EUROPEAN FOREST INSTITUTE
CENTRAL-EAST AND SOUTH-EAST EUROPEAN
REGIONAL OFFICE – EFICEEC-EFISEE

Forest Land Ownership Change in Greece

COST Action FP1201 FACESMAP Country Report

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EUROPEAN COOPERATION
IN SCIENCE AND TECHNOLOGY

COST Action FP1201
Forest Land Ownership Change in Europe:
Significance for Management and Policy
(FACESMAP)

Forest Land Ownership Change in Greece

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The COST Action FP1201 FACESMAP Country Reports are edited by the European Forest Institute Central-East and South-East European Regional Office (EFICEEC-EFISEE) at the University of Natural Resources and Life Sciences, Vienna (BOKU). The Country Reports are not subject to external peer review. The responsibility for the contents of the Country Reports lies solely with the country author teams. Comments and critique by readers are highly appreciated.
The main parts of these Country Reports will be included in the upcoming EFICEEC-EFISEE Research Report "Forest Land Ownership Change in Europe. COST Action FP1201 FACESMAP Country Reports, Joint Volume", published online on the FACESMAP (http://facesmap.boku.ac.at) and EFICEEC-EFISEE (www.eficeec.efi.int) websites.

Reference:

Spanos, I., Meliadis, I., Platis, P., Mantzanas, K., Samara, T., Meliadis, M. (2015) Forest Land Ownership Change in Greece. COST Action FP1201 FACESMAP Country Report, European Forest Institute Central-East and South-East European Regional Office, Vienna. 31 pages. [Online publication]

Published by:

European Forest Institute Central-East and South-East European Regional Office
(EFICEEC-EFISEE) c/o
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Papers published in this series can be downloaded in PDF-format from:
http://facesmap.boku.ac.at/library/countryreports

Cover: F. Aggestam Layout: S. Zivojinovic

COST is supported by the EU Framework Programme Horizon 2020

COST (European Cooperation in Science and Technology) is a pan-European intergovernmental organisation allowing scientists, engineers and scholars to jointly develop their ideas and initiatives across all scientific disciplines. It does so by funding science and technology networks called COST Actions, which give impetus to research, careers and innovation.

Overall, COST Actions help coordinate nationally funded research activities throughout Europe. COST ensures that less research-intensive countries gain better access to European knowledge hubs, which also allows for their integration in the European Research Area.

By promoting trans-disciplinary, original approaches and topics, addressing societal questions, COST enables breakthrough scientific and technological developments leading to new concepts and products. It thereby contributes to strengthening Europe's research and innovation capacities.

COST is implemented through the COST Association, an international not-for-profit association under Belgian law, whose members are the COST Member Countries.

Background of the project

Forest ownership is changing across Europe. In some areas a growing number of so-called "new" forest owners hold only small parcels, have no agricultural or forestry knowledge and no capacity or interest to manage their forests, while in others new community and private owners are bringing fresh interest and new objectives to woodland management. This is the outcome of various societal and political developments, including structural changes to agriculture, changes in lifestyles, as well as restitution, privatization and decentralization policies. The interactions between ownership type, actual or appropriate forest management approaches, and policy, are of fundamental importance in understanding and shaping forestry, but represent an often neglected research area.

The European COST Action FP1201 FOREST LAND OWNERSHIP CHANGES IN EUROPE: SIGNIFICANCE FOR MANAGEMENT AND POLICY (FACESMAP) aims to bring together the state-of-knowledge in this field across Europe and can build on expertise from 30 participating countries. Drawing on an evidence review across these countries, the objectives of the Action are as follows:

(1) To analyse attitudes and constraints of different forest owner types in Europe and the ongoing changes (outputs: literature survey, meta-analyses and maps).
(2) To explore innovative management approaches for new forest owner types (outputs: case studies, critical assessment).
(3) To study effective policy instruments with a comparative analysis approach (outputs: literature survey, case studies, policy analyses).
(4) To draw conclusions and recommendations for forest-related policies, forest management practice, further education and future research.

Part of the work of the COST Action is the collection of data into country reports. These are written following prepared guidelines and to a common structure in order to allow comparisons across the countries. They also stand by themselves, giving a comprehensive account on the state of knowledge on forest ownership changes in each country.

The common work in all countries comprises of a collection of quantitative data as well as qualitative description of relevant issues. The COUNTRY REPORTS of the COST Action serve the following purposes:

- Give an overview of forest ownership structures and respective changes in each country and insight on specific issues in the countries;
- Provide data for some of the central outputs that are planned in the Action, including the literature reviews;
- Provide information for further work in the Action, including sub-groups on specific topics.

A specific focus of the COST Action is on new forest owner types. It is not so much about "new forest owners" in the sense of owners who have only recently acquired their forest, but the interest is rather on new types of ownership – owners with non-traditional goals of ownership and methods of management. For the purpose of the Action, a broad definition of "new forest owner types" was chosen. In a broad understanding of new or non-traditional forest ownership we include several characteristics as possible determinants of new forest owners. The following groups may all be determined to be new forest owners:

(1) individuals or organizations that previously have not owned forest land,
(2) traditional forest owner categories who have changed motives, or introduced new goals and/or management practices for their forests,
(3) transformed public ownership categories (e.g., through privatisation, contracting out forest management, transfer to municipalities, etc.), and
(4) new legal forms of ownership in the countries (e.g. new common property regimes, community ownership), both for private and state land.

This embraces all relevant phenomena of changing forest ownership, including urban, absentee, and non-traditional or non-farm owners as well as investments of forest funds or ownership by new community initiatives, etc. Although the COST Action wants to grasp all kinds of ownership changes it has to be noted that the special interest lies on non-state forms of ownership.

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Acronyms and abbreviations

CPR	Commons - forest common property regimes
EC	European Commission
EU	European Union
FACESMAP	Forest Land Ownership Changes in Europe: Significance for Management and Policy
FAO	Food and Agriculture Organization of the United Nations
FMP	Forest Management Plan
FMU	Forest Management Unit
FRA	Forest Resources Assessments
FSC	Forest Stewardship Council
IUCN	International Union for Conservation of Nature
NFP	National Forest Program
NGO	Non-governmental Organisation
PFOA	Private Forest Owners Association
SPA	Special Protected Areas

Executive Summary

Ecological classification of Greek land has a long history, starting with the Greek scholars, Aristotle and Theophrastus during the third century B.C. Greece, is situated in south-eastern Europe and it is endowed with splendid scenery, historical and archaeological interest. The total area of the country covers 13.2 million hectares (ha), the population is approximately 11 million people and the land use is affected by the Mediterranean climate. The country is predominantly mountainous, the altitude ranges from sea level to approximately 3000 m (mount Olympus), and the land surface is broken up by hills and high mountains, usually steep and eroded. Moderate (40-70%) and steep (>70%) slopes are dominant and the dense drainage system is characterized by relatively narrow, deeply incised channels. Approximately 700 torrents carry a large load of debris after heavy rains each year, and soil erosion is a serious problem. Mediterranean climate corresponds to distinct associations of natural vegetation, many of which include important forest species. In recent years, many Greek areas have been declared as “protected”, 320 sites (2.7 million ha) listed in the European Network “NATURA 2000” and Special Protected Areas (SPAs) aiming to protect wild and vulnerable species of flora and fauna. The basic land uses are forestry, agriculture and grazing. However, many changes of the Greek woodlands have been taken place throughout the country history until today. From ancient times, agricultural clearances have played an important role in the deforestation, especially in the lowlands and foothills, while repeated wildfires destroyed many forests. According to the data of Forest Service wide-ranging wildfires destroyed more than 1.1 million hectares of woodlands in the last decades. Many problems arise because the basic land uses are intimately mixed with and, today suffer greatly from wildfires, destructive human operations and overgrazing (by goats particularly).

The state forest lands cover a high percentage (65.5%) of the total area, while according to the First National Forest Inventory, 49.3% of the land is forested areas, from which 25.4% is high and productive forests and 23.9% low forested lands mainly used for fuel production, grazing and soil protection. The remaining 34.5% belong to private entities, local authorities, monasteries, and other welfare institutions. Municipalities are the second larger owner with 12 per cent of the forest cover. Forest cooperatives own 9.7 per cent while the forestland owned by private individuals accounts for only 8 per cent of forestry land.

The Greek Forest Service (GFS) is responsible for providing information on legislative issues, rights and obligations regarding forests. GFS informs private owners of all regulations and measures available for improving the status of their estate and collaborates in creating the necessary plans for the application which is to be undertaken. There is a similar approach and procedures for all private forest owners and the management plan is compulsory for all forest owners regardless the size of the ownership. The GFS also, in close cooperation with Greek Forest Owners Association (FOA) and several NGOs prepares projects and undertakes action aiming at improving the Greek forest environment and the conservation of species in these areas.

1. Introduction

1.1. Forests, forest ownership and forest management in Greece

About half of the country is covered by forest and other woodlands. The major portion of forests is composed of sub selection and selection stands with the remaining of even-aged stands. A high percentage of forests is managed as coppice forests, consisting mainly of even-aged stands. Their condition from the point of view of density, quantity and quality of the growing stock is not satisfactory, mainly due to human impact during the past, such as fires, grazing, land clearings, illegal fallings, as well as lack of systematic silvicultural treatments. An ecological land classification, mapping and evaluation of land utilisation have been recently completed for the total area of Greece. A hierarchical land classification and mapping system was developed with four levels of intensity: land region, land district, land association and land type. Mapping is at the scale of 1:50,000, and the map units were described by the kind and state of natural regeneration, type of landforms, soil depth, erosion presence, slope and aspect. Land evaluation was carried out for forestry and agriculture uses, and for the risk of soil erosion (Nakos, 1983; Christodoulou and Nakos, 1990). The forest land use conflicts are matter of the existing trends in public and private sectors and are caused by a number of macro-demographic and economic factors (Vakrou, 1998), such as: social changes, institutional changes, modern style of life, population growth, urbanization, changing attitudes of people, the affluence and improvement of living standards, the technological change, the economic development, the existing properly rights, political and cultural changes. Destructive human activities such as illegal cuttings and clearances, as well as overgrazing (by goats particularly) are also responsible for forest decline (Anthopoulou *et al.*, 2006). The estimation of the current land capacity for grazing is a useful tool for forest managers for a scientific use of their land. Grass and shrub competition to forest regeneration can be reduced by judicious grazing management and it decreases the need for herbicide application. Hardwood forests are more vulnerable than coniferous forests to grazing damage (Table 1).

Table 1: Major land use categories (%) of Greece according to the First National Forest Inventory (Ministry of Agriculture, 1992).

Land use category	Area (ha)	Cover (%)
Woodlands	6,513,000	49.3
Rangelands	1,700,000	12.9
Agriculture	3,959,000	30.0
Urban/other	1,024,700	7.8
Total	**13,196,700**	**100.0**

Nakos (1983) reported total forest land in Greece covers 65.5%, with the highest share of high forests (19.5%), (Table 2).

Table 2: Main land categories of Greece (Nakos, 1983)

Land use categories	Area (ha)	%
Forest land	8,460,000	65.6
High forests	2,512,000	19.5
Exploitable	1,793,000	13.9
Un-exploitable	719,000	5.6
Other wooded land	3,238,000	25.1
Range land	2,490,000	19.3
Other forest land (rock outcrops, etc.)	220,000	1.7
Non-forest land	4,430,000	34.4
Agriculture	3,960,000	30.7
Others	470,000	3.7
Total land (exclusive water)	12,890,000	100.0

Regarding the ownership structure, 63.5% of the forests are state owned, 12% are owned by local communities and the rest 22.5% are privately owned by monasteries, or individuals, groups, various organizations and foundations.

Forests were not classified by ownership size in the National Forest Inventory (NFI,1992). The areas of the Inventory are classified by ownership size as it can be seen in table 3 and table 4.

Table 3: Distribution of forest and other wooded land by size class and state and community structure (First NFI, GSF&NE, Ministry of Agriculture, 1992)

Size class (ha)	State			Community		
	Number	Area (1000ha)	Percent %	Number	Area(1000ha)	Percent %
0-10	31	0.183	0.004	18	0.123	0.021
11-20	18	0.289	0.006	11	0.159	0.029
21-50	36	1.302	0.027	33	0.849	0.145
51-100	39	0.269	0.006	44	2.344	0.400
>101	1,361	4,824.602	99.957	599	582.513	99.405
Total	1,485	4,827.000	100.000	705	586.000	100.000

Table 4: Distribution of forest and other wooded land by size class on private structure (First NFI, GSF&NE, Ministry of Agriculture, 1992)

Size class (ha)	Private		
	Number	Area (1000 ha)	Percent %
0-10	613	3,241	0.767
11-20	139	2,986	0.706
21-50	146	7,043	1.666
51-100	77	8,116	1.920
101-500	151	51,235	12.120
501-1000	56	57,930	13.704
1000-1500	27	45,707	10.813
>1500	56	246,463	58.304
Total	1,265	423,000	100.000

The size of forest holding is of decisive importance, because the exploitation of a small forest holding cannot be carried out on competitive base. The prohibition of fragmentation of forest property by The Forest Law contributed to the maintenance of relatively large forest holding. Thus, there are few small-sized state and private forest properties in the country. In Greece, private forest holding of 2-50 ha constitutes 3.2% of the total forest land, one of the smallest percentages in Europe.

1.2. Overview of the country report

1.2.1. General overview of Greece

Greece is situated in south-eastern Europe and it is endowed with splendid scenery, historical and archaeological interest. The total area covers 13.2 million hectares (ha), the population is approximately 11 million people and the land use is affected by the Mediterranean climate. Greece is predominantly mountainous country, with the altitude ranging from sea level to approximately 3,000 m (mount Olympus), and the land surface is broken up by hills and high mountains, usually steep and eroded. Moderate (40-70%) and steep (>70%) slopes are dominant and the dense drainage system is characterized by relatively narrow, deeply incised channels. Approximately 700 torrents carry a large load of debris after heavy rains each year, and soil erosion is a serious problem. The basic land uses are forestry, agriculture and grazing.

The forest lands cover a high percentage (65.5%) of the total area (8.4 million ha), and according to the First National Forest Inventory (1992), 49.3% of the land is covered with forests, from which 25.4% are high and productive forests and 23.9% low forested lands that are mainly used for grazing and soil protection. In recent years, many natural areas have been declared as “protected”, 320 sites (2.7 million ha) listed in

the European Network “NATURA 2000” and Special Protected Areas (SPAs) aiming to protect wild and vulnerable species of flora and fauna. Many changes of the Greek forestry have taken place throughout the history until today.

2. Methods

2.1. General approach

According to the aims of the country report which is to give a comprehensive overview of forest ownership issues in the country, a mix of methods is applied. They include a literature review, secondary data, expert interviews as well as the expert knowledge of the authors.

Data include quantitative data (from official statistics and scientific studies) as well as qualitative data (own expert knowledge, expert interviews and results from studies). A literature review explicates the state-of-knowledge in the countries and contributes to a European scale state-of-art report. Case examples are used for illustration and to gain a better understanding of mechanisms of change and of new forest owner types. Detailed analyses of the collected data and case study analyses are done in subsequent work steps in the COST Action.

2.2. Methods used

The methods that are used for writing Greek report were: review of the bibliographic references from the network and libraries, meetings and interviews with Greek official authorities and Greek private forest owners.

At the end of September the meeting with the private forest owners was organized in order to discuss and find conclusions about their situation and problems in Greece. These findings are included in this report. The Greek Cost Action team held four meetings from June to December 2014, at the Forest Research Institute in Thessaloniki. At those meetings were attended the president and vice president of the Greek private Forest Owners Association as well as members of the Public Forest Authority.

From the private forest owners' view, emphasis needs to be placed on the very different economic circumstances of public and private forest management. Public forest is financed by the state while private forests owners must finance their management from the sales of their products (wood).

For the first time digital maps of the Ownership status of the Northern part of Greece have been produced by the WG1 and presented to one of the meetings.

A lot of effort needs to be taken and many things into consideration in order to achieve a forest management approach which will clarify the needs of the market and the obligations for the sustainable growth.

3. Literature review on forest ownership in change

3.1. Research framework and research approaches

The majority of the data about the forests in Greece comes from the results of the First National Forest Inventory (NFI) (Ministry of Agriculture, 1992). The First NFI in Greece was initiated in 1963 and covered 11,377,000 ha or 86.2% of the entire country (National Inventory of Greece 1992). Areas not covered by inventory were primarily agricultural lands which amounted to 1,819,000 ha or 13.8% of the country area. This inventory was conducted as a joint project between the Hellenic Forest Service and the Food and Agriculture Organization of the United Nations (FAO).

Policy measures to ensure and promote forestry in the mountainous areas of Greece (Vakrou, 1998).

Apart from their productive and environmental functions, the forests of Greece are also called upon to fulfill a distinct social role, by promoting rural development and guaranteeing mountain communities an income. Several instruments have accordingly been developed, to finance, regulate, communicate and evaluate the appropriate policies. Most of these are presented and an assessment of their impact is included, taking into account the conflicting interests between various land uses, the multipurpose objectives Greek forests are called to fulfill and, last but not least, that forestry is an active within the rural development process and cannot be viewed outside this context.

In 2000, the Greek Ministry of Agriculture published a publication (in Greek and English) related to criteria and indicators for a sustainable management of forest in Greece (Albanis *et al*., 2000). The "Criteria and indicators for the Sustainable Forest Management in Greece" is a commitment undertaken by our country from its participation in the Helsinki Process, which was taken on at the Second Ministerial Conference on the Protection of Forests in Europe, held in Helsinki in 1993. All the Process member-states have committed themselves to develop criteria and indicators for sustainable forest management at the national, sub-national and forest management unit level. This document is a first attempt to develop criteria and indicators at the national level for the Greek forests.

Sustainability should be a binding principle in managing forests and natural ecosystems in general, for the material goods that can be produced by forests, as well as for their non-material goods and services. The attempt to ascertain if sustainability is implemented in forest management, made the development of evaluation tools necessary. Such tools are the criteria and indicators for sustainable forest management.

The framework for the development of criteria and indicators for the sustainable forest management at the national level is the list of Pan-European Criteria and Indicators adopted at the meetings that followed the Second Ministerial Conference held in Helsinki, in which Greece regularly participated.

Assessment of Greek forests protection and management (Tambakis et al., 2003)

The main goal of this work was to investigate the citizens' views on their relationship with the Forest Service all over Greece. Although the view expressed was relatively positive, much has still to be done in order to reverse the neutral attitude of some citizens. Furthermore, the citizens' awareness about the European Union funding programs to convert rural areas into forest plantations needs to be assessed. The population in the Central and Northern areas of Greece was better informed compared to the islands and Thrace.

The existence of good relations with the Forest Service allows better information of citizens.

Finally, most Greek citizens believe that forests are neither managed efficiently nor protected properly, and therefore they foresee an ominous future. Citizens maintain that management is directly related to forest protect on and to the future of the country's forests.

Allowable interventions in forests and forest lands in Greece (Goupos and Papastaurou, 2000).

Many interventions are allowed in forests and forest lands and they refer to deforestation, installations for various activities. If the purpose of such interventions is agricultural exploitation, they must be important to the national economy. If these interventions take place for a different use, then they must be of benefit to the public. Forests cannot be deforested. However, they can be used, under certain terms, for arboriculture or certain activities such as the installation of camping grounds and children resorts, the installation of various military works, the installation of various cultural works, the construction of public projects, the installation of industries, the installation of stock-breeding stations, various tourism facilities, mining and quarry works, road openings, installations for serving visitors in the forests. The granting of public forests is allowed for the construction of installations for climbing and winter sports, for mines and quarries, for camping grounds and children resorts, and for military installations. Forest lands can be deforested under certain conditions. Moreover, they can be subject to demands for installations of almost all activities. Public forest lands can be granted to physical or corporate bodies, under public or private law, for almost all uses, and in accordance with the terms of the applicable legislation in force.

Legal restrictions on forest ownership in Greece (Goupos and Papastaurou, 2000).

Because of its important social role, forest ownership is subject to a number of restrictions beyond the ones of the Civil Code which are in force for all categories of real property. The main provisions that enact legal restrictions in forest ownership are dispersed within laws and decrees addressing forests and forested areas.

Legal restrictions in forest ownership refer to the use, to the usufruct or to the disposal of property. The principal aim for setting legal restrictions is the conservation of the character and use of forests and forest lands. Most of the legal restrictions in forest ownership do not create an obligation charging the owner for the benefit of third persons but create an obligation of the public authority. The implementation of such obligations requires an increase in the number of forest employees, proper organization of the forest service, supervision in the application of provisions of forest legislation, an increase of criminal penalties, reinforcement of the police in the area of forest administration, and mainly, political stability in forest policy and in forest ownership.

In compensation for restricted forest ownership it is necessary that the state takes measures in favor of the owners such as tax releases (preferential treatment), subsidies, etc. in order to increase and preserve forests and forest lands in our country.

Local people's perceptions of planning and management issues in Prespes Lakes National Park, Greece (Trakolis, 2001).

Local people's perceptions of planning and management issues were investigated in Prespes Lakes National Park in north-western Greece, 24 years after designation. Ensued conflicts due to lack of local community participation in the designation procedure and in the decision-making process thereafter necessitated this research. Knowledge of the park and its aims, source of information about aims, necessity for works and facilities, attitudes toward certain policies, and effectiveness of administration and management scheme, were studied by means of a questionnaire survey. Respondents were contacted by systematic sampling, which resulted in 201 cases for analysis. Poor knowledge of aims associated with education of people was revealed and the managing authority (the Forest Service) as source of information was mentioned in only one case. Forest recreation facilities and improvement of accessibility were considered of high priority, as means of possible tourism development of the area. A policy of non-intensive agriculture with compensation for loss of income, if the wetlands of the park were in danger, seems acceptable, younger ages accepting it more easily. The need for a new administration and management scheme with the participation of local communities in the decision-making process was revealed, supported mainly by the younger age groups. Finally, the results indicated that the information derived from such research could

help managers of protected areas to resolve arising conflicts.

Valuing Mediterranean forests towards total economic value, Greece (Kazana and Kazaklis, 2005).

Publication giving details about valuing Mediterranean forests towards total economic value, the case of Greece. Special issues that are given at this publication are:

1. Introduction
2. Forest resources
3. Institutional aspects
4. Contribution of the forest to the national economy
5. The values of Greek forests
6. Towards the total economic value of Greek forests
7. Conclusions and perspectives

Cost action E19: Forest Forests for the future. National forest programmes in Europe. Greece: Sustainable forest management and the challenge ahead for Greek state forestry (Papageorgiou et al., 2004).

National report giving details about sustainable forest management and the challenge ahead for Greek state forestry. Special issues that are given at this national report are:

1. Introduction
2. Supporting and impeding factors
3. Participatory mechanisms
4. Negotiation and conflict resolutions
5. Intersectoral approaches
6. Long term iterative planning
7. Other elements of Greek national forest policy
8. Conclusions

Perceptions and preferences of the local population in Eastern Macedonia and Thrace National Park in Greece (Pavlikakis and Tsihrintzis, 2006).

In order to achieve socially acceptable management solutions, a survey of the local population of the National Park of Eastern Macedonia and Thrace in Greece was carried out. With the use of an appropriate questionnaire, face-to-face interviews were performed. The survey aimed to: (1) involve the local population in decision-making by classifying the issues to be studied according to the importance they have for the ecosystem inhabitants, e.g., regarding people's income, and landscape aesthetics and ecological value; and (2) contribute to an appropriate and representative future management scheme. The investigation concerned local people's socio-economic status, their knowledge about the ecosystem area, their activities in the park area and their opinion about the ecosystem assets and services. Among the outcomes, biological factors such as flora and fauna and landscape aesthetics emerged as the most valuable ecosystem assets. Furthermore, the majority of those surveyed were willing to pay for the protection and the proper management of the park area.

Land use changes in the Greek woodlands (Spanos et al., 2009).

Publication giving details about land use changes in the Greek woodlands. Special issues that are given at this publication are:

1. Introduction
2. Land information about Greece
3. Main land uses categories in Greece
4. Land use changes in the Greek woodlands
5. Conclusions

Cost action E47: Forest vegetation management in Europe. Current practice and future requirements. National report Greece (Papachristou et al., 2009).

National report giving details about forest vegetation management in Greece. Special issues that are given at this national report are:

- Country background
- Treatments and alternatives
- Ecosystem responses
- Society and vegetation management

National forest inventory reports. Greece (Meliadis et al., 2010).

Publication giving details about the national forest inventory of Greece. Special issues that are given at this publication are:

1. Development of the Greek national forest inventory
2. General Use of the Results
3. Current Estimates
4. Sampling Design
5. Estimation Techniques
6. Current and Future Prospects

DSS in Environmental Governance: the case of forest management in Greece (Tasoulas et al., 2011).

Lately, as sustainability has been globally a key goal at local and regional level, environmental governance and management issues, related to decisions that verify performance have also gained a continuously growing focus. DSSs designed for this purpose can use multi criteria analysis and indicators to implement sustainable forest management. This DSS application includes 6 variables for the forest and by using the specific programming code based on If – Then statements of Visual Basic, automatically selects and decides management measures to propose to the forest manager as an output for each variable. This happens by estimating the interaction of different variables in the forest, which concerns the allowance or conflict case of two different uses. The manager can accept, reject or complete the proposed measures. Such a DSS application can easily be connected to other software as GIS or CAD and can easily be expanded to many new technology applications.

3.2. New forest ownership types

The physical and cultural environment has been characterized by the Constitution of Greece (1975) as an object of great interest, and consequently it is in need of special adjustment. Also the Constitution prohibits the changes in forest land use. According to article 24, *"change of forests and forest land allocation is prohibited unless the national economy or agricultural require exploitation for the benefit of the public"*. (Tahos A. I., 1987 and Vavouskos K., 1983). Allowed interventions in forests and forest areas are basically regulated by Law 998/1979 "on the protection of forests and forest lands of our country in general". Interventions in forests and forest areas are classified into following categories: 1) deforestation, 2) granting of public forests, 3) granting of public forest areas and 4) granting for installation and various activities according to the provisions of legislation. According to the Greek Constitution is not allowed new forest ownership types.

3.3. Forest management approaches

The main forest management approaches for Greece are:

- Wood-production (including boat building)
- Non wood production: resin, honey, livestock, mushrooms, pharmaceutical wild-plants
- Social uses: wildlife, recreation, hunting.

Main multiple functions of forests in Greece:

- Production of wood for national and local needs
- Production of non-wood products (resin, chestnuts, mushrooms, honey, berries, etc.)
- Protection of soils on steep slopes from water erosion
- Regulation of water flow of mountain streams
- Provision of food and forage for wild animals
- Provision of grazing for domestic animals
- Provision of recreation opportunities
- Provision of wildlife opportunities.

For our country, the same laws are followed in public and in private forests and the basic purpose of forestry today is the creation of ecologically healthy forests with a desirable structure, being capable for a perpetual production of the maximum possible quantity and best wood quality of various categories in conjunction to a very high public-beneficial

effect.

Under this concept, the conversion of coppice forests into high ones consists the best protection mean of the forest ecosystems and a highly scientific target for the global economy and for the global ecosystem as well (Hatzistathis A. and Hatzistathis T., 2003).

3.4. Policy change / policy instruments

According to Vakrou (1998) several instruments prescribed and developed through the process of the current forest policy formulation in Greece have been used for regulating forestry in mountainous areas. These are the following:

Regulatory instruments:

- Prohibition of change of land use of forests and forested lands
- Regulation and restrictions for grazing
- Supervision of forest management
- Protection of forest and forest areas against all dangers, i.e. soil erosion, wildfires, illegal loggings, torrents, insects, landslides, etc.
- Reforestation policy
- Regulations for special protected areas (National parks, nature monuments, avifauna, wildlife, recreation and historical sites, etc.)

Economic instruments:

Direct

- Forest funds, which are directed towards forest development and management projects
- Relations between state and private forests
- National program for the “Environment” and “Agriculture”
- EU regulations.

Indirect

- Granting of management rights to Forest Co-operatives
- Provision of facilities and productive investments
- Support to mountain communities and forest workers.

Informational instruments:

- Extension Service of the Forest Authority
- Forest educational program for forest workers
- Information on legislative issues and programs provided to private owners, co-operatives, NGOs and the general public.

Development of a forest economy in the mountainous areas of Greece can play a vital role in the survival and sustainability of these areas. These lands represent the arena for the application of forest policy. Recent trends suggest that even though forestry can represent the basic force driving development, it cannot be the only one. Other forms of economic activity, like tourism agriculture, small scale processing enterprises (agrifood, articrafts, etc.) need to be developed in parallel and coexist with other activities developed in mountainous areas. New instruments need also to be developed in order to assist older ones against land use of conflicts. Giving away some state land, preferably forested areas and grazing lands, might decrease pressure and allow the Forestry Service to concentrate its efforts and resources on more efficient policies and actions.

Private forestry needs assistance in order to be more productive, but also more economic rewarding for those who exercise it. The state as a forest owner assumes also a social function by providing recreation, game for hunters, protection against torrents and floods and other environmental benefits and maintaining the forest resources of the country. The same functions are also provided by the owners of private forests, since they do not impose any restrictions in the use of their forests by the public; forest owners be assisted, for example with specific tax breaks which will help enhance the potential profitability of the forests, in order for them to assume a more active role in the rebirth of the Greek mountains.

Trakolis et al. (1998) have identified the following points that need immediate attention in the near future:

- Identification of the perceptions and attitudes of forest workers and members of the forest co-operatives

dealing with the exploitation of Greek forests, towards management inputs and forest policies.

- Perceptions and attitudes of the mountain communities towards management inputs and forest policy, as well as establishment of the existing types of property rights and perceptions and communication of the existing agreements.
- Attitudes and reactions of forest visitors to the various management measures.
- Examination of the historical development of these property rights and determination of the way in which these rights have affected management practices, forest protection and the formulation of forest policy.
- Evaluation of the results of the application of E.U. Reg. 2080/92 for the afforestation of abandoned or marginal agricultural land.
- Assessment of the total economic value of forests and their contribution to the National Accounts.
- Evaluation of forests and prescribed forest policies and management in regional development, through their role in the creation of a cultural identity and a distinct image for the region, leading subsequently to the promotion and enhancement of development opportunities.

4. Forest ownership

The aim of this chapter is to give a detailed overview of forest ownership in Greece. The most detailed information at national level is often structured in different ways in different countries. In order to show the most accurate information, it was decided to use the national data sets in the country reports. To make this information more comparable still, the information is also collected in an international format that is used in the Forest Resources Assessments (FRA) by FAO. The transfer from national data sets to international definitions is, however, not always easy. This report therefore critically assesses how far the national categories and definitions may be transformed into the international FRA data structure and the extent to which there are inconsistencies between them.

4.1. Forest ownership structure

4.1.1. National data set

The first attempt for a NFI held in 1836 was more or less an empirical inventory of the country's forest and other wooded land. The results were published in 1842 by the consul of Bavaria and Hannover. The main point is that at that time the total area of the country was 4,761,000 ha, i.e. 1/3 of the current total area. The New Greek state which was formed at that time included Peloponnese, Central Greece and some islands, while the remaining of today's area was under Turkish occupation. Information for this inventory came from Kontos, who adapted inventory data from the silvicultural and forest policy point of view (Kontos, 1921).

In 1929 the results of a second "inventory" were published without providing any information on the methodology used. At this time the area of the country was almost the same as today, slightly different, due to the fact that in 1929 the prefecture of Dodecanese was under Italian domination.

The two inventories mentioned above are only of historical value and interest and the results are not comparable with current data.

Nowadays, the majority of the relevant data about forests comes from the results of the **First National Forest Inventory (NFI)** (Ministry of Agriculture, 1992). The First NFI in Greece was initiated in 1963 and covered 11,377,000 ha or 86.2% of the entire country (National Inventory of Greece 1992). Areas not covered by inventory were primarily agricultural lands which amounted to 1,819,000 ha or 13.8% of the country area. This inventory was conducted as a joint project between the Hellenic Forest Service and the Food and Agriculture Organization of the United Nations (FAO). This forest inventory was conducted in ten inventory regions of unequal sizes. The inventory regions of the 1963 Greek NFI were:

1. Central Greece (or "Work 81")
2. Mornos
3. Evinos
4. Peloponnisos
5. Western Greece
6. Eastern Macedonia, Thraki.

The first region was inventoried in 1965, and the inventory subsequently expanded to the other regions. In 1985, the first phase of the inventory, consisting of interpretation of aerial photographs and the field measurements, was completed. In 1991, the entire NFI was completed, and the results were reported in a handbook titled "Results of the First National Forest Inventory". The purpose of the NFI was to improve the database on Greece's forests and soil resources. For each inventory region, data that were collected and recorded included: soil morphology and watershed network, rocks – soil data, climatic data, vegetation data, land use of the non-forested areas, and distribution of forests. The users of the results are the Hellenic Forest Service and the Hellenic Statistical Service.

The forest regions or eco-regions according to the NFI are shown in figure 1. A scientific study of these zones may explain the distribution of forests in Greece.

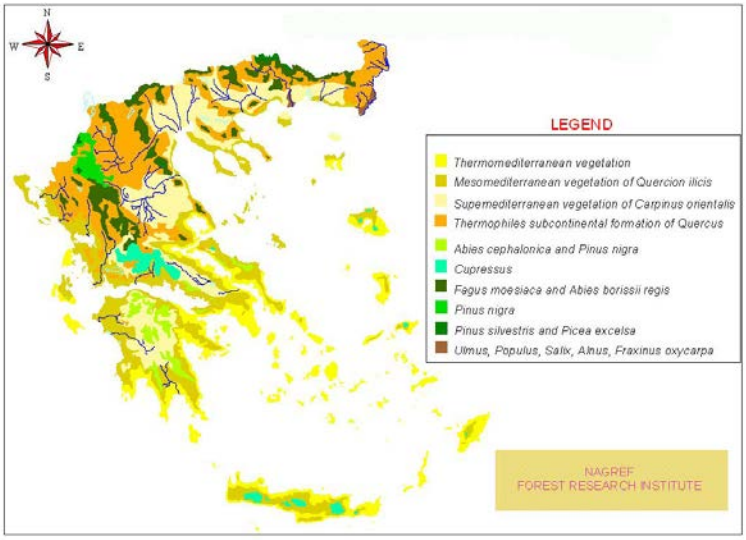

Figure 1: Eco-regions, according to the NFI. (General Directorate of Forests and Torrent Control, Ministry of Agriculture, 1964)

Based on the State Report of the Inventory (1999-2000) about half of the total area of the country is covered by forest and other wooded land (Figure 2). The most important portion of the forest is composed of sub selection and selection stands while the remaining is of even-aged stands. Forests managed as coppice totally consist of even-aged stands. The structure of the forest appears as a one-storied, two-storied and multi-storied.

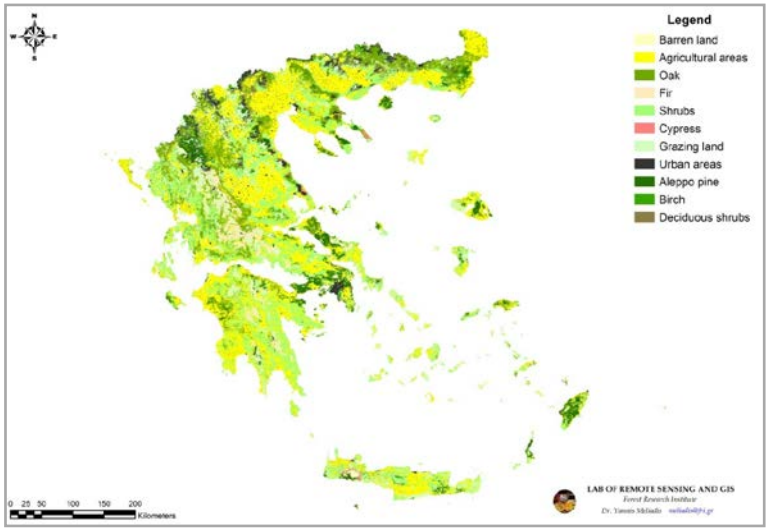

Figure 2: Vegetation map of Greece (Ministry of Agriculture, www.geodata.gov.gr)

According to, Albanis et al 2000, the forest area per capita is only 0.32 ha which is a very small proportion compared with international norms (that is in average at least 5 ha per capita). The absence of the second NFI, makes the assessment of the development of some basic forest parameters during the years impossible.

The distribution of Greek forests by the ownership structure is the result of historical, social, economic and political conditions. The political culture of Greece is characterized by an instrumental rationalist decision making process where the public authority is the only entity responsible for making choices in favor of the “common good”. This dominant political framework applies in forestry whereby the common interest is defined in an extra-societal way without considering the interests and needs of different users. Within the forestry department, national forest policy is made at a central level by a close circle of

well-intentioned forestry specialists. The high percentage of state forests 65.6% is considered as favorable, because it best serves the social role of forests. The more mountainous a country is the higher should the percentage of forests under state management be, since the state with the funds, personnel and framework it has at its disposal, proves to be a better manager than private forest owners. Consequently, in mountainous countries the protective and social role of forests better promoted.

Forests are not classified by ownership size in the 1992 NFI. The areas of the 1992 inventory are not classified by ownership size. The size of a forest holding is of decisive importance, because the exploitation of a small forest holding cannot be performed on competitive basis. There are few small-sized state and private forests in the country. In Greece, private forest holdings of 2-50 ha constitute 3.2% of the total forest land, one of the smallest percentages in Europe.

Table 5 shows the main categories of forest ownership. State is the main owner of forest land in Greece.

Table 5: Distribution of forests ownership in Greece (ha). (Albanis *et al.,* 2000)

Forest Ownership	Conifers	Broadleaves	Total	%
State	591,000	1,053,000	1,644,000	65.42
Municipalities	93,000	208,000	301,000	11.98
Monasteries	53,000	57,000	110,000	4.37
Organizations	9,000	3,000	12,000	0.48
Co-operatives	N/A**	N/A**	246,000	9.79
Idividuals	N/A**	N/A**	200,000	7.96
Total			**2,513,000**	**100**

** *N/A: not available*

State forest management and exploitation encountered various difficulties in the past due to the ordinary and traditional rights of grazing and fuel wood felling on forest land. In the forests owned by municipalities, is managed in accordance to the needs of the municipality residents and some surplus is made from sale. The monasteries category includes forests belonging to monasteries and charitable foundations. Cooperatives own the forests in various ways, as natural or legal persons. They are distinguished into two categories.

a) Joint forest property by state and other natural or legal persons

b) Joint forest property by natural or legal persons. All non-state forests are subject to state forest policy and works carried out in them are under state control and supervision.

Eventually the individuals are also private owners, or people or private companies.

More detailed distribution of the forest ownership categories in different geographical areas of Greece presented in Table 6. The figures 3 and 4 show graphical distribution of forest ownership by category and total Greek forests.

Table 6: Forest ownership in Greek geographical areas (ha) (1999-2000) (Ministry of Environment Energy and Climatic change, 2010).

Geographical areas (Prefectures)	State	Municipalities	Monasteries	Organisations	Cooperatives	Individuals	Total
Thrace	247,007	2,080	382	0	2,823	33	252,325
Macedonia	518,624	76,855	56,838	2,217	61,961	32,615	749,110
Ipeiros	86,459	80,184	3,285	62	33,753	3,021	206,764
Thessaly	86,328	99,829	18,052	10	38,093	26,036	268,348
Sterea Ellada-Evoia	420,787	12,801	16,903	1,305	87,729	67,381	606,906
Peloponisos	222,735	2,154	9,958	802	6,189	41,992	283,830
Ionian islands	350	5,453	493	1,744	803	11,382	20,225
Aegean islands	61,715	13,613	3,815	5,085	2,532	14,200	100,960
Crete	0	8,558	220	0	11,962	3,210	23,950
TOTAL	***1,644,005***	***301,527***	***109,946***	***11,225***	***245,845***	***199,870***	***2,512,418***

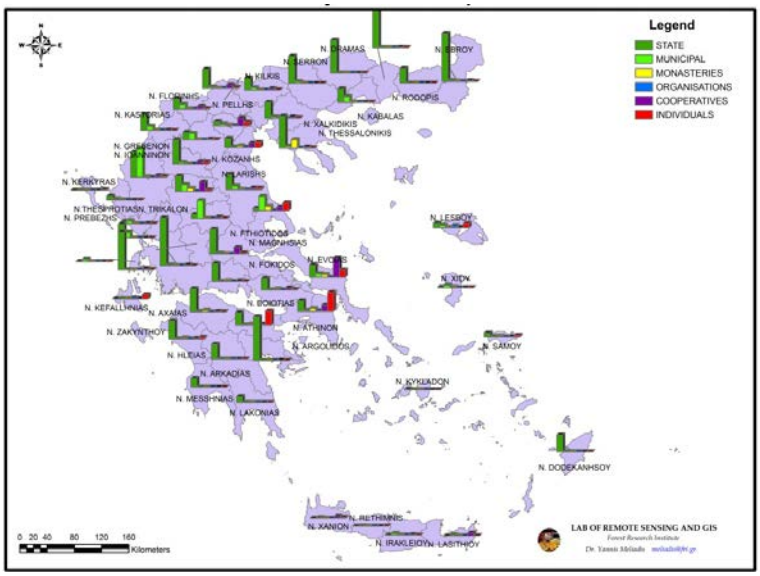

Figure 3: Distribution of forest ownership categories in Greece

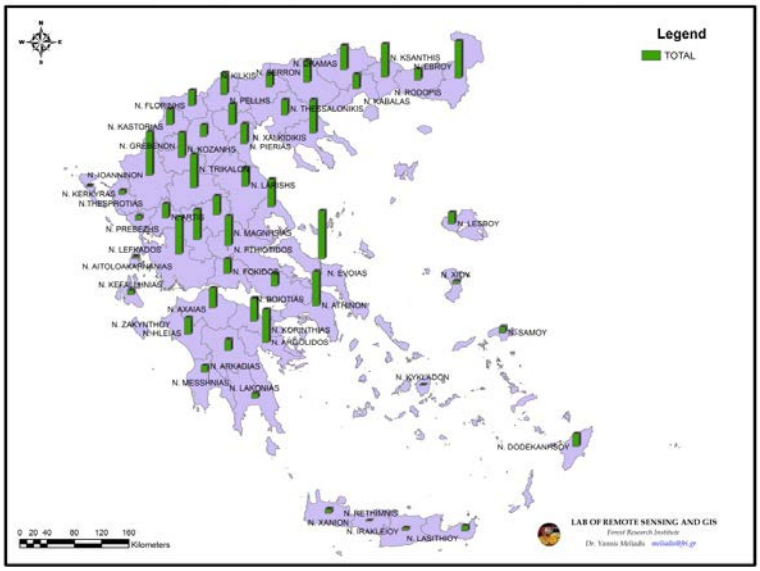

Figure 4: Total distribution of forest in Greece

Forests and forestlands have not yet been mapped in a systematic and scientific way. They cover about 6,505,499 ha, that is, 49.3 percent of the total country area (National Inventory of Forests, Ministry of Agriculture, 1992). According to the Greek Ministry of Rural Development and Food (2005), privately owned forests cover about an area of 199,870 ha. Municipalities, charitable foundations and monasteries own forest areas of 422,698 ha (Vogiatzis, 2008). The Hellenic Forest Service administers the rest of lands as public lands including grasslands. Grasslands are dominated by specific non-woody vegetation (low formations of shrubs, phryganas) with canopy cover less than 15 percent, located in lowlands or hills with elevation up to 200 m, Ministerial Circular No. 159140/1077/1980, and they are mainly spread over Greek islands and the coastal zone. On the mainland, they may be found in transition zones between forestland and rural areas. It is estimated that these lands cover approximately 1,600,000 ha (WWF Hellas, 1999).

In Greece, the coexistence of various forest species and bushes rich native flora, led to a composition of forest vegetation was distinguished by the diversity of forms and characteristic peculiarity. The diversity of forms is due to factors acting together, influenced and continues to have an impact

on vegetation of our country. The main ones are the following: The geographical position of Greece is such that it can accommodate plenty of flora elements from three different phytogeographic regions. The species of the Mediterranean, Mid Europe and Asia appear to forest vegetation in Greece and compose the rich flora in number and origin of species. The climate is with more or less expressed Mediterranean character.
Two more factors are characteristics of the Greek ecosystems:

1. The heterogeneity, instability and vulnerability (common characteristic in all Mediterranean countries).
2. The shortage of an authorized land registry (affecting forest ownership in many ways).

4.1.2. Critical comparison with national data in FRA reporting

According to the FRA data, Table 7 the forest land in Greece is 3,923.00 ha, Public ownership is 3,005.31 ha and the private ownership in total is 897.69 ha. This is the only data from FRA.

The difference comes from different years of data collecting and different terminology used for forests and forest lands.

Table 7: Forest Ownership according to FRA 2010

FRA 2010 Categories	Forest area 2005 (1000 hectares)
Public ownership	2907
Private ownership	845
...of which owned by individuals	N/A**
...of which owned by private business entities and institutions	N/A**
...of which owned by local communities	N/A**
...of which owned by indigenous / tribal communities	N/A**
Other types of ownership	0
TOTAL	**3752**

*** N/A: not available*

4.2. Unclear or disputed forest ownership

Not available data.

4.3. Legal provisions on buying or inheriting forests

4.3.1. Legal restrictions for buying or selling forests

Restrictions are set by the Private Law (Law of Neighbours, decrees 1003 and next of Civil Code) and Public Law with regard to public interests (reasons of security, hygiene, building alignment, etc.) (Vavouskos 1979, Georgiadis 1975, Balis 1961, Furkioti 1949, Stimfaliadi 1954, Tousis 1966, Kassimatis 1972). Article 17 of Constitution protects the liens (ol. State Council 1094/1987, Nom. b. 35/1987). The Private Law imposes restrictions by defining the content of ownership as related to its social content is compatible with article 17 of Constitution, even if the value of ownership is decreased due to the interference of the legislation or due to administrative regulations (State Council 37/1988, Nom.b. 37/1989, ol. State Council 695/1986, Nom.b. 34/1986) provided that the restrictions do not imply the annihilation of ownership (State Council 1743/1985, Nom.b. 34/1986).

Furthermore, division of a forest property either by distribution or by sale or by any other action is prohibited without the permission of the Minister of Agriculture (Article 60 par. 1 Forest Code). The Minister of Agriculture has a unique role and may grant such permission if forest development and preservation is facilitated (State Council 284/1960, 1306/1971, 1826/1979, 4220/1980) (Goupos and Papastavrou 2000).

A transaction that would contravene article 60 of Forest Code (Supreme Court 540/1965, 908/1972, 606/1976) is invalid. Permission is necessary, too, in a judicial partition, when the State is a joint-proprietor (State Council 284/1960) in a situation of approval or modification of building alignment (State Council 762/1967, 2760/1975). In case of expropriation, the consent of the Minister must be declared, except cases where the Minister co-signs the alienation (Gn. Legal Council of the State 426/1962). The donation

of a part of a forested area (Gn. Legal Council of the State 457/1961) and the previously agreed purchase of a defined proportion of the property are invalid if permission for the partition has not been claimed and granted by the Minister of Agriculture (Supreme Court 540/1965). This does not concern the acquisition of parts of forests and forested lands with usus fructus (Supreme Court 540/1965, 606/1965, State Council 1251/1975) (Goupos and Papastavrou 2000).

Right of State preference (State privilege): If a proprietor intends to sell a forest or forested land either totally or in fictitious shares, he is obliged to notify the chief forester in a written statement. The application is then forwarded to the District

Forest Council, which decides whether the State intends to acquire the land. If the procedure is not followed, the transaction can be annulled by bringing an action of the State to the Competent District Court within two years. Notaries have to verify whether the procedure is followed, to refer to it in the contract and to forward a copy to the Chief Forester. In case that a month has passed since the submission of the statement or in case that the proof of ownership (deed of property) is judged inadequate by the Forest Council, the deed of property is forwarded to the Ownership Council. The latter can proceed with the sale within a time limit of two years, and with a purchase price at least equal to the price indicated in the statement to the Chief Forester.

The State privilege is not valid in the following cases:

- if the area is less than 5 hectares,
- if the forest is enclosed in an urban area or has already been an urban area.
- if the forest belongs to a construction company and the transfer concerns only part of a forested area among members of the company provided that there are no different provisions in relevant town-planning legislation.

4.3.2. Specific inheritance (or marriage) rules applied to forests

There are no specific inheritance or marriage rules applied to forests in Greece.

4.4. Changes of the forest ownership structure in last three decades

There are no significant changes in ownership statue in Greece.

4.5. Gender issues in relation to forest ownership

There are no gender issues in Greece.

4.6. Charitable, NGO or not-for-profit ownership of the forests

This section is concerned with forests owned by organisations such as conservation and heritage NGOs, self-organised community-based institutions and other philanthropic (“Characterized or motivated by philanthropy; benevolent; humane” OED) organisations. The management objective for these forests is usually to deliver social or environmental aims with maximisation of financial or timber returns as a secondary concern. Most owners are corporate and may invoke at least an element of group or participatory decision-making on management objectives and high ethical standards. It is possible for such ownership to be entirely private. However, the provision of public benefits (services (e.g. biodiversity, amenity, recreation etc.) which are free for everyone to enjoy or provide benefits to local communities (employment for disadvantaged people etc.) are sometimes recognised in the form of charitable registration. This in turn puts restrictions on the rights of the owners to use profits and to dispose of assets in exchange for tax exemptions and access to charitable funding.

From above mentioned types of ownerships by specific organisation, in Greece exist only self-organised local community groups and co-operatives associations.

Forests owned by …	Yes	No	Uncertain
• Foundations or trusts		X	
• NGO with environmental or social objectives		X	
• Self-organised local community groups	X		
• Co-operatives/forest owner associations	X		
• Social enterprises		X	
• Recognized charitable status for land-owners			X
• Other forms of charitable ownerships, namely:			X

Self-organised local community groups are citizens of municipalities which have hold rights of forests but not the municipality itself.

Forest co-operatives are forest workers who usually live in mountainous areas and sustain their livelihood from logging.

Both of them are very small in numbers and in the total percentages of Greece.

4.7. Common pool resources regimes

There are no common pool resources regimes in Greece.

5. Forest management approaches for new forest owner types

In Greece, there are no new forest owner types. There are only allowance interventions by the law in forests and forest land in Greece. Only in 1930, was given title of ownership for the rehabilitation of refugees after the Asia Minor Catastrophe and the exchange of resident population between Greece and Turkey.

5.1. Forest management in Greece

Forests in Greece cover 25.4% of the country's total area (3.359 thousand ha). According to Albanis *et al* 2000, Table 8, approximately two thirds (65.5%) belong to the state and the remaining 34.5% belong to private entities, local authorities, monasteries, and other welfare institutions. Municipalities are the second larger owner with 12 per cent of the forest cover. Forest cooperatives own 9.7 per cent while the forestland owned by private individuals accounts for only 8 per cent of forestry land.

Table 8: Forest ownership in Greece

Forest ownership in Greece	ha	%
State	1,644,000	65.5
Municipality properties	301,000	12.0
Church	110,000	4.4
Welfare institutions	12,000	0.4
Joint ownership (forest cooperatives)	246,000	9.7
Private	200,000	8.0
Total	**2,513,000**	**100**

As far as the forests which belong to municipalities are concerned, the personal needs of the community's inhabitants are satisfied first and if there is a surplus, it is marked (Albanis, *et al*, 2000).

Forest cooperatives represent forest workers who usually live in mountainous areas and sustain their livelihood mainly from logging. Cooperatives work along with the forest authorities and forest owners on harvesting forest products and, to a lesser degree, on trading these products. Cooperatives based on voluntary membership that own only a limited portion of forest land (9.7 per cent). Despite their prosperous past, their future viability is declining as forestry has failed to provide year-round employment and sufficient income; locally-produced timber is out-competed by cheap imports from Eastern Europe. Forest cooperatives have little political power and have limited institutional influence on policy to ensure their economic viability in the long run. Another form of forest co-operative is the one that is more interested in developing the forestland it owns or has rights on, by building secondary homes and developing forest related tourism activities (Papageorgiou, *et al*., 2004).

The Forest Owners Association (FOA) in Greece, founded in 1926, is the main actor for non-state forests. As a result of the small share of private forestry in Greece (8%), the Society has about 120 members, even if the total individual private forests are closed to 3,000. Private forests are primarily coppice enterprises, producing mostly fuel wood, having low profitability and providing limited employment in rural areas. (Papageorgiou, *et al*., 2004). According to Greek society of Forest Owners their main objectives are (Oikonomou, 1980, Oikonomou 2014):

- Forest protection from arbitrary abuses and use changes
- Implementing sustainable management
- Compensation of private forests in the same way as public forests
- Liberalization of wood market
- Fair taxation and business finance.

The planning and management of state forests is centralized at the national level under the supervisor of the Ministry of Environment through its separate General Secretariat of Forest and National environment. At the regional level, forest management is divided into state forest districts, each run by a respective Forest directorate or Forest District Office, which are the statutory bodies with real power on the ground and with responsibility for the implementing the management plans.

The Forest Service has the entire responsibility for the management of forests and forested lands under its ownership, plus the responsibility of examining and approving the management plans for private owner forests. It is imperative that those management plans incorporate all environmental, ecological, socio-economic and productive conditions for the forest under consideration.

Forest planning as defined in Forest Law 998/79 aims explicitly at the planning of the forest resource mainly for timber production. The main planning tools are forest management plans, which are drawn up by the Forest Service for most state forests or by freelance foresters for private, communal and, in some cases, state forests, and approved by the regional Forest Directorates. All forest management plans are conducted according to the law of perpetuity in yield estimations and aim for the preservation of the forest-avoiding clear felling, improving natural regeneration by selective cuttings and reforestation after fire – as the sustainable utilization of timber. The planning period is ten years for the state forests and five years for private forests. The forest management plan is mainly a technical report focusing on sustainable timber yield without taking into account consideration the non-timber products and services of the forest resource. The management plan is not part of a long-term planning process pursuing the sustainability of the resource. On the contrary, its primary aim is to ensure maximum sustainable timber yield. In light of the National Forest Programme concept, however, it is imperative that management plans be extended and altered thoroughly to provide for balanced economic, ecological, social and cultural goals. Currently there is some progress in this direction, with the Forest Service trying to apply the integrated management of forests, taking the fullest possible account if natural processes and making provisions not only for timber production but also placing specific emphasis on other functions such as nature conservation, biodiversity, soil protection, aesthetic, environmental education, forest recreation and rational use of water resources (Papageorgiou, *et al*., 2004).

Today, in practice the basic rules that apply to every management plan based the six criteria and indicators for the sustainable forest management (Albanis, *et al*., 2000):

Criterion 1: maintenance and appropriate enhancement of forest resources and their contribution to global carbon cycles.

Criterion 2: maintenance of forest ecosystem health and vitality.

Criterion 3: maintenance and encouragement of productive functions of forests.

Criterion 4: maintenance, conservation and appropriate enhancement of biological diversity of forest ecosystems.

Criterion 5: maintenance, conservation and appropriate enhancement of protective functions in forest management (soil and water).

Criterion 6: maintenance of other socio-economic functions and conditions.

In practice, except the above criteria, taken into consideration the following rules:

- Identification of important ecosystem services
- Ensuring the sustainability and longevity
- Recommendations to reduce soil erosion sensitivity
- Identification of recreation activities
- Management measures for promoting water quantity and quality
- Taken into consideration non-wood products (honey, resin, livestock production, mushrooms, pharmaceutical plants, etc).
- Preservation of wild flora and fauna diversity
- Protection from various dangers (wildfires, soil erosion, landslides, diseases form insects, etc.)

- Delimitation and determination of protection measures for landscapes of special nature beauty.
- Generally, taken into consideration the National legislation and specific European and International obligations for the protection of nature and protected areas.

5.2. New or innovative forest management approaches relevant for new forest owner types

According to the data supplied by the National Forest Inventory and the data reported by Albanis, *et al*. (2000), over half of the forest and other wooded land in Greece (51.58%) is managed for production purposes, 5,18% for tourism-recreation, 14.4% for hunting and 28.84% for grazing (Kazana and Kazaklis, 2005).

Today, throughout Greece there is an increasing awareness of the necessity to apply and implement management practices that consider the multiple values in the woodlands on the long term sustainable basis. The new forest ecosystem should be a stable, upgrading, and adapted to the climatic and soil conditions, more resistant to fire and insect pests, with a normal potential of fauna and flora. For the reestablishment of a future forest we should take into consideration the rules of multiple and social uses of woodlands (as watershed management, wildlife, recreation, hunting, aesthetics, education, etc.), as well as the long-term protection from various dangers (as wildfires, soil erosion, storms, diseases due to insects and fungi, etc.) (Kazana and Kazaklis, 2005).

In our days, many public and private forests are managed for tourism-recreation, environmental education and wildlife protection uses. The tourism-recreation public land includes national parks, aesthetic forests, natural monuments, wetlands, recreational sites, urban forests, coastal forests, shelterbelts along highways and forest areas surrounding lakes (Kazana and Kazaklis, 2005).

Also water protection is one of the main management goals for the whole forest and other wooded land in Greece, due to the extent and intensity of erosion and torrential phenomena (Albanis, *et al*., 2000).

Another forest management approach in public forests is conservation. According to the United Nations Economic Commission for Europe/Food and Agriculture Organization (2000) classification, 1.03% of the Greek forest and other wooded land is placed under the International Union for Conservation of Nature (IUCN) categories I and II, i.e. virgin forests and National Parks. The same source also records 17.67% of the forest and other wooded land as IUCN land categories III and IV, i.e. aesthetic forests and other specially protected areas. However, this classification cannot be used to derive a good estimation of the productive land area as, in the National Forest Inventory; no distinction of land was made on the basis of the protection function of the land according to the IUCN categories.

5.3. Main opportunities for innovative forest management

The forestry sector is the primary sector of the economy of Greece with significant added value and multiplicative importance, both for the secondary (trading-forest woody and non-wood products and wood industry) and the tertiary sector of the economy (tourism). It also offers a range of environmental services (creation and protection of soil, water resources protection, carbon storage, etc.) which, although not easily classified in a productive sector, acquire value gradually growing. Forests cover about 49% of the territory and about 77% of them owned are publicly owned. Yet credits to forestry not exceed 0.35% of the state budget in recent years.

The main opportunities for Greek innovative forest management are (WWF, 2011):

- There are many scope for increasing forest production and improving the quality and value of produced forest products (technical and industrial wood), and enlargement of forest production in new directions, the non-wood products (mushrooms, truffles, chestnuts, hazelnuts, cranberries aromatic and medicinal plants, honey, etc.) and services (forest recreation and

mountain tourism). It is estimated that the economic value of forest goods, which are not valued and included today in the country's GDP, much higher than the value of the recorded hitherto forest production.

- Beyond the scope for improving the quality of the wood produced in forests can develop alternative business activities in the secondary sector like utilization of woody biomass for energy and other purposes.
- Important aspects of green development can be promoted through forestry, while protecting the natural environment. Save carbon - reducing greenhouse gas emissions and contribution of forestry to the new market of 'carbon trading' contribution to renewable energy sources (water / hydro, biomass), renewable natural and organic products to help improve the quality of life (leisure, inspiration and health), aiding the conservation of genetic resources, biodiversity and natural heritage comprehensively. The above also opens new horizons in the field of green economy and marketing.
- There are opportunities to promote alternative forms of development with emphasis on natural resources and protected forests of the country.
- There are possibilities to promote certification systems of sustainable forest management and labelling of forest products produced and hence opening new markets, but also promote a better image for the management practiced in our forests.

5.4. Obstacles for innovative forest management approaches

The main obstacles for Greek innovative forest management are (WWF, 2011):

- Thumbnail financing forestry and lack of investment resulting in state forests to farms poorly and not be able to plan and exploit the productive potential of forests, nor to protect forests from growing threats in recent years.
- Problematic logging system with significant deficiencies in the organization of wood harvesting in forests with significant negative effects both on forestry work and at the same forest ecosystem. The forest holdings, as units of production and development are almost idle, while forestry operations are often carried out without substantial supervision and forestry cooperatives, degraded and significant weaknesses, are on the verge of dissolution.
- Serious deficiencies in the information system and statistical forestry in all directions (natural environment, and establishment of forest productivity, forest inventory, forest ownership and land use, forest management, forestry, etc.) leading to weakness of the design development and mobilization resources and potential.
- Fractured and poorly performing system administration of forestry services. Forestry Services in two ministries (Ministry of Environment, Ministry of Interior), inappropriate governance structures Forest Service, external interference, dispersion and fragmentation of responsibilities of management responsibilities and protection forests, are some phenomena which render impossible the formulation of forest policy in the country and lead to ineffective management and inadequate protection forest.
- Protection system fire cracked and ineffective. Domination of perception that forest protection is identified with repression and neglect prevention.
- Convoluted and inefficient forestry legislation.
- Anachronistic context of forest management. Weathered context configuration (since 1965) and inefficient methods and management practices make it difficult to continue logging operations and forest production especially in environmentally sensitive areas (N. 2000 Network, National Parks, Aesthetic Forests, etc.)

- Faulting coupling forestry and environmental policy and ineffective management of protected forests.
- Incomplete support for forestry research, standard forestry research by the Act, serious lag of regional forest services in the field of technology and absorbing new knowledge.
- Serious problems and rigidities in the secondary sector and forestry. Inadequate standardization of forest products, problematic further exploitation of timber and other forest products and difficult to exploit new products, such as wood pellets with resulting in reduced competitiveness and are net imports - exports.
- Poorly coordination between the private sector processing / marketing of forest cooperatives and forest service that directs forest production.
- The very lacking adoption of modern systems of quality certification of wood and good forest management, resulting in significant lost opportunity to promote the market.
- Unable organization of a multifunctional forestry system, which combines protection, social services and producing a variety of products, thus losing significant economic benefits for the country.

6. Policies influencing ownership development / Policy instruments for new forest owners

Policy and ownership are related in various ways: Policies directly or indirectly influence ownership development or even encourage or create new forms of ownership; and policy instruments are emerging that answer to ownership changes, including instruments addressed to support new types of owners e.g. through advisory services, cooperative or joint forest management, etc.

Actors participating in Greek forest planning, management and other actions

In Greece, there are various actors that participated in Greek forest planning and forest management (Trakolis *et al*, 1998, Vakrou, 1998, Papageorgiou *et al*, 2004), but the final decisions were taken via Forest Service, through the laws and directions derived from the Ministry of Agriculture. The distribution of Greek forests by ownership structure is the result of historic, social, economic and political conditions.

Papageorgiou *et al* (2004) reported that institutions include organizations promoting and advocating norms, and people, policies and rules that impact upon forestry policy. Major police actors in Greece and the linkages between them do not seem to have changed following the changes in policy objectives in all forest sectors except nature conservation.

Intersectoral approaches serve to co-ordinate forest-related policies with other sectoral policies and programs. In National Forest Programs the overall intention is the coordination of the economic, ecological and social interests in forests (Hogl, 2002). Forest policy in Greece is connected with other national policy areas, such as agriculture, environment, urban, the economy and development (Smiris, 1999). The fulfilment of objectives in each of these sectors has created conflicts and has influenced the goal formulation and decision-making process in the forestry sector. Moreover, effective mutual co-ordination mechanisms to resolve conflicts are largely absent. The competency within various departments and ministries overlaps in some policy fields, such as nature conservation. An example is the framework for protected areas in Greece until 2010 when the Forest Sector moved to the Ministry of the Environment. Within the Ministry of Agriculture's responsibilities, and particularly within the authority of the General Secretariat of Forests and Natural Environment, environmental conservation applies to national parks, aesthetic forests and natural protected monuments. Hunting issues, such as the relevant legislation and regulation, are also under the responsibility of the Ministry of Agriculture. The Ministry of the Environment, on the other hand, under law 1650/86 was granted more power to deal with environmental issues and is responsible for taking care of managerial actions in wetlands and other protected areas, including NATURA 2000 sites.

Undoubtedly the overlapping jurisdictions correspond to an inter-ministerial problem solving system that, it can be argued, had created more confusion and further difficulties, and which consequently has been highly bureaucratic and inefficient. In addition, there is often a lack of coordination between various departments within the same ministry.

6.1. Influences of policies on the development of forest ownership

The increasing mandate for forest expansion through afforestation of arable and degraded land depends mainly on the efficiency of afforestation schemes as well as how new forests are accepted in comparison with agricultural land use values. Results of a landowner comparative survey undertaken in two varied rural areas in Greece, seek to enlighten why local landowner groups are resistant to the planting of land with trees. This is partly attributed to the long-driven agrarian character of these areas. To some landowners, forestry is envisaged as antagonistic, rather than synergetic to agriculture and thus not socially acceptable. Although it could also be the result of other factors, such as the administrative barriers or limited knowledge available to farmers, the research establishes grant aid funding for

forestry as a continuous and potent impetus for farmers to participate in planting schemes in rural areas. Forest policy should involve decisions more related with the regulation of subsidies to buy contributions of forestry to meet environmental and social objectives in addition to the productive ones (Kassioumis et al. 2004).

A major incentive for the establishment of forest plantations in Greece was provided by regulation 2080/92, which involves subsidies for the afforestation of agricultural land and the conservation of forest plantations, as well as premiums to compensate for loss of income. It also includes subsidies for the improvement of forested areas, which are granted to farmers, their cooperatives and associations, monasteries, businesses and to any natural or legal private entity, which owns a farm whose revenue accounts for 25% of their income (Arabatzis, 2000). From 1/1/1993 to 31/12/2002, 16,465 applications were approved. The land that corresponds to that number of applications is 35,840 ha and the eligible costs are 194.6 million Euros (Ministry of Agriculture, 2003). The planting of broadleaves accounts for 35,096 ha, i.e. 98% of the total afforested area. The poplar cultivation (broadleaf species) that took place on agricultural land from the 1950s onwards seems to have determined the decision to plant broadleaved forest species. Furthermore, another reason is that the broadleave forest species established (black locust, walnut and chestnut trees) were of a shorter rotation than conifers (Arabatzis 2005).

6.2. Influences of policies in forest management

Forest planning today as defined in Forest Law 998/79 aims explicitly at the planning of the forest resource mainly for timber production. The main planning tools are forest management plans, which are drawn up by the Forest Service for most state forests or by freelance foresters for private, communal and, in some cases, state forests, and approved by the regional Forest Directorates. All forest management plans are conducted according to the law of perpetuity in yield estimations and aim for the preservation of the forest – avoiding clear felling, improving natural regeneration by selective cuttings and reforestation after fire – as well as the sustainable utilization of timber. The planning period is 10 years for the state forests and 5 years for private forests. The forest management plan is mainly a technical report focusing on sustainable timber yield without taking into consideration the non-timber products and services of the forest resource. The management plan is not part of a long-term planning process pursuing the sustainability of the resource. On the contrary, its primary aim is to ensure maximum sustainable timber yield (Papageorgiou et al. 2004).

6.3. Policy instruments specifically addressing different ownership categories

The Forest Service is responsible for providing information on legislative issues, rights and obligations regarding forests. The Forestry Service informs private owners of all regulations and measures available for improving the status of their estate and collaborates in creating the necessary plans for the application which is to be undertaken. There is a similar approach and procedures for all private forest owners and the management plan is compulsory for all forest owners regardless the size of the ownership. The Forest Service also, in close cooperation with several NGOs, prepares projects and undertakes action aiming at improving the Greek forest environment and the conservation of species in these areas.

6.4. Factors affecting innovation in policies

A National Forest Program (NFP) process has not yet been initiated in Greece. The prime reason for this is limited political will, which results in a lack of commitment towards multifunctional sustainability. The small economic output of the forestry sector in Greece, when examined from a macroeconomic point of view also accounts for the low level of commitment shown by the government. The central Forest Authority – represented by the General Secretariat for

Forests and the Regional Forest Directorates and District Forest Offices – is the sole public entity for forest management, but remains a highly bureaucratic and slow-reacting body with an overwhelming timber-oriented professional mindset. These inherent attributes have so far acted as an impending factor to a substantial NFP. In time, however, a NFP is likely to arise as a new topic on the political agenda, as a process distinct from the existing national forest strategy, for reasons largely stemming from the inherent weaknesses of dominant forest planning traditions with respect to promoting sustainable forestry and providing for a continuous exchange between the multitudes of stakeholders. Any new planning framework will need to generate new approaches to integrating major stakeholders into policy formulation, as well as improving iterative planning and intersectoral coordination (Papageorgiou *et al.*, 2004).

CASE STUDY 1: THE IMPLEMENTATION OF DIRECTIVE 92/43/EEC FOR THE CONSERVATION OF NATURAL HABITATS AND WILDLIFE AND THE CREATION OF THE EUROPEAN NATURA 2000 NETWORK

Greece has great landscape biodiversity, for the same reasons that it has great genetic, species and habitat biodiversity. The landscapes range from the semi-desert of Eastern Crete to the Scandinavian (northern) of Rhodope and the Alpine of Mts. Olympus, Smolikas, Timfi, Voras and the other mountain ranges of Northern Hellas. Within the relatively short distance from town Amphipolis to Central Rhodope one meets all the landscape types from the Mediterranean, with olives, holm oak and Arbutus sp., to the northern landscapes of boreal conifer forests with Norway spruce, Scots pine and birch.

The implementation of Directive 92/43/EEC for the conservation of natural habitats and wildlife and the creation of the European NATURA 2000 network will contribute significantly to biodiversity conservation. The greatest strength of the directive is that it aims to protect species and habitats via a network of protected sites. This will provide comprehensive protection of biodiversity, the principal aim of the directive and the NATURA 2000 network. Unfortunately, the Annexes to the directive listing the natural habitat types and plant and animal species of Community interest do not make allowance for the great biodiversity found in Hellas. A significant number of habitat types and an even larger number of native endangered species of the country s wealth of flora and fauna have been left out of these Annexes. The competent Hellenic authorities must work to ensure that these habitat types and native plant and animal species are included in the forthcoming adaptation of the Directive. The inventory being drawn up as part of the implementation of Directive 92/43/EEC in Hellas could contribute significantly to this goal, as could the researchers whose dedicated work has made it possible.

Incentives to private forest owners (private forest owners or associations, and tenants of privately owned land such) to take appropriate measures to protect areas of the NATURA 2000 network, to avoid the deterioration of natural habitats and habitats of species as well as disturbance that affect species, as long as such disturbance could be significant in relation to the objectives set by Directive 92/43/EEC and 79/409/EEC, and to resolve specific problems arising from the application them. The NATURA 2000 areas in private forest areas amount about 60,000 ha. During the previous programming period 2007-2013 the subsidy for these areas was 10,000,000 Euros. Unfortunately, due to lack of information from the Ministry of Environment and less interesting from the beneficiaries because of bureaucratic procedures, there was not any application for this specific measure.

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8. Annexes

Case studies

Private forestry in Greece, as far as the forest management is concerned, follows the Greek rules for sustainability. The coppice system is applied to different species under a wide range of ecological conditions and with very different growth potential. The repeated coppicing along the centuries, the total exploitation of the above ground biomass at short intervals, often associated with uncontrolled livestock grazing, have led to an over-exploitation of the forest and to its degradation. The coppice system, with different rotation cycles varying from 20 to over 30 years, has been and is still applied to broadleaved forests, from oaks to chestnut and beech. The last three years, in the middle of the economic crisis and fiscal consolidation, the Greek state has increased very much the taxis on fossil fuels and caused very high increase import fuel wood from Balkan countries.

Below are describing three Greek pilot forests (two private and one public / University) that based on new approaches taken into consideration the innovative aspects, environmental issues and multiply uses (climate change, carbon storage, enhance flora and fauna diversity, LCA criteria of forests and forest products, recreation, wildlife protection, ecotourism, non-wood products, etc.).

CASE STUDY 2: PRIVATE FOREST OF "KASTANIA" (PIERIA REGION, N. GREECE)

Individual Forest (Owner: Theodoros OIKONOMOU, Chairman of Greek Forest Owners Association)

A case of oak coppice is the private forest "Kastania" that is located in Kastania village (Pieria region) and it is 60 km from Thessaloniki. The total forest surface is 1,500 ha (see figure below), from which the nature forest covers 1,300 ha and the remaining 200 ha are reforestations. It is located in the north-east hills of Pieria mountain, between 100 and 400 meters above sea level. This appears a typical oak coppice forest (Greek Quercus frainneto woods) as defined by directive 92/43/EU (cod. Corine 41.B or 9280 NATURA 2000).

The dominant vegetation type in the region is the broad leaved formation with Quercus frainetto. In the east lower part of the forest and in restricted areas the ever green formation of holm oak and horn beam and white oak (Quercus pubescens) can be found. The ravine forest consists mainly of oriental plane (Platanus orientalis) and white poplar, willows, whereas sporadically on slopes lime-species (Tilia sp.) are found. The "Kastania" forest was a case Greek study of a new management approach "Life Cycle Assessment in a coppice Greek forest" that based on LCA rules (COST Action E9: Life Cycle Assessments of Forests and Forest Products). Life Cycle Assessment (LCA) constitutes a new and useful tool in service of the forest management. Also, the above analysis with her objectivity, the integrated approach and other characteristics contributes positively to the decision-making, the sustainable forest management, the certification of forest products and services, etc. During this work were selected different kind of various criteria of forest structure, biodiversity and environmental and protection (Grigoriadis et al., 2003, Grigoriadis et., 2001).

The new approach and policy of "Kastania" forest management is to increase the coppice oak cutting rotation. At the present time the forest has achieved economic self contribution and seems to ensure its own perpetuation. It makes a modest contribution to local and national production of wood and to forest employment, as well as to soil protection, water flow management and carbon storage.

CASE STUDY 3: PRIVATE FOREST OF "BURAZANI-KONITSA" (IOANNINA REGION, HEPIRUS)

Individual Forest (Owner: Georgios TASOS)

Another Greek case, is the private forest "Bourazani" that is located near Konitsa village (Ioannina Prefecture, Epirus region) and managed with new approaches (except wood production) aiming to promote the ecotourism. The total area covers 204 ha, it is located in the north-west Greece in Pindos mountain and near the National Park of Aoos river. Today, it is managed as "Environmental park" and "Wildlife resource" since into forest there are interesting species with high diversity of flora and fauna and the woodland covers a unique aesthetic landscape.

The flora and fauna is very rich. There are 850 wild plant species, 51 wild orchids, 113 butterflies, 172 wild birds, 12 fishes, 17 reptiles, 22 limpellula (insects with big wings) and rich wild mammals. The main forest species are broadleaves trees, as oaks (Quercus frainetto, Q. macadonica), Coryllus avelana, Aesculus hippocastum, and two conifers (Pinus nigra and Abies borissii regis). In the entrance of the area is a Hotel, a Physical historic museum and an Information Center. Also, in the area (except the indigenous mammals) are hosted six wild species (Dama dama, Cervus elaphus, Carpa aegagrus var. cretica, Ovis amon mousimon, Capreolus capreolus, Sus scrofa) aiming to promote the environmental education.

The new approach and policy of "Burazani" forest is to manage for ecotourism, environmental education and wildlife protection.

CASE STUDY 4: PUBLIC / UNIVERSITY FOREST OF "TAXIARCHIS" (HALKIDIKI REGION, CENTRAL MACEDONIA)

Individual Forest (Owner: Aristotle University of Thessaloniki)

The Forest University Taxiarchis is one of the two university forests, in Greece. It has been established as University Institute in 1934 and has been granted to the Aristotle University of Thessaloniki by the Ministry of Agriculture. The forest is located at Cholomontas mountain, at the central part of Chalkidiki (altitude from 320 m to 1,625 m) 70 Km far from Thessaloniki. It is covers an area of 5,835 ha, of which 3,895 ha is forested, 234 ha is partially forested, 1,492 ha is arable land and 85 ha are various land uses.

The flora of the area is very rich (more than 1,100 wild species, 38 if which are under high protection) and mostly made up of deciduous natural forest species with extensive reforestations of conifers (30% of the total area). Major forest is productive species of oak, beech and chestnut and protective shrubs of evergreen broadleaves (holm oak, briar, arbutus, holly). The rotation period for oak and beech trees is about 120 years and the cutting cycle at seven years. For the evergreen broadleaves the rotation period was set 30 years. Of special interest are the fir sapling groves, cultivated in private fields for the production of Christmas trees and offering an extra source of income for the local population.

The fauna is greatly diverse, consisting of mammals, like boars, rabbits, roebucks as well as predatory species like wolves, foxes, jackals, weasels, ferrets, badgers and squirrels. Additionally, the avifauna is very rich with many predatory birds including several species of hawks and a few species if eagles. In total, 134 species of birds have been recorded, 52 of which are migratory, 46 breeding visitors, 27 visitors, 9 winter visitors and 4 are not breeding in the area.

"Taxiarchis" forest territory is a part of the Natura network and according to the 92/43/EEC and 79/409/EEC directions of European Union; it has been declared a protected site for predatory birds.

The main forest products are oak, beech and pine firewood, as well as charcoals, while present to a lesser degree is also carpentry. Finally, a total of 50-60 forest workers are employed annually in the various woodcutting activities. Pastoral activities make up another part of the local activities. Locally bred are stocks of sheep, goats, cattle, swine and chicken, with numerous units applying biological methods of breeding. Apiculture takes up the last part of the local occupation activities, with honey of excellent quality being produced.

The management plan aims to the even-aged and group selective seedling form for oak and beech stands and the even-aged deedling form for the conifer plantations. The new approach and policy of "Taxiarchis" forest is to manage for education (from students), research and ecotourism.

Figure 5: Orientation map of Private forest "Kastania" (source: GoogleEarth)

Figure 6: Orientation map of Private forest “Burazani-Konitsa” (GoogleEarth)

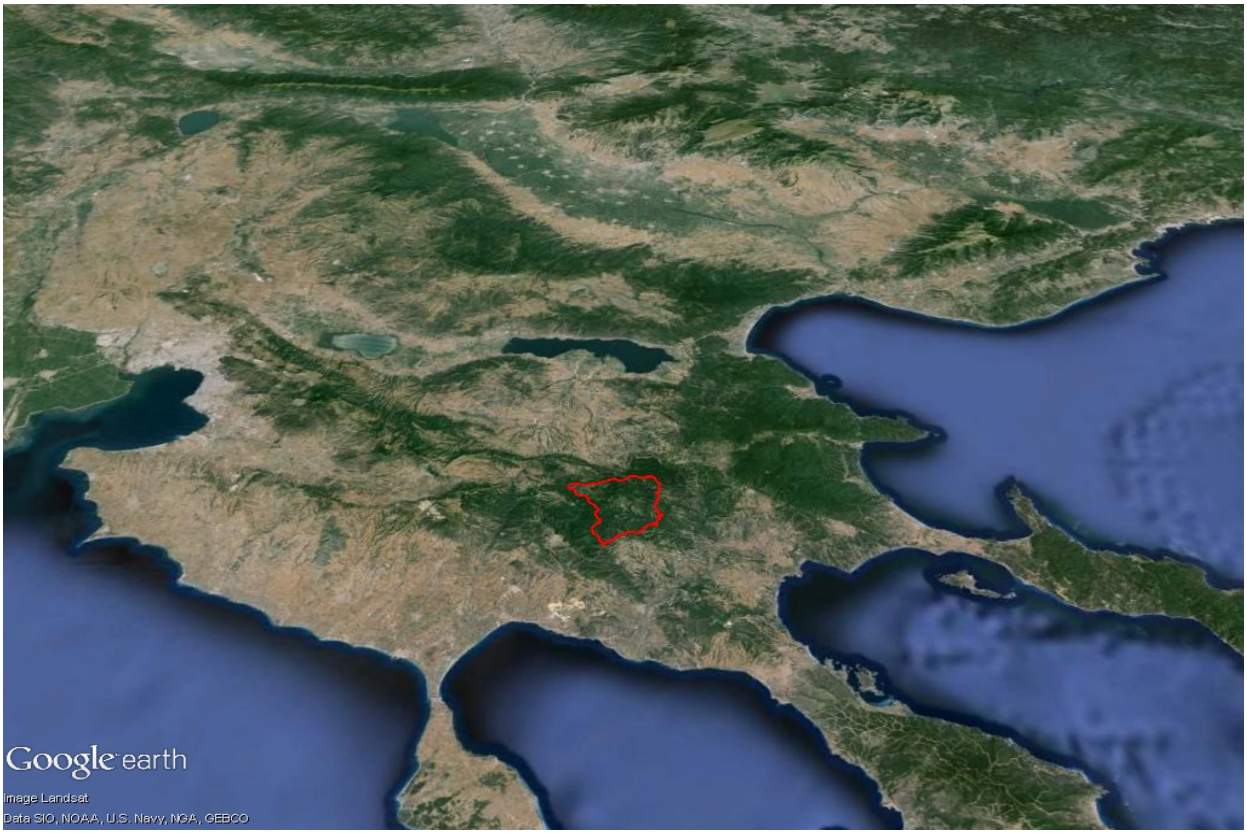

Figure 7: Orientation map of Public/University forest “Taxiarchis” (source: GoogleEarth)

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