tourism | Recreatieondernemers ('Horeca' sector) | Tourism entrepreneurs | |
| | Vereniging van Recreatieondernemers Nederland (RECRON) | Association of Recreation Entrepeneurs | www.recron.nl |
| | Provinciale overheden | Provincial governments | |
| | Gemeenten | Municipalities | |
| | Vereniging Natuurmonumenten | Natuurmonumenten | www.natuurmonumenten.nl |
| | De 12 Landschappen | Provincial Landscapes | www.landschappen.nl |
| | Staatsbosbeheer | State Forest Service | www.staatsbosbeheer.nl |
| | Stichting Nationale Parken (SNP) | Foundation of Cooperating National Parks | www.nationaalpark.nl |
| | NIVON Natuurvrienden NL | NIVON-Nature Friends NL | www.nivon.nl |
| | Vrijwilligersgroepen | Volunteer groups | |
| | Algemene Nederlandse Wielrijdersbond (ANWB) | Royal Dutch Touring Club | www.anwb.nl |
| | Fietsersbond<br>Koninklijke Nederlandse Wielren Unie | Cyclist's Union<br>Royal Dutch Cycling Union | www.wielrijdersbond.nl<br>www.knwu.nl |
| | Koninklijke Wandelbond Nederland | Royal Netherlands Walking Association | www.kwbn.nl/ |
| | Koninklijke Nederlandse Hippische Sportfederatie | Royal Dutch Equestrian Federation | www.knhs.nl |
| | Individual citizens | | |



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| | | | |
|---|---|---|---|
| Knowledge & education/science | Universiteiten/Wetenschap & Onderzoek (WU, VHL, WUR Environmental Research (Alterra)) | Institutions for academic education, science, applied research and higher vocational education | |
| | VMBO-Groen Terra/ MBO Helicon | Schools for vocational education | |
| | Centrum Hout | Wood Centre | www.centrum-hout.nl |
| | Houtopleidingscentrum | Wood Training Centre | www.houtopleidingscentrum.nl |
| | Instituut voor natuureducatie en duurzaamheid (IVN) | Institute for Nature and Sustainability | www.ivn.nl |
| | Koninklijke Nederlandse Natuurhistorische Vereniging (KNNV) | Royal Dutch Natural History Society | www.knnv.nl |
| | Stichting Hout Research (SHR) | Timber Research Institute | www.shr.nl |
| | Stichting Nationale Boomfeestdag | Arbor Day Foundation | www.boomfeestdag.nl |
| | Adviesbedrijven | Consultant companies | www.boscursus.nl |
| Other(s) | Bos- en zorgsector; groene zorgcombinaties (s-Heerenloo, Visio Het Loo Erf) | Forest and nature inclusive health care | www.zorghoutvesterij.nl/ |
| | Reclassering Nederland | Probation Netherlands | www.reclassering.nl/ |
| | Natuurbegraven Nederland<br>Brana Brancheverenigingen Natuurbegraafplaatsen Nederland | Nature burials Netherlands<br>Branch Association for Nature Cemeteries in the Netherlands | www.natuurbegravennederland.nl/natuurbegraven<br>www.brana.nu |
| | Nationaal Groenfonds | Dutch National Fund for Green Investments | www.nationaalgroenfonds.nl |

## Appendix 31: Power resources of different interests in forest management

Strong impact: +++; Medium impact: ++; Low impact: +; No impact: 0

| Interest in | Power resources | | |
|---|---|---|---|
| | **Means of Coercion** | **Incentives** | **Dominant information sources** |
| ***Provisioning forest ecosystem services*** | | | |
| Wood | ++ | +++ | +++ |
| Mushrooms | + | + | + |
| Berries | + | + | + |
| Game | ++ | ++ | ++ |
| Medical plants | + | + | + |
| ***Supporting forest ecosystem services*** | | | |
| Biodiversity | +++ | ++ | +++ |
| Habitat for species | +++ | ++ | +++ |
| ***Regulating forest ecosystem services*** | | | |
| Carbon sequestration | + | + | + |
| Climate regulation | + | + | + |
| Water quality | +++ | +++ | +++ |
| Pest control | ++ | ++ | ++ |
| ***Cultural forest ecosystem services*** | | | |
| Outdoor recreation | + | +++ | +++ |
| Aesthetic values | + | ++ | ++ |
| Tourism | + | +++ | +++ |
| Knowledge & education/science | + | +++ | +++ |



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 676754.

## Appendix 32: Market and civil society actors in Portugal forest policy (national level)

| Identified Actor (Organizations) [in country language] | Identified Actor (Organizations) [English translation] | Website |
|---|---|---|
| ***Market actors*** | | |
| **Forest management** | | |
| • Forestis, Associação Florestal de Portugal | • Forestis, Forest Association of Portugal (Federation of Forest Owners Associations) | • www.forestis.pt |
| • Floresta Atlântica, Sociedade Gestora de Fundos de Investimento Imobiliário | • Atlantic Forest Fund, Real Estate Investment Funds Management Company | • www.floresta-atlantica.pt |
| • ANEFA, Associação Nacional de Empresas Florestais, Agrícolas e do Ambiente | • Portuguese Association of Forestry, Agriculture and Environment Enterprises (ANEFA) | • www.anefa.pt |
| **Timber trade and processing** | | |
| • The Navigator Company | • The Navigator Company (pulp and paper industry) | • www.thenavigatorcompany.com |
| • Altri Florestal | • Altri Forest (pulp and paper industry) | • www.altri.pt |
| • Europac & Kraft Viana | • Europac & Kraft Viana (paper and packaging industry) | • www.europacgroup.com |
| • SONAE Indústria, Produção e Comercialização de Derivados de Madeira | • SONAE Industry, Production and Trade of Wood Derivatives | • www.sonaeindustria.com |
| • CELPA, Associação da Indústria Papeleira | • Pulp and Paper Industry Association (CELPA) | • www.celpa.pt |
| • Centro Pinus, Associação para a Valorização da Floresta de Pinho | • Pinus Center, Association for Pine Forest Sector Valorization | • www.centropinus.org |
| • AIMMP, Associação das Indústrias de Madeira e Mobiliário de Portugal | • Association of Industries of Wood and Furniture of Portugal (AIMMP) | • http://aimmp.pt |
| • AIFF, Associação para a Competitividade das Indústrias da Fileira Florestal | • Competitiveness and Technology Center for Forest Industries (AIFF) | • www.aiff.org.pt |
| • Abastena, Sociedade Abastecedora de Madeiras | • Abastena, Wood Supply Company | • www.abastena.pt |
| • Unimadeiras, Produção, Comércio e Exploração Florestal | • Unimadeiras, Production, Trade and Forest Exploitation | • http://unimadeiras.pt |
| **Renewable energy regeneration** | | |
| • APREN, Associação Portuguesa de Energias Renováveis | • Portuguese Renewable Energy Association (APREN) | • www.apren.pt |
| • CBE, Centro da Biomassa para a Energia | • Biomass Centre for Energy (CBE) | • www.centrodabiomassa.pt |



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| Identified Actor (Organizations) [in country language] | Identified Actor (Organizations) [English translation] | Website |
|---|---|---|
| • ANPEB, Associação Nacional de Pellets Energéticas de Biomassa | • Portuguese Association of Biomass Energy Pellets (ANPEB) | • www.anpeb.pt |
| • APEB, Associação dos Produtores de Energia e Biomassa<br>• EDP Produção - Bioelétrica | • APEB, Association of Energy and Biomass Producers (APEB)<br>• Portuguese Energies - Bioelectricity (EDP) | • apebiomassa.wixsite.com/apeb/biomassa<br>• www.edp.com |
| **Water provision**<br>• AdP, Águas de Portugal | • Portuguese company for water supply and wastewater sanitation (AdP) | • www.adp.pt |
| **Tourism**<br>• CTP, Confederação do Turismo Português | • Portuguese Association for Tourism (CTP) | • www.confederacaoturismoportugues.pt |
| ***Civil Society actors*** | | |
| **Employment in forests**<br>• SETAA, Sindicato da Agricultura, Alimentação e Florestas | • Union of Agriculture, Food and Forestry (SETAA) | • www.setaa.pt |
| **Sustainable biomass use**<br>• CBE, Centro da Biomassa para a Energia | • Biomass Centre for Energy (CBE) | • www.centrodabiomassa.pt |
| **Recreation**<br>• FCMP, Federação de Campismo e Montanhismo de Portugal | • Portuguese Camping and Mountaineering Federation (FCMP) | • www.fcmportugal.com |
| • UVP, Federação Portuguesa de Ciclismo | • Portuguese Cycling Federation (UVP) | • www.fpciclismo.pt |
| • FPCUB, Federação Portuguesa de Cicloturismo e Utilizadores de Bicicleta | • Portuguese Federation of Cycletourism and Bicycle Users (FPCUB) | • www.fpcub.pt |
| • FMP, Federação de Motociclismo de Portugal | • Portuguese Motorcycle Federation (FMP) | • http://fmp-live.pt |
| • FPTT, Federação Portuguesa de Todo o Terreno | • Portuguese All-Terrain Federation (FPTT) | • http://fptt.pt |
| • FPO, Federação Portuguesa de Orientação | • Portuguese Orienteering Federation (FPO) | • www.fpo.pt |
| • Geocaching | • Geocaching | • www.geocaching.pt |
| • FNAP, Federação Nacional dos Apicultores de Portugal | • Portuguese Beekeeping Federation (FNAP) | • http://fnap.pt/ |
| **Hunting and Fishing**<br>• Fencaça, Federação Portuguesa de Caça | • Portuguese Hunting Federation (Fencaça) | • www.fencaca.pt |
| • CNCP, Confederação Nacional dos Caçadores Portugueses | • Portuguese Hunters Confederation (CNCP) | • www.cncp.pt |



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| Identified Actor (Organizations) [in country language] | Identified Actor (Organizations) [English translation] | Website |
|---|---|---|
| • ANPC, Associação Nacional de Proprietários Rurais, Gestão Cinegética e Biodiversidade | • Portuguese Association of Rural Owners, Hunting Management and Biodiversity (ANPC) | • www.anpc.pt |
| • FPPD, Federação Portuguesa da Pesca Desportiva | • Portuguese Federation for Sport Fishing (FPPD) | • www.fppd.pt |
| **Certification** | | |
| • FSC Portugal | • Forest Stewardship Council (FSC) | • https://pt.fsc.org/pt-pt |
| • PEFC Portugal, Programa para o Reconhecimento da Certificação Florestal | • Programme for the Endorsement of Forest Certification (PEFC) | • www.pefc.pt |
| **Environmental, nature, and landscape conservation** | | |
| • Quercus, Associação Nacional da Conservação da Natureza | • Quercus, Portuguese Association for Nature Conservation | • www.quercus.pt |
| • WWF Portugal | • World Wildlife Fund (WWF) | • www.wwf.pt |
| • SPEA, Sociedade Portuguesa para o Estudo das Aves | • Portuguese Society for the Study of Birds (SPEA) | • www.spea.pt |
| • FAPAS, Fundo para a Protecção dos Animais Selvagens | • Fund for the Protection of Wild Animals (FAPAS) | • www.fapas.pt |
| • GEOTA - Grupo de Estudos de Ordenamento do Território e Ambiente | • Environmental and Land Use Planning Study Group (GEOTA) | • www.geota.pt |
| • LPN, Liga para a Protecção da Natureza | • Nature Protection League (LPN) | • www.lpn.pt |
| • ZERO, Associação Sistema Terrestre Sustentável | • ZERO, Sustainable Terrestrial System Association | • http://zero.ong/ |
| • Greenpeace Portugal | • Greenpeace | • www.greenpeace.org/portugal/pt |



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## Appendix 33: Governmental actors in forest policy (Portugal, national level)

| *Original name* | *Name translated into English* | *Website* |
|---|---|---|
| • MAFDR, Ministério da Agricultura, Florestas e Desenvolvimento Rural<br>○ ICNF, Instituto da Conservação da Natureza e das Florestas<br>○ IFAP, Instituto de Financiamento da Agricultura e Pescas<br>○ DGAV, Direção-Geral de Alimentação e Veterinária | • Ministry of Agriculture, Forestry and Rural Development<br>○ Institute for the Nature Conservation and Forests<br>○ Institute for Financing Agriculture and Fisheries<br>○ Directorate General for Food and Veterinary | ○ www.portugal.gov.pt<br>○ www.icnf.pt<br>○ www.ifap.min-agricultura.pt<br>○ www.dgv.min-agricultura.pt |
| • Ministério da Economia<br>○ DGEG, Direção Geral de Energia e Geologia | • Ministry of Economy<br>○ Directorate General for Energy and Geology | • www.portugal.gov.pt<br>○ www.dgeg.pt |
| • Ministério do Ambiente<br>○ APA, Agência Portuguesa do Ambiente | • Ministry of Environment<br>○ Portuguese Environment Agency | • www.portugal.gov.pt<br>○ www.apambiente.pt |
| • Ministério da Defesa<br>○ GNR, Guarda Nacional Republicana: SEPNA, Serviço de Proteção da Natureza e Ambiente e GIPS, Grupo de Intervenção de Proteção e Socorro | • Ministry of Defence<br>○ Portuguese National Guard (GNR): Protection of Nature and Environment Service (SEPNA) and Safe and Protection Intervention Group (GIPS) | • www.portugal.gov.pt<br>○ www.gnr.pt |
| • Ministério da Cultura<br>○ DGPC, Direção-Geral do Património Cultural | • Ministry of Culture<br>○ Directorate General for Cultural Heritage | • www.portugal.gov.pt<br>○ www.patrimoniocultural.pt |
| • Ministério das Finanças<br>○ AT, Autoridade Tributária e Aduaneira | • Ministry of Finance<br>○ Tributary and Customs Authority | • www.portugal.gov.pt<br>○ www.portaldasfinancas.gov.pt |
| • Ministério do Trabalho, Solidariedade e Segurança Social<br>○ ACT, Autoridade para as Condições do Trabalho | • Ministry of Labour and Social Solidarity<br>○ Authority for Work Conditions | • www.portugal.gov.pt<br>○ www.act.gov.pt |
| • ANMP, Associação Nacional de Municípios Portugueses | • Portuguese Association of Municipalities | • www.anmp.pt |



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# Appendix 34: Interests in different ecosystem services (Portugal, national level)

| Interest in | Identified Stakeholder (Organizations)<br>[Name translated into English] |
|---|---|
| ***Provisioning services*** | |
| Wood | • Forestis, Forest Association of Portugal (Federation of Forest Owners Associations)<br>• Atlantic Forest Fund, Real Estate Investment Funds Management Company<br>• Portuguese Association of Forestry, Agriculture and Environment Enterprises (ANEFA)<br>• The Navigator Company (pulp and paper industry)<br>• Altri Forest (pulp and paper industry)<br>• Europac & Kraft Viana (paper and packaging industry)<br>• SONAE Industry, Production and Trade of Wood Derivatives<br>• Pulp and Paper Industry Association (CELPA)<br>• Pinus Center, Association for Pine Forest Sector Valorization<br>• Association of Industries of Wood and Furniture of Portugal (AIMMP)<br>• Competitiveness and Technology Center for Forest Industries (AIFF)<br>• Abastena, Wood Supply Company<br>• Unimadeiras, Production, Trade and Forest Exploitation<br>• Portuguese Renewable Energy Association (APREN)<br>• Biomass Centre for Energy (CBE)<br>• Portuguese Association of Biomass Energy Pellets (ANPEB)<br>• APEB, Association of Energy and Biomass Producers (APEB)<br>• Portuguese Energies - Bioelectricity (EDP)<br>• Union of Agriculture, Food and Forestry (SETAA)<br>• Institute for the Nature Conservation and Forests<br>• Institute for Financing Agriculture and Fisheries<br>• Directorate General for Food and Veterinary<br>• Directorate General for Energy and Geology<br>• Portuguese Environment Agency<br>• Portuguese National Guard (GNR): Protection of Nature and Environment Service (SEPNA) and Safe and Protection Intervention Group (GIPS)<br>• Directorate General for Cultural Heritage<br>• Tributary and Customs Authority<br>• Authority for Work Conditions<br>• Portuguese Association of Municipalities |
| Mushrooms | • Quercus, Portuguese Association for Nature Conservation<br>• World Wildlife Fund (WWF)<br>• Environmental and Land Use Planning Study Group (GEOTA)<br>• Nature Protection League (LPN)<br>• ZERO, Sustainable Terrestrial System Association<br>• Greenpeace<br>• Portuguese Camping and Mountaineering Federation (FCMP)<br>• Geocaching |
| Game | • Portuguese Hunting Federation (Fencaça)<br>• Portuguese Hunters Confederation (CNCP)<br>• Portuguese Association of Rural Owners, Hunting Management and Biodiversity (ANPC)<br>• Institute for the Conservation of Nature and Forest |
| Medical plants | • Quercus, Portuguese Association for Nature Conservation<br>• World Wildlife Fund (WWF)<br>• Environmental and Land Use Planning Study Group (GEOTA) |



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| Interest in | Identified Stakeholder (Organizations)<br>[Name translated into English] |
|---|---|
| | • Nature Protection League (LPN)<br>• ZERO, Sustainable Terrestrial System Association<br>• Portuguese Beekeeping Federation (FNAP) |
| Fish | • Portuguese Federation for Sport Fishing (FPPD)<br>• Institute for the Nature Conservation and Forests |
| Honey | • Portuguese Beekeeping Federation (FNAP)<br>• Quercus, Portuguese Association for Nature Conservation<br>• World Wildlife Fund (WWF)<br>• Environmental and Land Use Planning Study Group (GEOTA)<br>• Nature Protection League (LPN)<br>• ZERO, Sustainable Terrestrial System Association<br>• Directorate General for Food and Veterinary |
| ***Supporting services*** | |
| Biodiversity | • Quercus, Portuguese Association for Nature Conservation<br>• World Wildlife Fund (WWF)<br>• Portuguese Society for the Study of Birds (SPEA)<br>• Fund for the Protection of Wild Animals (FAPAS)<br>• Environmental and Land Use Planning Study Group (GEOTA)<br>• Nature Protection League (LPN)<br>• ZERO, Sustainable Terrestrial System Association<br>• Greenpeace<br>• Institute for the Nature Conservation and Forests<br>• Portuguese Environment Agency |
| Habitat for species | • Quercus, Portuguese Association for Nature Conservation<br>• World Wildlife Fund (WWF)<br>• Portuguese Society for the Study of Birds (SPEA)<br>• Fund for the Protection of Wild Animals (FAPAS)<br>• Environmental and Land Use Planning Study Group (GEOTA)<br>• Nature Protection League (LPN)<br>• ZERO, Sustainable Terrestrial System Association<br>• Greenpeace<br>• Forest Stewardship Council (FSC)<br>• Programme for the Endorsement of Forest Certification (PEFC)<br>• Institute for the Nature Conservation and Forests<br>• Portuguese Environment Agency |
| Other(s) | - |
| ***Regulating services*** | |
| Carbon sequestra-tion | • Quercus, Portuguese Association for Nature Conservation<br>• World Wildlife Fund (WWF)<br>• Portuguese Society for the Study of Birds (SPEA)<br>• Fund for the Protection of Wild Animals (FAPAS)<br>• Environmental and Land Use Planning Study Group (GEOTA)<br>• Nature Protection League (LPN)<br>• ZERO, Sustainable Terrestrial System Association<br>• Greenpeace |



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| Interest in | Identified Stakeholder (Organizations)<br>[Name translated into English] |
|---|---|
| | • Institute for the Nature Conservation and Forests<br>• Portuguese Environment Agency |
| Climate regulation | • Quercus, Portuguese Association for Nature Conservation<br>• World Wildlife Fund (WWF)<br>• Portuguese Society for the Study of Birds (SPEA)<br>• Fund for the Protection of Wild Animals (FAPAS)<br>• Environmental and Land Use Planning Study Group (GEOTA)<br>• Nature Protection League (LPN)<br>• ZERO, Sustainable Terrestrial System Association<br>• Greenpeace<br>• Institute for the Nature Conservation and Forests<br>• Portuguese Environment Agency |
| Water quality | • Portuguese company for water supply and wastewater sanitation (AdP)<br>• Portuguese Association of Municipalities<br>• Quercus, Portuguese Association for Nature Conservation<br>• World Wildlife Fund (WWF)<br>• Portuguese Society for the Study of Birds (SPEA)<br>• Fund for the Protection of Wild Animals (FAPAS)<br>• Environmental and Land Use Planning Study Group (GEOTA)<br>• Nature Protection League (LPN)<br>• ZERO, Sustainable Terrestrial System Association<br>• Greenpeace<br>• Portuguese Environment Agency<br>• Portuguese Association of Municipalities |
| Pest control | • Forestis, Forest Association of Portugal (Federation of Forest Owners Associations)<br>• Atlantic Forest Fund, Real Estate Investment Funds Management Company<br>• Portuguese Association of Forestry, Agriculture and Environment Enterprises (ANEFA)<br>• The Navigator Company (pulp and paper industry)<br>• Altri Forest (pulp and paper industry)<br>• Europac & Kraft Viana (paper and packaging industry)<br>• SONAE Industry, Production and Trade of Wood Derivatives<br>• Pulp and Paper Industry Association (CELPA)<br>• Pinus Center, Association for Pine Forest Sector Valorization<br>• Association of Industries of Wood and Furniture of Portugal (AIMMP)<br>• Competitiveness and Technology Center for Forest Industries (AIFF)<br>• Abastena, Wood Supply Company<br>• Unimadeiras, Production, Trade and Forest Exploitation<br>• Portuguese Renewable Energy Association (APREN)<br>• Biomass Centre for Energy (CBE)<br>• Portuguese Association of Biomass Energy Pellets (ANPEB)<br>• APEB, Association of Energy and Biomass Producers (APEB)<br>• Portuguese Energies - Bioelectricity (EDP)<br>• Institute for the Nature Conservation and Forests<br>• Portuguese Association of Municipalities<br>• Quercus, Portuguese Association for Nature Conservation<br>• World Wildlife Fund (WWF)<br>• Portuguese Society for the Study of Birds (SPEA)<br>• Fund for the Protection of Wild Animals (FAPAS)<br>• Environmental and Land Use Planning Study Group (GEOTA)<br>• Nature Protection League (LPN) |



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| Interest in | Identified Stakeholder (Organizations)<br>[Name translated into English] |
|---|---|
| | • ZERO, Sustainable Terrestrial System Association<br>• Portuguese Beekeeping Federation (FNAP)<br>• Portuguese Hunting Federation (Fencaça)<br>• Portuguese Hunters Confederation (CNCP)<br>• Portuguese Association of Rural Owners, Hunting Management and Biodiversity (ANPC)<br>• Institute for the Nature Conservation and Forests<br>• Directorate General for Food and Veterinary |
| Wildfires reduction | • Forestis, Forest Association of Portugal (Federation of Forest Owners Associations)<br>• Atlantic Forest Fund, Real Estate Investment Funds Management Company<br>• Portuguese Association of Forestry, Agriculture and Environment Enterprises (ANEFA)<br>• The Navigator Company (pulp and paper industry)<br>• Altri Forest (pulp and paper industry)<br>• Europac & Kraft Viana (paper and packaging industry)<br>• SONAE Industry, Production and Trade of Wood Derivatives<br>• Pulp and Paper Industry Association (CELPA)<br>• Pinus Center, Association for Pine Forest Sector Valorization<br>• Association of Industries of Wood and Furniture of Portugal (AIMMP)<br>• Competitiveness and Technology Center for Forest Industries (AIFF)<br>• Abastena, Wood Supply Company<br>• Unimadeiras, Production, Trade and Forest Exploitation<br>• Portuguese Renewable Energy Association (APREN)<br>• Biomass Centre for Energy (CBE)<br>• Portuguese Association of Biomass Energy Pellets (ANPEB)<br>• APEB, Association of Energy and Biomass Producers (APEB)<br>• Portuguese Energies - Bioelectricity (EDP)<br>• Institute for the Nature Conservation and Forests<br>• Portuguese company for water supply and wastewater sanitation (AdP)<br>• Portuguese Association of Municipalities<br>• Quercus, Portuguese Association for Nature Conservation<br>• World Wildlife Fund (WWF)<br>• Portuguese Society for the Study of Birds (SPEA)<br>• Fund for the Protection of Wild Animals (FAPAS)<br>• Environmental and Land Use Planning Study Group (GEOTA)<br>• Nature Protection League (LPN)<br>• ZERO, Sustainable Terrestrial System Association<br>• Portuguese Beekeeping Federation (FNAP)<br>• Portuguese Hunting Federation (Fencaça)<br>• Portuguese Hunters Confederation (CNCP)<br>• Portuguese Association of Rural Owners, Hunting Management and Biodiversity (ANPC)<br>• Institute for the Nature Conservation and Forests<br>• Portuguese National Guard (GNR): Protection of Nature and Environment Service (SEPNA) and Safe and Protection Intervention Group (GIPS) |
| Soils | • Quercus, Portuguese Association for Nature Conservation<br>• World Wildlife Fund (WWF)<br>• Environmental and Land Use Planning Study Group (GEOTA)<br>• Nature Protection League (LPN)<br>• ZERO, Sustainable Terrestrial System Association<br>• Greenpeace<br>• Directorate General for Energy and Geology<br>• Portuguese Environment Agency |



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| Interest in | Identified Stakeholder (Organizations)<br>[Name translated into English] |
|---|---|
| | • Institute for the Nature Conservation and Forests |
| ***Cultural services*** | |
| Outdoor recreation | • Portuguese Camping and Mountaineering Federation (FCMP)<br>• Portuguese Cycling Federation (UVP)<br>• Portuguese Federation of Cycletourism and Bicycle Users (FPCUB)<br>• Portuguese Motorcycle Federation (FMP)<br>• Portuguese All-Terrain Federation (FPTT)<br>• Portuguese Orienteering Federation (FPO)<br>• Geocaching<br>• Portuguese Beekeeping Federation (FNAP) |
| Aesthetic values | • Quercus, Portuguese Association for Nature Conservation<br>• World Wildlife Fund (WWF)<br>• Portuguese Society for the Study of Birds (SPEA)<br>• Fund for the Protection of Wild Animals (FAPAS)<br>• Environmental and Land Use Planning Study Group (GEOTA)<br>• Nature Protection League (LPN)<br>• ZERO, Sustainable Terrestrial System Association<br>• Greenpeace<br>• Portuguese Camping and Mountaineering Federation (FCMP)<br>• Portuguese Cycling Federation (UVP)<br>• Portuguese Federation of Cycletourism and Bicycle Users (FPCUB)<br>• Portuguese Motorcycle Federation (FMP)<br>• Portuguese All-Terrain Federation (FPTT)<br>• Portuguese Orienteering Federation (FPO)<br>• Geocaching |
| Tourism | • Portuguese Association for Tourism (CTP) |
| Environmental education | • Quercus, Portuguese Association for Nature Conservation<br>• World Wildlife Fund (WWF)<br>• Portuguese Society for the Study of Birds (SPEA)<br>• Fund for the Protection of Wild Animals (FAPAS)<br>• Environmental and Land Use Planning Study Group (GEOTA)<br>• Nature Protection League (LPN)<br>• ZERO, Sustainable Terrestrial System Association<br>• Greenpeace<br>• Pulp and Paper Industry Association (CELPA)<br>• Pinus Center, Association for Pine Forest Sector Valorization<br>• Portuguese Environment Agency<br>• Institute for the Nature Conservation and Forests |
| Research | • Forestis, Forest Association of Portugal (Federation of Forest Owners Associations)<br>• Atlantic Forest Fund, Real Estate Investment Funds Management Company<br>• Portuguese Association of Forestry, Agriculture and Environment Enterprises (ANEFA)<br>• The Navigator Company (pulp and paper industry)<br>• Altri Forest (pulp and paper industry)<br>• Pulp and Paper Industry Association (CELPA)<br>• Pinus Center, Association for Pine Forest Sector Valorization<br>• Association of Industries of Wood and Furniture of Portugal (AIMMP)<br>• Competitiveness and Technology Center for Forest Industries (AIFF) |



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| Interest in | Identified Stakeholder (Organizations)<br>[Name translated into English] |
|---|---|
| | • Biomass Centre for Energy (CBE)<br>• Institute for the Nature Conservation and Forests<br>• Directorate General for Food and Veterinary<br>• Portuguese Environment Agency<br>• Directorate General for Energy and Geology |



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# Appendix 35: Actors in the case study (Vale do Sousa, Portugal)

| Stakeholder Category | Identified Stakeholder (Organizations) [Name in country language] | Identified Stakeholder (Organizations) [Name translated into English] |
|---|---|---|
| ***Market actors*** | | |
| Forest owners | • AFVS, Associação Florestal do Vale do Sousa<br>• Proprietários florestais individuais<br>• Floresta Atlântica, Sociedade Gestora de Fundos de Investimento Imobiliário | • Vale do Sousa Forest Owners' Association (AFVS)<br>• Individual, unorganized forest owners<br>• Atlantic Forest Fund, Real Estate Investment Funds Management Company |
| Timber processing | • Serrações de madeira locais e regionais<br>• Madeireiros (madeira e lenha) locais e regionais<br>• Madeicampo, Exploração Florestal<br>• Mcruz & Soares, Comerciante de Madeiras e Lenhas<br>• The Navigator Company<br>• Altri Florestal<br>• Unimadeiras, Produção, Comércio e Exploração Florestal<br>• Abastena, Sociedade Abastecedora de Madeiras | • Local and regional sawmills<br>• Local and regional timber and fuelwood companies<br>• Madeicampo, Forest Exploitation<br>• Mcruz & Soares, Wood and Firewood Trader<br>• The Navigator Company (pulp and paper industry)<br>• Altri Forest (pulp and paper industry)<br>• Unimadeiras, Production, Trade and Forest Exploitation<br>• Abastena, Wood Supply Company |
| Renewable energy provision | • Centrais Regionais Termoeléctricas de Biomassa<br>• Empresas regionais de pellets | • Regional thermoelectric biomass companies<br>• Regional wood pellet companies |
| Work in forests | • Técnicos florestais<br>• Trabalhadores florestais<br>• Empreiteiros florestais | • Forester<br>• Forest workers<br>• Forestry work contractors |
| **Civil Society** | | |
| Employment in forests | • Técnicos florestais<br>• Trabalhadores florestais<br>• SEETA, Sindicato da Agricultura, Alimentação e Florestas | • Forester<br>• Forest workers<br>• Union of Agriculture, Food and Forestry - regional delegation (SETAA) |
| Recreation | • Caminhantes da natureza<br>• Ciclistas<br>• Ciclistas de montanha (BTT)<br>• Praticantes de motocross<br>• Praticantes de escalada | • Individual hikers<br>• Individual bikers<br>• Individual mountain bikers<br>• Individual motor-cross riders<br>• Individual mountain climbing practitioners |



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| Stakeholder Category | Identified Stakeholder (Organizations) [Name in country language] | Identified Stakeholder (Organizations) [Name translated into English] |
|---|---|---|
| | • Praticantes de Rapell<br>• Geocachers | • Practitioners of rapell<br>• Individual geocachers |
| | • Praticantes de desportos de rio (rafting, hidrospeed, canoagem)<br>• Amigos do Pedal Lagares Clube (Penafiel)<br>• Associação Cultural Recreativa e Desportiva Sódescidas (Penafiel)<br>• Associação Desportiva BTTENROS (Penafiel)<br>• Associação Desportiva Recreativa Ases de Penafiel<br>• Associação Penafiel Bike Clube<br>• BTT Castro Mozinho (Penafiel)<br>• Clube BTT Penafiel<br>• Clube Penatrilhos Associação Desportiva (Penafiel)<br>• Clube TT Paredes<br>• Extreme Clube Lagares (Penafiel)<br>• J.R.C. Power (Castelo de Paiva)<br>• Apicultores | • River sports (rafting, hidrospeed, canoeing)<br>• Friends of Pedal Lagares Club (Penafiel)<br>• Sódescidas" Sports Cultural Association " (Penafiel)<br>• "BTTENROS" Sports Association (Penafiel)<br>• "Ases" Penafiel Sports Association<br>• Penafiel Bike Association<br>• Castro Mozinho Mountain Bikers Association (Penafiel)<br>• Penafiel Mountain Bikers Association<br>• Penatrilhos Sports Association (Penafiel)<br>• All-terrain Sports Association (Paredes)<br>• Lagares motor-cross riders Association<br>• J.R.C. Power (Castelo de Paiva)<br>• Beekeepers |
| Hunting and Fishing | • Caçadores<br>• Pescadores (águas interiores)<br>• Clube de Caça e Pesca do Vale do Sousa (Paredes)<br>• Clube de Caça e Pesca de Paredes<br>• Clube de Caçadores de Rebordosa (Paredes)<br>• Associação de Caçadores do Vale do Tâmega (Penafiel)<br>• Clube de Caçadores de Canelas (Penafiel)<br>• Clube de Caçadores de Rio de Moinhos (Penafiel)<br>• Associação de Caçadores e Pescadores da Serra da Boneca (Penafiel)<br>• Clube de Pesca e Caça de Penafiel<br>• Associação Pesca Desportiva Amigos do Douro (Penafiel) | • Hunters<br>• Fishermen (rivers)<br>• Sousa Valley Hunting and Fishing Association (Paredes)<br>• Paredes Hunting and Fishing Association<br>• Rebordosa Hunting Association (Paredes)<br>• Vale do Tâmega Hunting Association (Penafiel)<br>• Canelas Hunting Association (Penafiel)<br>• Rio de Moinhos Hunting Association (Penafiel)<br>• Serra da Boneca Hunting and Fishing Association (Penafiel)<br>• Penafiel Hunting and Fishing Association<br>• "Friends of Douro River" Fishing Association (Penafiel) |



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| Stakeholder Category | Identified Stakeholder (Organizations) [Name in country language] | Identified Stakeholder (Organizations) [Name translated into English] |
|---|---|---|
| | • Clube de Caça e Pesca de Castelo de Paiva | • Castelo de Paiva Hunting and Fishing Association |
| Environmental, nature, and landscape conservation | • S.O.S. Rio Paiva, Associação de Defesa do Vale do Paiva | • S.O.S. Paiva River, Paiva Valley Environmental Association |
| | • Organização Ambientalista "Campo Aberto"<br>• Quercus, Associação Nacional da Conservação da Natureza - Núcleo Regional do Porto | • "Campo Aberto" Environmental Association<br>• Quercus, National Association for Nature Conservation - Regional Delegation |
| ***Governmental-Actors*** | | |
| Forest management | • ICNF, Instituto da Conservação da Natureza e das Florestas - Departamento de Conservação da Natureza e Florestas do Norte<br>• CCDRN, Centro de Coordenação e Desenvolvimento Regional do Norte<br>• Câmara Municipal de Penafiel<br>• Câmara Municipal de Paredes<br>• Câmara Municipal de Castelo de Paiva<br>• Junta de Freguesia de Lagares<br>• Junta de Freguesia de Sobreira | • Institute for the Nature Conservation and Forests - North Regional Department (ICNF)<br>• North Regional Coordination and Development Commission (CCDRN)<br>• Municipality of Penafiel<br>• Municipality of Paredes<br>• Municipality of Castelo de Paiva<br>• Lagares Parish Council<br>• Sobreira Parish Council |
| Environmental, nature, and landscape conservation | • ICNF, Instituto da Conservação da Natureza e das Florestas - Departamento de Conservação da Natureza e Florestas do Norte | • Institute for the Nature Conservation and Forests - North Regional Department (ICNF) |
| Water provision | • Águas do Norte<br>• Be Water, Águas de Paredes | • North Water Supply System<br>• Paredes Water Supply System |



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## Appendix 36: Actors in the case study/Contacts (Vale do Sousa, Portugal)

| Identified Stakeholder (Organizations) [Name translated into English] | Website or physical address/contact |
|---|---|
| **Market actors** | |
| • Vale do Sousa Forest Owners' Association (AFVS)<br>• Atlantic Forest Fund, Real Estate Investment Funds Management Company | • www.afvs.ws<br>• www.floresta-atlantica.pt |
| • The Navigator Company (pulp and paper industry)<br>• Altri Forest (pulp and paper industry)<br>• Madeicampo, Forest Exploitation<br>• Abastena, Wood Supply Company<br>• Unimadeiras, Production, Trade and Forest Exploitation | • www.thenavigatorcompany.com<br>• www.altri.pt<br>• www.madeicampo.com<br>• www.abastena.pt<br>• http://unimadeiras.pt |
| **Civil Society** | |
| • Union of Agriculture, Food and Forestry - regional delegation (SETAA) | • www.setaa.pt |
| • Lagares motor-cross riders Association<br>• Friends of Pedal Lagares Club (Penafiel)<br>• Sódescidas" Sports Cultural Association " (Penafiel)<br>• "BTTENROS" Sports Association (Penafiel)<br>• Penafiel Bike Association<br>• Penafiel Mountain Bikers Association<br>• Penatrilhos Sports Association (Penafiel)<br>• All-terrain Sports Association (Paredes) | • www.extremelagares.com<br>• http://amigosdopedal.net<br>• http://sodescidas.blogspot.pt/<br>• https://bttenros.wordpress.com<br>• www.penafielbikeclube.pt<br>• www.clubebttpenafiel.pt<br>• www.penatrilhos.com<br>• www.clubettparedes.com |
| • Sousa Valley Hunting and Fishing Association<br>• Vale do Tâmega Hunting Association (Penafiel) | • http://ccpvalesousa.blogspot.pt<br>• http://acvt.weebly.com/ |
| • S.O.S. Paiva River, Paiva Valley Environmental Association<br>• Environmental Association "Open Field"<br>• Quercus, National Association for Nature Conservation - Regional Delegation | • www.riopaiva.org<br>• www.campoaberto.pt<br>• www.quercus.pt |
| **Governmental actors** | |
| • Institute for the Nature Conservation and Forests - North Regional Department (ICNF)<br>• CCDRN, North Regional Coordination and Development Commission<br>• Municipality of Penafiel<br>• Municipality of Paredes | • www.icnf.pt<br>• www.ccdr-n.pt<br>• www.cm-penafiel.pt<br>• www.cm-paredes.pt |
| • Municipality of Castelo de Paiva | • www.cm-castelo-paiva.pt |



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| Identified Stakeholder (Organizations)<br>[Name translated into English] | Website or physical address/contact |
|---|---|
| • North Water Supply System<br>• Paredes Water Supply System | • www.adnorte.pt<br>• www.paredes-bewater.com.pt |



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## Appendix 37: Actors in the case study interested in different ecosystem services (Vale do Sousa, Portugal)

| Interest in | Identified Stakeholder (Organizations)<br>[Name translated into English] |
|---|---|
| ***Provisioning services*** | |
| Wood | • Vale do Sousa Forest Owners' Association (AFVS)<br>• Individual, unorganized forest owners<br>• Atlantic Forest Fund, Real Estate Investment Funds Management Company<br>• Local and regional sawmills<br>• Local and regional timber and fuelwood companies<br>• Madeicampo, Forest Exploitation<br>• Mcruz & Soares, Wood and Firewood Trader<br>• The Navigator Company (pulp and paper industry)<br>• Altri Forest (pulp and paper industry)<br>• Unimadeiras, Production, Trade and Forest Exploitation<br>• Abastena, Wood Supply Company<br>• Regional thermoelectric biomass companies<br>• Regional wood pellet companies<br>• Forester<br>• Forest workers<br>• Forestry work contractors<br>• Union of Agriculture, Food and Forestry - regional delegation (SETAA)<br>• Municipality of Penafiel<br>• Municipality of Paredes<br>• Municipality of Castelo de Paiva<br>• Lagares Parish Council<br>• Sobreira Parish Council<br>• Institute for the Nature Conservation and Forests - Regional Department (ICNF)<br>• North Regional Coordination and Development Commission (CCDRN) |
| Mushrooms | • Vale do Sousa Forest Owners' Association (AFVS)<br>• Individual, unorganized forest owners<br>• Quercus, National Association for Nature Conservation - Regional Delegation |
| Game | • Hunters<br>• Sousa Valley Hunting and Fishing Association (Paredes)<br>• Paredes Hunting and Fishing Association<br>• Rebordosa Hunting Association (Paredes)<br>• Vale do Tâmega Hunting Association (Penafiel)<br>• Canelas Hunting Association (Penafiel)<br>• Rio de Moinhos Hunting Association (Penafiel)<br>• Serra da Boneca Hunting and Fishing Association (Penafiel)<br>• Penafiel Hunting and Fishing Association<br>• Castelo de Paiva Hunting and Fishing Association |
| Medical plants | • Sousa Valley Forest Owners Association |



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| Interest in | Identified Stakeholder (Organizations)<br>[Name translated into English] |
|---|---|
| | • Individual, unorganized forest owners<br>• Quercus, National Association for Nature Conservation - Regional Delegation |
| Fish | • Fishermen (rivers)<br>• Sousa Valley Hunting and Fishing Association (Paredes)<br>• Paredes Hunting and Fishing Association<br>• Serra da Boneca Hunting and Fishing Association (Penafiel)<br>• Penafiel Hunting and Fishing Association<br>• "Friends of Douro River" Fishing Association (Penafiel)<br>• Castelo de Paiva Hunting and Fishing Association |
| Honey | • Sousa Valley Forest Owners Association<br>• Individual, unorganized forest owners |
| ***Supporting services*** | |
| Biodiversity | • S.O.S. Paiva River, Paiva Valley Environmental Association<br>• "Campo Aberto" Environmental Association<br>• Quercus, National Association for Nature Conservation - Regional Delegation<br>• Institute for the Nature Conservation and Forests - Regional Department (ICNF) |
| Habitat for species | • S.O.S. Paiva River, Paiva Valley Environmental Association<br>• "Campo Aberto" Environmental Association<br>• Quercus, National Association for Nature Conservation - Regional Delegation<br>• Institute for the Nature Conservation and Forests - Regional Department (ICNF) |
| Other(s) | • |
| ***Regulating services*** | |
| Carbon sequestration | • S.O.S. Paiva River, Paiva Valley Environmental Association<br>• "Campo Aberto" Environmental Association<br>• Quercus, National Association for Nature Conservation - Regional Delegation<br>• ICNF, Institute for the Nature Conservation and Forests - Regional Department |
| Climate regulation | • S.O.S. Paiva River, Paiva Valley Environmental Association<br>• "Campo Aberto" Environmental Association<br>• Quercus, National Association for Nature Conservation - Regional Delegation<br>• ICNF, Institute for the Nature Conservation and Forests - Regional Department |
| Water quality | • North Water Supply System<br>• Paredes Water Supply System<br>• S.O.S. Paiva River, Paiva Valley Environmental Association<br>• "Campo Aberto" Environmental Association |



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| Interest in | Identified Stakeholder (Organizations)<br>[Name translated into English] |
|---|---|
| | • Quercus, National Association for Nature Conservation - Regional Delegation<br>• ICNF, Institute for the Nature Conservation and Forests - Regional Department |
| Pest control | • Vale do Sousa Forest Owners' Association (AFVS)<br>• Individual, unorganized forest owners<br>• Atlantic Forest Fund, Real Estate Investment Funds Management Company<br>• Local and regional sawmills<br>• Local and regional timber and fuelwood companies<br>• Madeicampo, Forest Exploitation<br>• Mcruz & Soares, Wood and Firewood Trader<br>• The Navigator Company (pulp and paper industry)<br>• Altri Forest (pulp and paper industry)<br>• Unimadeiras, Production, Trade and Forest Exploitation<br>• Abastena, Wood Supply Company<br>• Regional thermoelectric biomass companies<br>• Regional wood pellet companies<br>• Forester<br>• Forest workers<br>• Forestry work contractors<br>• Municipality of Penafiel<br>• Municipality of Paredes<br>• Municipality of Castelo de Paiva<br>• Lagares Parish Council<br>• Sobreira Parish Council<br>• Institute for the Nature Conservation and Forests - Regional Department (ICNF)<br>• S.O.S. Paiva River, Paiva Valley Environmental Association<br>• "Campo Aberto" Environmental Association<br>• Quercus, National Association for Nature Conservation - Regional Delegation |
| Forest fires | • Vale do Sousa Forest Owners' Association (AFVS)<br>• Individual, unorganized forest owners<br>• Atlantic Forest Fund, Real Estate Investment Funds Management Company<br>• Local and regional sawmills<br>• Local and regional timber and fuelwood companies<br>• Madeicampo, Forest Exploitation<br>• Mcruz & Soares, Wood and Firewood Trader<br>• The Navigator Company (pulp and paper industry)<br>• Altri Forest (pulp and paper industry)<br>• Unimadeiras, Production, Trade and Forest Exploitation<br>• Abastena, Wood Supply Company<br>• Regional thermoelectric biomass companies<br>• Regional wood pellet companies<br>• Forester<br>• Forest workers<br>• Forestry work contractors<br>• Municipality of Penafiel<br>• Municipality of Paredes |



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| Interest in | Identified Stakeholder (Organizations)<br>[Name translated into English] |
|---|---|
| | • Municipality of Castelo de Paiva<br>• Lagares Parish Council<br>• Sobreira Parish Council<br>• Institute for the Nature Conservation and Forests - Regional Department (ICNF)<br>• S.O.S. Paiva River, Paiva Valley Environmental Association<br>• "Campo Aberto" Environmental Association<br>• Quercus, National Association for Nature Conservation - Regional Delegation |
| Soils | • Institute for the Nature Conservation and Forests - Regional Department (ICNF)<br>• Municipality of Penafiel<br>• Municipality of Paredes<br>• Municipality of Castelo de Paiva |
| ***Cultural services*** | |
| Outdoor recreation | • Individual hikers<br>• Individual bikers<br>• Individual mountain bikers<br>• Individual motor-cross riders<br>• Individual mountain climbing practitioners<br>• Practitioners of rapell<br>• Individual geocachers<br>• River sports (rafting, hidrospeed, canoeing)<br>• Friends of Pedal Lagares Club (Penafiel)<br>• Sódescidas" Sports Cultural Association " (Penafiel)<br>• "BTTENROS" Sports Association (Penafiel)<br>• "Ases"Penafiel Sports Association<br>• Penafiel Bike Association<br>• Castro Mozinho Mountain Bikers Association (Penafiel)<br>• Penafiel Mountain Bikers Association<br>• Penatrilhos Sports Association (Penafiel)<br>• All-terrain Sports Association (Paredes)<br>• Lagares motor-cross riders Association<br>• J.R.C. Power (Castelo de Paiva)<br>• Beekeepers |
| Aesthetic values | • Vale do Sousa Forest Owners' Association (AFVS)<br>• Individual hikers<br>• Individual bikers<br>• Individual mountain bikers<br>• Individual motor-cross riders<br>• Individual mountain climbing practitioners<br>• Practitioners of rapell<br>• Individual geocachers<br>• River sports (rafting, hidrospeed, canoeing)<br>• Friends of Pedal Lagares Club (Penafiel)<br>• Sódescidas" Sports Cultural Association " (Penafiel)<br>• "BTTENROS" Sports Association (Penafiel)<br>• "Ases"Penafiel Sports Association<br>• Penafiel Bike Association |



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| Interest in | Identified Stakeholder (Organizations)<br>[Name translated into English] |
|---|---|
| | • Castro Mozinho Mountain Bikers Association (Penafiel)<br>• Penafiel Mountain Bikers Association<br>• Penatrilhos Sports Association (Penafiel)<br>• All-terrain Sports Association (Paredes)<br>• Lagares motor-cross riders Association<br>• J.R.C. Power (Castelo de Paiva)<br>• Beekeepers |
| Tourism | • Municipality of Penafiel<br>• Municipality of Paredes<br>• Municipality of Castelo de Paiva<br>• Lagares Parish Council |
| Environmental education | • Sousa Valley Forest Owners Association<br>• Municipality of Penafiel<br>• Municipality of Paredes<br>• Municipality of Castelo de Paiva<br>• S.O.S. Paiva River, Paiva Valley Environmental Association<br>• "Campo Aberto" Environmental Association<br>• Quercus, National Association for Nature Conservation - Regional Delegation |
| Research | • Sousa Valley Forest Owners Association<br>• The Navigator Company<br>• Altri Forest<br>• Atlantic Forest Fund, Real Estate Investment Funds Management Company<br>• Unimadeiras, Production, Trade and Forest Exploitation<br>• Abastena, Wood Supply Company |



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# Appendix 38: Market & civil society actors in Slovak forest politics (national level)

| Identified actors (organizations)<br><br>[in country language] | Identified actors (organizations)<br><br>[English translation] | Website |
|---|---|---|
| ***Market & Civil Society actors*** | | |
| **Forestry** | | |
| • Slovenská lesnícka komora<br>• Rada združení vlastníkov neštátnych lesov Slovenska<br>• Združenie obecných lesov Slovenskej republiky<br>• Únia regionálnych vlastníkov neštátnych lesov Slovenska<br>• Únia diecéznych lesov | • Slovak Forestry Chamber<br>• Council of Non-state Forest Owners Associations in Slovakia<br>• Association of Municipal Forests in Slovakia<br>• Union of Regional Non-state Forest Owners in Slovakia<br>• Union of diocesan forests in Slovakia | • http://www.slsk.sk/<br>• No web<br>• http://www.zolsr.sk/<br>• http://privlesy.sk/<br>• http://www.propopulo-poprad.sk/ |
| **Timber trade and processing** | | |
| • Zväz spracovateľov dreva SR<br>• Zväz celulózo-papierenského priemyslu Slovenskej republiky | • Slovak Association of Wood Processors<br>• Pulp and Paper Industry Federation of Slovak Republic | • http://www.zsdsr.sk/<br>• http://www.paper.sk |
| **Certification** | | |
| • PEFC Slovensko<br>• FSC | • PEFC Slovakia<br>• FSC | • http://www.pefc.sk/<br>• https://ic.fsc.org/en |
| **Hunting, Fishing** | | |
| • Slovenská poľovnícka komora<br>• Slovenský poľovnícky zväz<br>• Slovenský rybársky zväz | • Slovak Hunters Chamber<br>• Slovak Hunting Union<br>• Slovak Fishing Association | • http://www.polovnickako-mora.sk/<br>• http://www.polovnictvo.sk/<br>• http://www.srzrada.sk/ |
| **Agriculture** | | |
| • Zväz poľnohospodárskych družstiev a obchodných spoločností SR<br>• Slovenská poľnohospodárska a potravinárska komora | • Slovak association of agricultural co-operatives and companies<br>• Slovak Agriculture and Food Chamber | • http://www.zpd.sk/<br>• http://www.sppk.sk/index.php?start |
| **Tourism, recreation** | | |
| • Zväz cestovného ruchu SR<br>• Zväz hotelov a reštaurácií Slovenskej Republiky<br>• Klub slovenských turistov<br>• Slovenský cykloklub | • Slovak Association of Tourism<br>• Slovak Association of Hotels and Restaurants<br>• Slovak Club of Tourists<br>• Slovak Bicycle Club | • http://www.zcrsr.sk/<br>• http://www.zhrsr.sk/<br>• http://www.kst.sk/<br>• http://www.cykloklub.sk/ |
| **Water** | | |
| • Slovenský výbor pre hydrológiu | • Slovak Committee for Hydrology | |



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| | | |
|---|---|---|
| • Asociácia vodárenských spoločností<br>• Slovenský priehradný výbor<br><br>**Cultural**<br><br>• UNESCO<br><br>**Employment**<br><br>• Republiková únia zamestnávateľov<br>• Odborový zväz DREVO, LESY VODA<br><br>**Environmental, nature, and landscape conservation**<br><br>• WWF Slovakia<br>• Greenpeace Slovensko<br>• Slovak Committee for the UNESCO Man and Biosphere Programme (MAB) and Biosphere Reserves in Slovakia<br>• Medzinárodná únia na ochranu prírody a prírodných zdrojov<br>• Ochrana dravcov na Slovensku, občianske združenie<br>• Slovenská ornitologická spoločnosť / BirdLife Slovensko<br>• Lesoochranárske zoskupenie VLK<br>• RIEKA – občianske združenie na ochranu vodných tokov<br>• Iniciatíva Za Živé rieky<br>• PRALES, občianske združenie<br>• EKO budúcnosť, občianske združenie<br>• Spoločnosť pre ochranu netopierov na Slovensku<br>• DAPHNE – Inštitút aplikovanej ekológie | • Association of Water Companies<br>• Slovak National Committee on Large Dams<br><br>• UNESCO<br><br>• National Union of Employers<br>• Trade Union WOOD, FORESTS, WATER<br><br>• WWF Slovakia<br>• Greenpeace Slovakia<br>• Slovak Committee for the UNESCO Man and Biosphere Programme (MAB) and Biosphere Reserves in Slovakia<br>• International Union for Conservation of Nature<br>• Raptor protection of Slovakia<br>• Slovak ornithological Society/BirdLife Slovakia<br>• Wolf Forest Protection Movement<br>• RIEKA – civil society for water course protection<br>• Initiative live river<br>• PRALES, civil society<br>• EKO future<br>• Slovak Society for Protection of Bats<br>• DAPHNE | • http://www.ih.savba.sk/ihp/main-page.html<br>• http://www.avssr.sk/<br>• http://www.skcold.sk/<br><br>• UNESCO<br><br>• http://www.ruzsr.sk/<br>• http://www.ozdlv.sk/<br><br>• http://slovakia.panda.org/<br>• http://www.greenpeace.org/slovakia/sk/<br>• http://www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/biosphere-reserves/europe-north-america/slovakia/mab-national-commiteeslovakia/<br>• https://www.iucn.org/<br>• http://www.dravce.sk/<br>• http://www.vtaky.sk/<br>• http://www.wolf.sk/<br>• http://www.ozrieka.sk/<br>• http://zivericky.sk/<br>• http://www.oz-prales.com/<br>• http://eko-buducnost.sk/<br>• http://www.netopiere.sk/<br>• http://www.daphne.sk/ |
| ***Businesses*** | | |
| **Water provision**<br><br>• Veolia Voda Slovensko<br><br>**Renewable energy regeneration**<br><br>• Slovenské elektrárne, a.s. | • Veolia Water Slovakia<br><br>• Slovak power plants | • http://www.veolia.sk/o-nas/veolia-v-slovenskej-republike/veolia-voda<br><br>• https://www.seas.sk/ |



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## Appendix 39: Governmental actors in Slovak forest politics (national level)

| Identified actors (organizations)<br><br>[in country language] | Identified actors (organizations)<br><br>[English translation] | Website | |
|---|---|---|---|
| ***Government*** | | | |
| • Ministerstvo pôdohospodárstva a rozvoja vidieka Slovenskej republiky<br>• Ministerstvo životného prostredia Slovenskej republiky<br>• Ministerstvo obrany Slovenskej republiky<br>• Ministerstvo vnútra Slovenskej republiky<br>• Ministerstvo financií Slovenskej republiky<br>• Ministerstvo hospodárstva Slovenskej republiky<br>• Ministerstvo školstva, vedy, výskumu a športu Slovenskej republiky | • Ministry of Agriculture and Rural Development of the SR<br>• Ministry of Environment of the SR<br>• Ministry of Defense of the SR<br>• Ministry of Interior of the SR<br>• Ministry of Finance of the SR<br>• Ministry of Economy of SR<br>• Ministry of Education, Science, Research and Sport of the SR | • http://www.mpsr.sk/<br>• http://www.minzp.sk/<br>• http://www.mosr.sk/<br>• http://www.minv.sk/<br>• http://www.finance.gov.sk/<br>• http://www.economy.gov.sk/<br>• https://www.minedu.sk/ | • |
| ***Governmental organisations*** | | | |
| **Forestry**<br><br>• LESY Slovenskej republiky, š.p.<br>• Vojenské lesy a majetky SR, š.p.<br>• Štátne lesy TANAPu | • State-owned enterprise Forests of the SR<br>• Military Forests and Estates of the SR<br>• TANAP State Forests | • http://www.lesy.sk<br>• www.vlm.sk<br>• http://www.lesytanap.sk | |
| **Environmental**<br><br>• Štátna ochrana prírody Slovenskej republiky<br>• Slovenská agentúra životného prostredia<br>• Slovenská inšpekcia životného prostredia<br>• Environmentálny fond | • State Nature Protection of Slovak Republic<br>• Slovak Environmental Agency<br>• Slovak Environmental Inspection<br>• Environmental fund | • http://www.sopsr.sk<br>• http://www.sazp.sk<br>• http://www.sizp.sk/<br>• http://www.envirofond.sk/ | |
| **Other**<br><br>• Národné lesnícke centrum<br>• Technická univerzita vo Zvolene<br>• Slovenská agentúra pre cestovný ruch<br>• Slovenský vodohospodársky podnik, š.p.<br>• Vodohospodárska výstavba, š.p. | • National Forest Centre<br>• Technical University in Zvolen<br>• Slovak Tourist Board<br>• Slovak Water Management Company, SOE<br>• Water construction, SOE<br>• State Veterinary and Food Administration of the Slovak Republic | • http://www.nlcsk.sk<br>• www.tuzvo.sk<br>• http://www.sacr.sk<br>• http://www.svp.sk<br>• http://www.vvb.sk/<br>• http://www.svps.sk/<br>• www.spp.sk | |



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| | | | |
|---|---|---|---|
| • Štátna veterinárna a potravinová správa Slovenskej republiky<br>• Slovenský plynárensky priemysel | • Slovak Gas Industry | | |



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## Appendix 40: Interests in different ES in SR (national level)

| **Interest in ecosystem services** |
|---|
| ***Provisioning services*** |
| Wood |
| Mushrooms, Berries |
| Game, Fish |
| Food |
| Medical plants |
| Other(s) |
| ***Supporting services*** |
| Biodiversity |



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| |
|---|
| |
| Habitat for species |
| Other(s) |
| ***Regulating services*** |
| Carbon sequestration |
| Climate regulation |
| Water quality |



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| |
|---|
| Pest control |
| Other(s) |
| ***Cultural services*** |
| Outdoor recreation |
| Aesthetic values |
| Tourism |
| Cultural and national heritage |
| Research in Forestry |
| Education in Forestry |
| Other(s) |

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# Appendix 41: Actors in CSA Podpoľanie

| Stakeholder Category | Identified Stakeholder (Organizations)<br><br>[Name in country language] | Identified Stakeholder (Organizations)<br><br>[Name translated into English] |
|---|---|---|
| ***Market & Civil Society actors*** | | |
| Forest owners | • Združenie vlastníkov spoločenstevných a súkromných lesov BB kraja<br>• Spoočenstvá a súkromné lesy, ktoré nie sú v združeniach | • Association of Community and Private Forests in Banská Bystrica Region<br>• Community and Private Forests that aren't grouped in Associations |
| Recreation | • Klub slovenských turistov<br>  ○ KST Detva<br>  ○ KST Hriňová<br>• Cykloklub Poľana | • Slovak Club of Tourists (SCT)<br>  ○ SCT Detva<br>  ○ SCT Hriňová<br>• Cycling Club Poľana |
| Hunting | • Slovenská poľovnícka komora<br>  ○ Obvodná poľovnícka komora Zvolen<br>  ○ Obvodná poľovnícka komora Detva<br>  ○ Obvodná poľovnícka komora Banská Bystrica<br>• Slovenský poľovnícky zväz<br>  ○ Okresná organizácia Slovenského poľovníckeho zväzu vo Zvolene<br>  ○ Okresná organizácia Slovenského poľovníckeho zväzu v Detve<br>  ○ Okresná organizácia Slovenského poľovníckeho zväzu v Banskej Bystrici<br>• Lokálne poľovné združenia | • Slovak Hunters Chamber<br>  ○ Hunter Chamber District Zvolen<br>  ○ Hunter Chamber District Detva<br>  ○ Hunter Chamber District Banská Bystrica<br>• Slovak Hunting Union (SHU)<br>  ○ District organization of SHU in Zvolen<br>  ○ District organization of SHU in Detva<br>  ○ District organization of SHU in Banská Bystrica<br>• Local Hunting Associations |
| Fishing | • Slovenský rybársky zväz<br>  ○ Mestská organizácia SRZ Zvolen<br>  ○ Mestská organizácia SRZ Banská Bystrica<br>  ○ Mestská organizácia SRZ Lučenec | • Slovak Fishing Association (SFA)<br>  ○ City organization of SFA in Zvolen<br>  ○ City organization of SFA in Banská Bystrica<br>  ○ City organization of SFA in Lučenec |
| Environmental, nature, and landscape conservation | • Priatelia Zeme - CEPA<br>• Podpoľanie nad zlato, OZ<br>• Združenie Slatinka<br>• Občianske združenie PRONATUR | • Earth friends – CEPA<br>• Podpoľanie over Gold<br>• Association Slatinka<br>• Civic Association PRONATUR |
| Other | • Podpoľanie, OZ<br>• Miestna akčná skupina (MAS) Podpoľanie<br>• Miestna akčná skupina (MAS) Hornohrad (rozvoj, ochrana prírody)<br>• Partnerstvo pre rozvoj regiónu Poltár<br>• Koordinačné združenie miest a obcí mikroregiónu Podpoľanie | • Podpoľanie, Civic Association<br>• Local Action Group Podpoľanie<br>• Local Action Group Hornohrad<br>• Patnership for development of the region Poltár<br>• Coordination Association of Municipalities in Micro-Region Podpoľanie |
| ***Businesses*** | | |
| Timber processing | • Lokálne píly a obchodné spoločnosti s drevom | • Local sawmills and timber trade companies |



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| | | |
|---|---|---|
| Renewable energy provision | • AGROSEV, s.r.o. | • AGROSEV, LTD. |
| Water provision | • Stredoslovenská vodárenská prevádzková spoločnosť, a.s. | • Central-Slovakia Water Operating Company, Inc. |
| ***Government and Governmental organizations*** | | |
| Forest management | • Odštepný závod Kriváň, LESY SR, š.p.<br>• Pozemkový a lesný odbor<br>  ○ Okresný úrad Zvolen<br>  ○ Okresný úrad Lučenec | • State enterprise Forests of the Slovak Republic, Branch Kriváň<br>• Cadastral and forest division<br>  ○ District authorities Zvolen<br>  ○ District authorities Lučenec |
| Environmental, nature, and landscape conservation | • Správa CHKO Poľana | • Protected Landscape Area Poľana - the Poľana Biosphere Reserve |
| Water provision | • Slovenský vodohospodársky podnik, š.p., Odštepný závod Banská Bystrica, | • State-owned enterprise Slovak Water Management Company, Branch Banská Bystrica |
| Pest control | • Regionálna veterinárna a potravinová správa (RVPS)<br>  ○ RVPS Zvolen<br>  ○ RVPS Lučenec | • Regional Veterinary and Food Administration (RVFA)<br>  ○ RVFA Zvolen<br>  ○ RVFA Lučenec |
| Cultural | • Podpolianske múzeum Detva | • Museum in Detva |



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# Appendix 42: Actors in CSA *Podpoľanie* (Contacts)

| **Identified Stakeholder (Organizations)**<br><br>**[Name translated into English]** | **Website** |
|---|---|
| ***Market & Civil Society actors*** | |
| • Association of Community and Private Forests in Banská Bystrica County | • http://www.zvsaslbbk.sk/ |
| • Community and Private Forests that aren't grouped in Associations | • No web due lot of involved organisations and persons |
| • Slovak Club of Tourists (SCT)<br>○ SCT Detva<br>○ SCT Hriňová | • http://www.kst.sk/ |
| • Cycling Club Poľana | • http://www.cyklo.sk/ |
| • Slovak Hunters Chamber<br>○ Hunter Chamber District Zvolen<br>○ Hunter Chamber District Detva<br>○ Hunter Chamber District Banská Bystrica | ○ http://www.opkzvolen.sk/<br>○ http://www.opkdt.sk<br>○ http://www.polovnickakomora.sk/spk/kontakty/kraj-bb/opk-bb/4-opk-banska-bystrica.html |
| • Slovak Hunting Union (SHU)<br>○ District organization of SHU in Zvolen<br>○ District organization of SHU in Detva<br>○ District organization of SHU in Banská Bystrica | ○ http://www.spzzv.sk/<br>○ http://spz.polovnictvo.sk/kontakty/oko-rgo<br>○ http://spz.polovnictvo.sk/kontakty/oko-rgo |
| • Local Hunting Associations | • No web due lot of local associations and organisations. Most of them don't have website. |
| • Slovak Fishing Association (SFA)<br>○ City organization of SFA in Zvolen<br>○ City organization of SFA in Banská Bystrica<br>○ City organization of SFA in Lučenec | ○ http://www.srz-zvolen.sk/<br>○ http://www.rybybb.sk/<br>○ http://www.rybarstvonovohradu.sk/ |
| • Slovak association of agricultural cooperatives and companies | • |
| • Slovak Agriculture and Food Chamber (SAFCh)<br>○ SAFCh Zvolen<br>○ SAFCh Lučenec | • |
| • Earth friends – CEPA | • http://cepa.priateliazeme.sk/ |
| • Podpoľanie over Gold | • http://www.podpolanienadzlato.sk/ |
| • Association Slatinka | • http://www.slatinka.sk/ |
| • Civic Association PRONATUR | • http://www.ozpronatur.sk/sk/ |
| • Podpoľanie, Civic Association | • www.podpolanou.sk/ |
| • Local Action Group Podpoľanie | • www.podpolanou.sk/ |
| • Local Action Group Hornohrad | • http://www.mashornohrad.sk/ |
| • Patnership for development of the region Poltár | • http://www.ptpartnerstvo.sk/ |
| • Coordination Association of Municipalities in Micro-Region Podpoľanie | • http://www.detva.sk/?id_menu=63793 |
| ***Businesses*** | |
| • Local sawmills and timber trade companies | • No web due different companies |



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| | |
|---|---|
| • Local agricultural companies | • No web due different companies |
| • AGROSEV, LTD. | • http://www.agrosev.sk/ |
| • Central-Slovakia Water Operating Company, Inc. | • http://www.stvps.sk/ |
| • Gold mining company | • http://www.emed-mining.com/ |
| ***Government and governmental organizations*** | |
| • State-owned enterprise Forests of the SR, Branch Kriváň | • http://www.lesy.sk/showdoc.do?docid=223&id=18 |
| • Cadastral and forest division<br>○ District authorities Zvolen<br>○ District authorities Lučenec | ○ http://www.minv.sk/?pozemkovy-a-lesny-od-bor-50<br>○ http://www.minv.sk/?pozemkovy-a-lesny-od-bor-53 |
| • Protected Landscape Area Poľana - the Poľana Biosphere Reserve | • http://www.chkopolana.eu/ |
| • State-owned enterprise Slovak Water Management Company, Branch Banská Bystrica | • http://www.svp.sk/hron/ |
| • Regional Veterinary and Food Administration (RVFA)<br>○ RVFA Zvolen<br>○ RVFA Lučenec | ○ http://www.svps.sk/zakladne_info/rvps18.asp<br>○ http://www.svps.sk/zakladne_info/rvps20.asp |
| • Museum in Detva | No official web site; info can be found on: http://www.kcdetva.sk/sk/Category/19/Category/23/Podpolianske%20m%C3%BAzeum.proxia |



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## Appendix 43: Actors in CSA *Podpoľanie* interested in different ES

| **Interest in** | **Identified Stakeholder (Organizations)**<br><br>**[Name translated into English]** |
|---|---|
| ***Provisioning services*** | |
| Wood | • Association of Community and Private Forests in Banská Bystrica County<br>• Community Forests unorganized in Associations<br>• Local sawmills and timber trade companies<br>• AGROSEV, LTD.<br>• State-owned enterprise Forests of the SR, Branch Kriváň<br>• Cadastral and forest department<br>• Licensed forest manager<br>• Communal forest owners<br>• Private small scale forest owners<br>• Private large scale forest owners<br>• Forest contractors – workers |
| Mushrooms, Berries | • State-owned enterprise Forests of the SR, Branch Kriváň<br>• Slovak Club of Tourists - Regional Clubs<br>• Individual pickers |
| Game, Fish | • State-owned enterprise Forests of the SR, Branch Kriváň<br>• Slovak Hunters Chamber – District organizations<br>• Slovak Hunting Union - District organizations<br>• Local Hunting Associations<br>• Slovak Fishing Association – City organizations |
| Food | • Slovak association of agricultural cooperatives and companies<br>• Slovak Agriculture and Food Chamber<br>• Local agricultural companies |
| Bullion | • Gold mining company |
| Other(s) | - |
| ***Supporting services*** | |
| Biodiversity | • State-owned enterprise Forests of the SR, Branch Kriváň<br>• Protected Landscape Area Poľana - the Poľana Biosphere Reserve<br>• Earth friends – CEPA<br>• Association Slatinka<br>• Civic Association PRONATUR<br>• Individual nature conservationist |
| Habitat for species | • State-owned enterprise Forests of the SR, Branch Kriváň<br>• Protected Landscape Area Poľana - the Poľana Biosphere Reserve<br>• Association Slatinka<br>• Individual nature conservationist |
| Other(s) | - |
| ***Regulating services*** | |



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| | |
|---|---|
| Carbon sequestration | • State-owned enterprise Forests of the SR, Branch Kriváň<br>• Protected Landscape Area Poľana - the Poľana Biosphere Reserve<br>• Association Slatinka |
| Climate regulation | • State-owned enterprise Forests of the SR, Branch Kriváň<br>• Protected Landscape Area Poľana - the Poľana Biosphere Reserve |
| Water quality | • State-owned enterprise Forests of the SR, Branch Kriváň<br>• Protected Landscape Area Poľana - the Poľana Biosphere Reserve<br>• State-owned enterprise Slovak Water Management Company, Branch Banská Bystrica<br>• Central-Slovakia Water Operating Company, Inc.<br>• Association Slatinka<br>• Local citizens |
| Pest control | • State-owned enterprise Forests of the SR, Branch Kriváň<br>• Protected Landscape Area Poľana - the Poľana Biosphere Reserve<br>• Regional Veterinary and Food Administration<br>• Individual unorganized small scale forest owners<br>• Individual unorganized large scale forest owners |
| Other(s) | - |
| ***Cultural services*** | |
| Outdoor recreation | • Slovak Club of Tourists - Regional Clubs<br>• Cycling Club Poľana<br>• Civic Association PRONATUR<br>• Individual hikers<br>• Individual bikers and mountain bikers<br>• Individual moto-cross bikers and off-roud vehicle drivers |
| Aesthetic values | • Slovak Club of Tourists - Regional Clubs<br>• Cycling Club Poľana<br>• Association Slatinka<br>• Individual hikers<br>• Individual bikers and mountain bikers |
| Tourism | • Slovak Club of Tourists - Regional Clubs<br>• Cycling Club Poľana<br>• Civic Association PRONATUR |
| Other(s) | - |



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## Appendix 44: Organization of actors according to their interests for ecosystem services (Turkey, national level)

| Interest in | Identified Stakeholder (Organizations) [Name in country language] | Identified Stakeholder (Organizations) [Name in English] | Website/physical address. |
|---|---|---|---|
| ***Provisioning services*** | | | |
| Wood | • Orman Genel Müdürlüğü<br>• Gölcük İşletme Müdürlüğü<br>• Kastamonu Entegre<br>• ORKOOP: Orman Kooperatifleri Merkez Birliği<br>• Orman Mühendisleri Odası | • General Directorate of Forestry<br>• Gölcük State forest Industry<br>• Kastamonu Integrated<br>• ORKOOP: Associations of forestry cooperatives<br>• Chambers of Forest Engineers | • ogm.gov.tr<br>• sakaryaobm.ogm.gov.tr/Sayfalar/isletmeler/ GolcukIslMud.aspx<br>• kastamonuentere.com.tr<br>• orkoop.org.tr<br>• ormuh.org.tr |
| Mushrooms | • | • | • |
| Berries | • | • | • |
| Game | • **Sakarya** avcılar kulübü derneği | • **Sakarya** hunters club | • **sakarya-**vcilarkulubudernegi.com/ |
| Medical plants | • Ege İhracatçılar birliği | • Aegean Export associations | • Egebirlik.com.tr |
| ***Supporting services*** | | | |
| Biodiversity | • Orman Genel Müdürlüğü<br>• Doğa Koruma ve Milli Parklar Genel Müdürlüğü<br>• Doğa Koruma Merkezi<br>• WWF Türkiye<br>• Orman Mühendisleri Odası | • General Directorate of Forestry<br>• General Directorate of National Parks and Nature Protection<br>• Nature Conservation Center<br>• WWF Turkey<br>• Chambers of Forest Eng | • Ogm.gov.tr<br>• Dkmpgm.gov.tr<br>• Dkm.com.tr<br>• Wwfturkey.org<br>• Ormuh.org.tr |
| Habitat for species | • Orman Genel Müdürlüğü<br>• Doğa Koruma ve Milli Parklar Genel Müdürlüğü<br>• Doğa Koruma Merkezi<br>• WWF Türkiye | • General Directorate of Forestry<br>• General Directorate of National Parks and Nature Protection<br>• Nature Conservation Center<br>• WWF Turkey | • Ogm.gov.tr<br>• Dkmpgm.gov.tr<br>• Dkm.com.tr<br>• Wwfturkey.org |
| ***Regulating services*** | | | |
| Carbon sequestration | • Orman Genel Müdürlüğü<br>• Enerji ve Tabii Kaynaklar Bakanlığı | • General Directorate of Forestry<br>Ministry of Energy and Natural Resources | • Ogm.gov.tr<br>• enerji.gov.tr/en-US/Mainpage |
| Climate regulation | • Orman Genel Müdürlüğü<br>• Enerji ve Tabii Kaynaklar Bakanlığı | • General Directorate of Forestry<br>Ministry of Energy and Natural Resources | • Ogm.gov.tr<br>• enerji.gov.tr/en-US/Mainpage |
| Water quality | • Devlet Su İşleri GM<br>• OGM | • GD of State Water Works<br>• GDF | • Dsi.gov.tr<br>• Ogm.gov.tr |
| Pest control | • Orman Genel Müdürlüğü<br>• Tarım İşletmeleri GM | • General Directorate of Forestry<br>• GD of Agricultural Management | • Ogm.gov.tr<br>• Tigem.gov.tr |
| Soil protection | • Orman Genel Müdürlüğü<br>• TEMA: Türkiye erozyonla mücadele ağaçlandırma ve doğal varlıkları koruma vakfı | • General Directorate of Forestry<br>• The Turkish foundation for combating soil erosion for reforestation and the protection of natural habitats | • Ogm.gov.tr<br>• Tema.org.tr<br>• |
| ***Cultural services*** | | | |
| Outdoor recreation | • Orman Genel Müdürlüğü | • General Directorate of Forestry | • Ogm.gov.tr |
| Aesthetic values | • Kültür Varlıkları ve Müzeler GM | • GD of Cultural Heritage and Museum | • Kvmgm.kultur.gov.tr |
| Tourism | • Kültür Varlıkları ve Müzeler GM | • GD of Cultural Heritage and Museum | • Kvmgm.kultur.gov.tr |



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