

Forest Fire Country Studies

Republic of Albania



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FOREST FIRES COUNTRY STUDY

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Abbreviations

| | |
|--------|---|
| MAF | Ministry of Agriculture and Food |
| MCPFE | Ministerial Conference on the Protection of Forests in Europe |
| DGFP | Directorate General of Forests and Pastures |
| MoEFWA | Ministry of Environment, Forests and Water Administration |
| CCD | Coordination and Control Directorate |
| SCPC | Sector of Coordination and Police Control |
| ME | Ministry of Environment |
| SIEFW | State Inspectorate of Environment, Forests and Waters |
| RFSD | Regional Forestry Services Directorate |
| PA | Protected area |
| NP | National park |
| IUCN | International Union for Conservation of Nature |
| FPUA | Forests and Pastures Users' Association |
| LGU | Local government unit |
| CFP | Communal forests and pasture |
| DCEPR | Department of Civil Emergency Planning and Response |
| DRR | Disaster risk reduction |
| DFFRO | Directorate of Firefighting and Rescue Operations |
| UXO | Unexploded ordinance |
| DTFP | Directorate for Treatment and Forest Protection |
| NFCFP | National Federation of Communal Forests and Pastures |

Kosovo This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo declaration of independence.*

I. The forestry sector, forests and fire history

1. Overview of the forestry sector

Article 2 of the Law on Forests and Forestry Service (No. 9385 of April 5, 2005) contains the following definitions of forests and forest land in the Republic of Albania:

“Forest is land with a dense array of forest trees in stable form or other forest vegetation with low density, with an area greater than a tenth of a hectare with coverage of not less than 30 percent, that produces a timber mass, an impact on the surrounding environment and that provides the functions of the forest.

Forest land (open forest) means land surface with forest vegetation and another non-forest vegetation, with coverage from 5 to 30 percent, bare surfaces, rocky places, eroded and non-productive lands, nurseries, forest roads, land not registered as having another use in the land-use cadastre, and similar agricultural lands ecologically functional in the national forest fund, which all together provide the functions of forest.” [2]

1.1. Characteristics of forests

Albania is a mountainous country with greater topographic and climatic variety than any other European country: 52 percent of its surface is at an elevation of between 600 and 700 metres above sea level, with prevailing steep slopes (around 30 percent). Thus around 90 percent of its surface is subject to severe erosion. The northern, north-eastern, south-eastern and central areas are characterised by hilly/mountainous terrain, while the southern area along the Adriatic and Ionian coast is lowland.

All the forests (public and private) that make up the forest fund of Albania are grouped into 36 administrative units. There are 1,498,957 ha of forest area in Albania, subdivided according to the categories shown in Table 1.

Table 1. Subdivisions of the forest fund in Albania

| | | |
|-------------------------------|---------------------|-------------|
| Forest | 1,498,957 ha | 100% |
| High forest | 294,957 ha | 19.68% |
| Of which: - Coniferous | 84,461 ha | |
| - Broadleaved | 210,496 ha | |
| Coppice forest | 405,016 ha | 27.02% |
| Shrubs | 241,724 ha | 16.13% |
| Open forest | 557,260 ha | 37.17% |

Source: [4]

The productivity of Albanian forests is 1.4 m³ of wood mass/year/ha, which is far lower than in other European countries. Changes in the landscape caused by opening up land for agriculture and heavy grazing; population growth; fires; increased demand for fuel wood and timber, etc. are important factors contributing to forest degradation in Albania.

The ownership of forests and forest land is addressed in Article 15 of the Law on Forests and Forestry Service:

“Ownership of national forests

1. National forests, by ownership, are divided into:

- a) publicly owned forests;*
- b) privately owned forests.*

2. The public forests are owned and managed by the Directorate General of Forestry Service and its subordinate bodies and local government bodies.

3. The public forests are divided into:

- a) forests and forest land owned by the state (state forests);*
- b) forests and forest land in use or owned by local governments (communal forests).*

4. The private forest fund (private forests) consists of:

- a) forests and forest land in private ownership;*
- b) trees and groups of trees that are located within the boundaries of the land in private ownership, new forests that are planted in these lands, and parts of privately owned forest.” [2]*

State forests are owned by the state.

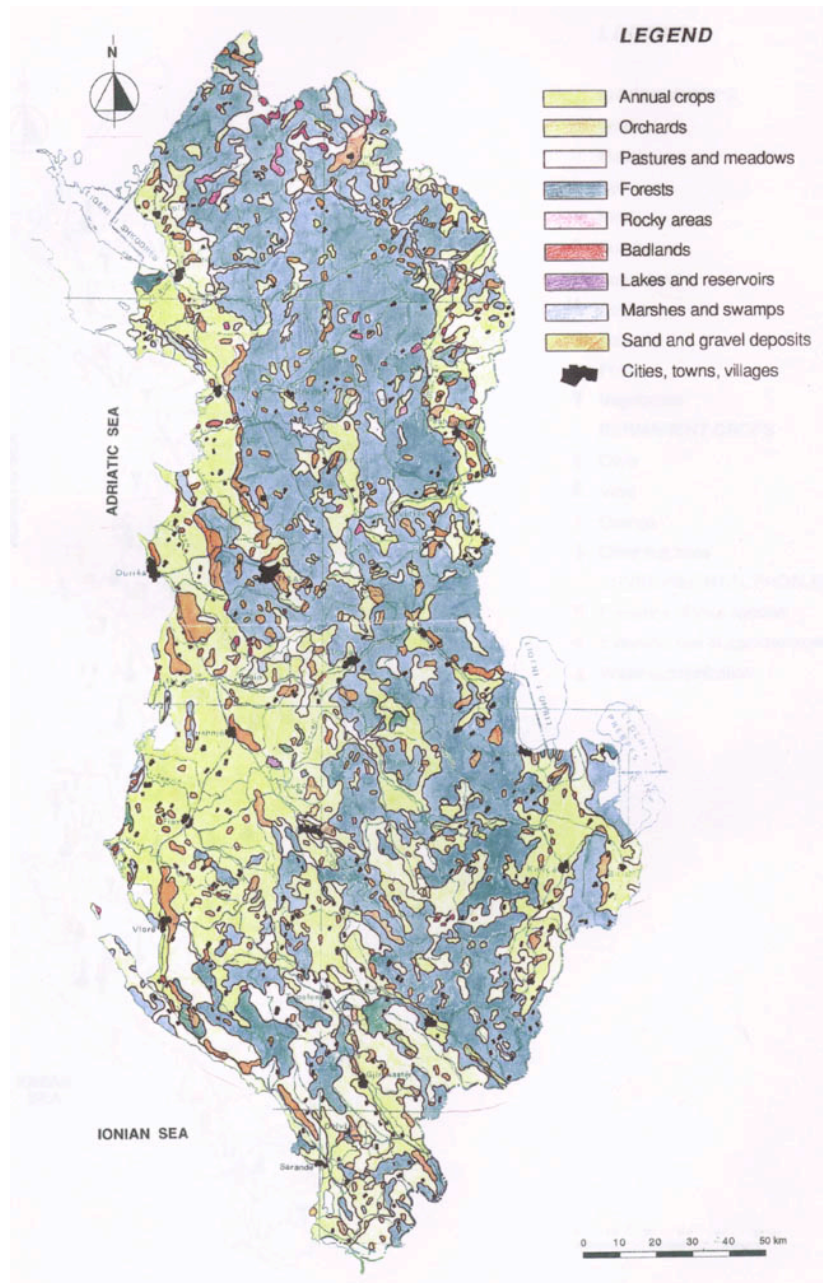
Communal forests are forests owned by the state but given over for communal use to a village or to several villages or communes. In accordance with criteria developed by the Ministry of Agriculture and Food (MAF), parcels of communal forest from 0.4 to 1 ha per family may be given for use to households of permanent residence in the village, subject to agreement between the local government and the forest authority. The specific rules and criteria for the definition and administration of these forests are the subject of a special regulation of the MAF.

Private forests are any bodies of trees and any forests created within the boundaries of land recognised as private property. [5] Up until 1945, private forests in Albania covered 63,000 ha out of the 1,379,000 ha of the total forest area, according to the available data. After 1945, the mass nationalisation of private property started and a few years later the concept of private ownership vanished. The restitution of private forests to their former owners began after 1996. A total of 19,000 ha, or less than 30 percent of private forest area, had been restored to their

former owners by December 2007. The restitution process is very slow and the former owners face various problems in relation to the management of their forests. [4]

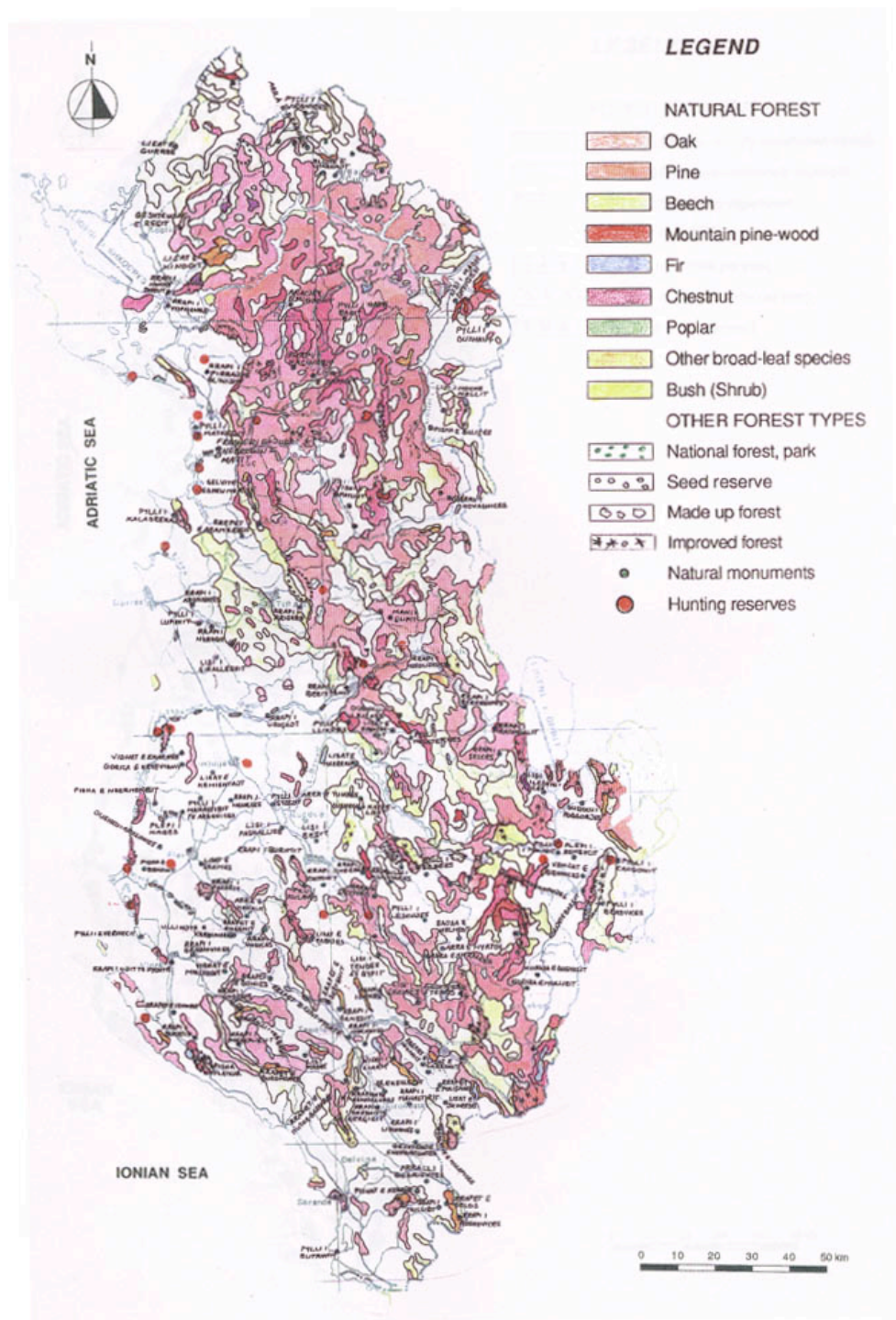
According to data from the Ministerial Conference on the Protection of Forests in Europe (MCPFE), 15.8 percent of the forests in Albania are protected forest areas. This equivalent European average is about 12 percent. [6]

Map 1. Land use in Albania



Source: [3]

Map 2. Forest types and forests by purpose



Source: [3]

1.2. Major forestry stakeholders

After the democratic transition in the 1990s, the process of restructuring the forest administration towards a market economy began. According to the 1992 Law on Forests and the 1993 Law on Forest Police, the district forest enterprises were transformed into forestry service directorates under the DGFP. By the end of 1997, the DGFP had five main directorates. At local level, forest control and forest management were delegated to 36 forestry service directorates, functioning at district level. Between 2002 and 2003, the DGFP began the process of institutional reform in the forest sector. In September 2005, the DGFP was abolished and the forestry sector was transferred to the Ministry of Environment, Forests and Water Administration (MoEFWA).

These reforms were aimed at dividing the regulatory and managerial functions by separating the Forest Police from forest management. With respect to illegal logging, the key body within the MoEFWA became the Sector of Coordination and Police Control (SCPC) under the Coordination and Control Directorate (CCD), which is responsible for planning and coordinating activities related to forest protection. The 36 district forestry services report indirectly to the SCPC through the General Secretary of the MoEFWA. Each of them has a specialised unit, the Sector for Forestry Police, responsible for control and monitoring. The institutional reform of the forestry sector has not been completed at the level of the district forestry service directorates, which carry out control and monitoring, the management of forest resources and the management of protected areas and hunting. This means that at field level the regulatory and managerial functions have not yet been separated. For this reason, at the beginning of 2010 the MoEFWA started to reorganise the Forestry Service on a regional basis, dividing the managerial functions and forest extension service and the regulatory and control functions into two separate bodies. [7]

In January 2014, the Council of Ministers decided to separate the Forest Police and control functions from the Forestry Service. Since then, forest management has been under the Directorate for Treatment and Forest Protection within the newly named Ministry of Environment (MoE), which delegates forest management to 12 regional forestry services. The Forest Police and control functions are under the State Inspectorate of Environment, Forests and Waters (SIEFW), which delegates control to 12 regional inspectorates at local level. Based on the reforms transferring communal forests to local-government units, the shift will be complete by 2016. According to the 2015 draft decentralisation strategy, the forests will be owned by the local-government units and the responsible ministry will be the Ministry for Local Government.

1.2.1. Ministry of Environment

The MoE works to guarantee a healthy environment for citizens; and to protect the environment from pollution, damage, the negative impacts of economic activities and other human impacts. The ministry must consider the environment as an added value for the generation of economic activities and protect it for future generations.

After the most recent government changes the forestry sector remained within the MoE, and institutional reform is ongoing. This reform has changed the structure of the administration of the forestry sector, with the Forest Police and control divided from management as separate institutions.

The main directorates within the MoE are the Directorate of Water Resources; the Directorate of Biodiversity and Protected Areas; the Directorate of Environment; the Directorate for Treatment and Forest Protection; and the Directorate of Priorities (which includes the sector of sustainable development of natural resources). All these directorates are under the General Directorate of Environmental Policies and Priorities.

The forestry sector comes under the jurisdiction of the Directorate for Treatment and Forest Protection. This directorate is responsible for forest management; the development of policies for the management of forests and pasture resources; the governance of forests and pastures; and forest extension services. Within this directorate are:

- the Sector for the Management and Treatment of Forests and Pasture; and
- the Sector for the Forest Cadastre and Communal Forests.

Since January 2014, the local forestry service is organised at regional level through the Regional Directorate of Forestry Services, which is responsible for the management of forests. Since January 2014, there is no longer a forestry service at district level.

Through this new re-organisation, and based on a decision of the Council of Ministers of January 2014, the State Inspectorate of Environment, Forests and Waters (SIEFW) was created as a separate institution.

1.2.2. The Forest Service

The management of state forests is delegated to the Public Forestry Service at local/regional level, which is under the direct responsibility of the MoE. The Forestry Service was established on the basis of forestry legislation and decisions of the Council of Ministers, both of which have undergone considerable changes since 1990. Prior to January 1, 2014, the Forestry Service was organised at district level, and both the Forest Police and forest management sectors were included in the district forestry service. As already mentioned, as of January 1, 2014, the Forestry Service and Forest Inspectorate are two separate units that operate at regional level. Illegal activities and forest crimes are monitored and controlled by the inspectorate. The Regional Forestry Services Directorate (RFSD) is responsible for the overall management of

state forests, silviculture, wood production, forest protection, the afforestation of barren land, the management of non-timber forest products, and support to other forest functions. The RFSD is responsible for the management and administration of protected areas and national parks. It is also responsible for providing services to forest users and communes, and for the management of communal forests and private forests. The Forestry Service has faced a variety of complex situations over the last two decades.

1.2.3. The State Inspectorate of Environment, Forests and Waters (SIEFW)

A Council of Ministers decision of January 29, 2014, created the SIEFW, which was at first a separate institution within the framework of the MoE. The SIEFW controls the enforcement of laws in the field of environment, forests and waters, and is responsible for all the functions of inspection in relevant fields in accordance with the responsibilities of the MoE.

There are four sections within the inspectorate: forestry, environment, water and finance. The inspectorate is organised and functions at national and regional level. At national level, the SIEFW plans and coordinates controls at national and regional level; ensures the harmonisation of inspection practices at national level; coordinates inspection activities; and provides technical, administrative and scientific support for inspection activities. The inspectorate controls and supervises the enforcement of the Law on Forests, the Law on Hunting and all other laws related to forestry, hunting and the environment. There is a regional office of the SIEFW in each of the 12 counties in Albania. These branches coordinate tasks with the customs offices and other relevant institutions for the prevention of damage to the environment, forests and waters.

1.2.4. Faculty of Forest Sciences

The Faculty of Forest Sciences was established in September 1959 in Tirana and is one of the faculties of the Agricultural University of Tirana. The faculty comprises two departments:

- The Department of Forestry works in the field of forest management, wildlife management, erosion control, environment and forest policy and economics.
- The Department of the Wood Industry deals with research related to physical properties of wood and wood macroscopy.

The main role of the faculty is education, scientific research and applied work in the field of forestry. The Faculty of Forest Science is the main educational institute in the field of forestry. Through its scientific work it contributes to the development of new forest management techniques, new policies for forest and nature management, practical guidance for plant breeding, and other work related to forestry and nature conservation.

1.2.5. Protected areas and national parks

A legal and regulatory framework on protected areas and national parks has been developed over the past decades that is in compliance with international obligations, standards and criteria established since 1991. This framework covers the designation of new protected areas and national parks, as well as their expansion, conservation and management.

Because Albania has committed itself to international obligations and standards by signing a number of international conventions and other regulatory instruments, there are several examples of integrated ecosystem management in Albania (at already protected areas or "pilot projects"), as well as participation in international biodiversity conservation and management activities. One of the government's priorities is the harmonisation of the legal forest framework with such conventions. This implies the improved management of natural resources, taking into consideration biodiversity and protected areas. Such integrated management is also aimed at raising public awareness and encouraging participatory approaches in the sustainable management of natural resources.

The Law on Protected Areas (No. 8906 of June 6, 2002) defines general criteria for the designation of PAs: "A protected area may be any terrestrial, water, sea or coastal territory, defined as an area for biodiversity preservation, of the territory's associated natural and cultural values, which are managed based on existing legal and managerial tools and methods."

According to the criteria for protected areas used by the International Union for Conservation of Nature (IUCN), national parks are classified as a separate category. According to Article 6 of the Law on Protected Areas, national parks are "wide territories of no less than 1,000 ha, having unique national and international values, a major part of which are natural ecosystems, little affected by human activity, where plants, animals and the natural physical environment are of a special educational and scientific importance".

Protected areas and national parks manage forests that are in state, communal and private ownership. Both protected areas and national parks come under the administration of the Forestry Service.

Economic activities are not permitted in forests located in protected areas and national parks. The production of wood products in protected areas is forbidden by law, and harvesting in national parks is also forbidden by law. According to Article 12/1 of the Law on Forests, "forests in protected areas and national parks are excluded from the classification categories as forests for harvesting".

Any illegal activities carried out inside national parks, including minor illegal cutting, are regarded as criminal offences according to the law. This creates difficulties for people living inside protected areas, who usually obtain firewood for household use through illegal cutting, having no alternative.

Protected areas in Albania cover 446,799 ha (15.54 percent of the territory of Albania), with an additional 12,428 ha in the sea (0.5 percent of Albania's territorial waters). Protected areas are classified according to six IUCN categories:

Category 1: Strictly Protected Areas — two sites covering a total of 4,800 ha

Category 2: National Parks — 15 national parks covering a total of 210,501 ha

Category 3: Nature Monuments — 3,470 ha

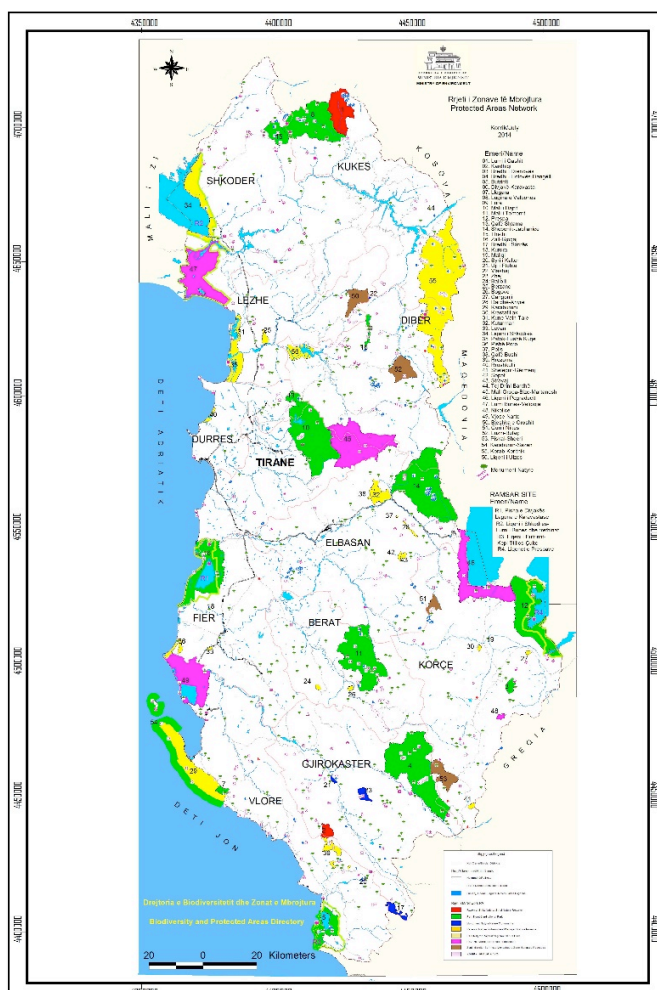
Category 4: Managed Nature Reserves/Natural Parks — 127,180 ha

Category 5: Protected Landscapes — 95,864 ha

Category 6: Protected Area of Managed Natural Resources — 18,245 ha

(Source: MoE <http://www.mjedisi.gov.al>)

Map 3. National parks and protected areas



Source: [11]

1.2.6. Communal forests: Forest users, forest users associations, local governments and communal forest federations

In Albania, communal forests are the most important sub-sector within forestry. In rural areas, there is a high level of dependency on natural resources from forests and pastures. Forestry is very important for land-use development in rural areas. Forests and pastures are used by farmers, typically in the form of agro-forestry systems. Within these agro-forestry systems, agricultural crops, trees and livestock are managed within the same land unit. Traditionally (i.e. before 1945), Albanian forest areas close to villages were either regarded as common “village forests” or divided among families and groups of families as “family forests” to fulfil their needs for wood, grazing and fodder. After 1990, with the transition from a centralised system to a free market economy, there was a focus on the transfer and usufruct of state forests and pastures to communes. The main custodians of forests and pastures in Albania are forest families, who undertake continual, sometimes seasonal, land management practices. Within the decentralisation process, associations of forest and pasture users have been established in most communes, while more recently, through the land transfer process, the role of local government units (communes and municipalities) has been strengthened. Regional federations and a national federation have been established and strengthened in order to represent the interests of communal forest and pasture users. Communal forest management remains the responsibility of local government units and the associations of forest and pasture users, supported by federations and the State Forest Extension Service. The control function lies with a separate forest inspectorate under the Environmental Inspectorate within the MoE.

At the same time as the institutional reform, a new forest law reflecting the major changes in the forestry sector over the last two decades is expected to be approved by the Parliament.

The recent transfer of management competences for communal forests and pasture lands to the communes and municipalities has fundamentally changed the management structure and focus for these areas. The new arrangements, as defined in Decision No. 22 of the Council of Ministers of 2008, establishes the management authority and gives responsibility over forests to local government units and local users (associations of forest and pasture users). This arrangement brings these forests and pastures under the management and accountability structures of the communes.

Although the situation in terms of ownership rights for individual forest and pasture users has not yet been greatly improved, the decentralisation of authority is expected to provide greater recognition of and respect for the rights of primary stakeholders — traditional forest families as local custodians of these resources.

Associations of forest and pasture users are local-level organisations that coordinate tasks among users and support the implementation of forest management activities.

The National Federation of Communal Forests and Pastures is a non-profit, non-governmental organisation that represents the interests of users of forests and pastures in Albania. Its mission is to address and represent the interests of its members, accelerate decentralisation, and legalise use/ownership rights in order to promote the sustainable management of forests and pastures.

To date, the Forestry Service is responsible for service provision, although this is not functioning. National and regional federations are filling part of the gap by providing services for associations of forest and pasture users.

1.2.7. Private forest owners

Private forests in Albania cover an area of 27,420 ha (2.6 percent of Albanian forests, which is a very small proportion compared to state and communal forests), with a standing volume of 3,402,000 m³ (4.4 percent of the total). The average standing volume in private forests is 124 m³/ha, which is higher than in communal and state forests. The main goals of the association of private forest owners are to address the needs and interests of private owners; help its members with the management of private forests; protect the forests and the environment; increase the tourism and recreation values of forests; and disseminate promotional materials.

Although private forest areas are very small, they have been intensively exploited in recent years. Owners are trying to make as much profit as possible, without thinking about the future of their forests. On the other hand, there are no subsidies available to encourage responsible management; there is no clear legislation on the management of private forests; and there is no manual on the technical aspects of private forest management. There are currently no investments in private forests, while illegal exploitation by the owners and illegal logging by others are among the biggest concerns in these forests. In some areas ownership is not clear: the completion of ownership documentation is complicated by bureaucracy and corruption, and there are many cases of conflict and disputed ownership. Forest management is typically ad hoc, leading to the degradation of private forests, low incomes, and frequent forest fires. [4]

1.3. Fire history

Between 2004 and 2013, the annual average burned area was 2,731 ha of forests; 50 ha of (non-forest) protected areas; and 2,000 ha of other vegetation (e.g. wetlands). Damage included 15 houses burned; four high-voltage pylons damaged; and 23 people injured. Each year around 200 ha of olive trees and other agricultural crops are also burned. This information is mostly provided by the state authorities and no independent studies have been carried out to confirm the figures. In 2007, for example, when fires were monitored by satellite, the situation was shown to be more negative than the figures reported by the responsible authorities. [19]

Table 2. Forest fires in Albania (2005, 2006, 2008 and 2010)

| Year | 2005 | 2006 | 2008 | 2010 |
|---|-------------|-------------|-------------|-------------|
| Nr. Of Cases | 174 | 176 | 348 | 246 |
| Forest surface (he) | 3241 | 1081 | - | 1133 |
| Burned surfaces (he) | 300 | 108 | 1483 | 1133 |
| Burned pastures (he) | 1740 | 303 | 2716 | 1741 |
| Value of damage in /000 Lekë(Albanian Money) | 31682 | 81317 | 139131 | 63733 |

Source: General Directorate of Forests and Pastures

The most severe forest fires in recent years occurred in 2007 and 2012.

2007:

- 1,190 fires in forests and pastures
- 2,700 ha of state forests burned
- 2,860 ha of communal forests burned
- 310 ha of private forests burned
- 6,263 ha of pastures burned
- Estimated damages of around EUR 20 million

2012:

- 440 cases of fires in forests and 47 cases of fires in pastures
- 3,300 ha of forest area burned
- 1,300 ha of pasture burned

Studies have shown that 29 percent of these forest fires were caused by negligence; 61 percent by unknown factors; 9 percent by arson; and only 1 percent by unusual events and lightning. However, it should be recognised that even those forest fires classified as “caused by unknown factors” can be considered to have been started as a result of human activity. They are

classified under “unknown factors” as the precise cause is not known, but it can still be concluded that a large proportion of forest fires in Albania are started by human activities. [9]

II. Legal framework and institutional set-up in the field of forest fire management

The following laws deal with forests, forest land, pastures and forest fire protection:

- Law on Forests and the Forestry Service (No. 9385 of April 5, 2005)
- Law on the Pasture Fund (No. 9693 of March 19, 2007)
- Law on Civil Emergency Services (No. 8756 of March 26, 2001)
- Law on Protection from Fire and Rescue (No. 8677 of April 5, 2001)
- Law on Protected Areas (No. 8906 of June 6, 2002)

According to this legal framework, all organisations that manage forests and pastures and the owners of private forests and pasture areas are obliged to take all the measures necessary to protect the areas under their jurisdiction. In addition to the Law on Forests and Forestry Service and the Law on Protection from Fire and Rescue, the following regulations/guidelines apply:

- Regulation on Forest Protection against Fires, Pests and Diseases, and Related Financial Means (No. 25 of February 8, 1993)
- Act of the Council of Ministers on Determining and Taking Measures against Fire and on the Rescue of Objects of Special Importance, Including Watersheds, National Parks etc., (No. 288 of June 27, 2002)
- Guidelines on Determining and Taking Measures against Fire and on the Rescue of Objects of Economic and State Importance (implementing Act No. 288 of June 27, 2002) (No.1 of July 30, 2002)

This legal basis establishes institutional obligations and responsibilities related to forest protection against fires, as well as the preventive measures to be taken in association with the relevant annual funds.

According to the laws listed above, the main institutions authorised in the field of forest fire protection in Albania are outline below:

1. The Ministry of Environment through the Directorate for Treatment and Forest Protection and the State Inspectorate of Environment, Forests and Waters (SIEFW).

The Directorate for Treatment and Forest Protection is, as mentioned above, responsible for forest management at state level, including forest fire protection.

At regional level, this function is delegated to the Regional Forestry Services Directorate. Besides other functions, the RFSD is obliged to ensure that all measures for prevention, preparation and suppression are conducted, in accordance with the laws in force, by all forestry stakeholders: the Public Forestry Service; protected areas and national parks; forest and pasture users; and private forest owners.

The Forestry Service at regional level must prepare annual plans for forest fire protection that contain:

- an analysis of the causes of wildfires and factors that influence the spread of fire;
- fire statistics for the previous year;
- forest fire risk areas and periods;
- activities for the forecasting and prevention of forest fires;
- the responsible entity and the location of the means, equipment and human resources for fighting forest fires;
- the responsible entity and the location of access roads to forests;
- technical fire prevention measures (fuel management and silvicultural and maintenance operations);
- training and information activities; and
- a financial plan.

Local headquarters of the national Forestry Service are dispersed throughout the country, with one in each district. When a wildfire occurs, Forestry Service personnel attend the scene but are active during the operational phase only, as observers or technical advisors. At present, the Forestry Service has no vehicles equipped to cope with forest fires.

The State Inspectorate of Environment, Forests and Waters (SIEFW) inspects the above-mentioned institutions and organisations (among others) with respect to the prescribed measures for forest fire protection.

2. National parks, forest and pasture users and private forest owners

According to the legal regulations currently in force, national parks, forest and pasture users and private forest owners are under the same obligations as the Forestry Service.

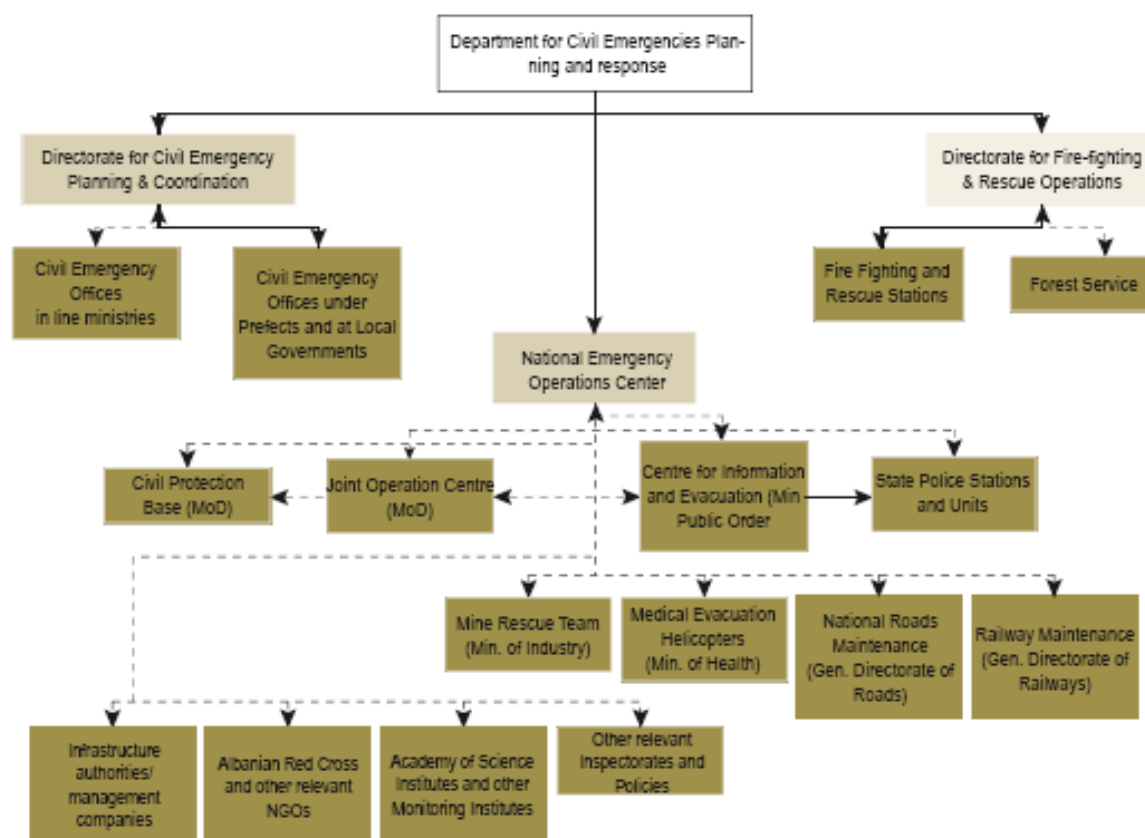
3. The Ministry of the Interior

The Ministry of the Interior has overall responsibility for managing civil protection. Among the ministry's departments is the Department of Civil Emergency Planning and Response (DCEPR). This department is responsible for ensuring effective coordination between all ministries, institutions and bodies in the field of disaster management. It has a close relationship with civil emergency officers in each of the 12 counties in Albania. It is divided into three units:

- The Directorate for Civil Emergency Planning and Coordination, which is the key institution for disaster management, especially coordination. This directorate has begun to move beyond mere preparedness and response towards recovery activities and the incorporation of disaster risk reduction elements into development plans, in particular for disaster-prone areas.
- The Directorate of for Firefighting and Rescue Operations (DFFRO)
- The National Operations Centre for Civil Emergency, which has direct links with all operational forces.

At district level, professional firefighters are organised within fire stations under the jurisdiction of DFFRO. The DFFRO cooperates with the national Forestry Service of the MoE. Firefighters are actively deployed by the DCEPR to tackle wildfires.

Figure 1. The structure of the Department for Civil Emergencies, Planning and Response



Source: [1]

Fires in forests, agricultural and conservation areas and other land, as well as the legal provisions for fire bans and the use of fires to reduce combustible vegetative matter and thus reduce the risk of wildfires, are regulated by the Law on Forests and Forestry Services and the Law on the Pasture Fund.

The use of fire to enhance biodiversity is regulated by the Law on the Pasture Fund.

Cross-border collaboration is handled by the civil emergency service (DCEPR) and agreements have been made for collaboration during the forest fire season with Italy, Greece, the former Yugoslav Republic of Macedonia, Montenegro, Bulgaria, Kosovo* and Turkey.

III. The impact of wildfires on the environment, economy and human health

The negative impacts of fires are extensive in conifer forests, but less so in coppice forests and shrub land. The main negative impacts are erosion in the burned area following the fire, the destruction of the regeneration cover, and the disturbance of the land structure and water regime. Another negative impact is the reduction in forest productivity. Bearing in mind the characteristics outlined above, forest ecosystems in Albania are very sensitive to fire. In the coastal forest protection belt only, surface fires in pine forests have a role in maintenance and are used as a control measure to minimise the amount of flammable material available for potential wildfires. In sites affected by fires, especially in the natural pine forests in the north of the country in Puke, Kukesi and Mirdita districts, the vegetation cover following a fire differs greatly from the vegetation before the fire.

In the southern part of the country, fire has traditionally been used as a means of cleaning and regenerating pasture. At these sites, the use of fire over many centuries has made big changes to ecosystems. One of the main impacts is the establishment of annual grasses and the disappearance of perennial plants. [9]

According to the JRC, the amount of biomass burned and the quantity of gas emissions from forest fires in Albania up to August 31, 2007, are estimated as follows (10^3 tonnes):

- Biomass burned – 1,161.30
- Carbon dioxide (CO₂) emissions – 2,052.60
- Carbon monoxide (CO) emissions – 82.60
- Methane (CH₄) emissions – 4.30
- Volatile organic compounds (VOCs) emissions – 4.30
- Nitric oxide (NO_x) emissions – 5.80

There have been no fatalities caused by forest fires in the last 10 years, although 15 volunteer firefighters have been injured and five houses destroyed in the region of Shkodra.

IV. Special issues

Unexploded ordnance (UXO)

There are several areas that are still contaminated with unexploded ordnance from World War II, although there are no official maps showing its distribution. It represents a potential danger in the case of fires in these areas.

There are also land mines along the border area with Kosovo*, and each year they cause injuries to at least three to five people during firefighting.

Transboundary fires and international cooperation

In the past 10 years, transboundary fires have occurred affecting Greece, the former Yugoslav Republic of Macedonia, Montenegro and Kosovo*.

Legal agreements on fire suppression have been signed with Italy, Turkey and Kosovo*, and international assistance for forest fire suppression has been given by Italy, Germany and Ukraine (during the fire seasons in 2007 and 2012).

V. Needs for improvement in forest fire management

A large number of institutions and organisations, both public and private, are involved in forest fire protection in Albania. In some cases, this is the main reason for the high number of fires and the large burned areas in some fire seasons. Problems arise when such a large number of authorised institutions and organisations act at different levels. In accordance with the legal regulations in force, all these institutions are obliged to carry out certain preventive, pre-suppression and suppression measures. In order to be efficient and effective, these measures must be coordinated and harmonised, and this is particularly important in the case of certain pre-suppression measures (early detection, the training of firefighters, the drafting of operational plans etc.) and during fire suppression. However, this is not what happens in reality, thus the existing regulations need to be reviewed and adjusted. Competencies must be made clear, with no overlapping, and procedures must be precisely established.

There are no qualification standards for personnel involved in firefighting. The Forestry Service provides training for staff involved in forest fire suppression. This training covers basic knowledge and firefighting techniques, but there is no professional training. Several study tours have been organised to Italy and Turkey, but these have been ad hoc and not part of an official training programme, nor are there any official training materials for forest fire protection. The Ministry of the Interior has, however, produced a National Civil Emergency Training Curriculum, comprising eight training manuals on disaster management, disaster response, disaster relief logistics and emergency preparedness.

The number of volunteer firefighters (seasonally) is between 2,500 and 3,000. These volunteers are integrated into firefighting operations and trained by the Forestry Service and the Fire and Rescue Training Centre. There are no legal insurance mechanisms and the volunteers are equipped only with hand tools. In addition, several programmes supported by forestry projects have been developed in the past 10 years to involve the local community in fire management. However, the involvement of the local community in forest fire protection (usually only in fire suppression) is only a partial and temporary solution. The organisation of fire protection associations and unions of volunteers (at national and local level), following the experiences of neighbouring countries (Serbia, the former Yugoslav Republic of Macedonia and Croatia), will engage the local community efficiently and permanently. Citizens of all ages can be involved in forest fire protection, depending on whether the measures are preventive, pre-suppression or suppression, and this involvement would be permanent throughout the year.

Albania is a hilly/mountainous country with very steep terrain and a fragmented topography. These conditions favour the very rapid spread of forest fires. At the same time, access to such

areas for fire suppression is very difficult. This is often one of the reasons for inefficient fire suppression and large burned areas. In order to improve the situation the network of forest roads should be expanded (in accordance with the needs of the Forestry Service and the community).

There is a lack of professionally trained firefighters (in both the Forestry Service and the emergency services). There is also a lack of equipment, especially off-road vehicles. In this respect, it would be appropriate for the equipment to be provided first of all, and for training to be organised subsequently for firefighters using the new equipment. This is particularly important in the case of the special vehicles.

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