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ARANGE Deliverable D3.1

Policy framework as related to multifunctional mountain forest management

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Abstract:

Deliverable D3.1 is concerned with the identification and analysis of policies related to multifunctional mountain forest management. The deliverable is divided into two sub-tasks. WP3 Task 3.1.1 – macro-level policy framework – looked at European and international policies. Its aim was to collect and evaluate data from all trans- and international policies relevant to forest policies in mountain areas. The macro-level policy analysis utilised the ARANGE Forest Policy Database that contains legislation and policy documents that relates directly to forests, forest management and the mountain landscape. WP3 Task 3.1.2 – micro-level policy framework – analysed national policies. The analysis was based on Guidelines for national policy reports– National policy template (MS9). National policy reports were elaborated by each case country covered by the ARANGE project. All reports were compared and analysed, and the results from the micro-level analysis represents the second part of this deliverable.

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1 INTRODUCTION

International awareness of mountain forests and their relevance for the global ecosystem has been gradually increasing in the past decades, especially since the Rio Earth Summit in 1992 (Price et al. 2011). Forests are a key component of this image and cover a large proportion of the mountain landscape, which in turn contributes to the natural (and human-made) diversity of the mountain areas, particularly in terms of species, productivity, ownership, socio-economic trends and environmental conditions. On the one hand, mountain forests (in comparison to lowland forests) are usually characterized by a better-preserved biological diversity, higher importance for water management and soil protection, recreation, hunting and other ecosystem services (ES)[1]. On the other hand, mountain forests have specific problems related primarily to their management and/or common natural hazards. Mountain areas in Europe benefit significantly from forests as they help to prevent natural events, such as avalanches, landslides and mudflows. Forests also help to protect against gravitational hazards (e.g. roads, settlements and agricultural land), as well as, provide a range of key ecosystem services (e.g. timber production, carbon sequestration and nature conservation) that generate a source of income from timber and nature-based tourism for local communities in mountain areas.

Given the range of functions and services provided for by forests in mountain areas it is necessary to evaluate them properly, not only to make decisions as regards their management but also to consider future developments. To this purpose it is necessary to consider the policy frameworks that currently have an impact on how forests and mountains are managed. To illustrate, climate change is seen as a threat to the health of mountain forests (Kelemen et al. 2009), but to understand what is being done to mitigate or adapt to these expected changes, we need understand what policies are in place at the micro- and macro-level. This deliverable will consequently review relevant policy frameworks from the EU (macro) to the national-level (micro).

The analysis of the macro-level policy framework will focus on the international and European policy level and the research is based on the ARANGE Forest Policy Database. The database was compiled for this purpose and is foreseen to also provide an important tool for future research aimed at mountain forests and ecosystem services. The database provides a detailed list of relevant policy documents mainly from the EU-level. These have been divided according to pre-selected types of ecosystem services (timber production, protection against gravitation hazards,

[1] Ecosystem services (ES)- in the ARANGE context mean *the benefits that human obtain from forest ecosystems in mountain areas*, but in the various policy papers a variety of partly synonymous terms are used (e.g. forest functions, externalities, non-marketed services). European Environmental Agency divides ecosystem services in to 3 main groups: provisioning (e.g. timber, fresh water, fuel wood), regulating (e.g. climate regulation, hazard regulation), and cultural (recreation and aesthetic). Millennium Ecosystem Assessment includes also Supporting ES (underpin all services e.g. nutrient cycling).

carbon sequestration and nature conservation), types of policy documents and the institutions that issued the policy document, etc. This has enabled the analysis of international and EU-level policies having an impact on forests and ecosystem services in mountain areas.

The analysis of the micro-level policy framework focus on the implementation policy measures at the national level in selected case study countries (Austria, Bulgaria, France, Slovenia, Slovakia, Spain, and Sweden). It is based on the analysis of existing top-down instruments in different sectors (e.g. environment, agriculture, nature conservation, energy and forestry) influencing the case study countries. The analysis primarily focused on the implementation measures of the corresponding EU-level policies and their targets towards ecosystem services at regional and national level, as well as, other country-specific mountain forest instruments.

The review of macro- to micro-level policy instruments provide the basis for understanding:

- the coherence between policies having an impact on mountain forests and the provision of ecosystem services,
- potential conflicts and/or solutions between the policy areas affecting mountain areas, and
- recommendations for solving and/or addressing possible trade-offs between policy targets affecting mountain areas.

2 MACRO-LEVEL POLICY FRAMEWORK

2.1 European Mountain Areas

Climate change, land abandonment and rural depopulation are just some of the drivers that are changing the European mountain landscape today. European mountains are also characterised by a natural diversity, and a range of issues that make them particularly susceptible to environmental and land management. This is especially apparent when considering the huge area encompassed by the European Union (EU) and the range of policy-making instruments, from the micro to macro-level, having an impact on how mountains are managed. It highlights the importance of policy as regards mountain areas at the EU-level.

Based on the social, environmental and economic importance of mountain areas, most countries do in fact have some form of mountain policy. There are however, as demonstrated by the national reports (see section 3), significant variations from country to country. The great diversity that can be found between national mountain policies (and even how mountains are defined) on the micro-level is made more complex due to its interaction (horizontally and vertically) with other policy areas, such as rural and agricultural policy at the EU-level. This complexity provides one incentive for gaining additional insights into the European and international instruments and tools that are affecting our mountain landscapes. The focus of this part of the deliverable will therefore be on the macro-level, namely, to give an overview of international and European policies affecting mountain areas.

Interlinked with the mountain landscape (and its policies) are issues concerned with mountain forests. At present, there is no legal basis in the EU treaty for a common forest policy. Forest policy at the EU-level is therefore characterized by a paradox. On the one hand, from a legal perspective, the EU does not provide a common forest policy. This is due to an exclusion of forest products, with the exception of cork and some forest-related fruits, from the existing EU laws on common policies. The formulation and implementation of forest policy is therefore subject to the principle of subsidiarity and under the competence of Member States. On the other hand, there is a long history of EU-level actions concerned with the support of forest management and monitoring measures. The picture is furthermore more complex due to forest issues being dealt with by several distinct sectors (e.g. agriculture and energy). There is also a recent history of comprehensive, but soft approaches, to forest policy based on coordination and communication (Pelli et al., 2012).

With this complexity in mind, as regards geographical and policy diversity, it becomes clear that there is a wide range of instruments and tools that may affect European mountain areas and mountain forest management. These vary significantly, in part, due to the lack of a common forest policy as well as the institutional setting at the EU-level that coordinates and creates

policy coherence (Vogelpohl and Aggestam, 2011). It will therefore be of relevance to introduce the different policy areas and sectors that touch upon mountain and forest policy, to complement the picture we will get through the micro-case analysis. In the following section we will therefore introduce a macro-level analysis of European (and international) policy supporting mountain areas and forests. The intent is to provide a short introduction to relevant policies. We conclude with a short assessment of the policy framework affecting mountain areas and forests. It is foreseen that this section will complement the micro-level case studies that are part of WP3 and the ARANGE project. The aim of this deliverable is also to present the ARANGE Forest Policy Database, a product developed in connection to the policy analysis. The database is particularly relevant as it is necessary to continue to improve our knowledge of mountain areas through continued policy research in the future, a task for which the database may be useful.

2.2 Method for Macro-level policy analysis

The methodology applied can be found in the "ARANGE Guideline for WP3 - Micro-level policy analysis" (see Annex I). Some changes were made to the original approach and these will be presented below. The forest policy database will be presented first, followed by the methodological changes applied. Some considerations as to the suitability of the chosen approach will also be considered in the results and analysis section.

2.2.1 Forest Policy Database

A Forest Policy Database was developed within the context of WP3.1.1 of the ARANGE project. The database contains legislation and policy documents that relates directly to forests, forest management and the mountain landscape. The database was based on previous experiences gained during the development of a policy database for the FP6 - EFORWOOD project.[2] The content of the EFORWOOD database has also been integrated into the current structure. The purpose of this section is to document the development of the forest policy database for policies relevant to mountain forestry and the aim of the ARANGE project. A brief introduction will be given to the structure and content of the database.

[2] See http://87.192.2.62/eforwood/default.aspx

2.2.2 Developing a policy database for the forest research community

The policy database was originally not foreseen as a product (nor as a deliverable) of WP3.1.1. It was developed as a tool for the analysis of EU and international policies affecting mountain forest management. Given its practical applicability, it was however decided to present and integrate the database within this deliverable. The ARANGE Forest Policy Database (see Figure 1) can now be found under http://policydatabase.boku.ac.at. To gain full access requires registration and approval from the website administrator, but it is foreseen to be open-access once it is fully operational.

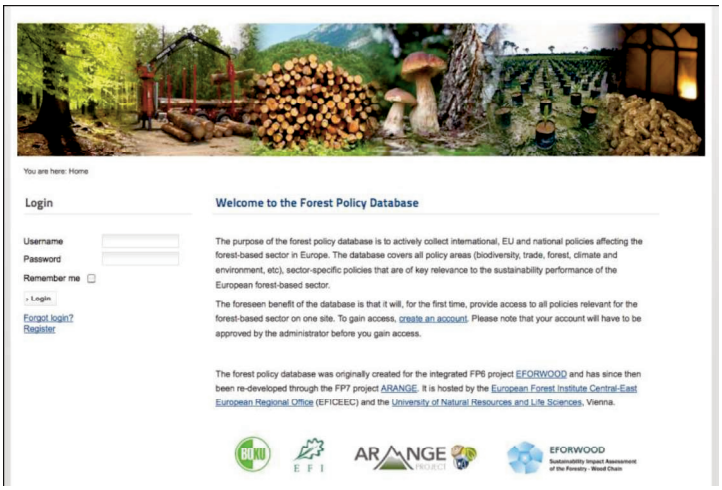

Figure 1 ARANGE Forest Policy Database

The database has identified and included relevant policy documents based on the European and international institutional background affecting the forest policy area, and analysed with a view to determine their impact on mountain areas.

The elements included under the available policy databases (EFORWOOD and ARANGE) are as follows: (1) List of Policies (2) Browse Database, (3) Add Policies and (4) Edit Policies. Section 1 provides the user with a basic list of all polices included (see Figure 2), which also provide some basic information on the policy document itself (e.g. type of policy, year and status). Section 2 enables the user to segment the database according to the criteria applied for the policy analysis (see the ARANGE guideline for WP3 for more information). Section 3 and 4 allow users to upload relevant new polices and to edit the information available on each policy document.

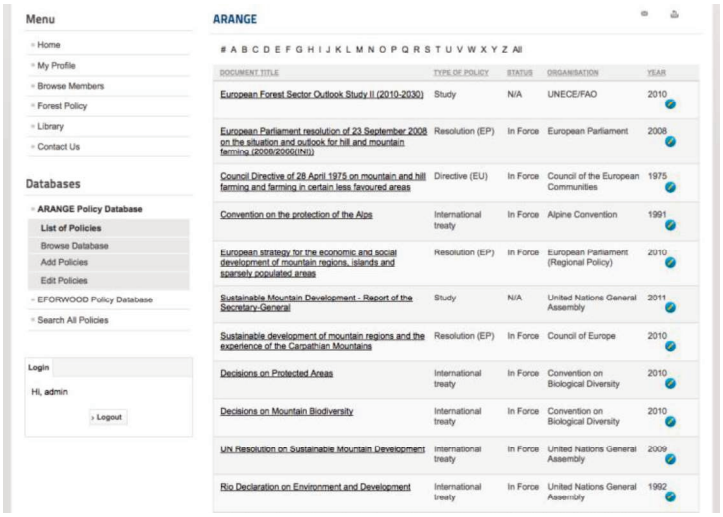

Figure 2 Example of a list of policies in the database

More information on the structure and content of the database is further presented and discussed in documentation available on the website. This can be found under the "Library" section. For more information on how to access the ARANGE Forest Policy Database you can also contact the administrator directly.[3]

2.2.3 Data source

All policy documents relevant to European forests have been identified and analysed with a view to determine their relevance to the mountain landscape and the provision of key ecosystem services (timber production, carbon sequestration, nature conservation and the protection against gravitational hazards) by mountainous regions.

The following sources were used to collect information on European and international policies and legislation:

- Official EU websites were used to identify EU-level policy documents, especially the "EUR-Lex",[4] "Summaries of EU legislation"[5] and "European Parliament Legislative

[3] Contact filip.aggestam@boku.ac.at or visit http://policydatabase.boku.ac.at for additional information.
[4] See http://eur-lex.europa.eu.
[5] See http://europa.eu/legislation_summaries/index_en.htm.

observatory"[6] websites were utilised. Directorates-Generals (DGs) were also screened to identify policy documents relevant to mountain forests

- For international conventions, applicable to the European context, policy documents were identified by screening relevant organisations and institutes, such as the Ministerial Conference on the Protection of Forests in Europe and the United Nations Forum on Forests, etc. Websites, such as the United Nations Treaties collection[7], were also utilised to search for relevant policies.

The reader is referred to more information available on the ARANGE Forest Policy Database website, particularly as regards to any changes and updates done to the database since this deliverable was published.

2.2.4 Classification of relevance of policy documents

The policies in the database were classified in order to tell something about the relevance they have for mountain forest management and the provision of ecosystem services (ES) in mountainous regions. In short, to identify all relevant issues, a two step-approach was applied, namely: (1) specification of the important ES and relevant policies, and (2) specification of policy instruments and description of relevant measures.

To determine the relevancy of the documents and instruments for mountain areas, the following questions were asked: (1) Is the issue of mountain forest management occupying any position within the policy document? (2) Is the topic of the ES occupying any position within the policy document? (3) Are there any instruments/measures concerned with mountain forest management and/or ES described within the policy document? By answering these questions it was possible to identify and rank the connection between policy instruments, mountain forest management and/or the provision of ES. The relevance of the linkage between the policy and ES will be classified as 1 (low), 2 (medium) and 3 (high). These scores signify the relevance of the linkage between a policy and mountain forest management, as well as ecosystem services, from low to high. It provides a simple approach to rank the connection between policy and the management of mountain areas. However, a low score does not need to mean irrelevance, as all the policy documents in the policy database have been judged to have some degree of relevance for mountain areas.

One adjustment was made to the original methodology. More specifically, this change concerns the first question referring to whether the policy document covered mountain forest

[6] See http://www.europarl.europa.eu/oeil/home/home.do
[7] See http://treaties.un.org/

management. As was discovered, almost no policy document actually defines or even mentions mountain forest management specifically. To address this issue, an additional ranking of 1 to 3 was applied to this question. "1" corresponds to natural resource management (in a broader sense) being mentioned, "2" corresponds to forest management being mentioned, and "3" corresponds to mountain forest management being mentioned. This has some impact on how the results are reported in terms of the linkage and relevance between the policy and ES in the following sections.

The methodology applied (for the micro as well as macro analysis) can be found described in more detail in the ARANGE Guideline for WP3 - policy analysis (see Annex I).

2.3 Macro-level policy results and analysis

2.3.1 Methodological changes and considerations

The first issue that had to be addressed as regards the methodological approach was the variation of terms referring to natural resources management. For example, question 1 (see section 2.2.4) asks whether mountain forest management occupy any position within the policy document. As was found, there was in fact only one policy document that actually mentions the term "mountain forest management" directly. Adjustments had accordingly to be made to accommodate for this lack of "mountain forest management" and the variation in terms. This was achieved by changing the relevance scores to 1 to 5, rather than 1 to 3. More specifically, if the document only mentions natural resources management (or some variation thereof) one point was assigned, if it mentions forest management two points were assigned, and if it mentions mountain forest management, 3 points were assigned. In addition, all policy documents were distinguished according to three categories, based on whether mountains or forests were mentioned in the document, or not mentioned at all.

A second issue that came up during the analysis concerns how to determine actual relevance. For instance, when asking whether ecosystem services occupy a central position in a policy document, being such a widely used term today, it becomes clear that nearly all policy documents that relate to the environment mentions ecosystems or conservation in one way or another. As such, all questions would have benefited from the type of ranking process that was applied to question 1, to better indicate the variations that actually exist within the database.

A third, and final, issue that came up is that a range of policy documents that are important to mountain areas (e.g. the recent "European strategy for the economic and social development of mountain regions, islands and sparsely populated areas" or the "Protocol on the implementation of the Alpine Convention") do not always mention key terms that would have labelled them as relevant under the current methodological approach. For example, the term "ecosystem

services" – covered by question 2 – is a relatively new term as regards to its use in policy documents, and it will most often be absent in Conventions that are more than 10-15 years old. Also policy documents that deal exclusively with mountain-related issues would not necessarily deal with forest-related issues. All these issues affect the relevance score attached to the document.

2.3.2 ARANGE Policy Database

175 policy documents were reviewed and included in the ARANGE Policy Database. 9 were excluded from the analysis as having no relevance. From the 166 documents that were analysed, there were 40 documents that did not mention mountains or forests. They were nonetheless not excluded as they have some indirect relevance, such as, agricultural policies.

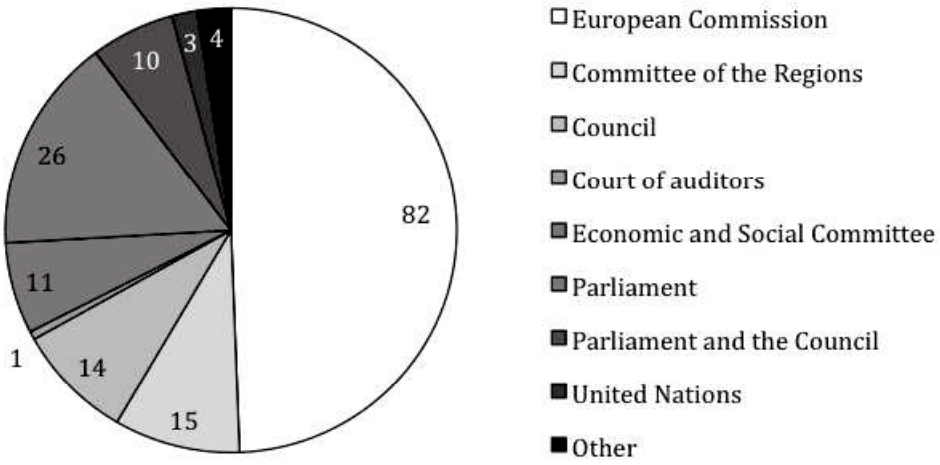

Figure 3 Organisations and institutions

As can be seen from Figure 3, a majority of all policy documents included for analysis were issued, directly or indirectly, by the European Commission (approximately 49%). As for time range, the earliest policy document in the database is from 1975. Most documents are however within the last 10 year period (79.5%).

Table 1 Types of policies in the ARANGE policy database

	Types of policy	No.		Types of policy	No.
Legislative and Regulatory instruments	Regulations	35	*Communication and Information-Based*	Communications	28
	Resolutions	27		Other*	11
	Opinions	25		Green Papers	4
	Proposals	14		Reports	4
	Decisions	6			
	Directives	5			
	International treaties	5			
	White Papers	2			

* Consist of working documents, common positions, corrigenda and community guidelines.

Table 1 demonstrates that a majority of the reviewed documents are legislative or regulatory policy documents (72%), while the remaining articles are communication and information-based documents (28%). No economic and fiscal instruments were distinguished at this level as this will be covered by the instruments noted in the policy documents themselves (see Figure 5 Word cloud on relevant instruments and measures for mountain areas and forests (produced using WordItOut with data from the policy database).

Many of the policy documents do however refer directly to economic and fiscal instruments, such as, Common Agricultural Policy (CAP) or the European Agricultural Fund for Rural Development (EAFRD) at the EU-level.

Out of the 166 policy documents included in the analysis, nature conservation is the most noted type of ecosystem services (ES), mentioned in 62% of all documents (see

Table 2). This was followed by protection-based ES, such as, against gravitational hazards, in 51.2% of all the documents. The least noted ES were those related to carbon sequestration (32.1%) and timber production (20.2%). There is, in general, no significant difference between the types of ES mentioned and types of policy documents. It was expected that communication-based documents may cover various ES more freely, but this cannot be substantiated from the selected set of policy documents. The only exception is for regulations that hardly seem to mention any of the key ES. This, however, may be due to their low relevance (see Table 3) as regards mountains and forests.

Table 2 Types of ecosystem services covered

Type of policy	Nature conservation		Protection against gravitational hazards		Carbon sequestration		Timber production	
	No.	*% tot.*	*No.*	*% tot.*	*No.*	*% tot.*	*No.*	*% tot.*
Communications	20	71.4	8	28.6	15	53.6	8	28.6
Others	7	63.6	4	36.4	0	0	3	27.3
Green Papers	2	50	4	100	4	80	2	50
Reports	3	75	3	75	1	16.7	2	50
Regulations	1	2.9	1	2.9	0	0	3	8.6
Resolutions	17	63	14	51.9	14	51.9	6	22.2
Opinions	19	76	10	40	7	50	4	16
Proposals	12	85.7	7	50	4	11.4	0	0
Decisions	4	66.7	3	50	0	0	0	0
Directives	4	80	3	60	1	4	2	40
International treaties	3	60	1	20	2	18.2	0	0
White Papers	1	50	2	100	2	100	0	0
Mean	**7.8**	**62%**	**5**	**51.2%**	**4.2**	**32.1%**	**2.5**	**20.2%**

For the relevance of the policy documents, the original approach was to assign a 1 (low) to 3 (high) relevance score based on three questions (for more details, see sections 2.2.4 and 2.3.1 on methodological changes) representing 1 point each. This was changed to a 1 to 5 score to better reflect the variation in the terms applied for natural resources management. From the initial categorisation, which relates to whether the policy mentions mountain(s) or forest(s), 22 documents were classified as having no relevance (not mentioning any of the key terms), 45 documents were relevant only as regards forests and/or forest management. The only policy document that actually mentions "mountain forest management" is the Carpathian Convention. Remaining documents most often noted variations of natural resources management (56 documents or 34% of total), while some noted (sustainable) forest management directly (30 documents or 18% of total). 34 documents (20.5%) were relevant only as regards mountains, while 60 documents (36%) mentioned both mountains and forests. Based on the questions posed for each document, it was possible to exclude an additional 27 policy documents (16%) across the three categories as having no relevance (see Figure 4).

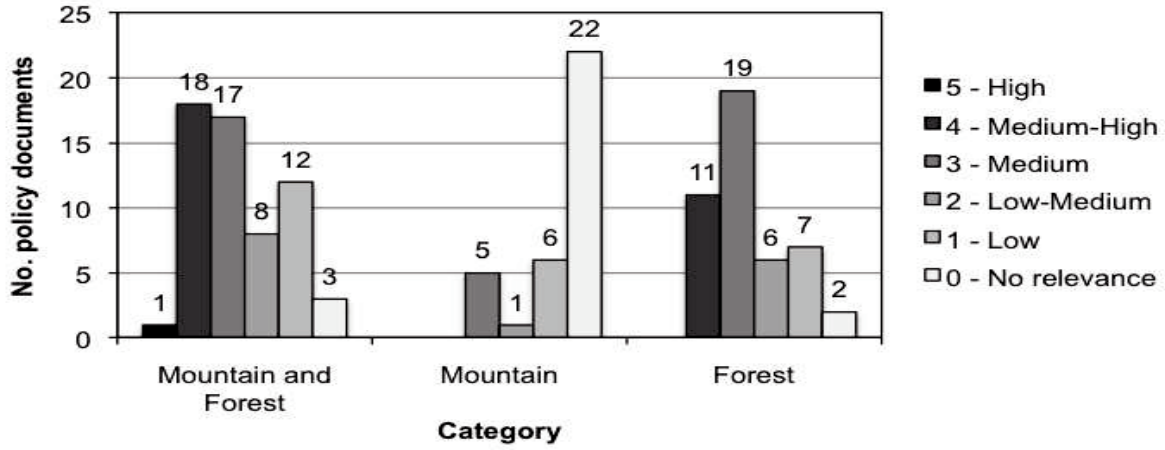

Figure 4 Relevance across categories

Table 3 shows the assigned relevance according to policy types. Several of the legislative and regulatory policy documents, in this case the Decisions, Directives and Regulations, have a rather low relevance (mostly low to low-medium). With the exception of a few relevant resolutions (primarily on hill and mountain farming, climate change and rural development) and international treaties (Alpine convention and Carpathian Convention), a majority of the relevant (medium to high) policy documents are in fact communication and information-based. This is rather indicative of the European forest sector as a whole (primarily due to the lack of a common forest policy) as well as policies concerned with mountain areas.

Table 3 Relevance across policy types

Type of policy	Low		Low-Medium		Medium		Medium-High		High	
	No.	*% tot.*	*No.*	*% tot.*	*No.*	*% tot.*	*No.*	*% tot.*	*No.*	*% tot.*
Communications	1	4.5	3	13.6	11	50	7	31.8		
Decisions	3	50	2	33.3			1	16.7		
Directives	2	66.7	1	33.3						
Green Papers					1	25	3	75		
International treaties					4	80			1	20*
Opinions	2	11.1	3	16.7	10	55.6	3	16.7		
Other	4	66.7	1	16.7	1	16.7				
Proposals			4	40	2	20	4	40		
Regulations	8	88.9				0	1	11.1		
Reports	1	25			3	75				
Resolutions	4	17.4	2	8.7	8	34.8	9	39.1		
White Papers					2	100				

* Mountain forest management is only mentioned directly in the Carpathian Convention.

Finally, all the policy documents in the database were screened for instruments and measures. To be included, the policy had to either mention forests or mountains (preferably both). This represented 139 documents (approximately 82%) of the complete database, the rest was deemed as having a low relevance and were excluded when screened for relevant instruments and measures.

Figure 5 Word cloud on relevant instruments and measures for mountain areas and forests (produced using WordItOut[8] with data from the policy database).

From the list of instruments and measures that has a relevance for forest management and mountain areas (see Figure 5) the most commonly noted (by far) were financing of forestry measures through the CAP and European Agricultural Fund for Rural Development (EAFRD) – financing INTEREG for regional cooperation – and NATURA 2000 for nature conservation in mountain areas and less-favoured areas. The EU Forest Action Plan (FAP), the Forest Law Enforcement, Governance and Trade (FLEGT)[9] Action Plan of the EU and the EU Emissions Trading System (EU ETS) were commonly noted in forest- and energy-related policies. In nature conservation oriented policies the Habitats and Birds Directive, as well as, the Water Frameworks Directive (WFD) were often mentioned. Also the Alpine Convention and the

[8] See http://worditout.com/
[9] See http://www.euflegt.efi.int/portal.

Convention on Biological Diversity (CBD) were commonly brought up in terms of protection of the environment and biodiversity.

2.4 Policies affecting mountain areas in Europe

Disregarding open-issues concerned with how mountain areas should be characterised or defined, at the international and EU-level, several policy instruments and measures (as noted in the results above) can be found to have a direct impact on the European mountain landscape. Some of these instruments include the CAP, which provides compensation to less-favoured areas, agricultural and environmental measures, as well as, providing a market for products from mountain areas. Other examples are initiatives concerned with rural development and cross-border, transnational and inter-regional cooperation, such as, the INTERREG IV (covering the period 2007–2013) aiming to stimulate cooperation between regions in the EU, and LEADER, aiming to supports rural actors to consider the potential of their region. Also forestry policies have a significant impact on the mountain landscape, such as the EU Forestry Strategy and the EU FAP, that were concluded in 2012. For example, under the general principle of multifunctionality put forward by the Strategy, forests in mountains are seen as mainly having a protective role. This may mean that mountain forest areas are increasingly managed with specific objectives in mind. Another important area would be the Directives on water, habitats, birds and soil that are linked to a common environmental policy between all EU Member States. Also the importance that cohesion policy and research and technological development policy do (and can) play for communities in mountain areas became clear. For example, the territorial aspects of EU cohesion policy requires that particular attention be paid to areas with natural handicaps, as such, more support is provided to areas with particular development difficulties, such as mountain areas.

All the above-given examples of policy instruments (noted throughout the analysed policy documents) illustrate some of the complexity that characterise European mountain regions and forest policy. The European mountains are effectively influenced by a number of sectors, ranging from agriculture to nature conservation to energy and tourism. An attempt will therefore be made to distinguish between some of these sectors and topics in the subsequent section, with a particular emphasis on recent policy developments and how they may affect mountain forests (see section 2.5). However, the results and examples also demonstrate that Europe currently lacks an integrated and flexible policy framework for dealing with mountain regions. The aim is therefore to provide some background information on specific polices (or policy areas) that are important for the European mountain landscape.

2.4.1 Alpine Convention

The Alps form the largest mountain range in Europe, in terms of population, countries and geographical area. With this in mind, the importance of having a Convention that can address the special demands of this region is clear. The Convention on the Protection of the Alps (Alpine Convention)[10] entered into force in 1995 and provides a common policy for the Alpine region, applying the principles of sustainable development. It tries to balance the environmental needs with socio-economic needs of the communities living in the Alpine region. Concrete measures and goals of the Alpine Convention are described in 10 different Protocols. Having ratified the Convention, the EU (and its Member States) is committed to fulfil the Alpine Convention. In fact, the EU has signed and ratified 5 Protocols (on tourism, soil conservation, mountain farming and energy), while the Protocols on Spatial Planning and Sustainable Development, on Mountain Agriculture, and on Nature protection have only been signed (in 1994). In contrast, the Protocols on Mountain Forests and on Dispute settlement are not signed. The signed Protocols do seemingly fit within the framework of the EU's common environmental policy, while the Protocols that are not yet signed may be indicative of the sectors for which the EU has a no common policy.

2.4.2 Carpathian Convention

The Carpathians, as another of Europe's largest mountain ranges, set the stage for a regional Convention covering this region. The Framework Convention on the Protection and Sustainable Development of the Carpathians (Carpathian Convention)[11] entered into force in 2006. Aside from the Alpine Convention, it is the only policy instrument covering the whole of the Carpathian area and it provides a regime for the protection and sustainable development of the Carpathians. The Convention provides a framework for cooperation and policy coordination, a platform for joint strategies on sustainable development, as well as, a forum for dialogue between all stakeholders. Similarly to the Alpine Convention, the most important means to express concrete measures and goals of the Convention are through 3 different Protocols, namely, on Conservation and Sustainable Use of Biological and Landscape Diversity, on Sustainable Forest Management, and on Sustainable Tourism.

[10] See http://www.alpconv.org/
[11] See http://www.carpathianconvention.org.

2.4.3 Cohesion Policy

For the mountain landscape, cohesion policy (as amended by the Treaty of Lisbon) identifies mountain areas as suffering from significant handicaps while also having an inherent significant diversity. It is thus supported through regional funding programmes at the EU-level that will be operational until 2013 (e.g. financed by the European Regional Development Fund). There are ongoing discussions in the EP, the Council and the Committee of Regions as regards to the cohesion policy reform for the 2014-2020 period and the Commission adopted a legislative proposal for cohesion policy in 2011 for the next period. It is now awaiting discussion and approval by the EP and Council. This discussion is however linked to the wider context of the EU budget as well as the Europe 2020 strategy, which is reflected in a range of policy documents, such as, the "*Green Papers on Territorial Cohesion - Turning territorial diversity into strength*", the "*Sixth Progress Report on Economic and Social Cohesion*" and the Commission communication "*Cohesion policy: Strategic Report 2010 on the implementation of the programmes 2007-2013*". Developments affecting the cohesion policy will have an impact on mountain areas and it is foreseen that the structural funds and strategy to support mountain areas (e.g. financial instruments set up at EU-level) will be changed by 2014.

2.4.4 Institutional opinions and reports

There are several opinions and reports issued by institutions with political significance. Some refer directly to mountains, while a majority relates indirectly. Examples of this is the opinion of the European Economic and Social Committee on the "*Green Paper on Forest Protection and Information in the EU: Preparing for Climate Change*" in 2010, or more specifically on mountain areas, "*The future outlook for agriculture in areas with specific natural handicaps (upland, island and outermost areas)*" in 2006 or its opinion on "*A policy for upland areas*" in 1998. Alternatively the opinions of the Committee of the Regions, such as its "*Own-initiative opinion of the Committee of the Regions on forest policy: the 20/20/20 targets*" in 2010 concern mountain forests while its opinion on the "*European Charter on mountain areas*" in 1996 and on "*A policy for upland agriculture in Europe*" in 1997 concern mountain areas directly. The Committee has also released relevant reports, such as its report on "*Community action for mountain areas*" in 2003. Other examples of reports that are relevant for European mountain areas are the Committee on Agriculture and Rural Development report on "*25 years' application of Community legislation for hill and mountain farming*" in 2001 or on "*A new strategy of mountain regions*" in 1998.

This list of opinions and reports is far from complete, but the purpose here is not to provide an exhaustive list, it is rather to illustrate the importance that certain institutions can have in political and technical terms, especially for mountain regions. In addition, many of the issued documents have called for a specific regulation (or directive) for mountain areas (aside from the legislation on hill and mountain farming), but without great success. If European institutions are

to be able to establish specific policies or measures for mountain areas, official recognition of mountain areas and forests is vital.

2.4.5 Global policies affecting mountain areas

No global treaty has been created specifically for mountain areas. This may (in part) be due to several treaties that already have an impact on mountain areas, even though they do not deal with mountains directly. Nonetheless, one key treaty is Agenda 21,[12] in which for the first time mountain areas received global recognition. It was adopted at the UN conference on Environment and Development in Rio de Janeiro in 1992. Many parts of the agenda refer directly to mountain areas, but it is particularly chapter 13 that deals explicitly with mountains as a unitary system. At the World Summit on Sustainable Development in 2002, chapter 13 was followed-up and concrete steps and quantifiable targets for implementing Agenda 21 were identified. Amongst other things, this resulted in the launch of the Mountain Partnership,[13] dedicated to improve the lives of mountain people and protecting mountain environments.

Other examples of global policy instruments includes the Convention on Biological Diversity (CBD)[14] that is relevant because mountain ecosystems are often areas rich in biodiversity, or the United Nations Framework Convention on Climate Change (UNFCCC)[15] that referees to the special vulnerabilities of fragile mountain ecosystems and the effect climate change may have on these, or the Charter for World Mountain People that has three major objectives to promote mountains on the international arena as well as at the regional and national level. Also earlier conventions are relevant to mountains, such as the World Heritage Convention[16], as regards to areas being protected by the convention.

2.5 Recent policy developments for mountain forests

Following from the previous section, different policy areas having an impact on mountain areas and forests at the EU-level, whether directly or indirectly, will be introduced. These include: (1) Forest policy, (2) Agricultural and rural development policy, (3) Environmental policy, (4) Energy policy, and (5) Climate change policy.

[12] See http://www.unep.org/documents.multilingual/default.asp?documentid=52
[13] See http://www.mountainpartnership.org
[14] See http://www.cbd.int
[15] See http://unfccc.int
[16] See http://whc.unesco.org

2.5.1 Forest policy at the EU-level

Forest management in Europe is driven by the concept of forests delivering multiple services to the public, which should be assured by applying a sustainable (and multifunctional) forest management approach. Both sustainability and multifunctionality have been fundamental concepts for the two most important Sustainable Forest Management (SFM) policy instruments at the EU-level, the EU Forestry Strategy (based on Council Resolution from 1998 and finalised in 2012) and the EU FAP (launched in 2007 and finalised in 2011). The Strategy states that the EU can contribute to the implementation of SFM through common policies. It emphasises that the implementation of international commitments, principles and recommendations through national or sub-national forest programmes and active participation in all forest-related international processes. It also stresses the need to improve coordination, communication and cooperation in all policy areas that affect forest-related sectors. Currently, a new EU Forest Strategy is under discussion and its future focus and contents is still being discussed. It is as such unclear what the implications this new strategy will have for mountain areas and forests.

Since there is no common policy on forests, both the Strategy and the EU FAP are based on the principle of subsidiarity and the concept of shared responsibility between EU institutions and its Member States. The FAP worked as a framework that used existing elements and actions as regards forest policy and built on other EU policies that affect mountain forests, such as NATURA 2000, the Rural Development Schemes of the CAP and the Biomass Action Plan. It includes the exchange of information and experience, communication and research. The aim was to allow a higher degree of flexibility for national and sub-national forest policy-making. The recent ex-post evaluation of the EU FAP concludes that while most of the planned activities were put into practice, the institutional set-up (as a voluntary coordination instrument) has limited its effectiveness (Pelli et al., 2012). The non-binding set-up of both the Strategy and the EU FAP limited the impact these instruments had in terms of supporting information exchange, and coordination, except in cases where compatible interests between sectors and Member States allowed for it. While this setup is in line with the overall governance approach available at the EU-level, highlighting the subsidiarity principle and soft coordination through communication, the effects from the Strategy and the FAP is questionable, not only for the forest sector but also as regards any impact on mountain areas.

2.5.2 Agriculture and rural development policy for mountain areas

The Common Agricultural Policy (CAP) provide the rules and priorities for agricultural support as well as for rural and mountain areas in Europe. This includes forestry (including mountain forestry), as the main form of land-use after agriculture. The Agenda 2000 CAP reform split up funding for agriculture into 2 pillars. Pillar 1 covers market and income support measures and Pillar 2 supports the development of rural areas through national or regional rural development

programmes. This reform made forestry an integral part of the CAP. Rural Development Policy (RD Policy) has a significant impact on the forest sector in Europe. The RD Policy for the 2007-2013 programming period offers a wide range of measures that are relevant for mountain forests, namely, measures linked to forest protection and rehabilitation measures, climate change mitigation, NATURA 2000 payments to forest holders, payment for ecosystem services and non-wood forest goods and services, as well as, help to implement the Birds and Habitats Directives.

Direct funding for mountain forests mainly occurs through co-financing of RD forestry measures and forest management through the second pillar of the CAP. This has become one of the most important financial instruments for mountain areas and forestry in the Europe, although it is difficult to separate from agricultural measures. Afforestation is the oldest forest-related measure of the CAP and it is still the most important one in terms of its percentage share of the European Agricultural Fund for Rural Development (EAFRD) contributions towards forest measures. Afforestation measures were introduced as a means to mitigate overproduction in the agriculture sector and to promote alternative use of agricultural land. Since 2000 these measures aim at the promotion of woodland expansion and the integration of environmental considerations. However, until the 2007-2013 programming period, most of the rural development funding for forest management was for the promotion of timber production and support to forest owners, rather than forest protection issues.

EAFRD has been the principal instrument for the implementation of the Strategy and the EU FAP, which Member States had to take into account when defining national rural development strategies. Compared to earlier regulations, EAFRD offers a coherent and structured set of measures that support forestry, with a strong emphasis on SFM. Member States can choose between 40 measures, out of which 8 are forestry-specific. All of these contribute to the priority objectives of biodiversity, water and climate change at the EU-level. Member States are principally free (as long as it is approved by the Commission) to choose measures and allocate budgets according to their specific needs through their national and regional Rural Development Programmes (RDP). However, for mountain areas and the forest sector, there has been significant under-spending, particularly in terms of the allocation to the forest-environment and NATURA 2000 measures in 2011 (Pelli et al, 2012). Also LEADER, being a promising instrument for RD and mountain forestry, has not been utilised to the extent expected.

RD is also interlinked with the EUs Regional Policy that supports an integrated approach that considers the three dimensions of sustainable development and takes advantage of natural assets, such as mountain forests. The European Regional Development Fund (ERDF), for the 2007-2013 period, provided financial support for the implementation of specific actions of the EU FAP in Member States. The cross-border, transnational and interregional projects on mountains forests and forestry represent an added value of cohesion policy in this area. This has

led to several projects at regional and local level, often as cross-border cooperation projects. One example of this is the previously noted INTERREG (financed by the ERDF). The forest sector takes part in some INTERREG IV[17] projects concerned with the promotion of SFM and efficiency in private forestry and the use of wood and wood based products as renewable resources.

Proposals for the next financing period for the CAP, EAFRD and ERDF (2014-2020) are, at this stage, still under discussion. For example, the Common Strategic Framework (CSF) was presented by the Commission in 2012, but all the new legislation will be in force by 2014. For mountain forests and the forest topic in general, it is currently foreseen that there will be fewer measures available for the forest sector in the future. Even though mountain areas are gaining in importance (as with the new cohesion policy), these developments will most certainly have an impact on the financing of mountain forestry.

2.5.3 Environmental policy in the EU

The Sixth Environment Action Programme (2002-2012) established a framework for action on the environment, focusing on four thematic areas – climate change, nature and biodiversity, environment and health, and natural resources and waste. Even though the programme does not specifically address mountain forestry, actions were set out for forestry as an important sub-area for achieving objectives concerned with nature, biodiversity and climate change. In the final assessment of the Programme, it was concluded that it has been helpful in providing a framework for environmental policy over the past 10 years at Member States and EU-level, despite the fact that a number of shortcomings were identified, in particular as regards the inadequate implementation and enforcement of some EU environmental policies. Linked to the discussion for a Seventh Environment Action Programme is the development of several strategic environmental policy initiatives, including the flagship initiative on a resource-efficient Europe as set out by the Europe 2020 Strategy under the heading of sustainable growth (and the roadmap for this presented in 2011). In 2010, the Council has also endorsed, following the failure to meet the EU 2010 target of halting biodiversity loss, a new vision for 2050 and a new target for halting biodiversity loss by 2020.

To deliver the 2020 target, a new EU Biodiversity Strategy was adopted in 2011, setting out six targets aimed at conserving and restoring species and habitats, maintaining and enhancing ecosystems and their services, ensuring the sustainability of agriculture, forestry and fisheries, combating invasive alien species, as well as stepping up the EU's contribution to global biodiversity. There is a specific 2020 target for sustainable forestry, which is to have Forest Management Plans compliant with SFM in place for all publicly owned forests and for forest

[17] See http://www.interreg4c.eu.

holdings (above a certain size) receiving funding under the RD Policy. The overall aim is to deliver measurable improvements on the EU 2010 Baseline in conservation status of forest species and habitats, and in the provision of ecosystem services.

The LIFE programme[18] is the only financial instrument dedicated to the environment. It is designed to contribute to the implementation, updating and development of EU environmental policy and legislation, including the protection of NATURA 2000 forests, forest monitoring and forest fire prevention awareness and training campaigns. Following a mid-term evaluation and an impact assessment on the future financing programme for the environment in 2010, the Commission called for its continuation into the next funding period (2014-2020). The proposed Regulation from 2011 calls for the establishment of a programme specifically dedicated to funding the environment and climate action (LIFE), a programme that would be more aligned with Europe 2020 objectives, serving as a financial instrument for the environment as well as for climate action.

Aside from these policy instruments, directives targeting important ecosystem goods and services mostly drive EU environmental policy. Two key EU policies are the Habitats Directive and the Birds Directive that aim at combating biodiversity loss by protecting, conserving and restoring nature. The Birds Directive seeks to ensure far-reaching protection for all of Europe's wild birds and identifies species that are particularly threatened and in need of conservation measures. The Habitats Directive is built around two pillars, the protected sites and the strict system of species protection (within and outside NATURA 2000 sites). NATURA 2000 aims at an integrated conservation approach that combines conservation goals with traditional land uses. But the Habitats Directive does not provide concrete standards or requirements for forest management on NATURA 2000 sites. Only non-legally binding guidelines with principles and examples of best practice and that highly recommends the development of management plans are available. However, in 2012, the Commission launched a process towards the development of more specific guidelines on managing forests on NATURA 2000 sites, which may have some implications for mountain forests as well.

2.5.4 Mitigating and adapting to climate change

Being a vulnerable area, the prospect of climate change has significant implications for mountain areas and forests. At the EU-level, several policy documents on climate change (and a number of communications) have been published concerning the future for mountain forests. One important development as regards policy instruments has been the first and second phase of the European Climate Change Programme (ECCP I and II) in 2000 and 2005. A core instrument of

[18] See http://ec.europa.eu/environment/life/funding/lifeplus.htm

the programme includes the Directive 2003/87/EC establishing the EU Emission Trading Scheme (EU ETS) adopted in 2003. The new EU ETS Directive was complemented by the Effort-Sharing-Decision and contains binding reduction targets beyond 2012. While these policy developments are not directly refereeing to mountain areas, they will have an impact on the forest sector.

Other policy developments include the Communication addressing the challenges of deforestation and forest degradation as regards climate change and biodiversity loss. Key aspect on the role of forests (and its effects on mountain areas) in climate change discussions refers to their potential functions for adapting to climate change and the risks mountain communities face. In 2007, the Commission adopted a Green Paper on Adapting to Climate Change in Europe – options for EU action followed by a White Paper Adapting to Climate Change: Towards a European framework for action in 2009. As part of the follow-up process to the White Paper, the Commission released a Green Paper on Forest Protection and Information – preparing forests for climate change in 2010, to engage stakeholders in a debate on EU's approach to forest protection and information concerning climate change.

As part of the Europe 2020 Strategy, another aspect of the climate change debate has been the recent Roadmap for Moving to a Competitive Low Carbon Economy. It emphasises that forestry practices will have an important impact on the capacity of the sector to preserve and sequester carbon in soils and forests, and the importance of a holistic approach, for example emissions and removals related to land use, land use change and forestry (LULUCF) in EU climate policy. This is connected to the EU's commitment to reduce greenhouse gas emissions by 20 per cent or, if conditions are right, by 25 per cent compared to 1990 levels by 2020. The roadmap has been followed by the recent proposal for a decision on accounting rules and action plans on emissions and removals from LULUCF in 2012, accompanied by a communication and impact assessment. LULUCF accounting rules address a gap in the EU's greenhouse gas inventory and opens up for the prospect of preserving mountain forests as carbon sinks in the future.

2.5.5 Energy policy for mountain forests

Interlinked with the climate change debate is the energy sector, as a major challenge to the EU and mountain communities at large. Especially in terms of how all these sectoral interests can be balanced. In the last few years, the EU has adopted several policy documents and legislative instruments aimed at expanding renewable energy use. Bio-energy, in particular, has been promoted in numerous ways. Examples are the Directive on the Promotion of Biofuels, or the Directive on the Promotion of the Use of Energy from Renewable Sources (RES-D), that establish a binding target for the EU to achieve a 20% renewable energy share by 2020. These directives provide a regulatory framework that is subject to environmental and social concerns about biomass production, having been intensively discussed in the last years. Also the EU FAP promoted the use of forest biomass for energy generation.

A key development to cut emissions and mitigate climate change is the Biomass Action Plan from 2005. It set out to increase the development of biomass energy from wood, wastes and agricultural crops, by creating market-based incentives for its use and removing barriers to the development of the market. The Renewable Energy Road Map adopted in 2006 set out a strategy to increase security of energy supply and reduce greenhouse gas emissions. It improves the legal framework for promoting renewable electricity, calls for national action plans for the development of renewable energy sources, and creates cooperation mechanisms to help achieve the targets cost effectively as well as establishes the sustainability criteria for biofuels.

The Climate and Energy Package, adopted by the Parliament and Council in 2009, also sets out to ensure that Member States meet targets for reducing emissions of greenhouse gases by 20% before 2020, known as the "20-20-20" targets. As a part of this package the Directive on the Promotion of the Use of Energy from Renewable Sources was approved in 2009. However, the growing demand for renewable energy, driven in part by direct and indirect incentives for energy substitution by the EU ETS, increases competition for wood and biomass. The forest sector in mountain areas will therefore face increasing pressure to balance new expectations, such as, societal demand for conservation versus carbon neutral energy. It is also foreseen that carbon sequestration will become an important aspect of mountain forests as well.

2.6 Assessment of Macro-level Policy

Based on the preceding analysis we can conclude that several sectors and policy areas affect European mountains and forests. The results from this deliverable points out the differences in the actions taken by different sectors in regard to mountain areas and forests, which indicates a purely sectoral rather than integrated development. Moreover, most measures do not specifically address mountain areas, but rather try to address the needs of specific groups or areas. Picturing the European mountain landscape is made even more complex as mountain areas are subject to permanent natural and economic handicaps as well as the lack of an integrated and flexible policy framework that can address this inherent complexity. This also applies to the forest sector, which suffers from the lack of a common policy, at least as regards to actions taken at the EU-level. For mountain areas, the key is however to recognise the great diversity, and the very specific challenges, that characterises mountains, namely, competing demands in terms of environmental concerns (e.g. nature conservation, water supply), economic interests (e.g. tourism and timber production) and social interests (e.g. recreation)) (Cocca et al. 2012; Marini et al. 2011). Not to forget that the pressure on mountain areas are expected to continue to increase as a consequence of changing incomes from agriculture, climate change and the loss of biodiversity (Kelemen et al. 2009).

Together, the present set of European policy instruments and measures creates a context in which it will be rather difficult to find a balance between these competing and contradictory challenges. In the absence of an integrated and flexible policy framework for mountain areas (as

well as the lack common forest policy), there is currently no platform through which these interests can be coordinated effectively. The result is policy fragmentation and incoherence at the EU-level. Also the existing platforms and instruments do not provide an effective way or solution, and there is no institution at the EU-level that can effectively coordinate or facilitate a discussion on key challenges for mountain regions and the forest sector. Instead, as this deliverable is illustrating, each policy area and/or sector focuses on what is important to them, rather than taking a holistic perspective on mountain regions and forests. The crux being that a coordinated mountain policy would have to involve these different policy areas and/or sectors, and would most likely remain subject to the principle of subsidiarity. Together, these contradictory issues represent the most significant challenge for any policy initiative that targets mountain areas and forests in Europe.

Aside from these embedded challenges, several ongoing policy developments are foreseen to have an impact on mountain areas and forests, such as, the reform of the CAP, which may result in a restructuring of agricultural sectors across the EU27 (soon to be EU28), as well as a changing cohesion policy, which may change the availability of different funds, including rural development funds. Not to forget ongoing discussions for a new EU Forestry Strategy and negotiations for a legally-binding agreement (LBA) through the Forest Europe process. At this stage, it not possible to foresee what impact these developments will have for mountain areas and forests, but it is clear that these developments will have a significant impact on mountain regions throughout Europe.

3 MICRO-LEVEL POLICY FRAMEWORK

Despite the importance of mountain forests, their definition remains unclear and the understanding of mountain forests differ from country to country. In general, there are two principal ways to define mountains. The definition can be based purely on topography (i.e. some altitudinal "lower limit" and/or slope limit and/or local elevation range, the so-called 7 kilometres radius (Korner, Ohsawa et al. 2005). One of the most commonly used definitions, adopted for example, by the United Nations Environment Programme World Conservation Monitoring Centre, uses the lower limit 300m above sea level (1,000 meters at the equator) (Kapos et al. 2000). However, many authors also admit that the lower limit of mountain ecosystems should be defined climatically. For example, as the isotherm with 7.5 °C average temperature during the vegetation season, which implies a difference between mountains (Korner, Ohsawa et al. 2005). This definition shares certain similarities as regards high-altitude and high-latitude ecosystems, but it also makes room for significant climatic, ecological and management differences.

Despite the fact that the above mentioned criteria were not set prior to the selection, selected case study areas are, in general, in compliance with them (Table 4). The majority of the case study areas are located above 300m above sea level, with the highest peaks exceeding 1,500m. Only the Swedish case study area, Vilhelmina, with a maximum altitude of 650m is exceptional, but it is also located in the highest latitude. In the case of the Slovenian case study area, Sneznik, the lower limit of 300m is not met, having a lower limit of 250m and a maximum of 1700m.

Table 4 Case study areas

Country	**Spain**	**France**	**Austria**	**Slovenia**	**Sweden**	**Slovakia**	**Bulgaria**
Mountain range	Iberian mountains Sierra Guadarrama	Western Alps	Eastern Alps	Dinaric mountains	Scandinavian mountains	Western Carpathians	Western Rhodopes
Name of Case study	Montes Valsain, Cabeza de Hierro	Vercors	Montafon	Sneznik, Leskova dolina	Vilhelmina	Kozie chrbty	Shiroka laka
Altitudinal range (m)	1200-1900	560-2270	600-2000	250-1700	300-650	600-1800	400-2000

The ARANGE project is not dealing with the full range of ES, it is focused on four services considered to be the most important:

- **Timber production**, as the most important ES amongst so-called provisioning services. This ES (or forest function) has been recognised for a long time and it is generally considered profitable and thus not demanding political support). This ES is generally

addressed by forestry legislation and strategic documents. Timber production is, however, sometimes perceived or framed negatively in terms of other ES.

- **Carbon sequestration** was recognised as a service only recently, even though it has been known since ecosystems have started to be studied. Its importance and marketability are based on the Kyoto protocol and emission trade. For its novelty, this ES has usually not been incorporated into forestry legislation, only into strategic documents or separate acts and regulations.
- **Nature conservation** is recognised in all case study countries, but in various forms. It was originally considered as more of a restriction than as a marketable service. In the last decade various forms of payments have however been developed.
- **Protection against gravitational hazards** represents a substantial part of generally recognised protective functions, which are traditionally divided into soil, water and infrastructure protection. Only a few case studies deal separately also with specific hazards, such as, avalanche protection or rockfall.

All country reports provided information on the policy frameworks for the following ES: timber production, carbon sequestration, nature conservation, protection against gravitational hazards, some case studies also included recreation, reindeer herding and hunting. The first four were obligatory for all case studies, as defined by the DoW for ARANGE. Each case study country was however allowed to include any ES that was important for their case study area. This secured plurality and allowed for a realistic demonstration of ES provision in the given CS areas, as well as, for the presentation of the broad range of legislative and economic tools applied in the case study regions. It is possible to say that these tools are mutually interlinked within a particular ES as well as among ES, and thus it would not be appropriate to restrict analyses only to single ES chosen in advance. This approach allowed for consideration of the complexity underlying ES as well as the relations between ES.

3.1 Method for Micro-level policy analysis

The methodology described in the *Guideline for WP3* (Annex I) was applied. Slight changes were however made to the original approach due to availability of data on national levels. All available policy instruments that are relevant according to experts' knowledge for mountain forestry or for the identified ES were included in analysis (see Annex II - List of analyzed documents on micro-level).

Terms of Reference (ToR) were intended to serve as a common framework that will provide the empirical work for all the case study partners. The ToR were designed to facilitate both inductive and deductive research to:

- Outline the relevant polices for each case study area, (e.g. environment, forestry, nature protection, rural development) influencing mountain forest management;
- Specify empirical data (from the document analysis), the main policy instruments and relevant measures dealing with ES;

The definition and background information about the particular instruments and measures can be found in the ARANGE Guideline for WP3 (ANNEX I).

3.2 Micro-level policy results and analysis

3.2.1 Forest ownership in the case studies

From the viewpoint of the measures being applied, the forest ownership structures within particular case study areas play an important role. For instance, the conditions set for the management of private forests may be freer, with more variable economic tools, while public forests are often expected to be "public beneficial" without special regards of their profitability. Furthermore, it is necessary to note that the commonly used classification of forests into two main groups – public and private – has in particular CS countries slightly different meaning. This raises concerns to whether only state properties should be considered to be in public ownership or this term should also include city, town and municipality forests. In Slovakia, for example, the ownership is primarily divided into state and non-state instead of public and private. Non-state ownership includes all types of ownership other than state, ranging from private to church and municipal. Thanks to this classification, even the forests owned by the largest cities are not considered public, which can have a significant impact on ES or functions that are beneficial to the public but that are not considered profitable. It means that there are some differences in terminologies of particular case studies and "state-owned" may not always to equal "public".

Another issue that was raised in the national policy reports is to what extent the ownership corresponds with the management rights in the particular area. Most case studies reported several types of forest ownership (e.g. Bulgaria, France, Sweden, Austria and Slovakia), while the Spanish and Slovenian case study forests are only in public ownership. State forests in Spain and Slovenia are, in fact, managed by the state forest administration authority. In the case of Slovenia, this is the "Farmland and Forest Fund of the Republic of Slovenia" that gave the 20 years concession for timber felling in the Sneznik case study area.

The other countries reported two or more types of ownership. For example, in Bulgaria, the state forest enterprise Shiroka laka (SLSFE) is responsible for managing state forests as the sub-unit of South central forest enterprise. The current ownership distribution of the forests area in the range of SLSFE was established after 2000. The forest cooperatives own 51 % of the forests,

followed by the state (20.1%), the private owners (16.5%), the municipality (5.3%) and other public organizations (0.4%). The remaining 6.7% of the forest area, with unclear ownership, is temporarily under the ownership of municipalities. The forest cooperatives are furthermore divided into 30 geographically distinguished units called "revirs". In Sweden, the situation in ownership is similar. Private forest owners own 36% of the productive forest area, state forest companies own 29%, private forest companies own 22%, Vilhelmina common owns 10%, and the church 3%. Forest management is influenced by overlapping administrative and regional structures. In France and Austria, the property rights division is simpler. France reported two types of forests in case study area – state and private. State forests are managed by the National Forest Agency and private are managed by the Regional centre for private forests. In contrast to France, Austria's case study area is divided into 10 municipalities with corresponding types of ownership. These municipalities are organised into so called "Stand Montafon", which represents an administrative union.

3.2.2 Regionality of forest policies and its importance

The country reports furthermore report that legislation, as well as forest policy documents, are applied to regions of different sizes and types, ranging from the national level to smaller units created on a variety of principles. Regional forestry policy is, in particular countries, applied on administrative division units of the country (their size and number depends on the size of the country), geographical units, (e.g. particular mountain ranges), landscape types, protected areas and forest regions. The regionalisation of the country is reported for each case study; however, the importance of regional documents, compared to national ones, differs significantly. In each country, we observe the existence of regional laws, acts or regulations, as well as, regional policy strategies or programmes; however, the importance and details of these regional-level documents differ from country to country significantly.

In Austria and Spain, each lower administrative unit ("state" or "autonomous community") can have its own counterparts of national legal norms, usually focused on different details than national legislation. On the other hand, in some countries (e.g. Slovakia), this kind of legislation is still lacking, making the national Acts superior. In many countries (including Slovakia), we also find regional policy documents, however, these documents are not equally influential.

Another type of regionality is based on regions created intentionally for the given document, sector or policy. The resulting regions include various "forest regions" based on characteristics important from a forestry viewpoint; regions based on social characteristics (e.g. rural areas) or protected areas. Particular protected areas (national parks, protected landscapes, etc.) are usually designated by legally binding documents, and their management may be based on different principles compared to the management of other protected areas of the same category. On the other hand, some countries (e.g. Slovakia) do not utilise this possibility often and the management of their protected areas depends mainly on the national legislation for the

categories of protected areas. Special "forest regions" have been created in several countries (France, Slovenia, Slovakia) for management planning purposes, however, their importance varies. Some countries (e.g. Austria) have also special legislation for their state forests and thus, the areas of forest land owned by the state can also be considered a special type of region.

3.3 Analysis of policy tools and instruments

Following the methodology all Country reports provided the description of relevant policy instruments implemented in the Case study according to the following typology: (i) Legislative and Regulatory, (ii) Economic and Fiscal, (iii) Communication and Information, (iv) Organizations and Institutions.

3.3.1 Legislation and regulatory instruments

All documents included in the analysis in the case studies have been divided into policy documents (non-legally binding instruments) and into legislative documents (policy binding instruments). These two groups were analysed from two viewpoints. Firstly, the principal documents from all countries were analysed and mutually compared from the viewpoint of main documents and tools, with a focus on the entire spectrum of ES covered by them (including overlaps of ES). Secondly, all reported documents were analysed from the viewpoint of each ES, with a focus on the complexity of mechanisms securing/supporting the ES.

Legislation of each country depends on its historical and political traditions. There are, however, some similarities between the case study areas. For instance, the legislative background for each case study area reflects (to certain extent) the ownership structure of a given area and the legislative framework for the state, municipalities, organisations or private owners usually differ, with the most significant differences existing between public and private ownership. Different rules for different forest ownership result not only from "moral principles" but also from different institutional contexts that are setting the rules (parliament, municipalities, regional parliament). The duality of the state and private ownership therefore represents an important issue that is now being discussed within the forestry sector, such as issues concerned with the provision of forest services/functions through private forests. However, disregarding the type of ownership, many issues are still rather strongly regulated by legislation, such as restrictions imposed on timber harvest or protective forest and commitments related to reforestation after harvest.

Below we provide the descriptions of the above-mentioned groups of documents as well as a summary of legislation and policy frameworks for particular ES and ownership types, as described in country reports.

In all case study areas the Forest Act (under various names) represents the main legally binding document that regulates the forest management. In the past, it used to be focused on the sustainability of timber production and the protection or proper enhancement of forest resources. More recently, many other issues are gradually incorporated into this act, including forest functions, ecosystem services and nature conservation. In most cases, profitable ES (such as timber production) are usually restricted by this act, while newer ES (for which the financial mechanisms are still unclear) are often supported or enforced.

The complexity of the particular Forest Acts also varies by country. Details that are in one country emphasised directly in the Forest Act, may be in other country included in separate regulations or other legal norms, or not considered at all. For example, Slovenia and Sweden have a separate regulation that prohibits driving vehicles in natural environment, while in Slovakia the same prohibition is covered by the Forest Act and Nature Conservation Act. Spain has separate Forest Acts for national and regional (autonomous community) level.

Nature conservation is usually addressed by separate Nature Conservation Act and related regulations. Nature conservation may belong under the same ministry as forestry, or under separate ministries, usually in charge of the protection of other parts of the environment. The latter solution may often lead to some controversy between foresters and conservationists; however, the issue of inclusion of both sectors under the same ministry can be also sensitive (for example, in Slovakia there was a strong opposition to this solution because of fear of loss of independence). The ratio between the number of issues covered by the Act and by the related regulations or other Acts vary from country to country. Slovenia, for example, has a separate Cave Protection Act, while in other countries (e.g. Slovakia) the Nature Conservation Act covers this issue. In many countries, protected areas are designated by separate Acts or regulations. Some countries, such as Spain, have a separate Nature Conservation Act for national and regional (autonomous community) levels.

Other relevant Acts for the case study areas include hunting, water or torrent control Acts, as well as Acts on environmental assessment and are regulations on protective forest or forest protection (e.g. against biotic and abiotic harmful agents).

Very common tool for implementation of legislative and strategic documents dealing with forestry issues to the operational level (i.e. forest stand level or forest management unit level) are Forest management plans (FMPs). Their role in forest governance can nonetheless be different. They may be issued as an independent legal norm, as a compulsory technical guide or as an optional document detailed to a variable extent. FMPs are elaborated for forest management units of various sizes. Some countries (e.g. Slovenia, Spain) have regional management plans (forest development plans, etc.) that set some limits for and principles of elaboration of FMPs in the region and contain some data which is not necessary to provide on

the forest management unit level (e.g. long-term goals, economy, tourism, human resources, infrastructure and wild-life management strategies at regional level).

All case study countries have adopted basic strategic documents to ensure further development and prosperity of these countries. In the forest sector, National Forest Programmes are considered to be the most important of such documents. These documents are usually elaborated for a certain period and they are (or should be) followed by related documents, such as action plans. They set priorities for forest development and are meant to address main challenges. These documents are usually not legally binding, however, their legal force vary from country to country. Other common programmes are related to rural development, climate change (e.g. bioenergy, afforestation programmes) or biological diversity. Some countries or regions also have regional programmes . For example development programmes consider the following issues: the lower importance of firewood collection; the potentiality of high quality timber harvest, the use of the edible stone pine nuts and mushroom harvest; the increasing demand of natural areas for recreation and sports, the increasing social conscience for the need of nature conservation and maintenance of biodiversity been adopted at regional level (in the Castilla and León Autonomous Community, Spain).

3.3.2 Relevance of legislative and regulatory instruments for particular Ecosystem Services

The relevance of any tool or document is considered to be of two basic types that can impact ES either positively or negatively. Positive influence includes direct support through imperatives, permissions of some activities, creation of necessary framework, declaration of importance or financial support. Negative influence is represented by ES-related restrictions imposed by the document or increased bureaucracy (system of application for permissions, certifications). Negative influences can sometimes also include unintentional “by-products” resulting from the support of other ES, such as pest outbreaks generated by nature conservation measures or the penetration of invasive species along forest roads.

For each case study had to be judge the relevance of these tools and documents. According to the Guidelines for national policy reports (MS9) was possible to identify and rank the connection between policy instruments, mountain forest management and/or the provision of ES. The relevance of the linkage between the policy and ES will be classified as 1 (low), 2 (medium) and 3 (high).

However, a low score does not mean irrelevance, as all the connections (between the policy documents and mountain forest management and/or ES) have been judged to be relevant by authors of Case study reports.

Despite the limitations of subjective judgement, the summary table 5 provides some interpretation of the results. Base of the 146 policy documents analysed in the Country reports

(Annex II), there is not the Mountain forest management as a central topic of the documents, but most of them dealing with selected ES. The majority were connected directly with the Timber production and/or Nature Conservation. It was not uncommon to find one policy document that was connected to two or more ES. Concerning the relevance of the documents, the most of the them have been judged as high relevant. Compared to other ES, a majority of countries reported a high number of highly relevant documents on nature conservation. This may reflect the strong position of nature conservation in European countries and the rather high bindingness of the respective documents. However, there are more programmes and strategic documents than legally-binding documents.

Table 5 Relevance of policy documents across countries

Ecosystem service	Relevance	Case study						
		Spain	France	Austria	Slovenia	Sweden	Slovakia	Bulgaria
Timber Production	*High*	8	6	5	2	2	2	3
	Medium	2	6	6	4	4	3	0
	Low	4	4	4	3	4	3	0
Protective Function	*High*	2	2	4	2	1	2	1
	Medium	4	5	5	3	1	3	1
	Low	1	9	2	0	0	0	0
Carbon Sequestration	*High*	1	4	3	0	1	4	1
	Medium	5	4	5	2	0	2	0
	Low	1	7	5	3	0	2	1
Nature Conservation	*High*	12	3	8	6	4	3	2
	Medium	1	5	7	5	1	3	1
	Low	0	8	2	3	0	5	0

3.3.2.1 Timber production

All case study countries reported the existence of a Forest Act, under various names, and noted its high relevance for timber production. Usually, the Forest Act is furthermore accompanied by a range of different regulations and norms. In general, it can be surmised from the results that the majority of Forest Acts aims to impose restrictions on harvest technologies and to set the responsibilities for the period following harvesting rather than to promote timber production (e.g. promote the effective use of production potential and/or production possibilities). National Forest Programs (NFPs) (in contrast to Forest Acts) usually include declarative as well as the

direct promotion of timber production as part of their priorities. NFPs are in most cases accompanied by related documents, such as strategies, action plans and progress reports.

Since timber production represents a significant source of income in rural areas, some support for this ES is declared in Rural Development Programmes (RDP) and related documents. All these strategic documents are accompanied by financial tools and corresponding executive legislation. These financial tools usually allow for support of measures in single forest stands (e.g. afforestation or low-impact technologies) or locations (e.g. forest road construction), and they are often linked to the support of other ES. RDPs are usually not focused on support for sustainable production and the long-term maintenance of its quality, which should be covered by Forest Management Plans (FMPs) or their equivalents. However, the general trend is that the legal nature of FMPs, along with the development of democracy, is changing towards less legally binding (e.g. the decrease of "legally binding figures" in Slovak FMPs) or less obligatory. In some countries, FMPs are still obligatory (Bulgaria, Slovakia and Slovenia), in the others, they are optional (Austria) or not present (Spain). Some countries (e.g. Slovenia) have also Regional FMPs, which allows for a focus on sustainability issues within a larger framework, or only regional FMPs (Spain).

Other legislative documents that effect timber-production include acts/regulations on pest control, planting stock genetic quality and fire protection. Some documents related to other ES, such as nature conservation, can also have significant negative impact on timber production.

3.3.2.2 Protective functions

Protective functions do not have the same meaning across the case study countries, nor do they refer to an identical set of functions or ES, however, the basic principles are the same. The term "protective functions" refers to the protection of water (e.g. against pollutants), soil (e.g. against erosion) and/or infrastructure (e.g. against damage). The term "gravitational hazards" is less common; however, it includes a substantial part of the aforementioned functions but only when related to gravitation, i.e. on slopes. On the one hand, gravitation is a trigger for almost all water erosion, pollution of waters by soil particles, landslides, rock falls and avalanches. On the other hand, wind erosion or the protection of infrastructure against wind, noise, air pollution and sunlight is excluded from this approach to hazards. In mountainous areas, the protection against gravitational hazards corresponds to a majority of the protective functions that a forest can have. Hence, there was no need to distinguish between gravitational and other protective functions in the case studies, and the findings relevant for protective functions are valid for protection against gravitational hazards as well.

It became clear that protective functions are one of the main issues tackled by the Forest Act in all case study countries, and often complemented by additional special regulations. Protective functions are usually directly promoted by the legislation, which sets the rules for protective forests designation and their management. The support of protective functions is usually

addressed also in NFPs as well as in its related documents (strategies, action plans, progress reports) and financial tools. Some countries report the existence of special tools or instruments for the identification of protective forests. For instance, Austria uses the Forest Development Plan (based on special regulation) and Slovakia uses site mapping (so-called Forest typology) in which certain units (forest types) have to be designated as protective forests (these units and additional conditions are listed in special regulation). Similar situation is in Bulgaria, where forests with special functions are designated for one or more protective functions expressed in prevention of erosion, improving of water holding soil capacity, regulation of water flow, etc. Timber production in these forests is of secondary importance.

Slovenia distinguishes between the category of protection forests (declared by the decree), forests with important protection function, and forests with important direct protection against hazards (i.e. protective function), the latter two being elaborated in forest management plans. In some countries (e.g. Bulgaria), protective functions (mainly protection against erosion) are addressed also in the Water Act or in national documents related to the EU Water Framework Directive (e.g. Slovak Water Plan). Also FMPs (and their equivalents) play an important role to support these functions into forestry practice. For instance, in Spain soil protection and protection against erosion is particular aim of forest management plan for each management unit.

Other legislative documents concerned with protective functions include acts/regulations for example on pest control (Slovakia) or forest fire protection (Spain).

3.3.2.3 Climate change mitigation via carbon sequestration and bioenergy production

Climate change mitigation by forestry measures and carbon sequestration is closely related to timber production and, less directly, to nature conservation. For these dependencies, the special legislation focused exclusively to these ES is not usual in case study countries. Moreover, it should be noted that climate change and carbon sequestration issues are rather new and their implementation is still in progress. Consequently, the case study countries reported almost no legislation related directly to this ES, however, many of them included this issue into special programs and strategic documents, such as NFPs, climate and bioenergy strategies.

Climate change mitigation is subject of national programs aimed at adaptation of the forests to the climate changes through a variety of forestry measures like mentioned in France or Bulgaria.

To reach Kyoto goals in reduction of CO2-emissions, different action plans and programmes are implemented to advise municipalities and companies to use biomass for energy (e.g. Austria). Legislation dealing with renewable energy sources increase the consuming capacity not only for biomass but also for other forest products including pulpwood, firewood and forest residues (e.g. in Bulgaria). For example in Austria or Slovakia the Action plans for biomass defined in

which extent energy production with biomass should be increased. According to the plans the resources of forest biomass should grow.

3.3.2.4 Nature conservation

In a majority of the case study countries, a Nature Conservation Act (or its equivalent) represents the most relevant document regulating the nature conservation. This policy document is usually accompanied by regulations and other norms focused on specific details. A country's Nature Conservation Act usually provides a framework for the establishment of protected areas, such as national parks or nature reserves, and for biodiversity protection outside protected areas. Particular protected areas are usually designated by special acts or regulations, individually or in bulk. The management in protected areas may depend almost exclusively on the category of protection (e.g. Slovakia) or can be tailor-made for each particular area (e.g. France). European nature conservation directives (i.e. Natura 2000) can be implemented in this legislation (partially or fully) or it can have its own legal norms (e.g. Spain). Most of the case study countries additionally have some Nature Conservation and/or Environment Protection strategic documents. However, not all of the countries reported the relevance of these documents in terms of nature conservation as a specific ES.

It furthermore became clear that the relevance of a forestry legislation (and related documents) for nature conservation in each country differs. In Slovenia Nature Conservation Institute provides guidelines that shall be incorporated in sectoral management plans (e.g. FMPs). On the other hand in Slovakia management in protected areas could be designated by both nature conservation and forestry plans in parallel way what result to the conflicts in management goals (active protection contra passive preservation). from "not relevant for protected areas" to "always relevant". All case study countries, however, did report some relevance. The problems resulting from such "conflict" can be described in many ways. In addition, NFPs usually declare the importance of nature conservation and biodiversity protection for sustainable forestry, but these declarations may not resound from forestry practice. Nature conservation issues are also frequently integrated into rural-development documents. For example Rural development programmes for the period 2007-2013 allow for subsiding management of habitats and/or species of European interest by the measure 224 -Payments for NATURA 2000 and measure 225 - Forest-environment payments. Both of these measures are implemented according to national rules in Austria and Slovakia, measure 225 also in France and Spain.

3.3.3 Economic and fiscal instruments

The work in this section is based on the classification of economic instruments into 3 groups – public, public/private and private related to market solution for ES (Weiss 2000), because it can be easily applied to the various conditions in the case study countries. As described in theory (see Annex I), economic instruments include negative incentives (taxes, fees and charges) as well as positive incentives (subsidies and payments on contractual basis). Since we had to identify and analyse relevant policies in each country, we have taken into account those economic instruments that are covered by legislative and policy documents described in country reports. We have moreover distinguished between these instruments based on the different ES they fund and/or support.

Based on the case study reports, we divided the case study areas into two main groups:

- case study areas with exclusively with state-owned forests (e.g. Spain and Slovenia) where mainly state-based types of economic instruments are applicable, and
- case study areas with other types of ownership, pure or mixed, where also a mix of economic instruments could be find.

In the first group, the economic instruments for case study areas are mainly funded by the state budget, or no financial mechanisms in terms of subsidies are applied at state estate in Slovenia. On top of that, for Slovenian case study forests, the state granted the concession for wood exploitation for 20 years to a private company, which pays the concession fee; the concession is going to expire in 2016. However, forest management planning (in the case study and elsewhere) is a part of public forest service (Slovenia Forest Service) irrespective of ownership.

All remaining cases, with different types of ownership (e.g. France, Austria, Slovakia, Sweden and Bulgaria), reported a range of mixed economic Instruments.

The results shows that individual countries clearly support all ES through their economic instruments. However, subsidies are usually not provided directly for timber production or its enhancement. Timber production is the most commonly supported indirectly (financial support for FMP elaboration, subsides for building of forest roads etc.) across the case study areas. Also the compensation for losses in timber production related to nature conservation is covered by different instruments. While in Slovakia, the Forest Act states the exact rules and guidelines for the compensation, in Bulgaria there are no compensatory mechanisms for the non-state forest owners related to restrictions in the NATURA 2000 zones regimes.

Apart from support addressed directly to particular forest management bodies, some types of support are provided at the national or regional basis. France, Austria and Sweden report support on different spatial levels, which is mainly based on the administrative divisions with different authorities or organizations responsible on the national and/or regional/local level.

As for regionality, the administrative division of French case study area is the most complicated compared to other countries in ARANGE. Economic instruments at the national level are overlapping by administrative, cooperative and development structures that fund forest-related issues directly with more or less coordination. In Austria, there is a two-level administration (national and regional). The upper level is covered by the Acts (Act on Environmental funding or Forest fire subsidies, Nature conservation funds and Subsidies for climate-friendly technologies and research). The regional level is financed by the Regional Forest Fund. In Sweden, economic instruments at a national level are provided by "The Forest kingdom", a program adopted by the Ministry of Rural Affairs, EU´s program for rural development and subsidies from the Swedish Forest Agency. The local level is covered by county administrations in a form of local nature conservation projects and nature reserves and is funded mainly from the national level. In Bulgaria, forestry is supported through the Rural Development Plan, particularly timber production. This type of instrument is well-known for all the EU member states. Different forestry measures and activities are supported on project basis funded from EAFRD in all case countries.

3.3.4 Type of financial mechanism and incentives

The promotion of ES takes place in the form of positive public incentives - subsidies and subventions in all of cases (see Table 6). In some countries subsidies are intended for private forest owners as well as for state enterprises (e.g. Bulgaria, Slovakia). Limited sanctions were mentioned only with the activities against legislation (e.g. in France regarding to directives on Private management plans).

Table 6 Examples of subsidies for multifunctional forest management

ES	France	Austria	Slovenia	Sweden	Slovakia	Bulgaria
Timber Production	Wood harvesting with cables Forest road constructions Grouped cuttings management	Reforestation and afforestation Approval of forest roads	Silvicultural and protective measures Forest road constructions	Innovation, purchase of new technologies	Forest roads constructions Forest revitalisation	Elaboration of forest management plans

ES	France	Austria	Slovenia	Sweden	Slovakia	Bulgaria
Protective Function	Harvesting in protected forests	Reprocessing of damaged wood, in case of bark beetle infestation, Reforestation of protection forest	Conversions of degraded forests, Sanitary measures in damaged forests	Program "The forest kingdom" initiatives in relation to sustainable forest management	Purchase of environmentally friendly machinery, Re-afforestation or afforestation of vulnerable soils damaged by water erosion, landslides and floods Fire reservoirs, maintenance of fire breaks,	Early release treatments, Purchase of specialized forest equipment
Carbon Sequestration	Wood constructions, Fuelwood, Management of non profitable stands by stem selection without clear cuttings in old coppice	Subsidies in connection with air pollution	Measures for climate change mitigation (max allowable cut, clear cutting is prohibited)	Program "The forest kingdom" initiatives in relation to sustainable forest management	Construction of bioenergy facilities Complex use of woody biomass,	Newly established forest plantations Traditional use of wood biomass Production of renewable energy afforestation of non-agricultural land
Nature Conservation	Network of voluntary unmanaged forests Protected areas	Conservation of Natura 2000 areas, Landscape development	Compensation for lower timber yield in the special purpose forests Biodiversity conservation projects on wildlife conservation	Preservation of endangered species, Compensation for reserves, Nature conservation projects	Management of habitats/species of European interest, Biodiversity conservation projects	

In Bulgaria, private forest owners (physical persons) do not have to pay any taxes for forests, and still there are no taxes for the forest property despite of its ownership. State also supplies Forest management plans for free for the small forest owners and the forest cooperatives what is very helpful measure that supports the proper management of the numerous small-sized

forest enterprises. The only active mechanisms which support financially forest related activities in Bulgarian forestry is Rural Development Programme of the Ministry of Agriculture and Foods.

Economic instruments in Austria cover all four groups of ES, particularly the Regional Forest Fund and Forest Fire Subsidies promote all four types. Besides this, other instruments that are relevant for timber production are subsidies for climate-friendly technologies and research. Biomass for energy, carbon sequestration and nature conservation is supported by the Act on Environmental Funding. Nature conservation is also supported by nature conservation funds.

In Sweden, subsidies represent the most frequent type of measure**.** "The forest kingdom" is focused on rural development and covers issues related to timber production, biomass for energy, carbon sequestration, and nature conservation. Specific instrument are focused based on the traditional use of forests - *sami* culture (i.e. reindeer herding). For example there exist compensation for losses due to hydro electric power stations and dams supported from Sami foundation. Another type of instrument is Rural development program with subsidies for conservation of nature and social values and cultural heritage. Innovation and development subsidies are provided by regional authorities (e.g. County Administrative of Västerbotten) for timber production, as well as economic compensation for forest owner and local nature conservation projects. Other types of subsidies are provided by the Swedish Forest Agency with a national scope of competence.

In Slovakia, economic instruments are divided in terms of policy documents and legislative acts. Policy documents (e.g. National Forest programme and the Action Plan of the National Forest Programme) that establish the details and financial support of the NFP and Forest Development Strategy. It poses no binding obligation for the forest owners and managers. Rural development strategy supports all four ES through measures aimed at improving the competitiveness of the agricultural and forestry sector, as well as, measured aimed at improving the environment and country side. As regards Slovak legislative acts, these are primarily focused on timber production, protective functions and nature conservation. Slovakia reported two principal instruments, namely, exclusion from property tax as a part of the Act on local taxes (exclusion of taxes as a public economic instrument was also reported by Bulgaria and Slovenia) and the Ordinance (adopted by the Ministry of Agriculture) on subsidies for forestry and rural development. The Ordinance provides 5 types of subsidies, including sustainable forest management, recreational forest function, promotional activities, protection against bark beetle and participation on forest exhibitions.

All the activities in Spain case are covered by National Budget. The main aim is to manage the region to make compatible timber and livestock production, preservation of traditional activities, recreation, protection improvement of habitats, protection of fauna and flora, public use, history and landscape. This is possible only by joined support to all ES and the periodical Revisions of the Management Plans. No details on particular economic measures were described beside the projects subsidised by EAFRD.

Regarding financial mechanisms in Slovenia eligible are only in the case of private forests. The benefits available for private owners can be divided into four groups: (1) the right to full or

partial funding of silvicultural and protective measures, (2) the rights to partial funding of conversions of degraded forests, sanitary measures in damaged forests and forest road construction, (3) the right to tax concession and in some cases complete tax exemption, (4) the right to compensation for lower timber yield in the special purpose forests. The subsidies can be realised in nature (e.g. tree plants) or in money. In privately owned forests the following measures are partly budgeted: silvicultural and protective measures, special measures to improve or maintain wildlife habitats, restoration of forests if the party responsible for damage is unknown, reforestation of forests after fires, and restoration of forests damaged by natural disturbances, maintenance of forest roads, second stand thinning, conversion, forest road construction, production of seed in nurseries and forest nursery investments.

3.3.5 Communication and information-based instruments

Communication and information instruments serve two goals. First, to inform the public about the activities and matters related to the case study area, and second, as an important instrument for various organizations and professionals in terms of knowledge transfer and best practices.

Responses from the case study countries can be divided into two categories. One group of case studies reported on communication and information instruments as documents and their corresponding measures on a national or regional basis, mainly regional (e.g. France) or mainly national (e.g. Sweden). The other group of case studies reported on specific instrument, such as plans, information boards, tables, internet portals information systems or brochures. For example, Austria elaborates and communicates the risks from gravitational natural hazards and the planned use of forests in the form of maps (*Gefahrenzonenpläne* and *Waldentwicklungsplan*). Information tables, boards and paper brochures are used in Slovakia, Slovenia and Spain, to inform about forestry (referring to all ES) in the case study areas. Specific information systems were reported in Slovakia and Slovenia. In Slovenia, there are several GIS portals serving as information disclosure systems; a GIS that provides the information on nature conservation, detailed GIS of local communities, and a GIS viewer of public forest service. The majority of these instruments are aimed towards the public or forester's community, such as the Forestry Information system in Slovakia that is intended for forest managers, but partially open to wide public.

3.3.6 Organisations and institutions at micro-level

Most of the case studies reported that a particular Ministry (concerning Agriculture, Environment, Forestry, Water management or Rural affairs) was responsible for implementing important policy documents at the national level. It is however worth noting that some of the

Ministries combine sectors of forestry and nature conservation (e.g. Austria, Slovenia, Spain), while others (e.g. Slovakia, Bulgaria) have two different institutions covering these two issues. This may provide the institutional basis for conflicts between forestry (particularly timber production) issues and organizations concerned with nature protection. In addition to Ministry in charge of forestry, there are many other state and public institutions participating in the management of the case study area, among them the organizations that are based on both sectors i.e. forestry and nature protection (e.g. Slovenia, Sweden and Slovakia). On contrary, in other case studies, there exists only one organization for forestry or nature conservation in the case study area (e.g. Bulgaria's Executive Forest Agency).

Table 7 Institutions engaged in multifunctional management of mountain forests

		Spain	France	Austria	Slovenia	Sweden	Slovakia	Bulgaria
Type of institutions	*Ministries*			✓	✓	✓	✓	✓
	Other national public bodies (agencies)				✓	✓	✓	✓
	State forests	✓	✓		✓	✓	✓	✓
	Private forests (associations, centers, agency)		✓	✓		✓	✓	✓
	Cooperatives					✓		✓
	Municipalities		✓			✓		
	R&D					✓	✓	
	Local or regional authorities	✓	✓	✓		✓		✓
	Nature conservancy	✓			✓	✓	✓	
	NGOs			✓	✓	✓	✓	
	Others	✓				✓		

Due to the state-owned forests in, Spanish and Slovenian case study, private forest owners/managers as an institution are lacking (see Table 7). All countries (with the exception of Austria) have some type of organization that manages state forests. These are identified as forest enterprises, centres, agencies or funds.

Organizations that manage forests can be divided (according to an administrative division) into two groups: national and regional. For example, France and Slovakia reported the national state forest enterprises (in France the "*National Forest Agency*" and in Slovakia the "*Forests of the*

Slovak Republic"). Spain and Bulgaria have regional bodies managing state forests (in Spain the "*Montes de Valsain Centre*" and in Bulgaria the "*South central forest enterprise*"). Slovenia case study area is owned by the "*Farmland and Forest Fund of the Republic Slovenia*", which is the official owner of all the farmland and forestland of the state, but the management itself is granted to a private company. Private forest owners tend to join and establish associations, councils and centres (e.g. France, Slovakia or Sweden).

The administration corresponds also to regional and local authorities. Regional administration depends on the administrative division and distribution of political power in the respective country. In some cases, there exists a regional government (e.g. Government of Vorarlberg in Austria) or a regional parliament (e.g. the Swedish "*Sametinget*" or Sami parliament). In all countries, except Slovakia and Slovenia, there is distinctive division of governance between the national, regional and local level. These division takes on many forms, such as municipal representation through the joining of several municipalities (e.g. Austria), communes (e.g. France). Other forms of power division include boards (e.g. Sweden) or solely forestry-oriented (e.g. Bulgaria) or environmentally oriented (e.g. Spain) bodies.

It should also be noted that the role of NGOs is indispensable in modern forestry, a fact that has been confirmed by a majority of the case studies. In the case study reports, nature protection organizations, hunting clubs and associations, as well as, hiking and mountaineering associations are most frequently reported.

3.4 Assessment of Micro-level Policy

There is no generally accepted definition of mountain areas and thus the understanding of the altitudinal limits of mountains varies from country to country, partially based on country's climate and/or latitude. Regional policies of particular countries are applied to regions of different nature and size, varying from administrative division units (districts, provinces, states, etc.) to protected areas or "forest regions" created specifically for this purpose.

For mountain areas it is a key issue to recognise very specific challenges characterising by the competition of environmental, economic and social interests. The intensity of this competition is country specific, depending, for example, on the ownership of forest areas or the position of particular sectors in a country. Mountain forest management is influenced by many various policies at national or regional levels which are not crated with a special focus on mountain forests.

Presenting mix of instrument and measures creates a complex of different approaches which are implemented for maintenance of mountain forest areas at micro-level. Summarizing, one could say that there are no legally binding or national policy documents addressing the mountain areas as a whole. Forestry, nature conservation, and other related issues are addressed separately by "sectoral acts" (e.g. Forest Act, Nature Conservation Act) and related regulations.

Strategic documents, such as National Forest Programmes, are also sectoral. In the field of economic instruments, the situation is slightly better, since these tools are usually more complex and, in some respect, they integrate at least forestry, agriculture and rural development in mountain areas together with recreation and traditional use of these areas. Many of subsidies are connected with CAP - Rural development programmes (funded by EAFRD) which are usually focused on disadvantaged areas, which many times mean the focus on mountain regions. As for communication and information instruments, they are usually sectoral and intended for entire country's territories, not for mountain areas separately. Organisational and institutional development on regional level is based on long-term solutions for the people and environment. In addition, continuing budget pressure on governments is crating a platform for involvement of foundations and NGOs, as well as other private donors in multifunctional use of mountain areas and forests (Cubbage et al. 2007).

In the field of particular ecosystem services, it is necessary to realise that the term "ecosystem services" is a relatively new and it is absent in the majority of documents older than 10-15 years. Despite this fact, majority of ecosystem services addressed in ARANGE project are, under different names, traditionally used in all case study countries. It means that they are included in legally binding documents as well as in strategic and economic documents. Carbon sequestration, climate change mitigation and bioenergy production represent certain exception as the climate change issue is newer than other services. For this reason, this ES is many times not directly addressed in legally binding documents such as acts; however, it is usually included in special programmes and strategic documents.

The implementation of measures supporting ES significant for mountain regions is very sectoral oriented. Nature conservation, rural development, forestry, recreation, cultural heritage, all sectors, focus on their own goals in mountain regions which are corresponding with the public utilisation and available financial resources and support mechanisms. The coordination and engagement of all the parts with defined right and duties could be a solution for optimal management of mountain forests at different scales.

4 CONCLUDING REMARKS AND HIGHLIGHTS

This deliverable has demonstrated that mountain forest policy, at the micro and macro-level, cover many different policy areas, such as agriculture, environment and energy. It is also clear from the macro-level results that the EU has contradictory policy objectives that have a similar importance for mountain areas and forests, not clearly set priorities, and different impacts. For instance, since different policy areas deal with forest policy, there are conflicting objectives and targets at the EU-level. Different EU forest-related policies pursue distinct and in parts contradicting ideas of what mountains and forests actually are and how they need to be managed (e.g. conservation versus energy). Hence, there are different objectives that compete with each other, resulting in policy fragmentation and incoherence. The situation at the micro-level, in the case study regions, is rather similar. There are almost no legally binding or national policy documents addressing the mountain areas as a whole.

Table 8 presents a summary of the main highlights from this report and some of the key challenges associated with these highlights.

Table 8 Challenges and highlights for multifunctional management of mountain forests

Highlights	i. Policy affecting mountain areas, forests and ecosystem services, at the micro and macro-level, is cross-sectoral across Europe. ii. Policy affecting mountain areas, forests and ecosystem services is fragmented and incoherent. iii. Inter-linkages between micro- and macro-level policy instruments is primarily based on sectoral principles. iv. Policy instruments and measures implemented at the micro-level are principally not focused on multifunctional forest management in mountain regions.
Challenges	i. Efficient coordination and priority setting, including the question of the appropriate policy level for addressing mountain forest and ecosystem services. ii. Finding a balance between the objectives of development, protection and conservation. iii. Support for organisational and institutional cooperation at all levels (horizontally and vertically). iv. Establishing more market oriented economic instruments (e.g. payments for ecosystem services) for mountain areas and forests.

There is no clear solution at hand for the above-noted highlights and challenges (i-iv), but the effort to manage the fragmentation and incoherence of mountain and forest policy should begin with the identification of the best policy level (European, national or regional) at which coordination and priority setting should be achieved. If not, it is likely that this fragmentation

and incoherence (and its effects) will remain as a defining character of European mountain and forest policy.

To summarise, the results in this deliverable underlines the fact that European mountain regions are not separate but rather woven into a fabric of interconnected institutions, policies and sectors, all of which are having an impact on mountain areas, forests and ecosystem services that are experiencing rapid change. In other words, mountain forests and ecosystem services (whether at the micro- or macro-level) are susceptible to all the environmental and societal processes of change currently going on across Europe. Even more, it is clear there is currently no framework under which all of these issues can be addressed and coordinated effectively.

More concluding remarks will also be given in deliverable D.5.3 *Policy frameworks to secure the multifunctionality of mountain areas* which is expected in M34.

5 REFERENCES

All international and EU polices referred to in this study are available through the ARANGE policy database. The database can be found under: http://policydatabase.boku.ac.at/.

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ANNEX I GUIDELINE FOR WP3 - POLICY ANALYSIS

Guideline for the WP3 policy analysis and Terms of Reference on country reports could be find in the separate MS Word document - ARANGE MS9.doc.

ANNEX II List of analyzed documents on CS country level

AUSTRIA:

Forstgesetz 1975
Bundesforstegesetz 1996
Forstliches Vermehrungsgutgesetz
Forstliche Vermehrungsgutverordnung
Umweltverträglichkeitsprüfungsgesetz
Verordnung über die Gefahrenzonenpläne
Verordnung über den Waldentwicklungsplan
Wildbachverbauungsgesetz
Forstschutzverordnung
Schutzwaldverordnung
Verordnung über raschwüchsige Baumarten
Verordnung über abweichende Bewuchshöhe bei Neubewaldung durch Naturverjüngung
Verordnung gegen forstschädliche Luftverunreinigungen
Verordnung über den Aufgabenbereich der Dienststellen in Angelegenheiten der Wildbach- und Lawinenverbauung
Verordnung über den Bundeszuschuß zur Waldbrandversicherung
Klima- und Energiefondsgesetz
Landesforstgesetz
Umweltförderungsgesetz
Raumplanungsgesetz
Land- und Forstwirtschaftsförderungsgesetz
Naturschutzgesetz
Naturschutzverordnung
Richtlinien der Landesregierung für die Verwaltung des Natuschutzfonds
Jagdgesetz
Jagdverordnung

Verwaltungsabgabenverordnung

Verordnung über die Festlegung der Waldregionen

Richtlinien der Vorarlberger Landesregierung für die Gewährung von Beiträgen für forstliche Maßnahmen

Gesetz über das Gemeindegut

Verordnung der Landesregierung über den Gemeindeverband Forstfonds des Standes Montafon

Verordnung des Gemeindeverbandes Forstfonds des Standes Montafon über Satzungen zur Regelung der Holzbezugsrechte aus den Wäldern des Standes Montafon (Holzstatut)

Verordnung der Landesregierung über die Ruhezone „Vergaldatal" in St. Gallenkirch

Verordnung der Landesregierung über den Schutz der Landschaft im Rellstal und im Lünerseegebiet

BULGARIA:

Forests Act and its ordinances

Hunting and Game Protection Act and its Ordinance for implementation

Environmental Protection Act

Protected Areas Act

Biodiversity Act

Waters Act

Renewable Energy Sources Act

Accountancy Act

Cooperatives Act

Duties and Agreements Act

FRANCE:

Forest Territory Charter (2006-2012)

Sustainable Development Charter (2006-2015)

Charter of the Regional Nature Park of Vercors (2008-2020)

Massif Alpes Strategic scheme

Regional mobilisation plan,

Multifunctional road network plan

Wood supply territorial plans

Public management plans directives

Private management plans and animation directives

SLOVAKIA:

National Forest Programme of the Slovak Republic

Action Plan of the National Forest Programme of the SR

Conception of the Agricultural Development 2007-2013

Act on forests

Decree on forest management and forest protection

Forest Development Strategy

Action plan on biomass utilization 2008-2013

Act on support of renewable energy sources and highly effective combined production

Slovak Water Plan (2010-2015)

Act on nature and landscape protection

Act on forest reproduction material

Rural Development Programme of the Slovak Republic 2007-2013

Decree on the scope, mode and the conditions for support in forestry and rural development

The National Strategic Reference Framework – Operational programmes

SLOVENIA:

Act Amending Game and hunting Act

Act on forests

Act on wildlife and hunting –

Annual plan for IV. Notranjsko hunting management unit 2007.

Biodiversity conservation strategy of Slovenia

Brown bear management strategy in Slovenia

Cave Protection Act

Conservation guidelines for forest management area Postojna, unit Snežnik. 2005.

Decision to initiate the preparation of detailed municipal spatial plan for Mašun

Decision to initiate the preparation of municipal spatial plan Ilirska Bistrica

Decree on concession for exploitation of forests in the ownership of the Republic of Slovenia

Decree on ecologically important areas

Decree on habitat types

Decree on national emission ceilings for atmospheric pollutants

Decree on protected wild animal species

Decree on protected wild plant species -

Decree on special protection areas (Natura 2000 areas) -

Decree on the categories of activities for which an environmental impact assessment is mandatory

Decree on the categories of valuable natural.

Decree on the establishment of special-purpose hunting districts in the Republic of Slovenia -

Decree on the protection of wild fungi

Decree specifying the wild game and hunting periods

Environment protection act

FM plan for FM region Postojna

FM plan for FM unit Leskova dolina

FM plan for FM unit Sneznik.

Adaptation strategy of agriculture and forestry in Slovenia to climate change.

Long-term plan for IV. Notranjsko hunting management unit for the period 2007-

National forest programme

Nature conservation act

Operational programme - Natura 2000 management programme 2007 -2013

Operational programme for limiting greenhouse gas emissions until 2012

Order on proclaiming the area of Notranjski Snežnik for a natural heritage

Ordinance on hunting districts in the Republic of Slovenia and their boundaries

Ordinance on proclaiming Snežnik castle for natural heritage and cultural monument

Regional development plan for Notranjska-Karst region 2007-2013.

Regulation on protective forests and forests with a special purpose

Regulation prohibiting driving vehicles in natural environment

Resolution on National Environmental Action Plan 2005-2012

Rules for recording kills and losses of game and on appointing commissions for assessing kills and losses in hunting management regions

Rules on criteria for the designation of a water protection zone

Rules on forest management plans and game management plans

Rules on forest management plans and game management plans

Rules on forest protection

Rules on the designation and protection of valuable natural features

Rules on the inclusion of endangered plant and animal species in the Red List

Spatial Planning act

Strategy on the reduction of greenhouse gases

SPAIN:

Act on forests

Law on Natural Heritage and Biodiversity

Law on Conservationof Natural Environments and wild flora and fauna

Game Law

Law relative to the declaration of the Natural Park "Sierra Norte del Guadarrama"

Management Plan for Sierra de Guadarama

Law on Area of limited use of the mountain summits

Forest Law of Castilla y León

Game Law of Castilla y León

National Game Law

Decree of Junta de Castilla y León related to the approval of the Management Plan of the Natural Resources of Sierra de Guadarrama

Law on Natural Areas of Castilla y León

Autonomous Decree relative to the Approval of the Recuperation Plan for the Spanish Imperial Eagle and complementary measures for its protection in Castilla y León

Autonomous Decree relative to the Approval of the Recuperation Plan for the Black stork and complementary measures for its protection in Castilla y León

Autonomous Decree of Castilla y León, for the management and harvest of mushrooms in the forests of Castilla y León.

Autonomous Decree of Castilla y Leónto approve the General Instructions for the Management of forested stands.

SWEDEN:

Rural development programme, County Administrative Board of Västerbotten

Climate and energy strategy for the County of Västerbotten

Decree for authorities on environmental guidance,

The Forestry Act,

The Environmental Code,

The Planning and Building Act,

Reindeer husbandry (reindeer meat production, cultural heritage)

The Reindeer Husbandry Act

Law on relics on culture,

The code of land laws,

The forestry kindom “Skogsriket”

Rules of Forest Certification

Legal right of access to private land

Climate change mitigation via carbon sequestration and bioenergy production

The Environmental Objectives

The Planning and Building Act