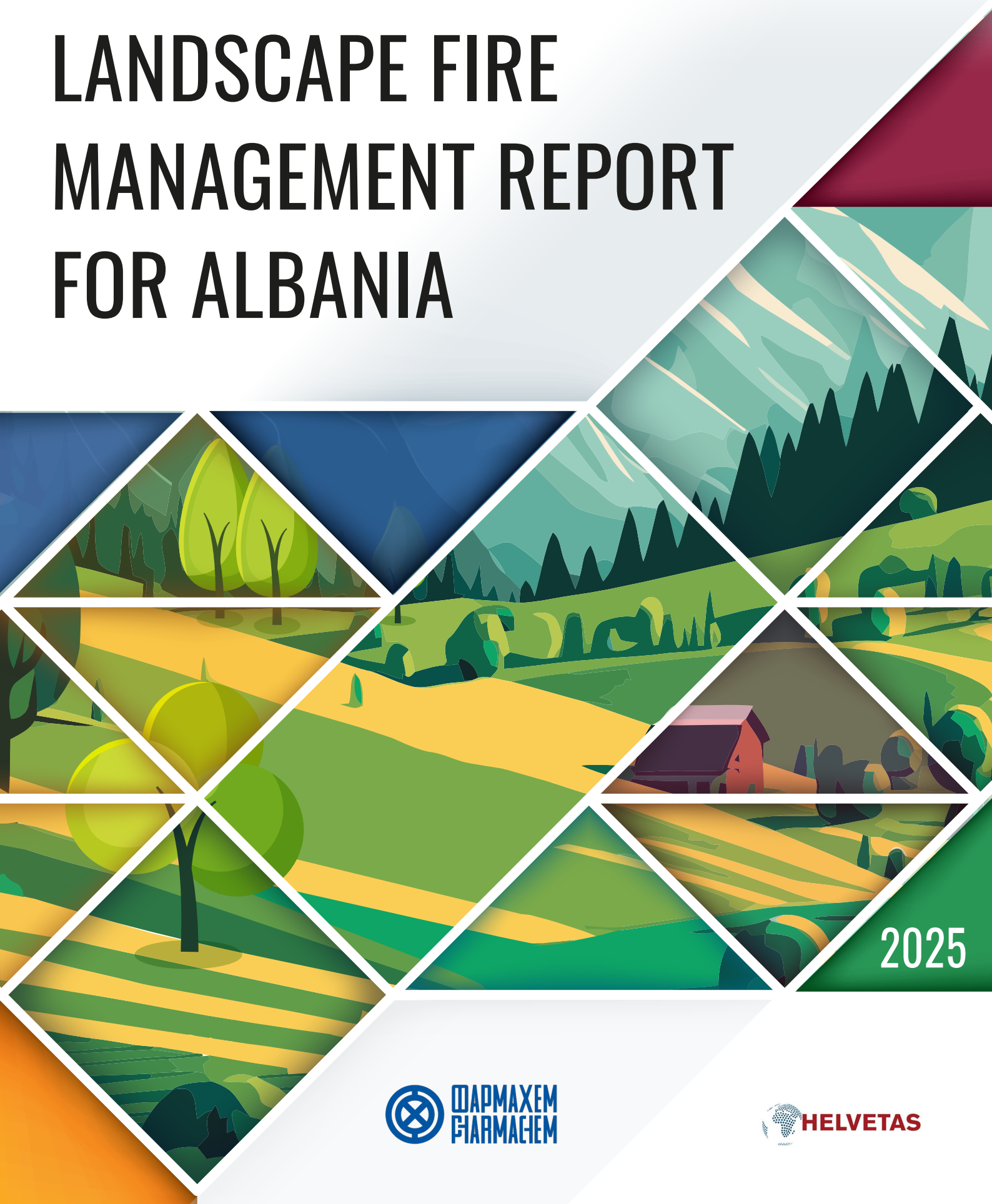
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Regional Fire Monitoring Center - RFMC

LANDSCAPE FIRE MANAGEMENT REPORT FOR ALBANIA



2025

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PHARMACHEM

HELVETAS

List of institutions and experts involved in the preparation of the LFM Report for Albania

- Faculty of Forestry Sciences
- General Directorate of Fire Protection and Rescue
- Institute for Municipalities of Albania
- Institute of Geosciences
- Livestock Entrepreneurs Association of Albania
- Ministry of Environment
- National Agency of Protected Areas
- National Civil Protection Agency
- National Forest Agency
- Prefectures of Berat, Durrës, Fier, Gjirokastër, Kukës, Lezhë, Shkodër and Tiranë
- Strong Municipalities Project/Helvetas
- The Agency for the Support of Local Self-Government

List of institutions and organizations involved in the process of the development of the report

Preparation and compilation of the report:
Arjol Lila, LFMWB Country Project Staff in Tirana

National supervisor of the process:
Ylli Hoxha, LFMWB Country Focal Point, Ministry of Environment of Albania

Expert process support:
Prof. Dr. Nikola Nikolov, Regional expert for landscape fire management, Regional Fire Monitoring Centre (RFMC), with support of RFMC staff

Proofreader:
Elena Jankoska

The Landscape Fire Management Report for Albania is prepared within the Landscape Fire Management in the Western Balkans (LFMWB) Programme financed by the Swiss Agency for Development and Cooperation (SDC) and coordinated by Farmahem - Skopje with backstopping support of Helvetas Swiss Intercooperation. The process for preparation of this report was coordinated by the Ministry of Environment of Albania with the support of the Regional Fire Monitoring Centre (RFMC) for the Southeast Europe/Caucasus Region as partners of the LFMWB Programme.

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List of Abbreviations

CEOCM	Civil Emergency Operational Centre in Municipality
CEOCQ	Civil Emergency Operational Centre in Qark
CHO	Central Head of Operations
CLC	Corine Land Cover
CMIP5	Coupled Model Intercomparison Project Phase 5
CPC	Civil Protection Committee
CPCM	Civil Protection Commission in Municipality
CPCQ	Civil Protection Commission in Qark
CPS	Civil Protection System
DCM	Decision of the Council of Ministers
DG ECHO	Directorate-General for European Civil Protection and Humanitarian Aid Operations
DRR	Disaster Risk Reduction
EAA	European Environment Agency
EFFIS	European Forest Fire Information System
EU CPM	EU Civil Protection Mechanism
EU	European Union
EMT	Emergency Management Team
FAO	Food and Agriculture Organization of the United Nations
FPRS	Fire Protection and Rescue Service
FRS	Fire and Rescue Service
FWI	Fire Weather Index
GDFPR	General Directorate of Fire Protection and Rescue
GDP	Gross Domestic Product
GFFF	Ground Forest Fire Fighting
GIS	Geographic Information System
ICEC	Interministerial Civil Emergency Committee
ICS	Incident Command System
IGEO	Institute of Geosciences
INSTAT	Institute of Statistics of Albania
JRC	Joint Research Centre (European Commission)
LFM	Landscape Fire Management
MARD	Ministry of Agriculture and Rural Development
MoD	Ministry of DefenceMoI Ministry of Interior
MoE	Ministry of Environment
MMS	Military Meteorological Service
NAP	National Adaptation Plan
NAPA	National Agency of Protected Areas
NCEP	National Civil Emergency Plan
NCPA	National Civil Protection Agency
NDC	Nationally Determined Contribution
NDRRS	National Disaster Risk Reduction Strategy
NFA	National Forest Agency
NFPI	National Forest and Pasture Inventory

NGO	Non-Governmental Organization
NITP	National Inspectorate of Territory Protection
NOCCE	National Operational Centre of Civil Emergencies
RAPA	Regional Agency of Protected Areas
RCP	Representative Concentration Pathways
RCPC	Regional Civil Protection Centre
SCA	State Cadastre Agency
SPI	Standardized Precipitation Index
TAC	Technical Advisory Commission
UN	United Nations
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
WUI	Wildland-Urban Interface

Introduction

The countries of the Western Balkan (WB) region in the last three decades have gone through a period of societal, economic, and social transformation. A significant period for almost all countries and some of the processes of change and transformation are still being developed. In this period, the migration of the population within the countries is particularly pronounced, but emigration outside of the region is also resolutely ongoing. In addition to these processes, unfortunately, the WB region has not been spared from the impacts of climate change either. Therefore, they have caused numerous disasters and catastrophes, such as floods, landslides, periods of extremely high temperatures, etc. All this has had a negative impact on the occurrence of forest fires as well as landscape fires in the region. This resulted in large-scale forest fires, material damage, and unfortunately also cases of injuries and loss of human life in some instances.

Insufficiently defined forest fire protection systems (prevention, preparedness, suppression, and post-fire management) and inadequate coordination between the stakeholders on the landscape level within that system persist in all WB countries. This is influenced by the ever more frequent occurrence of fires that are not limited to forests but also burn on arable and agricultural areas, pastures, abandoned agricultural areas, and peri-urban landscapes. These types of fires (landscape-level fires) require both an appropriate approach and a concept for protection against them.

This was recognized by the **Swiss Agency for Development and Cooperation (SDC)** which supported the **Landscape Fire Management in Western Balkan (LFMWB) Programme**, coordinated by Farmahem (Regional Executive Agency-REA) – Skopje, North Macedonia, and Helvetas Swiss Intercooperation as a backstopper. The LFMWB Programme operates under the steering of the SDC, while REA has a Programme management and coordinating role. REA works in close partnership with a diverse group of Programme partners and stakeholders, forging collaborative relationships with organizations such as the Regional Fire Monitoring Centre (RFMC), Global Fire Monitoring Centre (GFMC), Bern University of Applied Sciences BFH-HAFL, and a network of Country Partner Institutions located across the Western Balkans. Within this collaboration, RFMC plays a pivotal role in implementing the Programme's activities at both national and regional levels. They also engage in establishing synergies with other projects and initiatives on an international scale. The global outreach and landscape fire management (LFM) know-how are ensured by the Global Fire Monitoring Centre (GFMC) based in Germany. HAFL has an advisory role and contributes with its expertise and managing connections and interactions with Swiss counterparts to support the Programme's objectives.

This Programme, through its activities, *aims to increase the resilience of Western Balkans forests and landscapes against uncontrolled landscape fires to the benefit of the people who depend on these landscapes for their livelihoods and socioeconomic development*.

Following a landscape and participative approach, the LFMWB Programme contributes to the establishment of the Landscape Fire Management (LFM) Network in Albania as a science-practice-policy mechanism where different stakeholders can discuss the current situation and propose future guidelines regarding landscape fires. Acting as Albania's sounding board, the members of LFM Network were actively involved in the dynamic feedback process of preparation of the first Landscape Fire Management Report for Albania, representing a comprehensive, authentic and well-rounded document that elaborates the country's current situation with landscape fires. The process for the preparation of this report was coordinated by the Ministry of Environment of Albania with the support of the Regional Fire Monitoring Centre (RFMC) for the Southeast Europe/Caucasus Region as partners of the LFMWB Programme.

Members of the LFM network in Albania, in 2025, through several workshops succeeded in developing a common understanding covering different areas of landscape fires. All data elaborated in the report are provided and confirmed by official institutions of Albania, giving more legitimacy to the conclusions derived from the analysis of the results. This report gives an overview of the land use, demography and migration, climate characteristics, climate change and nationally determined contribution, analysis of the existing landscape fire management system, recording fires, landscape fire risk assessment, and existing initiatives. Additionally, this report presents findings of the LFM network members in Albania who worked

on developing a SWOT analysis elaborating strengths, weaknesses, opportunities, and threats related to the LFM.

In the last chapter of this report, the LFM Guidelines are defined and developed by the members of the LFM Network, which will serve as a fundamental framework to steer future actions and strategies into landscape fire management governance in Albania. These guidelines offer essential recommendations, laying a solid foundation for implementing the landscape fire management approach in all its phases, especially through stressing the role of prevention and preparedness measures, all in one cohesive Landscape Fire Management system.

The validation process of the Landscape Fire Management Report was ensured through continuous communication among the LFMWB Country Project Staff in Tirana seconded to MoE as a drafting person of the report as well as the members of the LFM Network of Albania with expert support provided by the RFMC. Through ensuring an inclusive and participatory approach, this report has become a valuable source for promotion and advancement of the LFM guidelines and principles for the purpose of making Albania's forests and landscapes fire resilient.

This report will serve as a fundamental document for planning measures and activities that will lead to the establishment of a more efficient landscape fire management system that will be able to successfully respond to the challenges resulting from socioeconomic, demographic, natural, and climate change.

I. Land Use In Albania

Land use plays a fundamental role in shaping both the occurrence and behaviour of landscape fires in Albania. The way land is managed – whether through agriculture, forestry, grazing, or peri urban and urban expansion – determines the distribution of fuels, the continuity of vegetation, and the level of human exposure to fire hazards. In Albania, changes in land use over recent decades have created new fire-prone interfaces, particularly between forests, abandoned farmlands, and expanding urban areas. Abandonment of agricultural lands, especially in hilly and mountainous zones, has allowed the natural regrowth of shrubs and secondary forests, which in turn increases fuel loads and the likelihood of landscape fire ignition probability and spread. On the other hand, rapid urbanization and tourism-related development have intensified the wildland-urban interface (WUI), where human activities frequently cause fires that spread into natural landscapes.

These dynamics make land use a central factor in LFM. Effective landscape fire management must therefore go beyond suppression and integrate spatial planning, sustainable agriculture, and forest management practices that reduce ignition sources and fuel continuity. Understanding land use patterns is essential for identifying high-risk areas, designing prevention strategies, and balancing economic development with ecosystem resilience. In this sense, integrating LFM into national land-use policies – such as agricultural zoning, forestry management, and urban planning – is key to preventing future fires and ensuring sustainable landscape governance in Albania.

This chapter provides a comprehensive, policy-ready view of Albania's land use for landscape-fire management. It integrates official national statistics, European land-monitoring products, and international assessments, and it sets up clear links to exposure and risk in later chapters (WUI growth, protected areas, transport corridors, and tourism zones).

I.1. Land Use and Land Cover Statistics

Albania's land-use mosaic features coastal agricultural lowlands intensively cultivated valleys, and uplands dominated by forests, shrublands, and pastures. The WUI is expanding around metropolitan areas (e.g., Tirana-Durrës) and touristic coastal/mountain municipalities, which elevates ignition likelihood and the exposure of people and assets to fire. From a fuel perspective, the contiguity between shrublands (maquis/garrigue), abandoned fields, pine stands, and broadleaf forests create continuous fuel beds under summer drought and wind, increasing spread potential.

The data of land cover in this chapter are obtained by the National Environment Agency, which in collaboration with the European Environment Agency, have developed the project Corine Land Cover 2006-2012 for Albania. This project was updated in 2018. Corine Land Cover 2018 is one of the projects produced within the framework of the Corine Land Cover programme that refers to the land use status of 2018. Corine Land Cover (CLC) is a European programme, coordinated by the European Environment Agency (EEA), which provides stable geographical information on land cover and changes across Europe. The concept of Land Cover differs from that of Land Use where the first shows the physical types of land, while the second presents what people are using the land surface for. Different types of land cover can be managed or used completely differently. The resulting databases are based on the standard methodology and nomenclature with the following basic parameters: 44 classes in the 3-level Corine hierarchical nomenclature – the minimum unit (MMU) for status layers is 25 hectares – the minimum width of linear

elements is 100 meters – the minimum unit (MMU) for Land Cover Change (CLC) is 5ha. Based on the standard methodology, regrouping the data of 44 classes further into 5 main classes, information is obtained on the area occupied by each class. The land cover map is presented as follows:

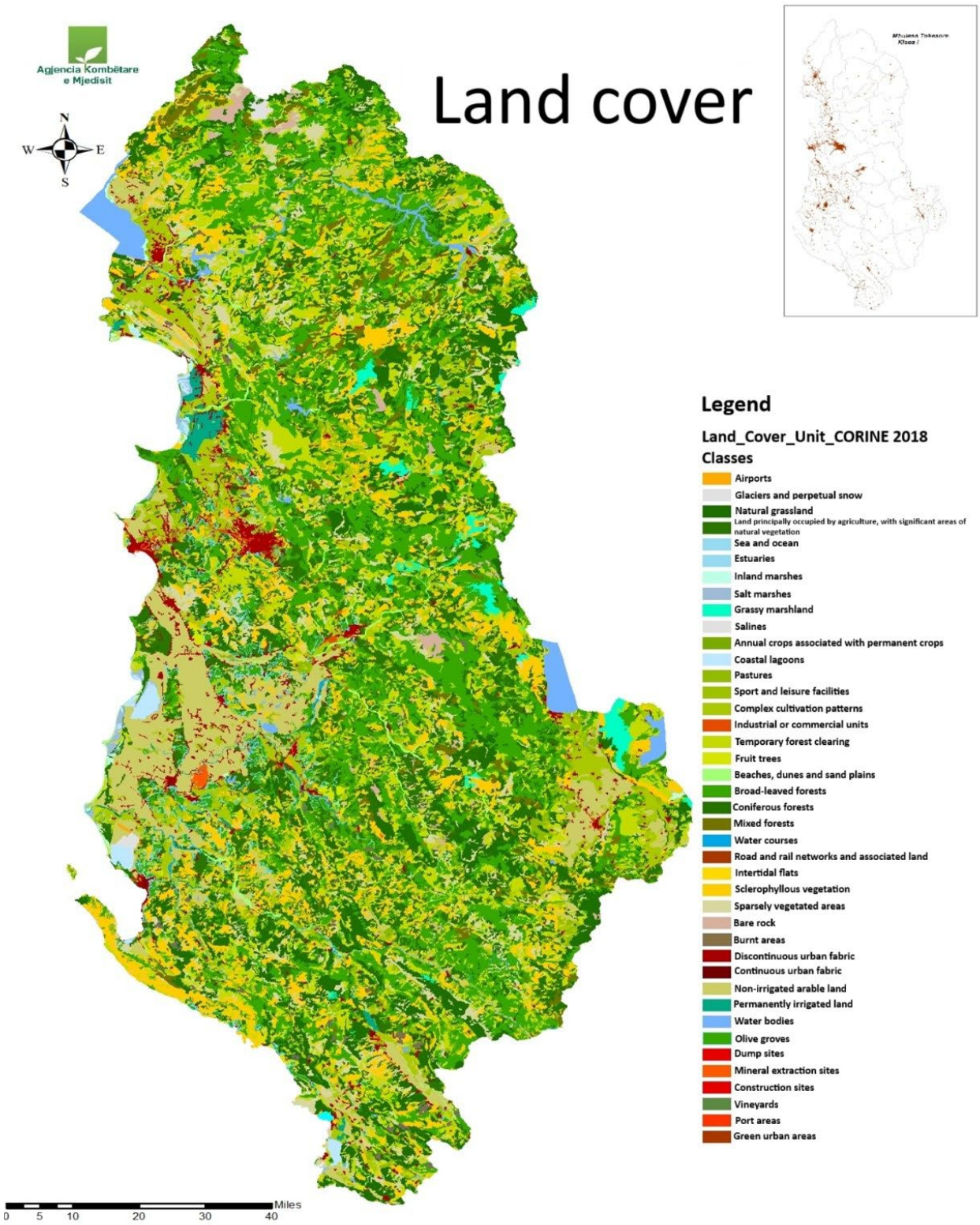


Figure 1. *Map of land cover of Albania, CLC 2018.* ***Data source:*** *National Environment Agency*

Table 1. *Classes of land cover, CLC 2018.* ***Data source:*** *National Environment Agency*

Class	Description	Area (ha)	Percentage (%)
I	Urban, industrial, recreational processed surfaces	77,228.91	2.68
II	Agriculture with other types of land cultivation	805,636.44	27.98
III	Forests, shrubs and other wooded land	1,915,849.78	66.54
IV	Wetlands	11,619.81	0.4
V	Water bodies	68,590.77	2.4
TOTAL		**2,878,925.71**	**100**

It must be noted that multiple official sources report Albania's land resources, which often have discrepancies among each other. For example, the FAO FRA 2020 desk study (FAO, 2020) gives consistent forest and other-wooded land series with a 2015-2020 forest area around 789 thousand ha and other wooded land about 263 thousand ha. This equates to roughly 29% and 10% of FAOSTAT land area respectively (2.74 million ha). The classification basis differs across sources. This chapter is based the Albanian official source, CLC 2018, which is also the foundation for other institutions (such as ASIG). For fire planning, absolute areas and spatial distribution are more relevant than high-level shares.

I.2. Forests and Pastures

Based on the National Forest and Pastures Inventory (NFPI, 2021), forests in Albania occupy around 46% of the total area, and along with pastures, they occupy around 65% of the total area equivalent to 0.65 ha/capita. In Europe, forests occupy 227 million ha, covering 35% of the total area. According to the NFPI 2021, the value of forest cover in Albania is greater than the average forest area in the European Union countries, which reaches 0.36 ha/capita. Agricultural lands occupy 24.4% of the total area and are situated in lowland and hilly areas. Pastures occupy 19% of the national area and are situated in both hilly and mountainous areas, meeting part of the needs of livestock. On the other hand, urban lands occupy 2.3% and water bodies occupy 2.7% of the national area, being two of the categories with the smallest percentage of coverage. These figures are very close to CLC 2018 results and represent a decent database for landscape fire management.

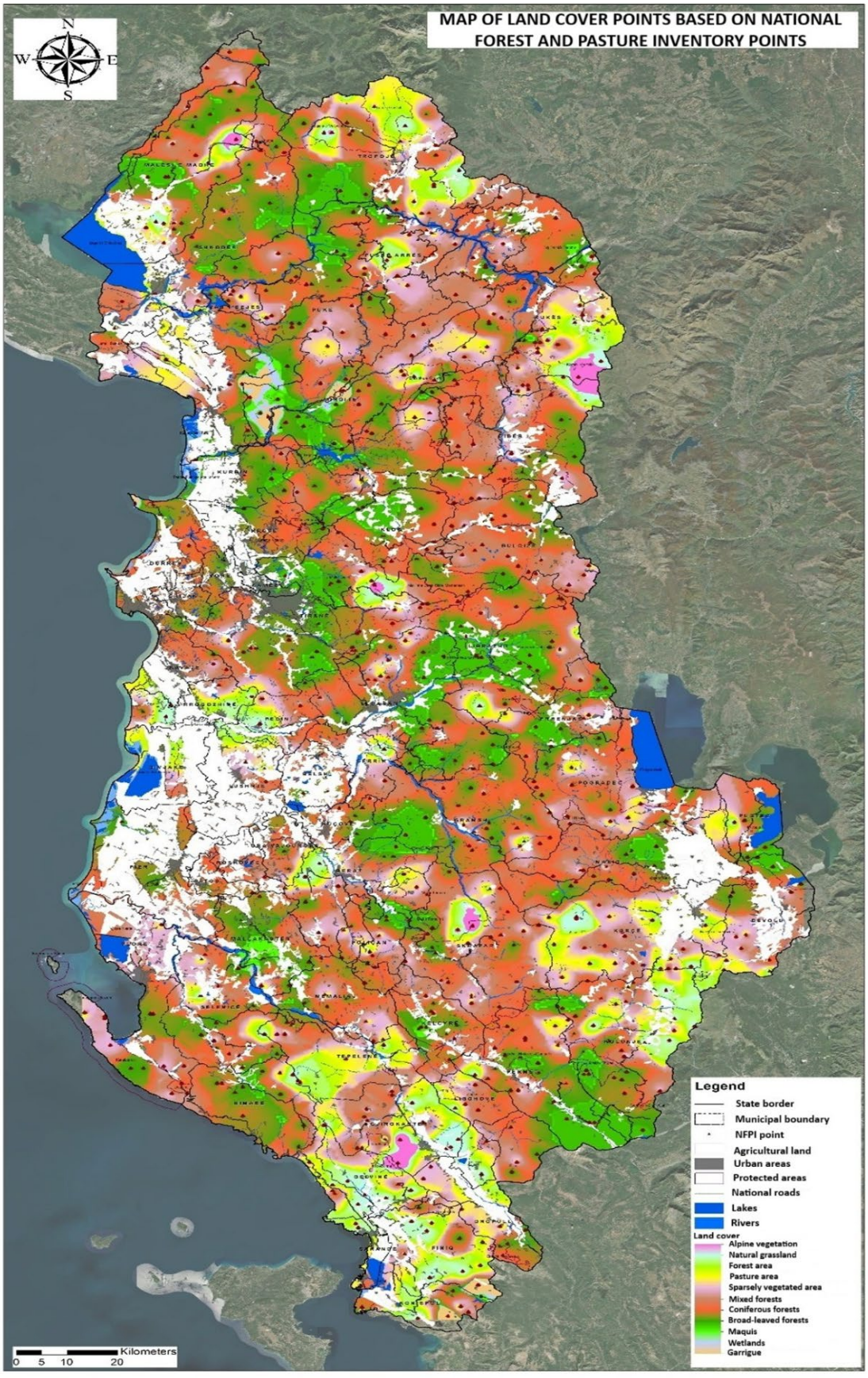


Figure 2. *Map of land cover based on National Inventory grid.* ***Data source:*** *NFPI, 2021*

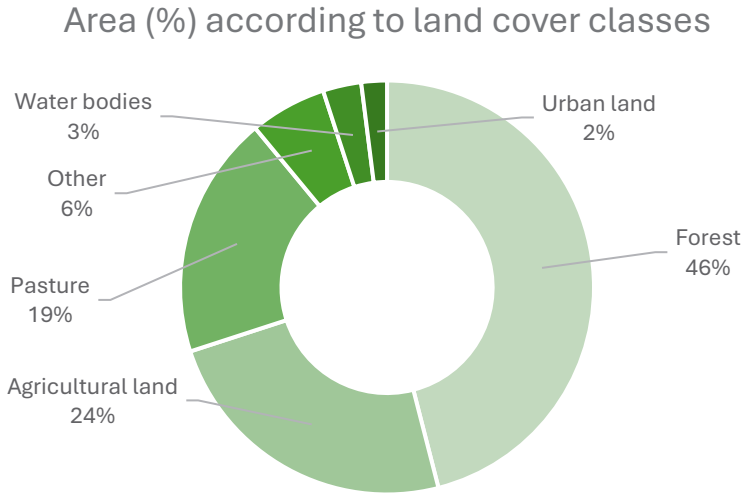


Figure 3. *Chart of area according to land cover classes.* ***Data source:*** *NFPI, 2021*

Table 2. *Total area of Albania according to land cover class.* ***Data source:*** *NFPI, 2021*

Land cover class	Area (ha)	Percentage (%)
Forests	1,309,767	45.56
Pastures	547,682	19.05
Agricultural land	702,646	24.44
Water bodies	78,013	2.71
Urban land	66,337	2.32
Other	170,335	5.92
Total	**2,874,780**	**100**

Regarding forest ownership, public forests (state and municipal) dominate, occupying 90.6% of the total forest area, while private forests occupy only 1.8%. Of the public forests, the largest area is occupied by forests owned by municipalities (74%), followed by state forests or protected areas (16.6%). According to the National Agency for Protected Areas, the total area under specific protection status constitutes 21.76% of the national forest area. This discrepancy can be attributed to expansions of protected areas that occurred after the NFPI was carried out, implemented via Decisions of the Council of Ministers No.59 and No. 60, dated 26.1.2022. An area of 130,021 ha (7.6%) is undetermined due to lack of information.

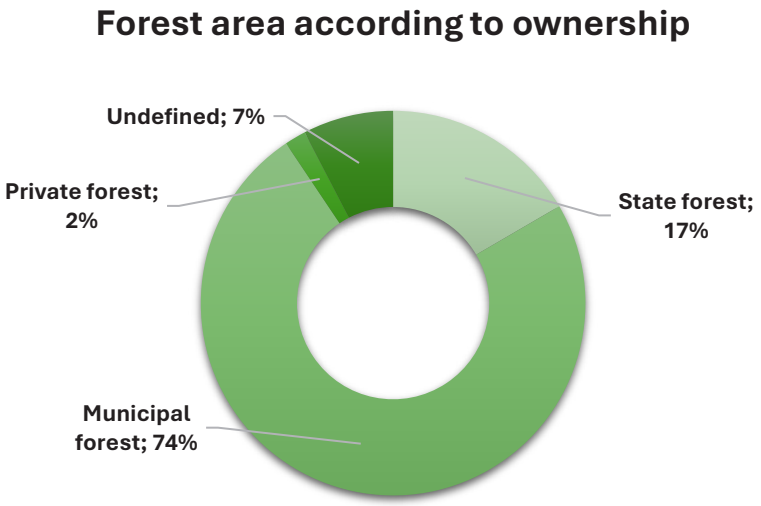


Figure 4. *Forest area according to ownership.* ***Data source:*** *NFPI, 2021*

In terms of function, the forest fund in Albania is dominated by the production function (87.3%), while forests with a social function occupy only 0.3% of the total forest area. Forests with a conservation function occupy an area of 1.8%.

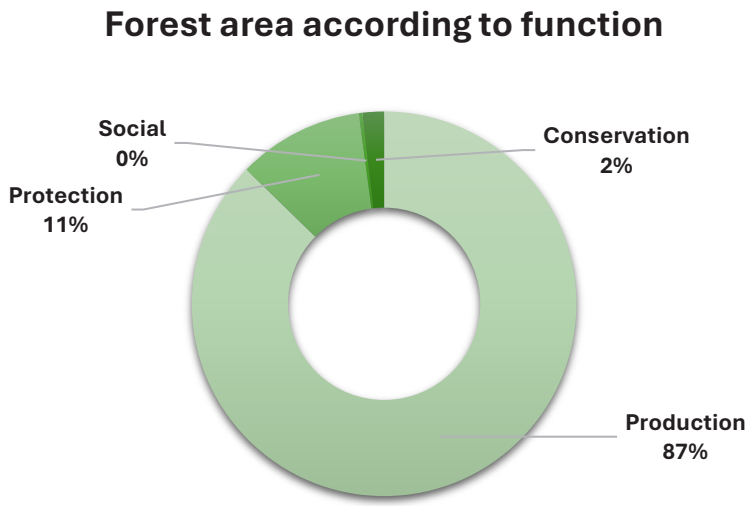


Figure 5. *Forest area according to function.* ***Data source:*** *NFPI, 2021*

The national forest fund is dominated by broadleaf forests, which occupy 80% of the total area. Beech (*Fagus sylvatica* L.) and oaks (Quercus spp.) are the main broadleaf species in Albania. Conifers occupy the second place in terms of area comprising 11% of the forest fund area and 22% of the standing volume. The main weight is occupied by forests of Black Pine (*Pinus nigra* Arnold.), White Fir (*Abies alba* Mill.), Scots Fir (*Pinus heldreichi* Chirst.), as well as those of Mediterranean conifers. Mixed forests rank last in terms of both area and standing volume, but mixed forests, dominated by broadleaf species, constituting the largest weight. This composition of forests in Albania is strictly determined by ecological conditions, geographical location and human activity.

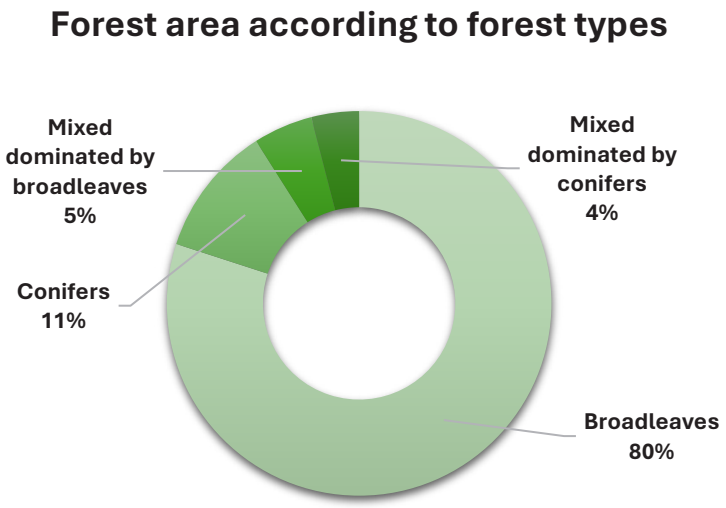


Figure 6. *Forest area according to forest types.* ***Data source:*** *NFPI, 2021*

Table 3. *Forest volume according to forest types*

Forest type	Volume (m^3)	Percentage (%)
Broadleaves	38,300,000	66
Mixed dominated by broadleaves	4,000,000	7
Conifers	11,500,000	20
Mixed dominated by conifers	3,900,000	7
Total	**57,700,000**	**100**

According to the inventory data, 98.7% of forests are situated in mountainous and hilly terrain, of which over 80% are situated on slopes with a steepness of 30 to 100% and road access for over 70% of the forest area is 500 metres and greater. These elements are very important when considering fire risk assessment.

I.3. Pastures

Pastures cover an area of 506,288 ha or approximately 19% of the country's territory. Summer pastures occupy the largest area at a national level with 439,000 ha, followed by winter pastures with 67,000 ha. Pastures mixed with shrubs, mainly for goats, occupy a smaller area of 31,000 ha at a national level.

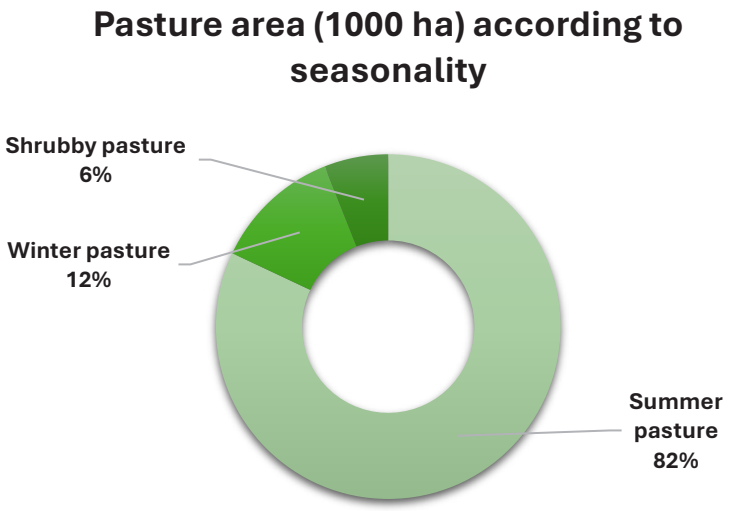


Figure 7. *Pasture area according to seasonality.* ***Data source:*** *NFPI, 2021*

76% of the pasture area is owned by municipalities, 15% are state pastures and 4% are private pastures. 5% of the pasture area ownership is undetermined.

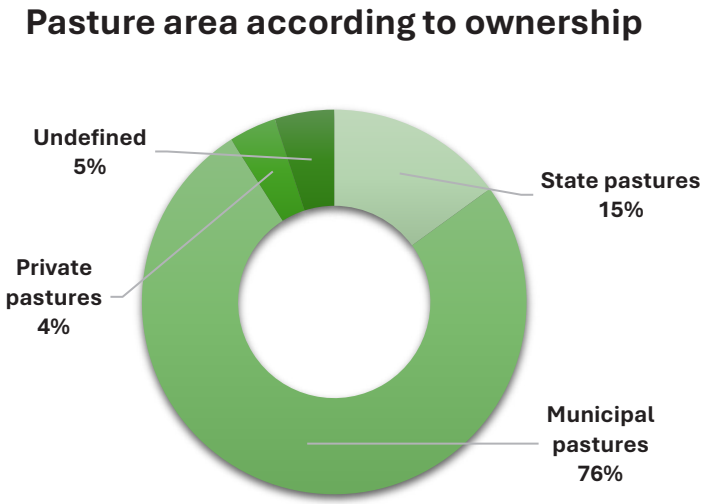


Figure 8. *Pasture area according to ownership. NFPI, 2021*

Due to the decline in livestock herds, about 10% of the pasture area remains ungrazed, increasing the mass of dry grass, which serves as a source of fuel, mainly during the fire season.

I.4. Protected Areas

According to National Agency of Protected Areas, Albania's network of 777 protected areas covers 21.76% of the country and approximately 34% of the forest and pasture fund. These areas are comprised of national parks, natural monuments, managed natural reserves, protected landscapes and protected areas of managed resources.

Albania is remarkably rich in biodiversity for its size and hosts approximately 4000 plant species – around 30% of all European flora – with 32 endemic and 160 subendemic species. Diverse fauna includes brown bears, wolves, lynx and numerous bird species. Fires threaten this biodiversity, especially when they occur in protected areas. Although only 50 protected areas burned annually in 2004-2013, recent fires have affected sensitive habitats (e.g., Karavasta lagoon). Effective fire management in protected areas is therefore crucial. Below is depicted a summary of protected areas:

Table 4. *Number and area of protected areas by categories.* ***Data source:*** *NAPA, 2024*

No.	Description of protected area	Number of protected areas per category	Category of the protected area	Area (ha)
1	Strict Natural Reserve	0	I	0
2	National Park	12	II	313,923.77
3	Natural Monument	724	III	85.50
4	Managed Natural Reserve/ Natural Park	28	IV	217,814.68
5	Protected Landscape	11	V	82,426.68
6	Protected Area of Managed Resources	2	VI	11,300
TOTAL		**777**		**625,550.63**

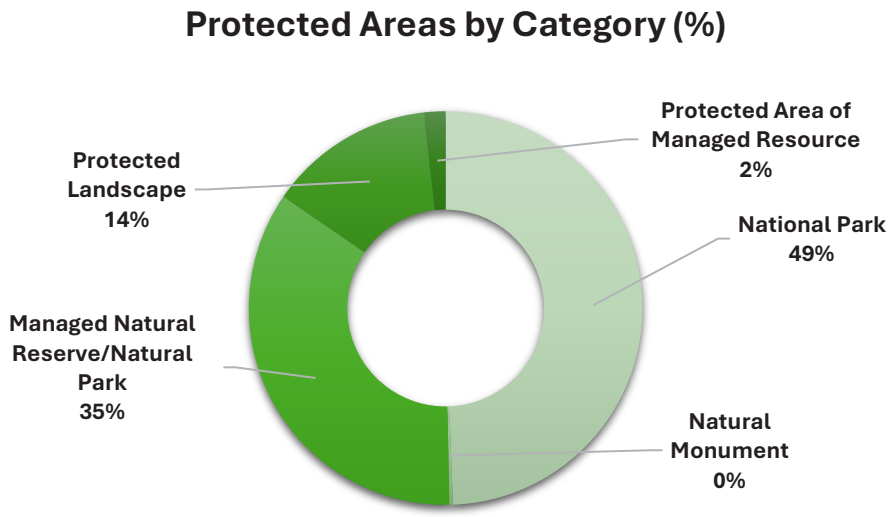


Figure 9. *Division of protected areas by category.* ***Data source:*** *NAPA, 2024*

Natural Parks make up 50.2% of the total protected areas, followed by Managed Natural Reserves at 34.8%, with the remaining area accounted for by the other categories. The table below presents the 12 National Parks in Albania.

Table 5. *National parks in Albania and their respective area.* ***Data source:*** *NAPA, 2024*

NATIONAL PARKS	
Name of National Park	**Area (ha)**
Albanian Alps	82,844.65
Hotova Fir – Dangelli	36,003.76
Butrint	8,622.2
Divjake-Karavasta	22,389.08
Dajti Mountain	28,561.85
Lure-Deja Mountain	19,288.88
Llogora	1,769.2
Tomorri Mountain	27,158.5
Karaburun-Sazan	12,437.7
Shebenik	34,507.9
Prespa	27,613.05
Vjosa River	12,727.0
TOTAL	**313,923.77**

A larger protected area estate requires targeted fuel treatments at boundaries and critical habitats, co-produced prevention plans with local communities, and compatible suppression tactics that safeguard biodiversity.

I.5. Agricultural Land and Rural Dynamics

The agricultural land in Albania is highly fragmented, most farms are under 1 ha and inherited through family divisions. According to the Ministry of Agriculture and Rural Development data, processed by INSTAT (2024), the total agricultural land fund is comprised of 677,300 hectares. 502,918 hectares are currently cultivated, and the rest remains barren. Field crops occupy the largest share in cultivation, which count 415,298 hectares or approximately 82.7% of all cultivated land and are mainly comprised of fodder, cereals, potatoes and vegetables. Orchards, olive groves, and vineyards occupy the rest.

Table 6. *Agricultural land according to type of cultivation.* ***Data source:*** *INSTAT, 2024*

No.	Type of crop	Area (ha)	Percentage (%)
	Field crops		
1	Fodder	211,878	42.1
2	Cereals	126,132	25.1
3	Vegetables	44,664	8.9
4	Beans	12,328	2.5
5	Potatoes	10,368	2.1
6	Medicinal plants/spices	7,508	1.5
7	Tobacco	907	0.2
8	Sunflower	537	0.1
9	Sugar-beet	517	0.1
10	Soy	338	0.1
11	Strawberry	121	0.0
	Olive groves, orchards and vineyards		
12	Olive groves	55,391	11.0
13	Orchards	20,823	4.1
14	Vineyards	9,845	2.0
15	Citrus	1,561	0.3
	TOTAL	**502,918**	**100**

Thus, approximately 26% of agricultural land is abandoned, mainly in remote villages close to forests due to migration to large cities or immigration abroad. This unmanaged land becomes a source of fuel accumulation and a potential risk of fire spreading across the landscape. Land abandonment has led to shrub encroachment, increasing fuel continuity and fire susceptibility. Coordinating agricultural-burning permits with daily fire danger and promoting alternative residue management reduces escaped-fire risk.

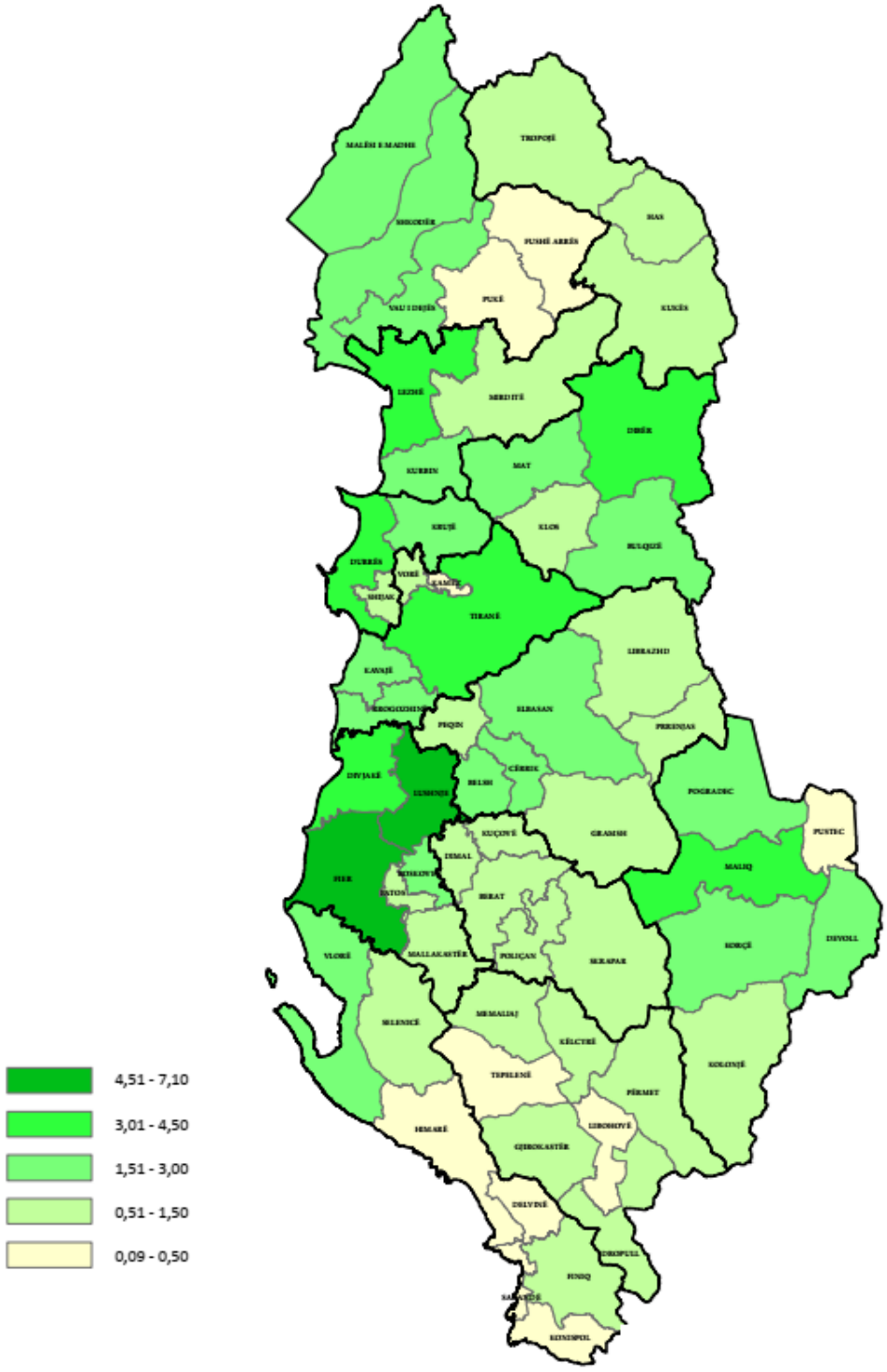


Figure 10. *Map of cultivated agricultural land according to districts.* ***Data source:*** *MARD/INSTAT, 2023*

I.6. Urban Expansion, Infrastructure and the WUI

The transformation of Albania's land use since the early 1990s is perhaps most clearly visible through the expansion of its urban footprint. Once characterized by compact towns and villages, closely tied to agriculture and contained by strict planning regulations, the country has undergone a profound spatial reorganization. The collapse of centralized planning after 1990 set in motion new dynamics of migration, settlement, and construction, reshaping both demographic patterns and the physical landscape.

In 1990, built-up land in Albania covered around 41,300 hectares. Settlements at that time were dense, their expansion limited by state regulations and an economy where mobility was restricted. Over the following decade, however, the scale of change accelerated. By 2000, built-up areas had reached 54,200 hectares, reflecting the surge of rural-to-urban migration and the proliferation of informal housing, particularly around Tirana and Durrës. This was a period when construction often outpaced regulations, producing scattered developments at the edge of existing towns.

The pace of expansion continued. In 2006, urban surfaces were estimated at 65,800 hectares, climbing further to 71,400 hectares by 2012. This era was marked not only by the growth of the Tirana metropolitan area but also by an upsurge of coastal development. Tourism-driven demand transformed towns such as Vlorë and Saranda, where seasonal and permanent settlements multiplied along the shoreline. By 2018, the built-up surface stood at 77,229 hectares – nearly double the figure recorded three decades earlier.

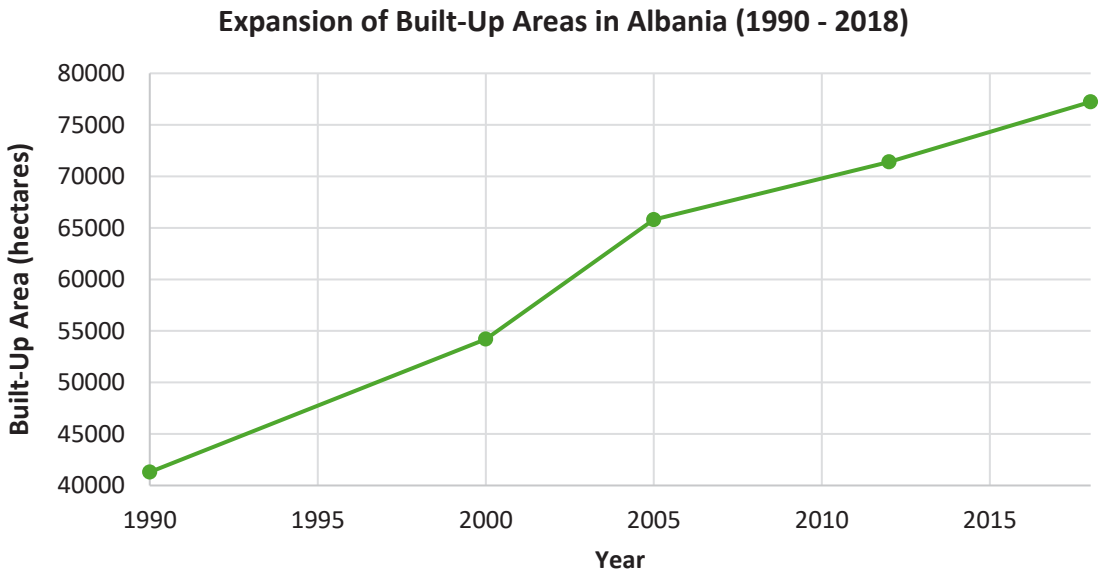


Figure 11. *Expansion of built-up areas in Albania 1990-2018.* ***Data source:*** *CLC 2018, INSTAT*

This growth has not occurred evenly across the territory. The western lowlands have borne the greatest pressures, with fertile farmland frequently converted into residential and industrial plots. The Tirana-Durrës corridor is the most striking example: a once semi-rural mosaic of fields and villages is now a continuous urbanized belt. Meanwhile, smaller cities and coastal settlements have expanded outward, driven by both population growth and a construction sector that has become one of Albania's economic engines.

Yet, the implications of this transformation extend beyond questions of land allocation. Urban expansion has fundamentally altered the relationship between people and their surrounding landscapes. A growing share of Albania's housing now lies directly adjacent to forests, shrublands, or pastures, creating what fire scientists call the Wildland-Urban Interface (WUI).

The WUI represents the contact zone where human settlements and flammable vegetation meet. In Albania, this zone has widened significantly over the past three decades. While forest cover has remained relatively stable or even increased slightly due to regeneration and reforestation, the spread of settlements has pushed deeper into foothills, peri-urban spaces, and rural clearings. The result is not simply the loss of agricultural land, but the embedding of people and infrastructure into fire-prone ecosystems.

Built-up areas have expanded rapidly, while forest cover has remained largely constant, producing an ever-growing overlap where different types of land use meet. The shaded "WUI zone" is a conceptual proxy for this contact. It highlights how new residential areas, particularly in Tirana-Durrës, Shkodër, Vlorë, and Saranda, now sit directly against vegetation that becomes highly flammable during long, hot summers.

This overlap creates a double vulnerability. On the one hand, wildfires that begin in forests or shrublands now have a greater chance of threatening homes, roads, and utilities. On the other, the very presence of human activity within these areas increases the risk of ignition, whether from agricultural burning, unmanaged waste disposal, or sparks from infrastructure. In effect, the WUI is both a fire-prone landscape and a fire-prone society.

Managing this challenge requires a shift in policy and planning. Traditional fire management systems, designed to protect forests in isolation, are no longer sufficient. Instead, Albania must adopt integrated approaches that account for the realities of the WUI: urban zoning that prevents uncontrolled sprawl into risky areas; resilient building codes for new construction; community preparedness programmes in peri-urban settlements; and stronger coordination between urban planners, environmental authorities, and emergency services.

In short, the expansion of built-up areas has not only reshaped Albania's economic and social geography, but it has also redefined its fire risk. The WUI is now the frontline where development and natural hazard meet, and where the country's ability to balance growth with safety and sustainability will be tested in the years to come.

Land use structure and dynamics in Albania play a decisive role in shaping both the frequency of landscape fires and the complexity of their management. This means that changes in agriculture, forestry, pastures, and urban development have collectively redefined the spatial distribution of fuels, the exposure of people and assets, and the capacity of institutions to prevent and respond to fire events.

One of the most obvious transformations has been the fragmentation of the landscape. After the 1990s, agricultural land collectivization was dismantled. The land was redistributed to small private owners, offering opportunities for rural households, but it also led to the abandonment of marginal lands, particularly in mountainous regions, leaving fields, once cultivated, overgrown with shrubs, bushes, and early successional forests, providing continuous fuel beds that are highly flammable during dry summers, and in areas where traditional grazing declined, the accumulation of biomass further amplified fire hazards.

At the same time, expansion of urban/peri-urban areas has created new challenges, as settlements have spread into previously rural or forested zones. The WUI has grown dramatically and now fire management is not limited only to protecting forests or agricultural fields but must also safeguard homes, critical infrastructure, and human lives. Therefore, firefighting strategies that integrate both landscape management and urban safety standards are needed, something that Albania's current systems are only beginning to adapt to.

Agricultural burning remains a widespread practice in some regions, where farmers use fire to clear stubble, regenerate pastures, or control pests. Without strict enforcement and awareness campaigns, such activities frequently escape control, spreading into surrounding forests and grasslands. It is certain that urban expansion into rural areas has added new ignition risks, from construction activity, energy infrastructure, and waste burning at the edge of towns.

Another dimension is the seasonal use of land, particularly in tourist zones. Coastal areas like Vlorë, Saranda, and Durrës experience an influx of people during summer months, which coincides with peak fire season. The seasonal increase in energy demand, transportation, and recreational activity in forests

and parks increases the probability of human-caused ignitions while stretching the capacity of local fire services.

The distribution of forest ownership and use rights also plays a role. With the decentralization reforms, the management responsibilities were transferred from the central government to the municipalities. Even though the aim was to bring the governance closer to local communities, many municipalities lack the resources, technical staff, and equipment needed to manage fire risk effectively, resulting in uneven preparedness across the country, with urbanized municipalities often better equipped than rural, forest-rich areas that face the highest hazards.

Seen from a fire management perspective, these dynamics generate several implications:

- Fuel Accumulation: Abandoned pastures and agricultural fields have increased biomass loads, making fires more intense and harder to control.
- Increased Exposure: Expanded WUI zones mean that fires now threaten not only ecosystems, but also densely populated areas and infrastructure.
- Complex Ignition Patterns: The mix of agricultural practices, urban activities, and seasonal tourism generates diverse ignition sources, complicating prevention measures.
- Institutional Challenges: Decentralized management without adequate resources and training has created gaps in local response capacity.
- Need for Integrated Planning: Effective fire management now requires cross-sectoral coordination, linking land use planning, forestry, agriculture, urban development, and civil protection.

The evolution of land use in Albania has heightened the intricacy of landscape fire control, where fire is no longer restricted to isolated rural regions. It has evolved into a multifaceted concern that intersects with urban expansion, economic progress, and ecological transformation. Addressing this requires a comprehensive strategy that acknowledges land use as both a catalyst for fire risk and a crucial mechanism for enhancing resilience.

II. Demographics

Demography is essential for understanding the interactions between cultures and their environments. Both the use of natural resources and the susceptibility of communities to hazards, such as wildfires, are influenced by the demographic composition, geographic dispersion, and dimensions of a population. The population of Albania has undergone substantial and revolutionary changes over the past three decades with significant internal migration from isolated mountain communities to metropolitan areas, decreasing fertility rates, and emigration surges have significantly altered the country's social and physical landscape. Rural depopulation leads to neglected landscapes and increased fuel accumulation, while urban expansion enhances human interaction with fire-prone regions. These dynamics are crucial for landscape fire management.

The demographic trajectory of Albania is the primary focus of this chapter, which is informed by the 2023 Population and Housing Census, INSTAT's annual statistics yearbooks, the United Nations' World Populations Prospects, Eurostat's Population Projections, and World Bank data. Collectively, these sources offer a comprehensive understanding of the demographic landscape's baseline and the annual fluctuations in migration, mortality, and fertility.

II.1. Population Size and Trends

The Census of 2023 documented 2,402,113 inhabitants in Albania. This represents a sharp contraction compared to the 3,069,275 people counted in 2001 and the 2,821,977 recorded in 2011. In little more than two decades, the country has lost around 667,000 people, or over 21% of its population.

This decline reflects a combination of low birth rates, rising life expectancy, and above all, the continuous flow of outward migration. Albania is today one of the few countries in Europe where the population has been in continuous annual decline since the 1990s, and the demographic contraction is not evenly spread across the territory.

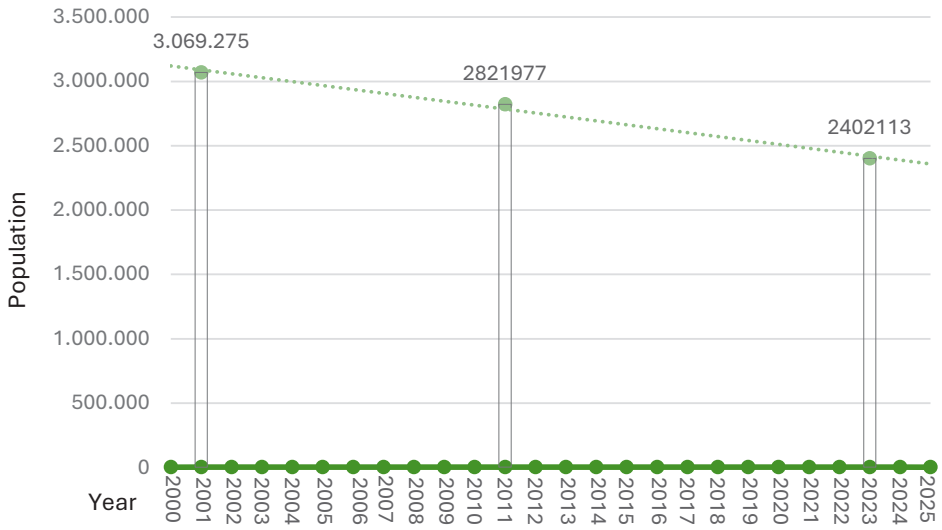


Figure 12. *The chart of population size and trend.* ***Data source:*** *INSTAT, 2023*

The chart shows a downward line from 2001 to 2023 and continues. While natural increase (births minus deaths) remains marginally positive in some years, it is not enough to offset the large numbers of Albanians leaving the country.

The decline is particularly striking when compared with Albania's past demographic profile. At the beginning of the 1990s, Albania was one of the youngest countries in Europe, with a rapidly growing population of about 3.3 million. Today, that growth momentum has completely reversed.

II.2. Spatial Distribution

The 2023 Census confirmed what many observers had long sensed, Albania's population is concentrating ever more tightly in a few urban and coastal regions, while much of the mountainous interior is steadily emptying. The uneven distribution of population, particularly the concentration in Tirana (now home to about 758,500 residents, which is nearly 32% of Albania's entire population), has profound implications for land management, local economies, and fire risk. The capital has grown into a dominant urban hub, pulling people from across the country, especially from the north and northeast. Whereas Durrës, the country's second-largest city and its main port, counted about 226,800 inhabitants in 2023. Together, the Tirana–Durrës corridor concentrates close to half of the national population, making it the densest demographic belt in Albania.

By contrast, mountainous prefectures have seen dramatic decline. Kukës, for example, which had more than 111,000 people in 2001, counted barely 62,000 in 2023, a loss of over 44% in just two decades. The counties of Dibër and Gjirokastër have gone through similar patterns, where shrinking populations leave behind vast stretches of abandoned land. The Census maps show stark differences: while the central-western lowlands appear shaded dark with high densities, much of the mountainous northeast is pale, reflecting thinly scattered communities.

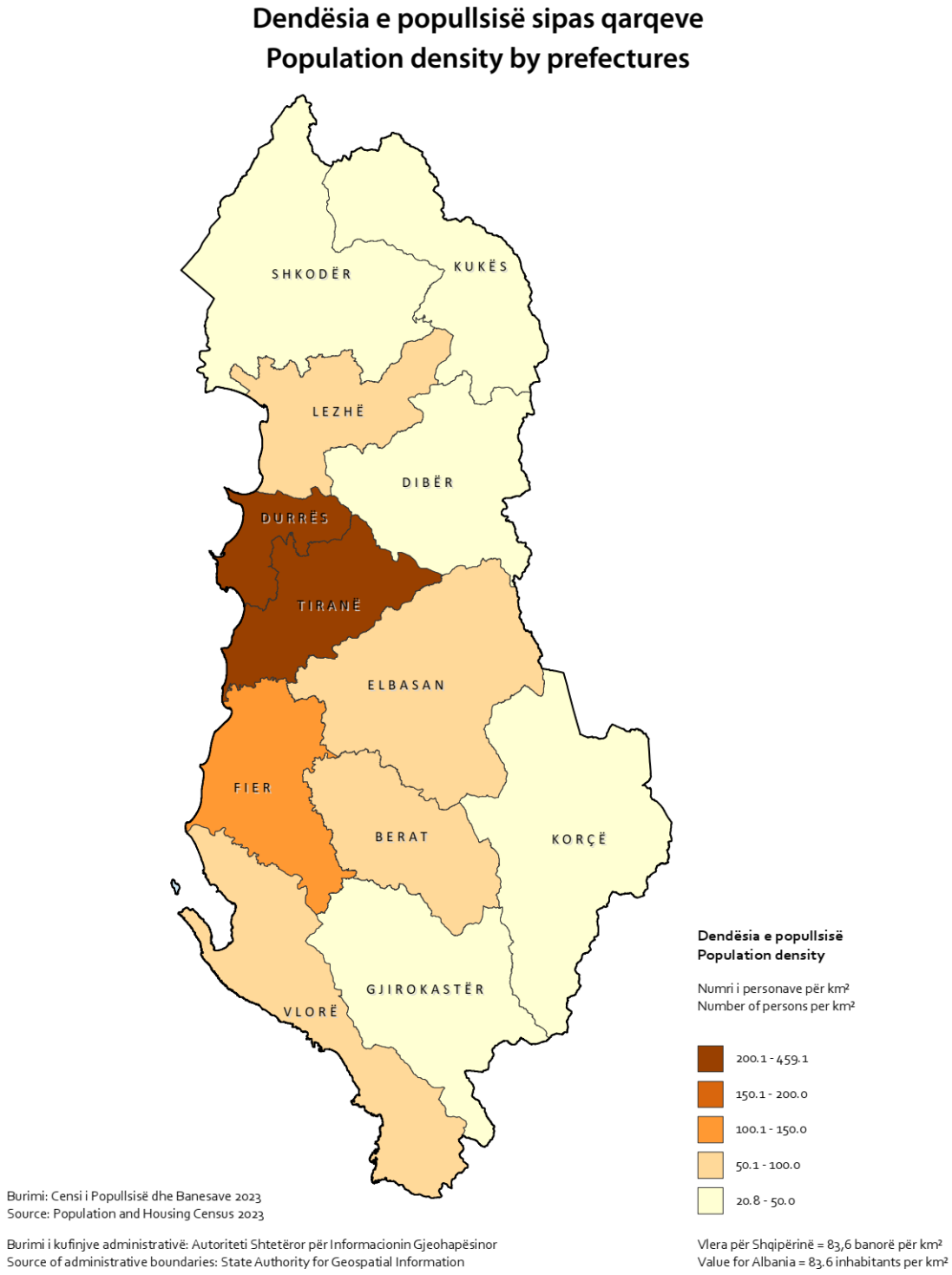


Figure 13. *Population density by prefectures.* ***Data source:*** *INSTAT, 2023*

These regional population imbalances have profound implications for landscape fire management; depopulation in the mountainous regions often means that traditional land uses, such as grazing and wood gathering, are abandoned, leaving vegetation to grow unchecked and creating thick layers of fuel. Meanwhile, in urban belts, the sprawl of housing into the surrounding countryside has expanded the wildland–urban interface (WUI), exposing more lives and assets to fire risk.

II.3. Urban/Rural Population

Over the past two decades, Albania has become steadily more urban. The 2011 Census was the first to record a majority-urban country, with 53.7% urban and 46.3% rural residents. Twelve years later, the urban share had climbed further: World Bank population statistics (harmonized from official sources) place Albania at 64.6% urban in 2023, underscoring the strength of the shift from villages to towns and cities.

Urbanization is not evenly spread. Tirana County alone accounts for over 31% of the national population, and overall population density is 83.6 inhabitants/km^2—both clear signals of concentration in the central-western lowlands while much of the mountain interior thins out. This pattern amplifies two distinct risks relevant to landscape fires: sprawling peri-urban belts press closer to flammable vegetation (expanding the WUI), while depopulating rural zones accumulate unmanaged biomass and face slower initial attacks when fires start.

From a management perspective, the country is dealing with two fire geographies at once. On the urban edge, prevention hinges on zoning, defensible space, and building standards; in retreating rural areas, fuel management, grazing and silvicultural practices, and better detection/response coverage are required.

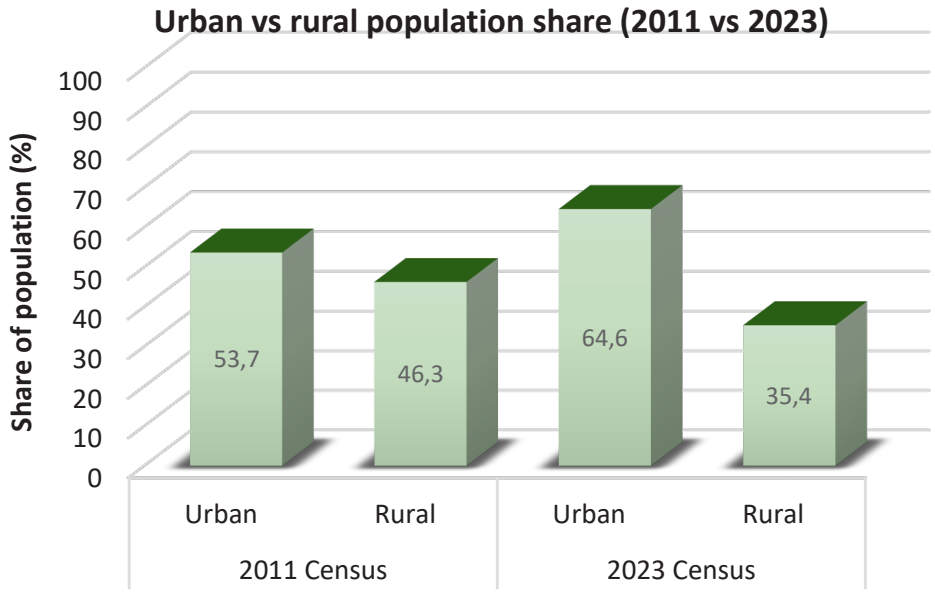


Figure 14. *Urban vs rural population share (2011 vs 2023).* ***Data source:*** *INSTAT, Cens 2011; World Bank, WDI, 2023*

The story of Albania's population isn't only about fewer people and quicker urbanization; it's also about people becoming older faster. The 2023 Census makes it apparent that youngsters and teenagers are still a large component of the population, but the balance is shifting toward older people.

15.6% of the individuals in 2023 were 14 years old or younger, whereas at the start of the millennium, over 20% of the inhabitants were under 14. This constitutes a substantial decline over that period. The number of individuals over 65 has also grown, from roughly 7.5% of the overall population in 2001 to nearly 20% now. The average age in 2001 was just 30.2, but by 2023 it increased to 42.5. This shift is driven by lowered birth rates, increased longevity, and the out-migration of the younger population.

This shift in structure is shown by the population pyramid. The base, which used to be broad, is now considerably smaller, while the upper layers are now wider. This is a common sign of a change in demographics. Emigration exacerbates this problem, as the departure of a larger number of young individuals (aged 20–40), particularly men, accelerates the ageing of rural areas.

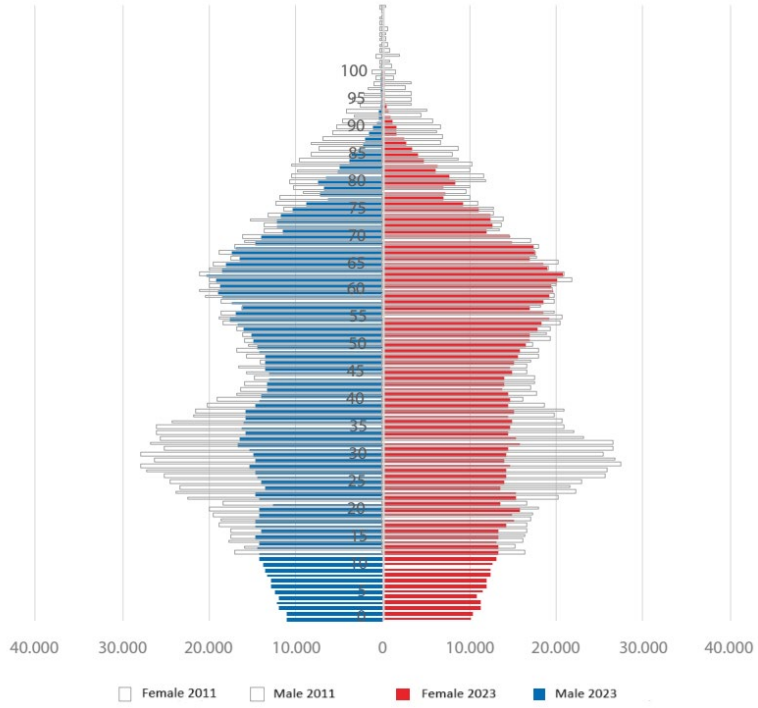


Figure 15. *Albanian population pyramid.* ***Data source:*** *INSTAT, Cens 2023*

The implications for fire management are profound. An older rural population has fewer physically capable individuals to maintain land, carry out preventive burning, or respond quickly to fire outbreaks; aging also intensifies vulnerability as elderly people are less mobile and more at-risk during evacuations. Thus, what begins as a demographic shift, has cascading consequences for resilience and safety.

II.4. Migration Patterns

Since the 1990s, the most influential demographic process in Albania is migration. It has left profound imprints on population size, age structure, and regional balances. Both external emigration and internal movements (particularly rural-to-urban shifts) must be considered to understand how people and landscapes interact - and, by extension, how fire risks evolve.

Following the political and economic transition of the early 1990s, Albania experienced one of the most dramatic waves of emigration in Europe. Over the past three decades, more than 1.7 million Albanians have emigrated at least once, with the largest flows directed toward Greece and Italy, followed by Germany and, more recently, the UK and North America. The Census of 2023 reveals that emigration is still highly active, with about one-third of households reporting at least one member living abroad. In addition, age composition is critical, migrants are young adults (20-39 years), with a notable male predominance, consequently draining many rural communities of their working-age population, leaving behind aging villages with declining capacity to manage land and prevent fire hazards.

Whereas permanent emigration dominates, the country has also seen episodes of return migration, particularly during economic downturns in host countries. Many returnees often concentrate in urban areas, reinforcing depopulation of the uplands and accelerating the spread of informal peri-urban settlements, which lack proper land-use planning and create new WUIs where fire risks are amplified. It must be mentioned here that lately, the territory control by state authorities has improved and informal building has decreased significantly.

Internal migration mirrors broader socio-economic divides. Since the 1990s, tens of thousands of rural residents from mountainous districts (Kukës, Dibër, Tropojë, Gramsh, Skrapar, etc.) moved toward Tirana-Durrës metropolitan area, Vlora, and Saranda. The result has been a demographic vacuum in upland landscapes, where reduced grazing, abandoned terraces, and unmanaged forest patches accumulate combustible biomass.

Conversely, the western lowlands and coastal strip have absorbed disproportionate growth. Tirana County alone now holds nearly 1 in 3 Albanians, reflecting the centripetal pull of the capital. This redistribution of people has both sharpened the urban sprawl challenge and hollowed out the rural human presence needed for active land stewardship.

II.5. Demographic Projections and Scenarios

Albania is at a demographic juncture, where long-term population projections by INSTAT, corroborated by the UN World Population Prospects (2022 Revision) and Eurostat trend models, indicate that the country will undergo a consistent population decline in the forthcoming decades.

- Population size: Albania's population, currently at 2.4 million as of 2023, is projected to decrease to between 2.1 and 2.2 million by 2035 and further decline to approximately 1.8 to 2.0 million by 2050. Such a decline is projected to be one of the most substantial in Europe.
- The median age is projected to increase from approximately 42 years in 2023 to nearly 50 years by 2050, indicative of a continuous decline in fertility rates and an increase in life expectancy.
- Fertility rates remain consistently low, ranging from 1.3 to 1.4 children per woman, way below the replacement level of 2.1.
- The working-age population (15-64 years) is projected to decline by approximately 30% from 2020 to 2050, thereby diminishing Albania's ability to maintain labour-intensive rural economies.
- Urban concentration in Tirana and its metropolitan area is expected to persist, resulting in disproportionate growth, whereas certain municipalities in the northeastern highlands may experience a population decline of 40–50%.
- Migration effect is projected to be very sensitive, where even slight departures of young adults will exacerbate these trends, considering the vulnerable demographic foundation.

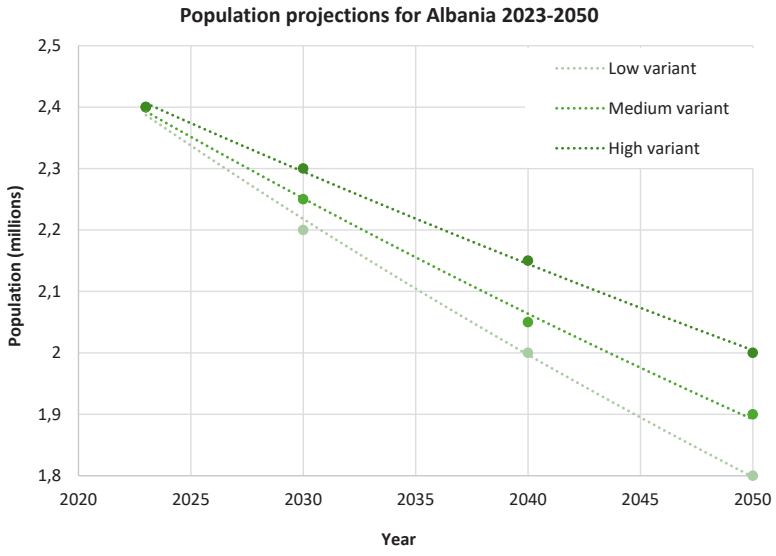


Figure 16. *Population projections for Albania 2023-2050 under three scenarios.* ***Source of data:*** *INSTAT, UN World Population Prospect, 2022.*

II.6. Demographic Implications for Landscape Fire Management

Demography represents more than mere numerical data. It serves as a catalyst for ecological and social vulnerability. The projected population dynamics of Albania have significant implications for landscape fire management, which are briefly listed below:

1. Depopulated rural areas. As the population in rural areas declines, landscapes that were previously maintained through practices such as grazing, wood collection, and terrace farming are likely to become overgrown. Accumulated biomass serves as fuel for wildfires, while the lack of human presence diminishes early detection capabilities, meaning fires in mountain areas can grow unnoticed until they reach dangerous scales.
2. Urban and peri-urban expansion. Migration is driving unplanned urban sprawl in Tirana, Durrës, Vlora, Shkodër, etc., resulting in the emergence of new WUIs. These peri-urban areas present fire hazards to households and complicate LFM.
3. Aging population. The demographic shift towards an increasing proportion of elderly individuals in the population is a significant phenomenon that warrants examination. Older rural residents continue to inhabit villages, however, their physical capacity for land management and fire response has declined. This diminishes community resilience in areas susceptible to wildfires.
4. Labor force reduction. A decreasing working-age population diminishes institutional capacity, resulting in fewer recruits for forestry, firefighting, and civil protection services, thereby complicating the sustainability of professional fire management.
5. Alteration of Settlement Patterns. Seasonal and return migration can result in semi-abandoned residences, where neglected properties become fire prone areas with potential for extreme fire behaviour. Simultaneously, higher summer populations in coastal resorts elevate exposure during the peak fire season.
6. Remittance economies. While remittances improve household income, they rarely translate into investments for sustainable rural land management, leaving ecological risks unmitigated.
7. Policy implications. The demographic realities highlight the necessity of integrating landscape fire management planning with demographic forecasting. Rural revitalization initiatives, peri-urban zoning regulations, and focused investment in LFM measures will be essential.

III. Climate Characteristics, Climate Change Scenarios And Nationally Determined Contributions (Ndcs)

Climate significantly influences the frequency, intensity, and spatial distribution of landscape fires in Albania. Temperature, precipitation, wind patterns, and extended drought periods strongly determine fuel moisture, vegetation growth, and the length of the fire season. In recent decades, Albania has undergone a notable warming trend, characterized by extended dry summers and heightened climatic variability, all of which substantially increase the risk of extensive, rapidly spreading landscape fires. High temperatures, strong winds, and reduced soil moisture create conditions conducive to the rapid escalation of small ignitions into large landscape fires.

The relationship between climate and LFM is essential. Effective LFM strategies must anticipate and adjust to changing climatic conditions. Seasonal forecasts, drought indices, and fire danger ratings, based on meteorological data, provide the scientific basis for early warning, prevention planning, and operational readiness. Climate change projections suggest an extension of the fire-prone season, highlighting the necessity for Albania to incorporate fire risk into its climate adaptation and mitigation policies, including its Nationally Determined Contributions (NDCs). Enhancing the connection between climate science and LFM not only contributes to preparedness but also guarantees that LFM aligns with wider resilience and environmental sustainability objectives.

This chapter provides a comprehensive analysis of Albania's meteorological conditions, historical and projected trends, fire-related climate indicators, and the country's adaptation and mitigation commitments as specified in NDCs. It combines information from the Albanian Institute of Geosciences (IGEO), the Copernicus Climate Change Service, the World Bank Climate Change Knowledge Portal, and peer-reviewed research.

III.1. Climate Baseline

Albania has a Mediterranean climate with mild and humid winters and hot and dry summers, with some continental influence in the south-eastern part of the country. According to IGEO (and earlier climatological studies), Albania's climate is categorized into 4 Mediterranean climatic zones, each with specific characteristics and regional sub-divisions:

Mediterranean Coastal Plain Zone - Encompasses the lowland coastal plains along the Adriatic and Ionian seaboard (from the Shkodër/Lezhë plain in the north, through the central Durres-Tirana plain, down to the Vlorë and Sarandë areas in the south). This zone has hot, dry summers and mild, rainy winters. Average annual temperatures range roughly 14-17 °C (warmer toward the southern coast) and annual

rainfall is about 650-1,000 mm, mostly falling in the cool season. (Sub-zones: North, Central, South coastal plain)

Mediterranean Hilly Zone - Covers the rolling hills and uplands that lie inland of the coastal plain and in river valleys (roughly the mid-elevation zones up to 600-800 m, including areas like the Western foothills and interior hill country). This zone is a transition between the coast and mountains, with warm summers and moderately cool winters, and higher precipitation than the lowlands. Many locations here still have a pronounced dry summer but slightly more temperate conditions. Annual temperatures average around 11-15 °C (cooler than the coast) and rainfall increases with elevation (often 1,000-1,500 mm per year). (Sub-zones: North, Central, Southeast, Southwest hilly regions)

Mediterranean Pre-Mountain (Sub-montane) Zone - The transitional highland zone at the base of Albania's mountains (approximately 600–1,200 m elevation, depending on region). These areas border the true mountain ranges (e.g. around the northern Alps' foothills and the lower slopes of eastern/southern massifs). The climate here is noticeably cooler and wetter: snowfall is common in winters, and summers are warm but shorter. This zone is influenced by both Mediterranean and continental air masses, yielding considerable precipitation (often 1500–2000+ mm annually on slopes). Average annual temperatures are in the 8–12 °C range. (Sub-zones: North and South pre-mountain belts)

Mediterranean Mountain Zone - Comprises the high mountainous interior of Albania, including the Albanian Alps in the north, the Korab-Shar massif in the east, Nemërçka, etc. ranges in the southeast, and other alpine areas typically above 1,200 m elevation. This zone has a markedly continental and alpine-influenced climate. Summers are mild or cool and relatively short, while winters are cold and snowy (many high valleys see persistent snow cover). Precipitation is abundant year-round, especially on west- and south-facing slopes that intercept Mediterranean moisture - yearly totals can reach 2,100-3,100 mm in wetter locales. Average temperatures are the lowest in the country (annual means around 7-10 °C, with winter months often below freezing). The highest peaks (over 2,500 m, such as Mt. Korab) experience alpine tundra conditions. (Sub-zones: North, East, Southeast, South Mountain ranges).

Annual average air temperatures in Albania range from 11.3 °C in mountainous areas to 21.8 °C in lowland and coastal areas, while minimum annual average temperatures range from -0.1 °C to 14.6 °C, respectively. The lowest temperatures were recorded in Sheqeras (-25.8 ° C), Voskopoja (-25.6 °C) and Biza (-34.7 °C), while the highest were encountered in Kuçova (43.9 °C), in Roskovec (42.8 °C) and in Çiflig (42.4 °C). The map below shows the distribution of annual average maximum and minimum temperatures.

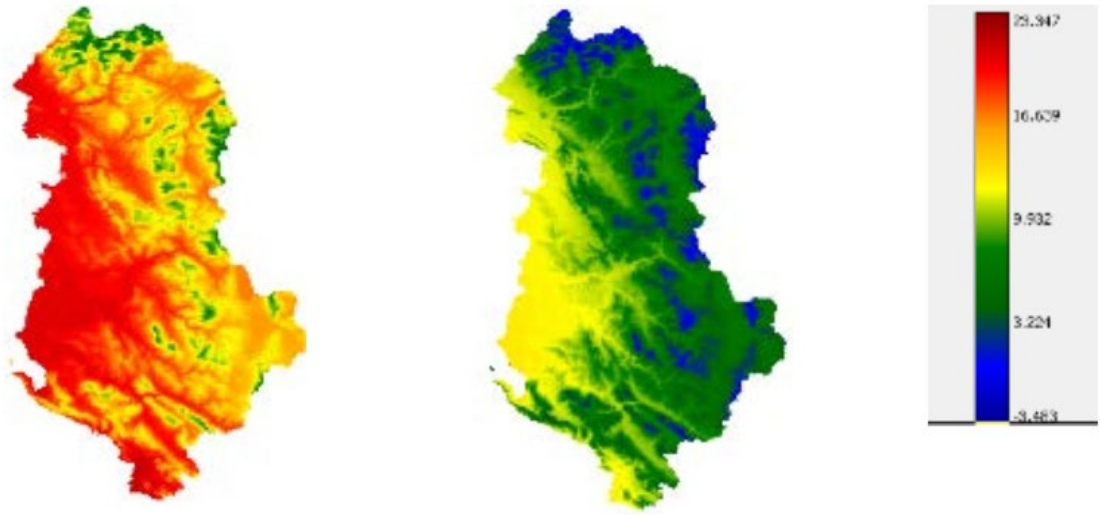


Figure 17. *Distributions of average maximum temperature (left) and average minimum temperature (right).* ***Data source:*** *MoE, 2022 -The Fourth National Communication of Albania on Climate Change*

The annual average precipitation total is 1430 mm. However, the spatial and seasonal distribution of rainfall varies; 70% of the annual rainfall occurs during the cold half of the year. The most humid areas are the Albanian Alps in the north (Koder Shengjergj with 2935 mm and Boga with 2883 mm annual precipitation) and Kurveleshi in the south (Nivica with 2204 mm annual precipitation). The highest level of precipitation is experienced in November and the lowest during July to August.

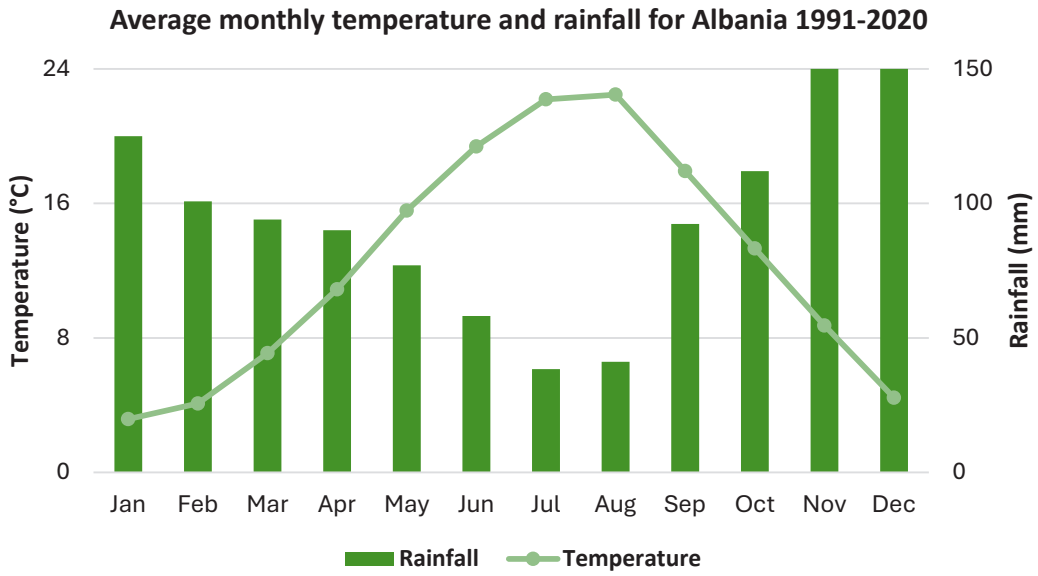


Figure 18. *Average monthly temperature and rainfall for Albania, 1991 – 2020.* ***Data source:*** *Country Risk Profile – Albania, World Bank Group, 2021*

Snowfall occurs in the Albanian Alps, in the mountainous central and southern areas. The average snowfall depth in mountainous areas is 60-120 cm, with the highest snowfall reaching a depth of 2-3 m in Vermosh, Boga, Theth, Valbona, Curraj and Lure. Snow is rare in the West Plains lowlands to the southwestern coast.

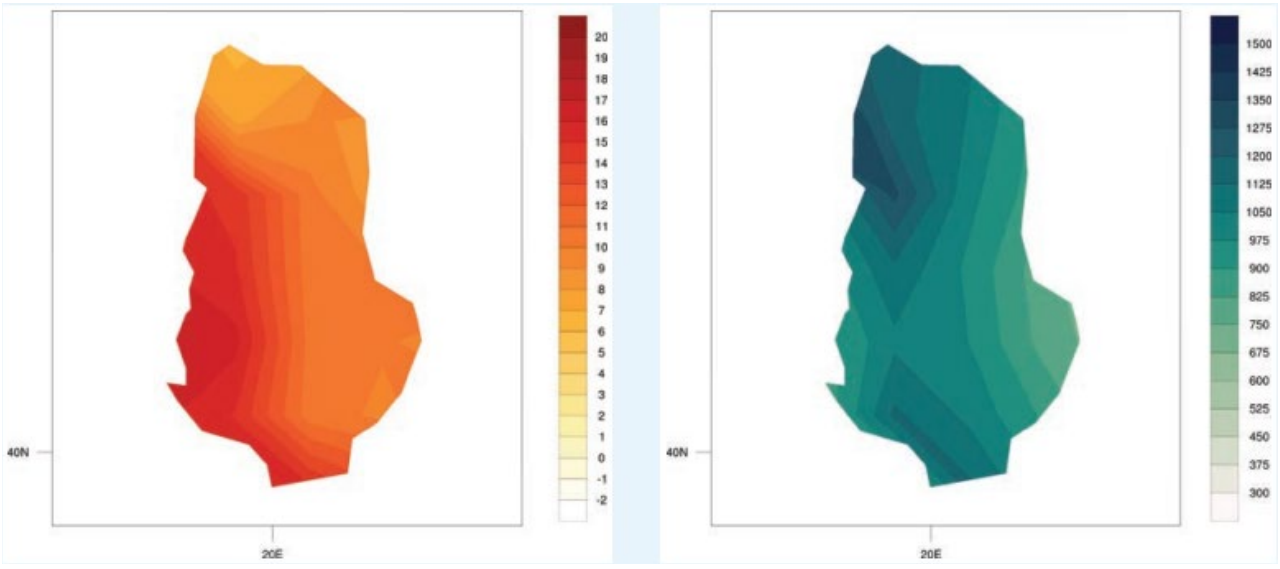


Figure 19. *Map of annual temperature (°C, left) and annual precipitation (mm, right) of Albania 1991 – 2020.* ***Data source:*** *Country Risk Profile – Albania, World Bank Group, 2021*

III.2. Observed Climate Trends

Albania has experienced an increase in mean annual temperature. Analysis of 1961–2023 data indicates a significant warming trend of +1.2°C nationally. Temperature increases have been observed to be higher in the summer months. Heat waves have doubled since the 1980s and they are expected to increase in intensity, duration and frequency across the eastern Mediterranean, possibly by as much as six-to-eight times per year.

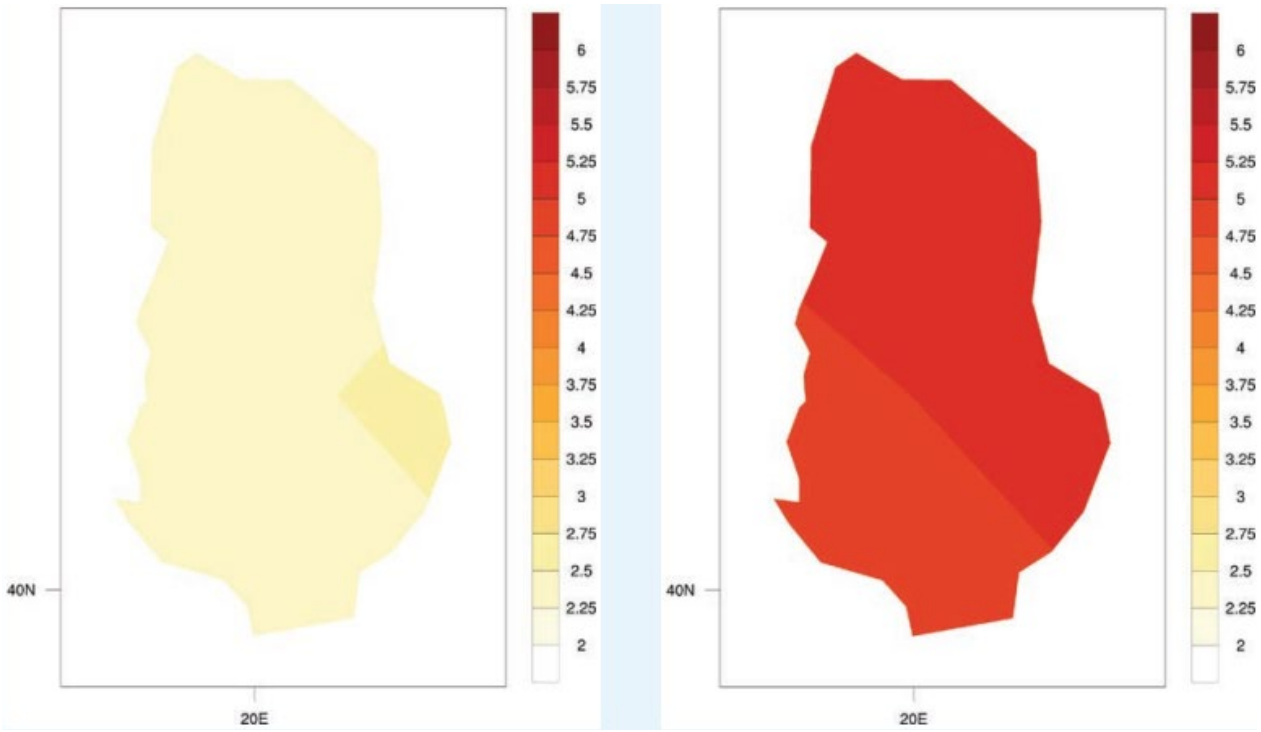


Figure 20. *CMIP5 ensemble projected change (32 GCMs) in annual temperature by 2040–2059 (left) and by 2080–2099 (right), relative to 1986–2005 baseline under RCP8.5.* ***Data source:*** *Climate Risk Country Profile, 2021 - WBG*

Albania is already facing a decrease in total annual precipitation, by 20% in coastal area, the largest decrease in the entire country. Summer months are projected to experience a reduction of up to 40% in precipitation. The overall precipitation will decrease with more impact in their seasonality. Hazardous rainfalls are expected to increase overall, especially in the coastal area, where intensive precipitation greater than 182 mm/24h will increase by 1-2 days by 2030, 2-3 days by 2050, 3-4 days by 2080 and 4-5 days by 2100.

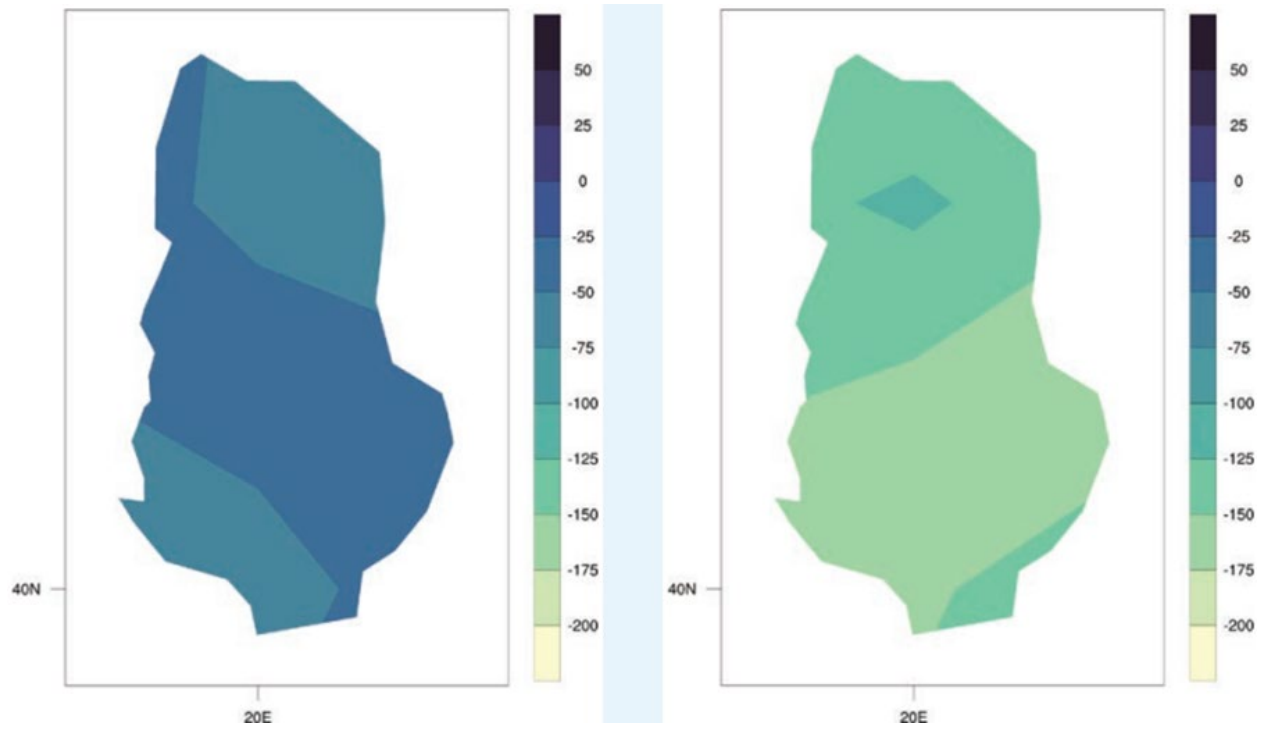


Figure 21. *CMIP5 ensemble projected change in annual precipitation by 2040-2059 (left) and by 2080-2099 (right), relative to 1986-2005 baseline under RCP8.5.* ***Data source:*** *Climate Risk Country Profile, 2021 - WBG*

Drought frequency, as measured by the Standardized Precipitation Index (SPI), has increased, particularly affecting the southwest.

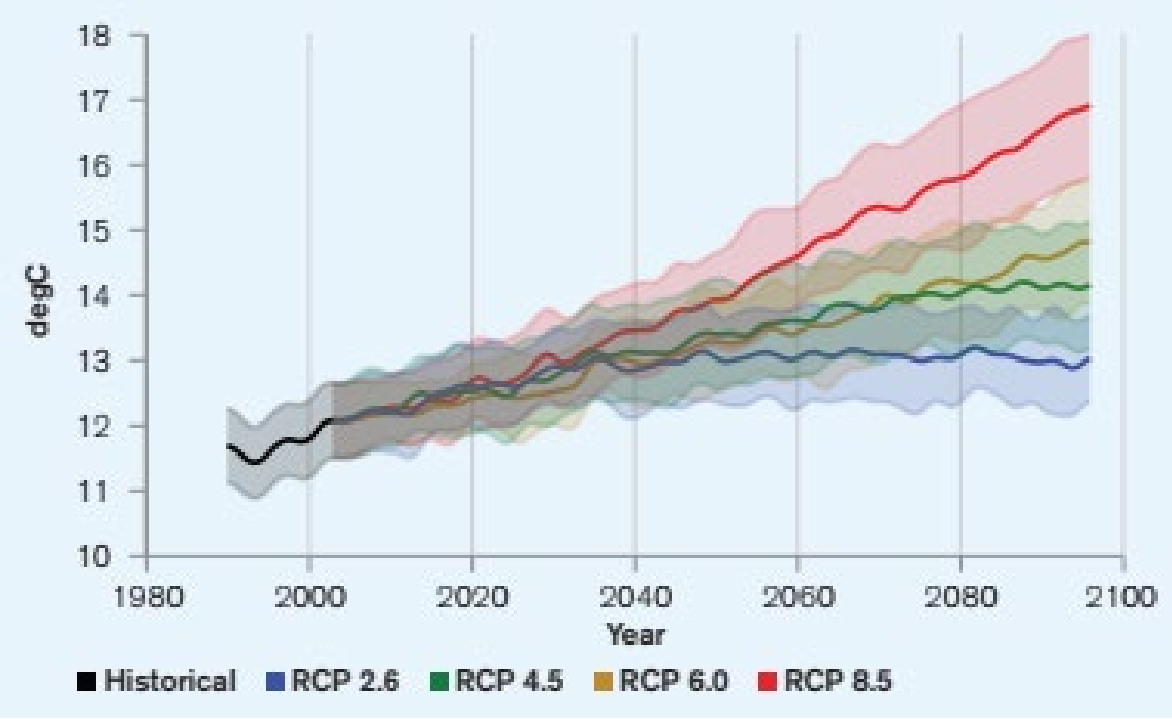


Figure 22. *Historical and projected average temperature for Albania from 1986 to 2099.* ***Data source:*** *Climate Risk Country Profile, 2021 - WBG*

III.3. Climate Change Projections

The future climate of Albania is affected by the paths that greenhouse gases (GHGs) take across the world. The World Bank Climate Risk Profile (2021) and IGEO both state that Albania is particularly sensitive to changes in temperature and rainfall patterns. These changes might have a huge impact on ecosystems, farming, water supplies, and the probability of fires in the landscape.

Using Representative Concentration Pathways (RCPs), notably RCP4.5 (stabilization scenario) and RCP8.5 (high-emission trajectory), we can observe that Albania's average temperatures will rise significantly, and precipitation will decrease markedly over the 21st century. The average annual temperature is anticipated to rise by 1.2 to 1.5 degrees Celsius (RCP4.5) by 2030, based on the years 1986 to 2005.

By 2050, the warming will be harsher, reaching +2.2 °C (RCP4.5) and +3.5 °C (RCP8.5).

RCP4.5 predicts that by the end of the century (2100), temperatures might increase by 3.0 °C. RCP8.5, which assumes the greatest emissions, predicts that temperatures in Albania might scaleup by +4.5 °C.

Changes in the way rain falls are also concerning. RCP4.5 suggests that Albania's annual rainfall will reduce by 5–15% by 2100. On the other hand, the high-emission RCP8.5 predicts that precipitation would decrease up to 25%. The harshest consequences will emerge in the summer, when drought stress and the danger of wildfires are already high.

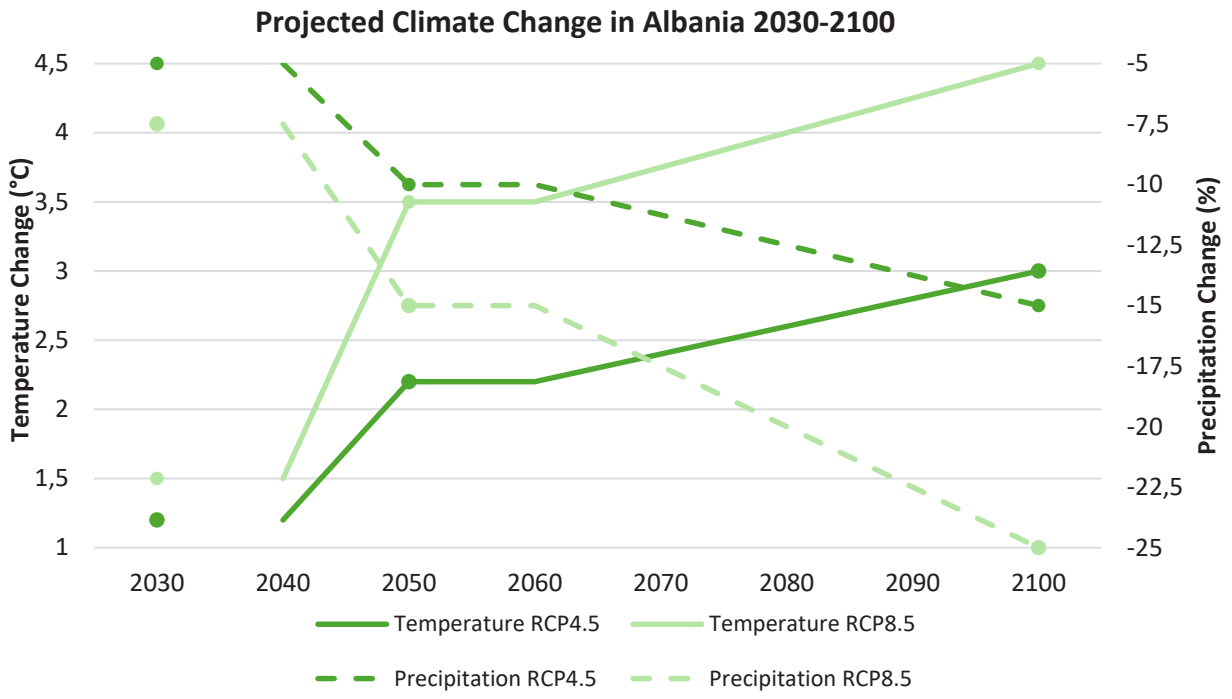


Figure 23. *Projected climate change in Albania: temperature and precipitation 2030 – **2100. Data source:** IGEO; World Bank Climate Risk Profile – Albania, 2021*

These projections raise several critical concerns:

- Longer periods of drought will make it more difficult to locate water, which will impact both agricultural and the generation of hydroelectricity.
- There will be more frequent and stronger heat waves. This will have a direct effect on people's health and the need for energy.

- Longer and worse wildfire season. As the weather becomes hotter and drier, the land will also get drier and more likely to ignite fire and spread quickly.
- Ecosystem stress is expected to increase, which will make forests and pastures more sensitive to pests, diseases, and fire disturbances.

Both mitigation and adaptation programmes are necessary to deal with these situations. The contrasts between RCP4.5 and RCP8.5 show how important it is to take genuine steps to fight climate change. If Albania follows a course with lower emissions, the effects will be far less severe.

III.4. Climate Indices Relevant to Fire Risk

Long-term weather predictions give a rough notion of the context, but they don't indicate the daily or seasonal variations that make wildfires more probable. Scientists and fire managers may use climate and drought indicators to determine the probability of a fire to start. These indexes use meteorological data to show plant dryness, fuel flammability, and ignition probability. The European Forest Fire Information System (EFFIS) utilizes these indices throughout Europe. Also, IGEO in Albania and local fire control organizations are employing them increasingly. EFFIS identifies 6 levels of risk, while IGEO has only four, the ranges of which coincide with the corresponding levels in the EFFIS classification. In general, the difference is that the European system distinguishes two more levels of "very high" and "extreme" danger, which are not distinguished by the Institute of Geosciences of Albania.

Table 7. *EFFIS vs IGEO fire danger classes.* ***Data source:*** *Jaupaj et. al. 2023*

Fire danger classes	FWI ranges	
	EFFIS	IGEO
No risk		< 5.2
Very low	< 5.2	
Low	5.2 – 11.2	5.2 – 11.2
Moderate	11.2 – 21.3	11.2 – 38.0
High	21.3 – 38.0	≥ 38.0
Very High	38.0 – 50.0	
Extreme	≥ 50	

Two of the most widely used indicators are the Standardized Precipitation Index (SPI), which reflects drought intensity, and the Fire Weather Index (FWI), which summarizes the meteorological potential for fire ignition and spread. Both have been increasingly applied in Europe and are also relevant for understanding Albania's fire landscape.

Standardized Precipitation Index (SPI). The SPI measures rainfall anomalies over different timeframes, typically between one and twelve months. Negative values of SPI imply drought, whereas positive SPI values suggest wetter conditions. The SPI analysis shows that prolonged summer droughts in Albania, particularly in 2007, 2012, and 2017, correspond closely to years of severe fire outbreaks, thus confirming the SPI as a critical early warning tool in landscape fire management.

Fire Weather Index (FWI). As part of the Canadian Forest Fire Danger Rating System (CFFDRS), the FWI integrates temperature, humidity, wind speed, and rainfall to provide a composite measure of fire danger. The European Commission has adapted FWI for pan-European monitoring, and Albania is included in the regional fire danger maps. Local data show that FWI values spike in August, especially during heatwaves when winds from the Adriatic intensify. This directly coincides with the most active fire months in Albania.

Table 8. *Annual national averages of SPI and FWI for Albania 2000-2023.* ***Data source:*** *ERA5 & ECA&D precipitation datasets (SPI calculations); Copernicus EFFIS fire danger indices (FWI); National Civil Protection Agency annual reports; UNECE/FAO fire statistics.*

Year	SPI (Annual Avg.)	FWI (Annual Avg.)	Notable Fire Seasons
2000	-0.8	24	Severe fire year (915 fires, 3,675 ha burned)
2001	+0.1	19	Moderate year
2002	-0.4	22	Localized outbreaks
2003	-0.7	27	High fire danger; >4,400 ha burned
2004	+0.3	18	Relatively calm
2005	+0.2	20	Normal year
2006	-0.6	26	Precursor to 2007 extremes
2007	-1.5	34	**Extreme season:** 1,190 fires, >30,000 ha burned
2008	+0.2	21	Lower impact
2009	-0.3	23	Moderate
2010	-0.5	25	Elevated danger
2011	-1.1	29	Drought; severe outbreaks
2012	-1.3	31	**Extreme season:** 600 fires, 4,700 ha burned
2013	+0.6	17	Very low activity (97 fires)
2014	+0.9	16	Exceptionally calm (47 fires)
2015	-0.4	22	Moderate
2016	-0.1	20	Mild (38 fires)
2017	-1.2	32	**Extreme season:** thousands of ha burned
2018	+0.4	19	Lower fire activity
2019	-0.6	23	356 fires reported
2020	+0.3	21	Mild year
2021	-1.4	33	**Extreme season:** 329 fires, 31,275 ha burned
2022	-0.7	28	887 incidents (Jun–Sep); 17,700 ha burned
2023	-0.2	22	5,000–10,000 ha affected

This 24-year dataset shows clear alignment between negative SPI values (drought years) and high FWI averages (fire danger years). Critical fire seasons – 2007, 2012, 2017, 2021 – coincide with severe droughts (SPI ≤ -1.0) and very high fire weather indices (FWI ≥ 30). Conversely, wet years (2013, 2014) show positive SPI and low FWI, with very few fires recorded.

The data confirm that Albania's landscape fire risk is strongly climate-driven, with drought amplifying fire danger. However, socio-economic factors (illegal burning, limited suppression capacity) often determined the ultimate severity of fire seasons. This highlights the importance of integrating drought monitoring (SPI) and fire weather forecasting (FWI) into Albania's national fire early warning and management systems.

III.5. National Determined Contributions (NDCs)

Albania, as a non-Annex I Party to the United Nations Framework Convention on Climate Change (UNFCCC), has progressively increased its commitments under the Paris Agreement. The obligations are articulated in the Nationally Determined Contributions of the country, encompassing both mitigation and adaptation policies linked to its national development objectives and the trajectory for European Union accession.

Overview of Albania's Obligations

In 2015, following its initial proposal, Albania submitted its Updated NDCs in 2021, which delineates more ambitious objectives. The updated commitment outlines a 20.9% reduction in greenhouse gas emissions by the year 2030, relative to the baseline established in 2016. This objective demonstrates Albania's dedication to decoupling economic growth from carbon intensity, recognizing the country's minimal contribution to global emissions, which is less than 0.01%.

Table 9. *National Determined Contribution target year emission level compared to BaU.* ***Data source:*** *MoE, NDC for Albania revised, 2021*

Sector	2030 BaU	2030 NDC	Difference compared to BaU and NDCs	
	GgCO2e	GgCO2e	GgCO2e	%
Energy	8 466	6 544	- 1 921	- 23
IPPU	1 854	1 854	0	0
Waste	966	959	- 7	- 1
Agriculture	2 140	2 071	- 68	- 3
LULUCF	1 722	549	- 1 174	- 68
TOTAL	**15 148**	**11 978**	**- 3 170**	**- 20.9**

The NDCs emphasize the importance of the energy sector, particularly the advancement of renewable energy sources in addition to hydropower, such as solar and wind energy and it is also acknowledged the critical role of land use, land-use change, and forestry (LULUCF) in achieving benefits related to both mitigation and adaptation. Forests and pastures, covering more than 65% of the total area, function as carbon sinks that reduce climate-related hazards such as floods, erosion, and wildfires.

Adaptation Priorities and Fire Relevance

Adaptation constitutes a key component of Albania's NDCs. The specified priority sectors are as follows:

- Forestry and ecosystems encompass commitments to improve forest management practices, as well as initiatives focused on reforestation and afforestation efforts.
- Agriculture and rural regions are critical areas where sustainable land management is essential for reducing vulnerability to droughts and wildfires.
- Disaster risk reduction integrates climate change adaptation with civil protection strategies, encompassing fire prevention and response measures.

The NDCs explicitly recognizes that the increasing frequency of heatwaves and droughts is heightening fire risk, and that adaptation necessitates the improvement of both institutional capacity and local community resilience. The proposed measures for this include:

- Development of early warning systems that incorporate climatic indicators, including the SPI and FWI for the purpose of enhancing fire hazard predictions.
- Enhancement of functionalities of the NCPA to effectively manage climate-induced threats, including wildfires.
- Expansion of the protected areas network while ensuring incorporation of fire control measures into their management plans.
- Implementation of climate-smart forestry through silvicultural techniques designed to reduce fire-prone fuel accumulations and improve landscape diversity.

Institutional and Policy Linkages

The commitments outlined in the NDCs are interrelated and mutually dependent. They are closely associated with:

- Law no. 57/2020 "On Forests" establishes a legislative framework for sustainable forest management and outlines the responsibilities associated with fire prevention and response.
- The National Strategy on Climate Change (2019-2030) outlines mitigation and adaptation pathways specific to various sectors.
- The integration plan of Albania into the EU requires compliance with the European Green Deal, as well as adherence to the EU Forest Strategy and Fire Management standards.

In this sense, the NDCs functions as a national climate strategy while also serving as a diplomatic signal of Albania's alignment with European and international climate governance frameworks.

Challenges in Implementation

Despite its goals, Albania faces structural and budgetary challenges in meeting its NDCs:

- **Financial limitations** arise due to the reliance of climate initiatives on external benefactors and climate financing sources.
- **Institutional fragmentation**, defined by the allocation of responsibilities among various ministries, agencies, and municipalities, can lead to deficiencies in coordination.
- **Limitations in data**, particularly regarding the assessment of carbon sequestration in forest ecosystems and the accurate measurement of emissions associated with land use.
- **Fire vulnerability** is currently addressed insufficiently in practical applications, as fire management predominantly operates in a reactive capacity rather than a preventative one.

The identified deficiencies highlight the necessity of explicitly incorporating fire risk into the implementation of NDCs, ensuring that climate objectives remain intact despite the increasing frequency and intensity of wildfires.

Prognosis

The effectiveness of Albania's Nationally Determined Contribution will depend on its capacity to transform political commitments into practical actions. Improving forest governance, allocating resources for climate services, and incorporating fire risk management into climate policy are essential actions. The effective execution of the NDCs has the potential to significantly reduce Albania's vulnerability to wildfires, while also contributing to broader global climate goals.

III.6. Concluding Synthesis

The analysis of Albania's climatic conditions indicates that climate serves as a fundamental factor influencing landscape fire dynamics. Increasing average temperatures, prolonged heatwaves, and extended drought conditions have collectively established more conducive environments for ignition and swift fire propagation. Extreme weather events, including intense dry winds and abrupt temperature increases, exacerbate these risks, especially in western and southern regions where dense vegetation intersects with growing urban areas. Simultaneously, irregular rainfall patterns have modified vegetation growth cycles: intense spring precipitation fosters dense biomass, which subsequently desiccates during hot summers, creating ample combustible material.

The increasing interaction between climate and fire underscores the necessity for a fundamental change from reactive suppression to proactive prevention. Enhancing LFM involves tackling the root causes rather than merely responding to the outcomes of landscape fires. Albania should prioritize investments in long-term prevention strategies, including systematic fuel management, the incorporation of fire risk into land-use and forest planning, the establishment of early-warning systems utilizing meteorological indices, and the development of community preparedness programmes. Closer alignment between climate adaptation policy and fire management practice is necessary, ensuring that mitigation efforts, including reforestation and restoration, are designed with fire resilience as a priority.

In conclusion, the evolving climate necessitates the establishment of a proactive culture of coexistence with fire. Adopting a landscape-based, cross-sectoral LFM approach enables Albania to convert climate challenges into opportunities for sustainable land stewardship, thereby enhancing resilience for ecosystems and communities in the future.

IV. Existing Landscape Fire Management System

The LFM system in Albania embodies the integrated development of its civil protection, forestry, environmental, and local government structures. In the last ten years, the country has substantially advanced in harmonizing its laws and institutions with modern disaster risk reduction principles, however, the management of landscape fires continues to be a multifaceted, cross-sectoral challenge. Fires in Albania constitute a complex problem, including environmental and forestry matters, land use, rural livelihoods, public safety, and climate resilience.

This chapter offers a comprehensive assessment of the existing institutional, legislative, and operational framework regulating landscape fire control in Albania. It analyzes the roles and duties of key stakeholders, the system's structure at both national and local levels, the legal and policy frameworks influencing their activities, and the current firefighting capabilities and coordination strategies. Comprehending the interactions among these components is crucial for recognizing strengths, deficiencies, and potential for improvement in achieving a fully integrated, preventative, and landscape-oriented fire control strategy.

IV.1. Legal and Policy Framework

The legal foundation for landscape fire management in Albania is multi-sectoral and includes a comprehensive legal acts and documents:

- Law 45/2019 "On Civil Protection" establishes the institutional framework for disaster risk reduction and emergency management, positioning the National Civil Protection Agency (NCPA) as the coordinating authority for wildfire risk prevention, preparedness, response, and recovery at the national level.
- Law 57/2020 "On Forests" regulates the sustainable management and protection of forests, assigning the National Forest Agency (NFA) responsibilities for wildfire prevention, monitoring, and rehabilitation of burned forest areas.
- Law No. 9663, dated 18.12.2006 "On the Pasture Fund" and its amendments (2008-2016) establishes the legal basis for the protection, administration, and sustainable use of Albania's national pasture and meadow resources – an essential element of the rural landscape and a determining factor in fire behaviour.
- Law 68/2023 (amending Law 9244/2004 "On Agricultural Land Protection") reinforces obligations to protect agricultural land, prohibiting uncontrolled burning of stubble and residues, thereby directly contributing to wildfire prevention in rural landscapes.
- Law 152/2015 "On Fire Protection and Rescue" defines the structure and duties including organizational norms and safety rules of the Fire Protection and Rescue Service, ensuring municipalities maintain dedicated firefighting units as the first responders to wildfires within their territories.
- Law 81/2017 (amended by Law 21/2024) "On Protected Areas" establishes the framework for the management of Albania's protected areas, mandating the National Agency of Protected Areas

(NAPA) to implement fire prevention and suppression measures within parks and reserves to safeguard biodiversity.

- Law 139/2015 "On Local Self-Government" establishes municipalities as the first-line authority for civil protection, including responsibilities for wildfire prevention, preparedness, and initial suppression within their territories, making them central actors in Albania's landscape fire management system.
- Sublegal acts (DCMs 747/2019, 923/2020, 431/2021, 158/2021, 94/2023, 168/2023, 807/2023) operationalize these laws, defining the functioning of the Civil Protection Committee, NCPA, line ministry units, the National DRR strategy, the National Risk Assessment, and the updated Civil Emergency Plan.

This legal corpus establishes a multi-level wildfire management framework in which responsibilities are distributed among national, local, and sectoral institutions, constituting the foundation of Albania's fire management system. But enforcement is still a key challenge, which will be further elaborated in the following sections.

IV.2. Civil Protection Law and Reforms

Law 45/2019 "On Civil Protection" is the cornerstone of Albania's disaster risk management system. It was adopted in July 2019, replacing the earlier 2001 civil emergency law and marking a shift from ad-hoc emergency response to a comprehensive risk reduction approach. The law's objective is to reduce disaster risks and strengthen the protection of life, property, livestock, cultural heritage, and the environment. To achieve this, it established a new institutional structure with clearly defined responsibilities for disaster risk management at all levels. Notably, it introduced the National Civil Protection Agency as the successor to the former Civil Emergencies Directorate, and it expanded the role of local governments in disaster planning and response. This law aligns Albania's system with international best practices, emphasizing risk assessment, prevention, and preparedness in line with the Sendai Framework for Disaster Risk Reduction.

Under Law 45/2019, the Council of Ministers (Cabinet) carries key duties for civil protection policy and as such must approve a National Strategy for Disaster Risk Reduction, a National Civil Emergency Plan, and a National Risk Assessment. In accordance with these mandates, Albania has developed the "National Strategy for Disaster Risk Reduction 2023–2030" (approved by DCM No. 94, dated 22.02.2023) and a thorough Risk Assessment at the national level (DCM No. 168, dated 24.03.2023). Another important policy document is the revised National Civil Emergency Plan, which was adopted by DCM no. 807, dated 28.12.2023 and guides in detail the steps for emergency preparedness and response across all hazards, including forest wildfires. These strategic documents – the DRR Strategy, Risk Assessment, and Plan – complete the necessary legal framework for disaster risk management, incorporating technical expertise and aligning with EU and international standards.

Law 45/2019 lays the procedures for declaring and managing disaster emergencies. The Council of Ministers is the body responsible to declare a state of natural disaster for up to 30 days in part or all over the country. In case of extension beyond 30 days of the emergency state, then parliamentary approval is needed, ensuring oversight for prolonged emergency powers. DCM no. 158, dated 17.03.2021 "On the criteria and procedures for declaring the state of natural disaster" lays out the details of declaring the state of emergency. This framework provides a clear legal basis for emergency declarations, resource mobilization, and extraordinary measures when severe events (such as major earthquakes, floods, wildfires, etc.) occur.

IV.3. National Civil Protection Structures and Institutional Setup

The Civil Protection System in Albania consists of permanent and temporary structures at central, regional and municipal levels. Through these structures, each ministry, agency or institution currently has specific roles and responsibilities for all phases of the emergency management cycle. The main legal act covering all activities of the civil protection system in Albania is Law No. 45/2019, "On Civil Protection". This law establishes the basic rules for the functioning of the civil protection system, clearly defining the responsibilities of the institutions and structures of this system, international cooperation, the rights and obligations of citizens and private entities, education, training and inspection. This legal act also ensures the adaptation of the Civil Protection System to European standards, in line with the priorities of the Sendai Framework for Disaster Risk Reduction.

Central Level Institutions and Structures

The ***Assembly*** is the highest body of the Legislative Power and exercises three main functions: legislative, electoral and control. Regarding the civil protection sector, the Assembly, exercising the legislative function: ratifies international agreements on civil protection; decides on the extension of the state of natural disaster beyond the 30 days declared by the Council of Ministers; approves the budget of the NCPA, as part of the budget of the ministry responsible for civil protection. In implementation of the control function, it exercises parliamentary control on issues related to civil protection.

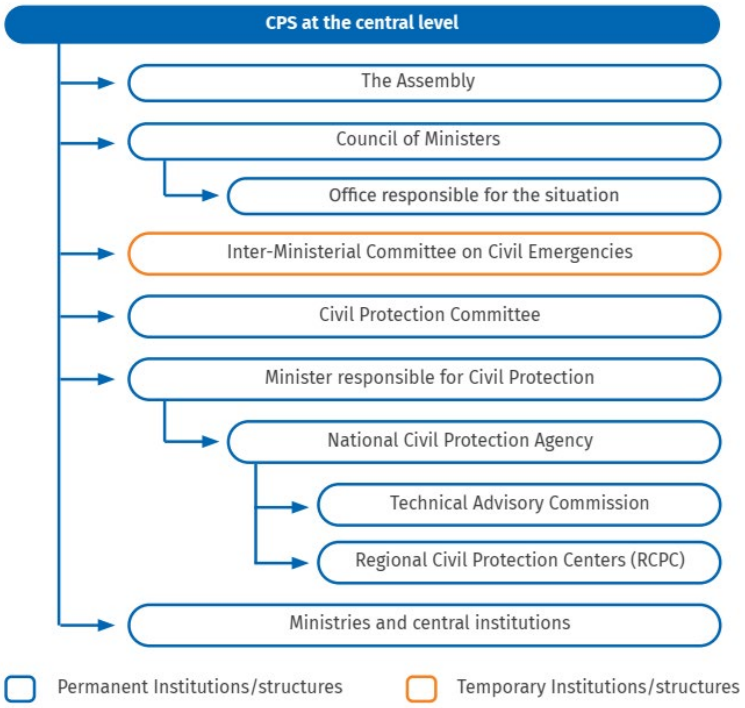


Figure 24. *Organogram of central institutions and structures of civil protection.* ***Data source:*** *National Civil Emergency Plan, 2023*

The Council of Ministers directs the system of civil protection in Albania and ensures the implementation of policies for disaster risk reduction and civil protection in the Republic of Albania. The Council of Ministers is responsible for approving strategic documents, policies and programmes covering all phases of the emergency management cycle in the Republic of Albania and specifically: approves the risk assessment document at central level; approves the National Strategy for Disaster Risk Reduction in the Republic of Albania; approves the National Plan for Civil Emergencies; approves policies for coping with and regulating the consequences of natural disasters and other disasters. It may also decide, for a period not exceeding 30 days, a state of natural disaster in part or in the entire territory of the country.

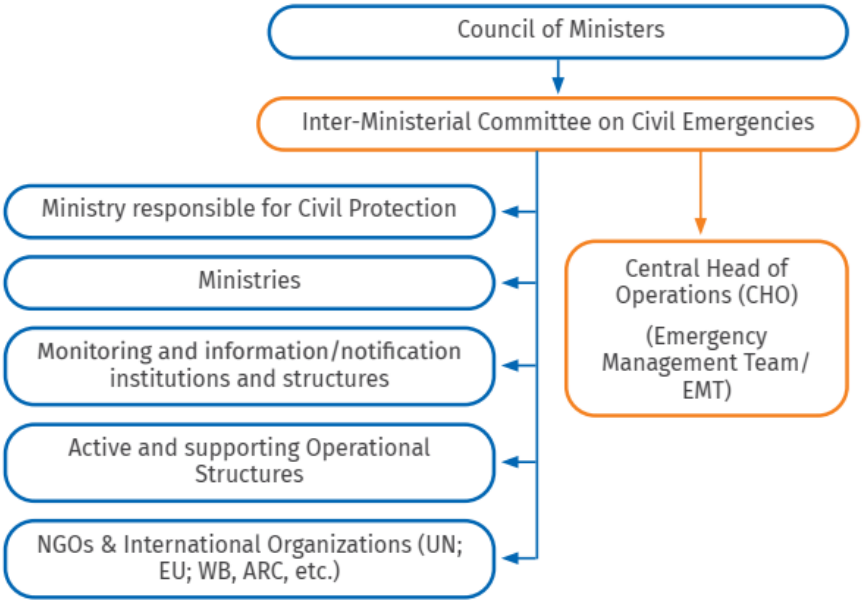


Figure 25. *Central institutions, monitoring and operational structures and international organizations (state of natural disaster declared).* ***Data source:*** *National Civil Emergency Plan, 2023*

The Office Responsible for the Situation is a structure under the Prime Minister for collecting information on civil emergencies, crises and drafting periodic analytical reports for the Prime Minister, the Council of Ministers and the CPC, as well as maintaining continuous communication between the Council of Ministers and other structures charged with civil emergencies and crises functions. This Office is part of the integrated information and statistics system of the Council of Ministers and performs several tasks in implementation of the Council of Ministers Decision No. 148, dated 24.2.2016

Civil Protection Committee (CPC) is at the top, a high-level permanent inter-institutional body. The CPC is the highest authority responsible for implementing disaster risk reduction policies and civil protection measures nationwide and brings together key ministers and agency heads to coordinate policies and assess the country's readiness. The organization, functioning, and inter-agency cooperation procedures of the CPC and the broader civil protection system are defined by government decision (DCM No. 923, dated 25.11.2020, guaranteeing all ministries and relevant institutions work in a unified manner during emergencies and in risk reduction efforts.

In parallel, the government, for large-scale emergencies can convene an ad-hoc ***Inter-Ministerial Civil Emergency Committee (ICEC)*** when a state of disaster is declared. This committee is chaired by the Prime Minister or a designated Deputy PM/minister depending on the type of disaster and is the highest coordination body during the emergency period and oversees the national response and resource allocation for the duration of the crisis. Once the emergency ends, the Inter-Ministerial Committee

dissolves, whereas the permanent Civil Protection Committee remains in charge of ongoing risk reduction and preparedness initiatives.

Central Head of Operations (CHO) and an ***Emergency Management Team (EMT)*** are activated under a declared natural-disaster state to manage nationwide operations.

The ***Ministry of Defence (MoD)*** is a key and decisive actor in the Disaster Risk Reduction System. Currently, NCPA is part of this ministry. Therefore, the MoD plays an important role in drafting the strategy and functioning of NCPA. It is engaged in 5 functional areas (risk identification, risk reduction, preparedness and response, disaster rehabilitation and financing). With the DCM No. 9, dated 12.1.2018 "On an amendment to the decision no. 501, dated 13.9.2017, of the Council of Ministers, "on determining the scope of state responsibility of the Ministry of Defence", the Ministry of Defence plans and copes with civil emergencies and establishes the legal and administrative basis for regulating the relationships that arise, exist and cease during the administration, maintenance and control of ownership in the material reserves of the state".

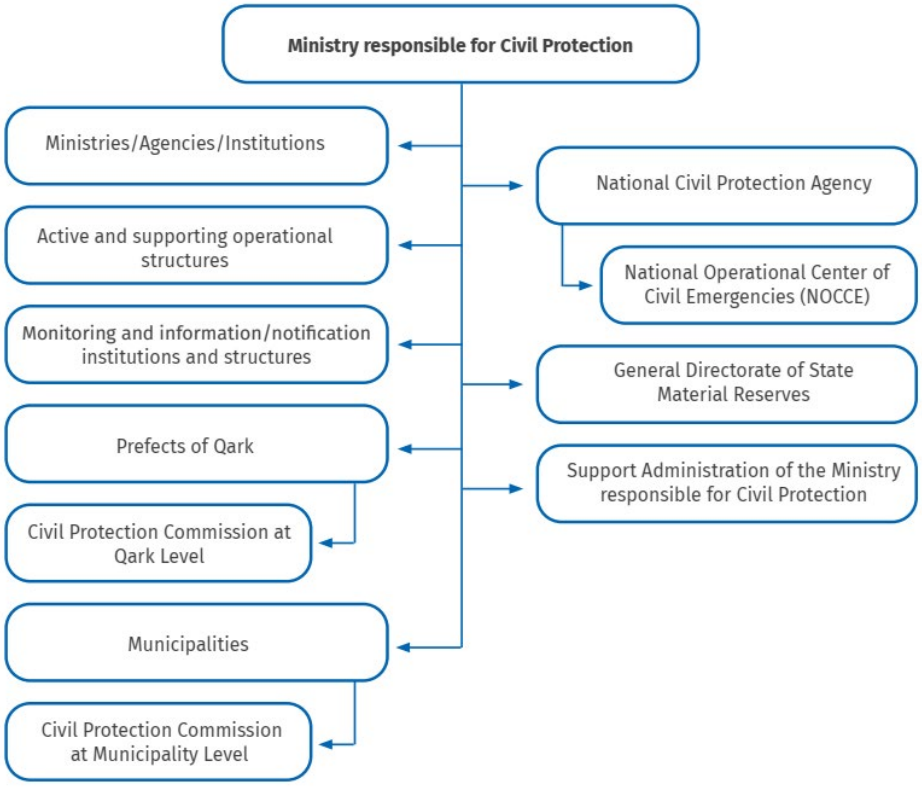


Figure 26. *The Ministry responsible for civil protection and its interaction with the central, qark and local levels.* ***Data source:*** *National Civil Emergency Plan, 2023*

Line Ministries are given specific civil protection duties within their domain (health, infrastructure, environment, etc.), as mandated by Law 45/2019. They must draft their own sector emergency plans and allocate 2-4% of their budgets for disaster risk reduction and civil protection activities. Each ministry has created an internal unit or focal point for civil protection (formalized by DCM No. 431, dated 15.07.2021 "On the composition and duties of civil protection units in line ministries". Such units ensure that disaster risk management is integrated into sectoral policies (e.g. the health ministry addresses health emergencies, the agriculture ministry addresses food security in disasters, etc.) and maintain communication with the NCPA.

Ministry of Interior (MoI) is a very important actor in the Disaster Risk Reduction System. According to the Council of Ministers No. 502, dated 13.9.2017 "On the determination of the scope of state responsibility of the Ministry of Interior", as amended, the areas of state responsibility in which the Ministry of Interior exercises its activity include policy development, coordination and supervision of the fire protection service, protection and control of the territory. The Ministry of Interior contributes to Emergency Management through its structures such as: State Police, General Directorate of Fire Protection and Rescue, Municipal Support Agency, Directorate for Local Government and Prefectures and now the Inspectorate for Environmental and Territory Protection.

Ministry of Environment (MoE) – its responsibility is defined in DCM no. 509, dated 13.9.2017 according to which MoE has the mission of drafting and implementing policies aimed at environmental protection, sustainable use of natural resources, protection of nature and biodiversity, sustainable development and management of forests and pastures and monitoring of water quality. The Forest and Pasture Sector at the MoE through the National Forest Agency (NPA) are responsible for forests management at the national level, including also protection of forests from wildfires.

National Coordination and Management Backbone

The ***National Civil Protection Agency (NCPA)*** is the operational hub of the system. Established by Law 45/2019 and organized by DCM No. 747, dated 20.11.2019, NCPA is a specialized government agency under the Ministry of Defence. It is tasked with risk assessment, early warning, coordination of emergency response, and supporting local authorities. In essence, NCPA serves as Albania's civil protection authority, managing the National Emergency Operations Centre and coordinating resources (including international assistance when needed). Following the new law, the former General Directorate of Civil Emergencies was transformed into this agency in late 2019. Internally, NCPA is divided into directorates for risk reduction, preparedness and emergency response coordination, rehabilitation and recovery, international cooperation and projects, education/training/IT, and finance/support services. It also has inspection and auditing units to supervise compliance. Four Regional Civil Protection Centres (RCPCs) serve as NCPA's arms in the field, each covering a group of counties (qarks); they support local planning and surge capacity. By centralizing these functions, NCPA professionalizes disaster management and ensures continuous monitoring of risks nationwide.

Technical Advisory Commission (TAC) – A multi-disciplinary advisory body comprised of experts from different domains such as academia, hydrometeorology, seismology, environmental agencies, etc. provides scientific and procedural guidance to NCPA and the government.

National Operational Centre of Civil Emergencies (NOCCE) – A 24/7 centre that collects data from monitoring systems, counties and municipalities, enabling rapid decision-making and resource deployment. It coordinates with:

- State Police Command Room and other security services for order and safety.
- National Emergency Medical Centre for healthcare response.
- State Material Reserves for logistical support.
- Inter-Institutional Maritime Operations Centre for coastal incidents.

These bodies ensure that the civil protection system has integrated situational awareness and can mobilize sectoral resources.

Specialized agencies and partners

Beyond NCPA, sectoral institutions have defined roles:

National Forest Agency (NFA) is a public budgetary institution, subordinate to the MoE. NFA is responsible for ensuring performance and standards in management of national forest fund, leading function in the

forest sector regarding policymaking, regulatory functions, financing and developing the forest sector, including fire prevention, monitoring and rehabilitation of burned forests.

National Agency of Protected Areas (NAPA) manages, protects, develops and expands the surface of protected areas in Albania and it is obliged to develop fire-prevention and response plans for parks and reserves and coordinate with fire-rescue services.

General Directorate of Fire Protection and Rescue (GDFPR) is responsible for inspection, prevention with fire protection measures, intervention to extinguish fires, saving lives, livestock, property, environment, forests, and pastures in various accidents, natural disasters, as well as those caused by human hands. The fire and rescue service is organized at the central and local levels. The GDFPR serves as the central authority, representing the highest technical, supervisory, and management body for all fire services across Albanian territory. The GDFPR drafts regulations on fire protection and rescue, and unifies the methodology for prevention measures, interventions rules, interference and inspection of fire protection and rescue service of Albania. It also coordinates the activity of the municipal Fire Protection and Rescue Stations (FPRSs) and orders interventions by their forces, vehicles and fire extinguishers in cases of mass fires or other situations involving complex rescue operations requiring the intervention of service units by some municipalities. The FPR service structures in municipalities represent the local level and are organized into departments or sectors. The department or the FPR service sector at the local level is subordinated to the mayor. It represents the basic operating and inspection structure in the field of fire protection and rescue on the territory under its jurisdiction.

National Inspectorate of Territory Protection (NITP) controls and protects the territory and landscape from illegal interventions and developments, guaranteeing sustainable and safe development in the field of development, planning, protection of territory, land, air, waters and forests, discipline of construction works, construction products, as well as in the field of integrated management of water resources.

Institute of Geosciences (IGEO) provides information and issues warning bulletins based on data from hydrological and meteorological stations, weather forecasts, hydrological forecasts, air and water quality information to the authorities at different levels, including the NACP, prefectures and municipalities whose mandate is to alert the public. IGEO is also responsible for hazards data collection and post-disaster analyses, managing the national meteorological and hydrological networks, providing studies about climate and hydrology, water and air quality in Albania, and carrying out studies about climate change and its impacts.

Military Meteorological Service (MMS) provides scientific and meteorological data to forecast hazards and supports early warnings.

State Cadastre Agency (SCA) maintains land-ownership records, which is essential for post-fire recovery and liability decisions.

Non-Governmental Organizations (NGOs) and volunteer groups are recognized as partners for public awareness, early response and post-fire recovery.

Regional Level Organization

At the regional level, the 12 Prefects (representatives of the central government in each qark (county) play a coordination role. Each qark has a Civil Protection Commission led by the Prefect, which includes municipalities and local branch agencies. Additionally, Civil Protection Centres at the Qark level (CPCQ) have been established. These are essentially regional emergency management offices (often based in the prefecture or NCPA regional structures) that link the national agency with municipalities and communities. The CPCQs help implement preparedness programmes and coordinate inter-municipal response when disasters affect more than one municipality.

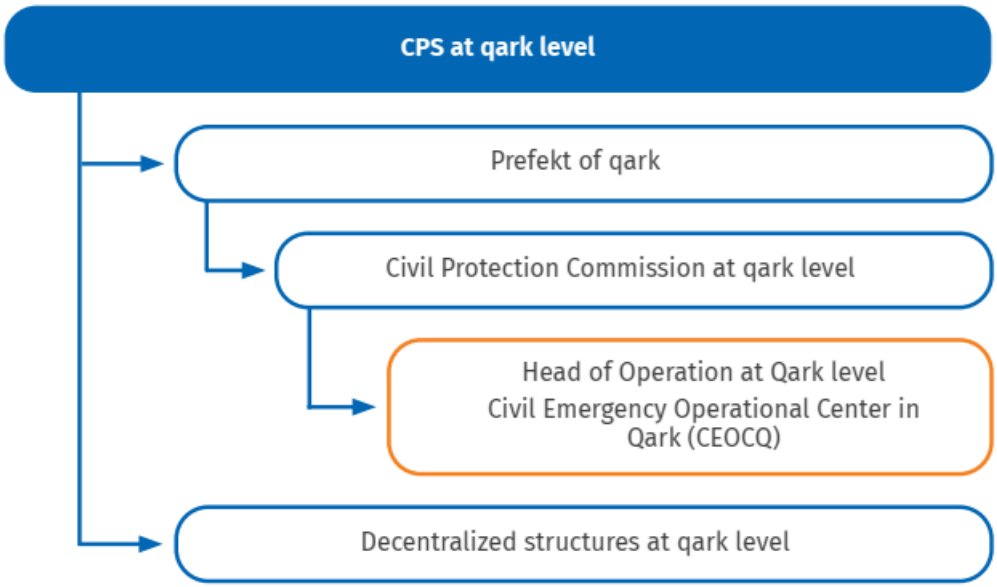


Figure 27. *Civil protection institutions and structures at qark level.* ***Data source:*** *National Civil Emergency Plan, 2023*

Key structures include:

Civil Protection Commission in Qark (CPCQ) brings together leaders of deconcentrated line ministries (health, education, agriculture, police) to plan and coordinate risk-reduction and emergency actions.

Head of Operations for the Qark acts under the prefect and liaises with the CHO/EMT during larger emergencies.

Civil Emergency Operational Centre in Qark (CEOCQ) – Functions like a mini-NOCCE, with planning, operations and logistics sectors to manage incident information and resources.

Regional Civil Protection Centre (RCPC) – Each RCPC supports multiple counties and works closely with the prefect to conduct training and coordinate surge capacity.

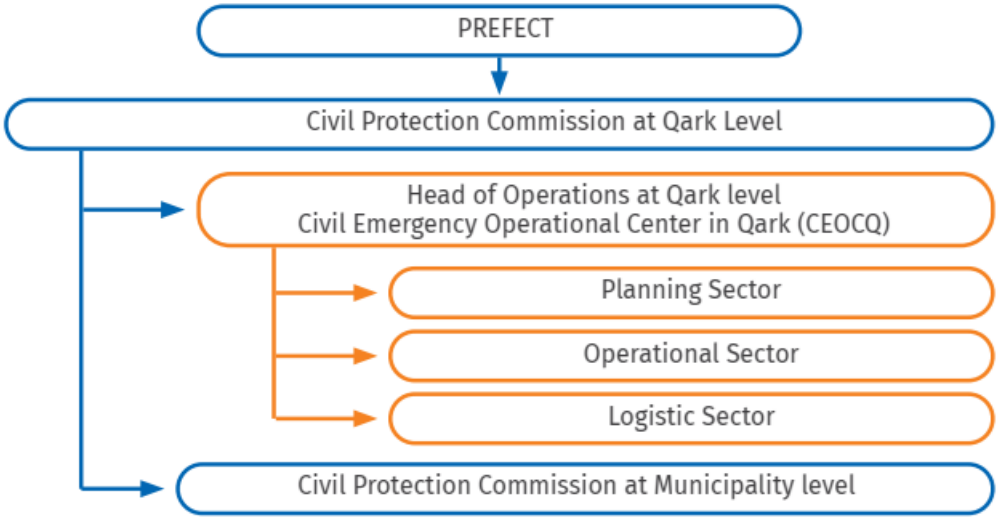


Figure 28. *Civil protection structure at qark level and CEOCQ.* ***Data source:*** *National Civil Emergency Plan, 2023*

The prefect must ensure that municipal budgets include funds for disaster risk reduction, coordinate early-warning dissemination, maintain regional risk inventories and request national assistance when local capacities are insufficient.

Municipal Level Organization

At the local level, municipalities are at the forefront of civil protection, as laid out under Law 45/2019 and Law 139/2015, with their clear duties in disaster risk reduction and emergency response. Every municipality must create a Local Civil Protection Plan and regularly update its risk assessment for the community. Municipalities also chair local emergency committees and coordinate volunteer efforts. The structures at municipal level are organized as follows:

Mayor and Civil Protection Commission in Municipality (MCPC) provide policy oversight and approve local civil-protection plans.

Head of Operations at municipal level leads the tactical response and coordinates with the county and national heads of operations.

Civil Emergency Operational Centre in Municipality (CEOCM) is composed of:

- *Planning sector* (risk assessment, plan maintenance, training schedules).
- *Operations sector* (incident management, coordination of fire-rescue services and volunteers).
- *Logistics sector* (resource management, supply and transportation).

Local operational forces – Municipal fire and rescue services, police units, health-care teams, water and drainage services and other municipal departments that handle immediate response.

Volunteers and NGOs – volunteer firefighting teams and community groups, the Albanian Red Cross and other NGOs are integrated into local response.

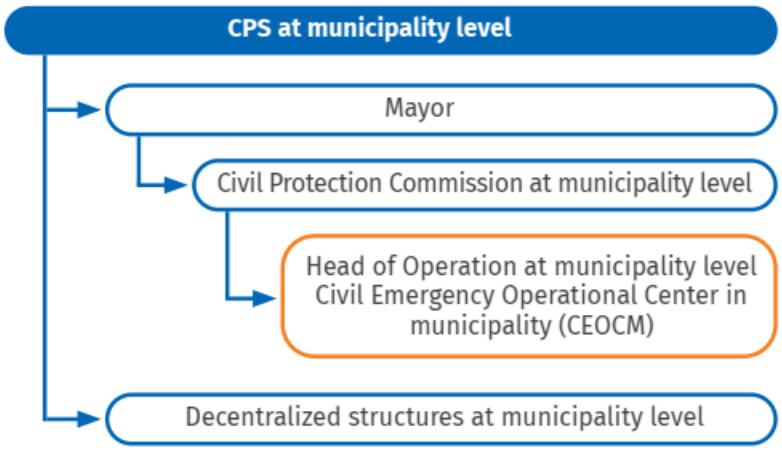


Figure 29. *Civil protection structures at municipal level. Data source: National Civil Emergency Plan, 2023*

To fund the municipalities' responsibilities, the law obligates that a portion of the state budget is transferred as a conditional civil protection fund to each municipality. Specifically, each municipality receives the equivalent of 4% of its total budget from the national budget earmarked for civil protection (they may also add their own funds beyond those 4%). This financial mechanism, introduced by Law 45/2019, ensures that local governments have dedicated resources for emergency preparedness investments and response readiness (e.g. maintaining emergency stockpiles, clearing riverbeds before flood season, training local staff, etc.).

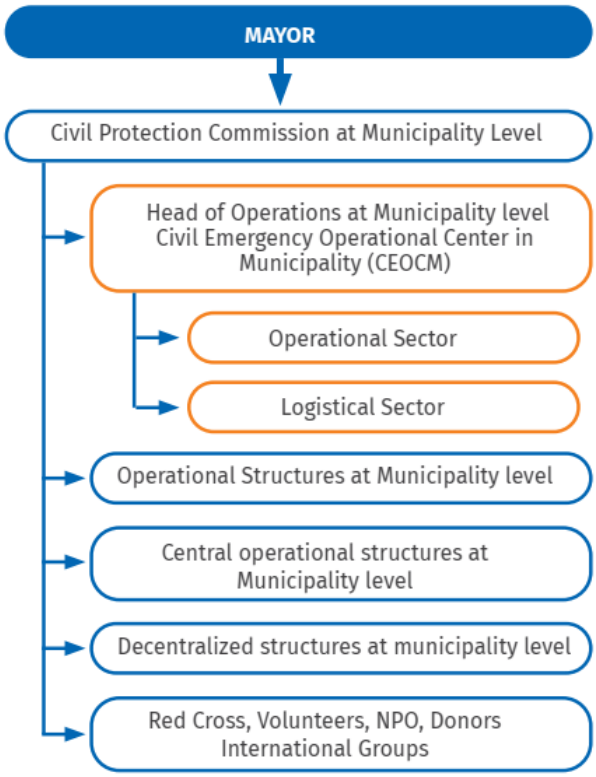


Figure 30. *Civil protection structures at the local level and CEOCM.* ***Data source:*** *National Civil Emergency Plan, 2023*

Operational Structures

Operational activities across all levels include planning, search and rescue, emergency assistance, site security, evacuation, firefighting and post-disaster recovery. The National Civil Emergency Plan emphasizes a bottom-up information flow (municipalities to counties to national level) coupled with top-down command: when an incident exceeds municipal capacity, the prefect mobilizes cross-county resources and notifies NCPA. If county resources are insufficient, NCPA activates national assets and, if necessary, requests international support.

Operational structures engaged in firefighting include:

Armed Forces engage in disaster management cycle operations, if other available capacities are insufficient for this purpose, supporting institutions, central and local authorities, and the community; Special structures of search and rescue engage in carrying out disaster response operations; In cases of declaration of a state of natural disaster, the capacities of the Armed Forces are engaged in the implementation of the tasks appointed by the Inter-Ministerial Committee of Civil Emergencies.

Fire Protection and Rescue Service (FPRS) is an integral part of the operational forces on permanent alerts acting to extinguish fires, search for and rescue people in case of civil emergencies, and alleviate the consequences of natural or other disasters. At local level (61 municipalities), 70 fire stations exist with a total of 1270 employees.

Forest Service at Municipal level is responsible for the administration of the forest and pasture fund within their territory in accordance with the Law on Forests. These structures perform managerial and operational functions, and their main tasks are forest management, territory control/ inspection, provision of technical and advisory support for the owned forest fund . One of the functions of municipalities in the field of public

safety is the provision of the fire service, at local level, and administration of relevant structures, in such manner as prescribed by the respective laws.

Voluntary Service for Firefighting - Every citizen of Albania contributes voluntarily to the management of disasters (forest fires) and to the reduction of their consequences. Volunteers can act individually or in organized groups as non-profit structures, but in all cases, depending on the situation and the needs, their tasks are assigned by local institutions or structures of forest service or civil defence. The financial treatment of volunteers for their engagement in civil protection activities or in disaster prevention and coping operations is approved by a decision of the Council of Ministers, on the proposal of the Minister or covered by municipalities.

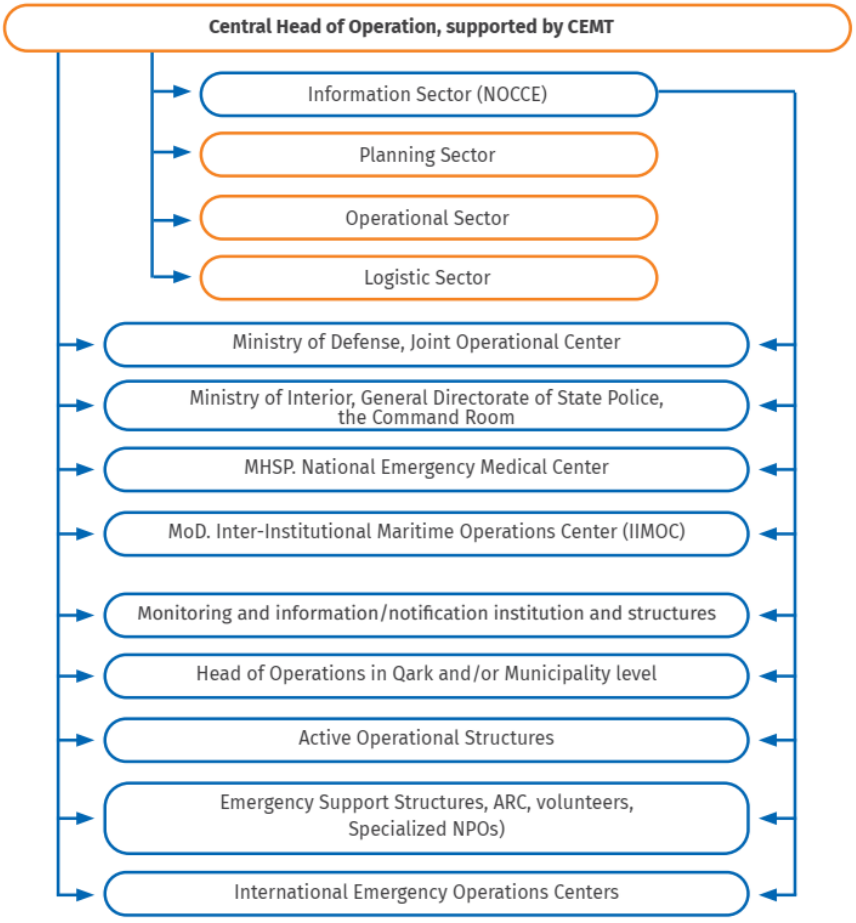


Figure 31. *Heads of operation, operational centres, and operational structures.* ***Data source:*** *National Civil Emergency Plan, 2023*

The civil protection framework encourages inter-institutional cooperation at all levels. DCM No. 923/2020 "On the functioning and organization of the civil protection committee and the interinstitutional cooperation of the institutions and structures of the civil protection system" lays out how ministries, the NCPA, prefectures, and municipalities coordinate and share information.

Albania's institutional setup now integrates national, regional, and local authorities under a unified civil protection system, with clearly defined roles from the Cabinet level down to municipalities, aiming for a proactive and coordinated approach to disasters.

IV.4. Role of Local Government and Fire Rescue Service

Law 139/2015 "On Local Self-Government" (as amended) underpins the responsibilities of municipalities in civil protection. It identifies fire protection and rescue, as well as civil emergency management, as functions of local government, in line with the country's decentralization reforms. In fact, since 2016, Albania has decentralized the Fire Protection and Rescue Service – transferring it from central government to municipal control. This was codified in Law 152/2015 "On the Fire Protection and Rescue Service", which works in tandem with Law 139/2015. This legal framework defines responsibilities for municipalities regarding the establishment and maintenance of fire stations, hiring and training firefighters and procuring firefighting vehicles and equipment. Municipalities' responsibility is to ensure their entire territory is covered by fire rescue service, including rural areas that previously had none. Several bylaws and regulations have been issued to guide this transfer of functions - covering the handover of assets, personnel, and funding from the central government to local governments.

The Fire Protection and Rescue Law (152/2015) sets national standards for firefighting and rescue (such as response norms, firefighter training, and safety regulations), but execution is at the local level. Civil society monitoring has noted that municipalities vary in capacity, but efforts are ongoing to standardize service delivery and even encourage volunteer firefighter networks to support the professionals. The shift of the fire service to local control aimed to bring first responders closer to communities for a faster response, given Albania's mountainous terrain and the need for local knowledge in emergencies.

In practice, this means each of Albania's 61 municipalities now operates a Fire and Rescue Unit, which is also a core part of the municipal emergency structures. During disasters, municipal fire units are often the first responders (for example, tackling wildfires or urban fires, responding to building collapses, traffic accidents, and other rescue situations). They work closely with the NCPA and Prefect's offices when an incident escalates beyond local capacity. In large emergencies, the Civil Protection law (45/2019) obliges municipalities to activate their emergency plans, coordinate evacuation/shelter for affected population, and can request additional forces (including armed forces, police, or fire units from neighbouring municipalities) through the prefect/NCPA coordination.

Also, the role of municipalities is highly vital in risk prevention and community awareness. NCPA and other donors have funded risk reduction initiatives, and many municipalities are engaged. These initiatives include reinforcing riverbanks, improving drainage for flood prevention, training on earthquake-resistant construction, and launching public awareness campaigns on disaster preparedness.

According to Law 45/2019, every municipality must create a Civil Protection Plan and a local Disaster Risk Assessment, and they must maintain these and update on a regular basis. These documents explain the specific risks that the municipalities face and the steps and resources that have been put in place to cope with them. Some of these risks include flood-prone zones, wildfire hotspots, seismic risk for building, etc. The law requires harmonization of these local plans with the national plan and the plans at the county (prefect) level ensuring a vertical coordination in disaster management. By 2023, all municipalities were expected to have their risk assessments and emergency plans in place with the technical assistance provided by NCPA.

The legal framework places municipalities as the foundation of Albania's civil protection system, underpinned by conditional financing and incorporated into national organizations. Law 152/2015 and the provisions of Law 139/2015 facilitate the decentralization of the fire service, enabling local authorities to address crises and provide resources for prevention and preparation within the community. Challenges remain as many municipalities continue to lack sufficient equipment or specialized staff. Nevertheless, continuing reforms and initiatives are addressing these deficiencies, informed by legal provisions that emphasize local-level resilience.

IV.5. Environmental and Sectoral Legislation Supporting Risk Reduction

There are several regulations that apply to certain sectors that operate with the civil protection framework. These laws help stop and lessen the effects of natural disasters including wildfires, deforestation, and environmental crises. These regulations ensure that disaster risk management is mainstreamed in environment protection, forestry, and land use practices:

- Law 57/2020 "On Forests" - This new legislation on forests has clear rules on fire prevention and response in forested areas. It prohibits burning any form of plant or biomass in or near forests given the risk of wildfire. The law mandates each municipality's forestry unit along with private forest owners to prepare an annual plan for preventing and fighting forest fires. The municipal council must approve these local forest fire plans by March of each year. They must detail the available equipment, personnel, and coordination mechanisms. The law also requires that forest fire plans must be coordinated with the civil protection emergency plans of the municipality and county. This is to ensure integration with other disaster response systems. The Forest Law also calls for public education campaigns on forest fires prevention and allows creation of volunteer or community fire protection units in rural areas. In forest fire events, local governments, communities and private owners are obligated to collaborate and may establish joint firefighting brigades. The legislation stipulates that the forest owner or management (public or private) must cover the costs for firefighting. Only in cases when fires occur in forests with national importance, then the state will cover them. Also, Law 57/2020 cross-references the national fire rescue legislation, stating that all measures to protect forests from fires must follow the Fire Protection and Rescue law and the civil protection law. The Forest Law features a significant disaster risk reduction role that focuses on prevention (via prohibitions and plans) and explicit duties for response. This is to address the common problem of wildfires in Albania's forested regions.
- Law No. 9663, dated 18.12.2006 "On the Pasture Fund" and its amendments (2008-2016) defines the pasture fund as a category of state and communal land dedicated mainly to grazing and hay production, while recognizing its ecological and protective functions. Its provisions assign responsibility for management and maintenance to municipalities and local pasture user associations, requiring them to prepare annual or multi-year pasture management plans. These plans include measures such as rotational grazing, vegetation control, and the upkeep of infrastructure that, when implemented correctly, directly contribute to reducing fuel accumulation and the spread of fire. The law also places clear obligations on users to maintain the ecological condition of pastures and explicitly prohibits uncontrolled burning as a method of cleaning or regenerating grasslands. Only authorized burning is permitted under supervision, and violations are subject to administrative sanctions or the loss of usage rights. Through its amendments between 2008 and 2016, the legislation reinforced the role of local government, adjusted governance to the territorial reform, and strengthened cooperation between municipalities, forest services, and civil-protection structures.
- Law 81/2017, "On Protected Areas" (amended by Law 21/2024). This law governs national parks, and all categories of protected areas. While its primary focus is conservation, it has important links to disaster management because many protected areas (forests, wetlands, coastal zones) are vulnerable to natural hazards (fires, floods) and play a role in ecosystem-based risk reduction (for example, wetlands mitigating floods, forests stabilizing slopes). Law 81/2017 enabled the legal framework for establishment of the National Agency of Protected Areas (NAPA) as the central authority for managing protected areas, under the Ministry of Environment. The NAPA oversees a network of Regional Protected Areas Administrations (RPAAs) in each county, which are responsible for on-the-ground management and enforcement in parks and reserves. The law assigns these bodies the duty to protect against illegal activities (logging, poaching, pollution) and to prevent and respond to environmental emergencies in the protected territories. For instance, park administrations work on fire prevention in national parks (clearing dry brush, maintaining fire

breaks) and coordinate with fire services and civil protection when fires or floods occur in a protected area. Municipalities also have responsibilities for protected areas that lie within their territory – they are expected to cooperate with NAPA and integrate protected area concerns into local plans. Management of resources (forests, waters, pastures) inside protected areas must be done according to the area's management plan and conservation objectives, which indirectly contributes to risk reduction (avoiding over-exploitation that could lead to environmental degradation and disasters). Amendments made by the Law 21/2024 have been subject to public debate. They reportedly ease some restrictions on development in certain zones and therefore environmental groups have raised their concerns that allowing large-scale resorts or infrastructure in or near protected areas could increase environmental vulnerability and disaster risks (for example, construction in wetlands could worsen flooding). Regardless of these controversies, the protected areas framework remains a key part of Albania's overall risk reduction strategy – recognizing that healthy ecosystems are a first line of defence against hazards. The law thus reinforces that any interventions in protected zones must undergo environmental assessment and adhere to regulations that also serve disaster prevention (e.g. maintaining riverbanks, prohibiting activities that could trigger wildfire or erosion).

- Law 9244/2004 "On the Protection of Agricultural Land" (as amended by Law 68/2023) – This law protects farmland from degradation and unplanned change of destination. The most recent changes to Law 68/2023 (July 2023) were aimed to reduce fire risk on farmland. The law now clearly bans burning stubble, agricultural leftovers, or any other sort of biomass in open fields. This practice of lighting fire to clear agricultural land has been common in Albania throughout the summer and has been identified as a major cause of wildfire spreading to forests and communities. Research and studies show that agricultural burning is responsible for large wildfire incidents in different kinds of land cover (almost 50%). Law 68/2023 addresses this danger at source by penalizing burning of any sort of biomass on farms. The new law also promotes safe, different methods to manage agricultural biomass and transfer the responsibility to local governments to enforce the ban. This is a crucial preventive measure to stop uncontrolled field fires, as they not only destroy the soil's fertility, but they frequently turn into big wildfires. The new law is projected to reduce these kinds of fires significantly. This legislation also aims to protect farmland from erosion, pollution, and poor management. These issues are also good for reducing the danger of disasters, such as maintaining green cover to prevent landslides and floods.
- Other important legislation: The Albanian legal system for civil protection is complemented by legislation in several areas that help in disaster resilience. The Law on Water Resources Management, for example, requires that flood danger must be assessed and that dams must be monitored. When developing cities and giving out construction permits, the Law on Territorial Development requires that disaster risk (including seismic risk and floodplains) must be considered. The legislation on Climate Change (No. 155/2020) establishes targets for cutting greenhouse gas emissions and adapting to climate change. This is in accordance with DRR's aims. The Law 107/2016 "On Prefects" stipulates that the Prefect is responsible for coordinating emergency response among municipalities in each county. Law 45/2020 "On Civil Protection" refers to several of these sectoral legislations to make sure they all operate together. While these laws are not listed above, they are part of the wider multi-sector plan to minimize risk.

IV.6. National Strategy and Plans for Disaster Risk Reduction

Albania's notable recent advancement of the disaster management system is the implementation of the National Disaster Risk Reduction Strategy 2023–2030 and its corresponding Action Plan (DCM No. 94/2023). This Strategy is the nation's first comprehensive Disaster Risk Reduction Strategy document,

in alignment with the objectives of the Sendai Framework and European Union Civil Protection regulations. It delineates strategic goals for mitigating risk, including enhancing risk mapping and early warning systems, investing in robust infrastructure, augmenting public awareness, and fortifying emergency response capabilities. The policy prioritizes the integration of disaster risk reduction into sustainable development and climate change adaptation initiatives, acknowledging Albania's significant vulnerability to natural hazards, since the country ranks first in Europe for disaster risk in several indices and with the establishment of a national plan, Albania complies with the stipulations of Law 45/2019 and exhibits a governmental commitment to proactive risk management.

The National Risk Assessment Document (2023) offers an exhaustive evaluation of the country's risk profile, supplementing the action plan, it outlines the main threats facing Albania, including floods, forest fires, earthquakes, landslides, diseases, extreme weather, and technological mishaps, and assesses their likelihood and potential impacts. The national risk assessment evidenced that floods and wildfires are the most common hazards, although earthquakes provide the highest potential for mortality. This evidentiary foundation aids in the prioritization of activities and resources. The risk assessment (endorsed by DCM No. 168/2023) is intended for periodic updates and serves as a basis for national and local emergency preparedness.

Finaly, organization of emergency response and recovery at all levels is comprehensively outlined in the National Civil Emergency Plan (2023), which defines the roles of each institution in various disaster scenarios, the standard operating procedures for coordination and the mechanisms for requesting international assistance if needed.

The plan covers multi-hazard scenarios and establishes phases of emergency management (preparation, response, recovery) and it includes provisions for ensuring continuity of government and critical services during disasters. The National Plan is aligned with the DRR Strategy's goals and the risk assessment findings, guaranteeing consistency across strategic, analytical, and operational documents. Together, these three documents (Strategy, Risk Assessment, Plan) are described by the NCPA as the "base documents" that fill the remaining gaps in the legal framework for civil protection, developed with technical expertise from domestic and international experts and involved broad consultations in 2022-2023. With their adoption, Albania already has a robust policy framework to guide investments and actions for disaster resilience through 2030.

In summary, Albania's legal framework for civil emergencies and DRR is comprehensive and multifaceted. Law 45/2019 established a contemporary civil protection framework, including new entities such as the National Civil Protection Agency and coordinating committees. It redirected emphasis towards risk mitigation and readiness, in alignment with international norms. Subsequent laws and governmental actions have established this framework, including national coordinating bodies (CPC, technical commissions) and enhancing the capacity of local authorities and fire services as principal responders. In addition, sectoral legislation in forestry, environmental protection, and land management increasingly incorporates disaster risk factors, tackling the underlying causes of hazards such as wildfires (e.g. via prohibitions on biomass combustion and mandated fire control plans).

Even though completion of the national disaster risk reduction strategy, risk assessment, and emergency plan in 2023 finalizes the strategic framework – allowing Albania to confront disasters in a more proactive, planned, and coordinated manner than before – a dedicated strategy to landscape fires is lacking as Law No. 45/2019 "On Civil Protection" and Law No. 57/2020 "On Forests" treat forest fires as part of disasters, but there is no specific act that regulates in detail landscape fires (forests, pastures, abandoned land, wildland-urban intermediate zones, WUI).

It is of high importance to emphasize that the efficient execution and enforcement of these laws and initiatives will pose a significant challenge. Effective financial management at the municipal level, along with continuous education and public awareness, is essential for translating the legal framework into practical resilience. The legal frameworks outlined in this chapter establish a robust foundation for Albania's initiatives to safeguard its population, economy, and environment against the threats posed by natural and human-made disasters.

IV.7. Conclusion

The institutional framework for landscape fire management in Albania represents a solid foundation built upon the principles of decentralization, inter-agency coordination, and shared responsibility across governance levels. Over the past decade, the country has made substantial progress in establishing a modern civil protection system through the adoption of key legislative instruments such as Law no. 45/2019 "On Civil Protection", Law no. 57/2020 "On Forests", and the National Disaster Risk Reduction Strategy 2023-2030 and its corresponding Action Plan (DCM No. 94/2023). Together, these instruments have clarified mandates, structured vertical communication lines between central and local authorities, and embedded risk reduction and preparedness into Albania's national policy architecture.

At the central level, coordination among the Council of Ministers, ICEC, CPC and the NCPA has improved the country's ability to manage large-scale emergencies, including landscape fires. The establishment of the National Operational Centre for Civil Emergencies has also strengthened situational awareness, real-time information exchange, and operational control during critical incidents. These structures increasingly align Albania's governance framework with the standards and operational logic of the EU Civil Protection Mechanism.

At the territorial level, the roles of Prefectures and Municipalities have become more pronounced, ensuring that disaster risk management and landscape fire prevention are locally grounded. The formation of CPCQ and CPCM, and the appointment of operational leaders have institutionalized a chain of command capable of coordinating multi-agency response at the community level. Yet, these local structures continue to face challenges related to human resources, technical expertise, and funding allocation, particularly in smaller municipalities where landscape fire risk is high, but capacity remains limited.

In parallel, the integration of specialized agencies such as the NFA, NCPA, and IGEO reflects a growing understanding that LFM extends beyond emergency response. It requires an ecosystem-based approach linking forest governance, land-use planning, and climate adaptation. The evolving cooperation between NCPA and these agencies has created opportunities for joint prevention programmes, risk mapping, and early warning systems.

However, despite these advancements, the current landscape fire management system still requires further polishing and harmonization between sectoral laws, institutional consolidation, continuous capacity building, and a dedicated funding stream to sustain prevention and preparedness measures. Clearer protocols for ICS and data sharing, interoperability of early warning platforms, and systematic integration of local volunteer groups remain pressing needs. Moreover, climate-induced shifts in temperature and precipitation patterns continue to increase the complexity of fire risk, demanding proactive cross-sectoral collaboration that transcends administrative boundaries.

In conclusion, Albania's LFM system has entered a decisive stage. The legal, institutional, and operational foundations are now well-defined, but the effectiveness of the system will depend on how these structures are activated, resourced, and interconnected in practice. Continued investment in local capacity, science-based policy, and inter-institutional cooperation will be essential to transform the system from a reactive emergency response mechanism into a comprehensive, preventive, and adaptive landscape fire management model aligned with European and global standards.

V. History Of Landscape Fires

Landscape fires have been a persistent threat to Albania's environment and society over the past several decades. Due to the country's mountainous terrain, Mediterranean climate, and extensive forest and pasture lands, conditions conducive to summer wildfires are created. Most of these fires are human-caused often through agricultural burning, negligence, or deliberate arson. Furthermore, climate change also is amplifying the risk. In recent years, there have been higher temperatures, prolonged droughts, and heatwaves that increase fire frequency and intensity. There are several institutions in Albania that are responsible for wildfire management and data collection, such as the National Civil Protection Agency (NACP), National Agency of Protected Areas (NAPA), National Forest Agency (NFA) and municipalities, but the absence of a centralized wildfire database and limited resources have traditionally impeded thorough reporting and response. As a result, data on wildfire occurrences and damages in Albania often depend on varied sources. This chapter integrates Albanian official data with international datasets, particularly the European Forest Fire Information System (EFFIS), to provide a comprehensive historical overview of landscape fires in Albania from 1990 to 2024, emphasizing burned area, incident frequency, and socio-economic impacts.

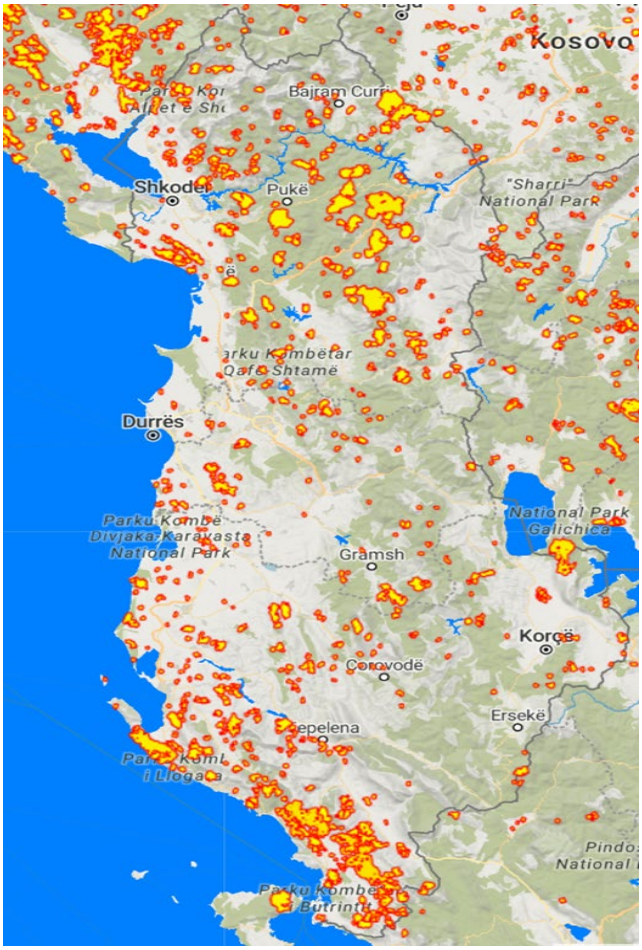


Figure 32. *Forest area burned from January 2018 to August 2024 (MODIS & VIIRS NRT).* ***Data source:*** *Copernicus EMS*

V.1. Long-Term Trends in Wildfire Incidents and Burned Area (1990–2024)

1990 - 2000: During the decade after the collapse of communism, along with the socio-economic and political changes, Albania experienced numerous small wildfires each year. According to official records, there occurred an average of 532 fires per year during 1990–2000, but with a relatively modest mean burned area of only about 942 ha annually was registered. Many fires were quickly contained and remained limited in size. Nonetheless, fire activity spiked in certain years – for example, 1997 saw 735 reported fires (amid social unrest) and 628 fires were registered in 1999. Burned area in those years, however, stayed under 2,000 ha. The largest fire year of this period was in 2000, with 915 fires that burned about 3,675 ha. Generally, the 1990s were characterized by high fire frequency but generally small burn extents per fire.

Table 10. *Number of fire cases and burned area 1990 – 2020.* ***Data source:*** *MoE from 1990 to 2014; NCPA from 2015 to 2020*

Year	No. of fires	Burned area (ha)	Year	No. of fires	Burned area (ha)
1990	273	417	2006	176	767
1991	184	250	2007	1190	30856
1992	659	1011	2008	348	1476
1993	676	522	2009	189	1229
1994	585	705	2010	246	1133
1995	110	153	2011	559	3492
1996	490	410	2012	600	4707
1997	735	1847	2013	97	184
1998	601	680	2014	47	17
1999	628	689	2015	162	-
2000	915	3675	2016	38	630
2001	327	941	2017	362	5055
2002	140	690	2018	73	35.7
2003	771	4419	2019	356	-
2004	143	491	2020	78	338.1
2005	174	1041	**TOTAL**	**11932**	**67860.8**

2001 - 2010: The 2000s saw a reduction in the number of reported fires, but a dramatic rise in burned areas due to several extreme fire seasons. During 2001–2010, the average dropped to 370 fires/year, yet mean burned area jumped to 4,304 ha/year – over four times higher than the 1990s. This shift indicates that while there were fewer ignitions, the fires that did occur were much larger and more destructive. The most catastrophic year was 2007, when a severe summer drought and heatwave helped ignite 1,190 wildfires that ravaged approximately 30,856 ha of land. The season of 2007 stands out as one of the worst on official record in Albania. According to EFFIS data, 2007 had the highest burned forest ever recorded in the country, though it has a large discrepancy with the official data. According to EFFIS, the total burned

area was 127,491 ha, and the number of fires was 163. Here we should mention that EFFIS considers only burned areas over 30 ha. Other notable years in the 2000s include 2003 (over 4,400 ha burned) and 2008 (with a comparatively lower approximately 1,476 ha). The latter part of the decade benefitted from some milder summers, but 2007's fire disaster underscored a new era of mega-fires in Albania.

2011 - 2020: Wildfire activity in the 2010s was relatively lower overall but punctuated by occasional severe seasons. The decade averaged around 233 fires and 1,446 ha burned per year in official counts, a decrease from the 2000s. Indeed, 2013 and 2014 were exceptionally quiet years (only 97 fires and 184 ha burned in 2013; 47 fires and 17 ha in 2014), likely due to favourable weather. However, several years saw dangerous flare-ups. In 2012, Albania faced 600 fires burning over 4,700 ha amid a regional heatwave. The 2017 season was especially destructive as well – EFFIS ranks 2017 among the most severe fire years (alongside 2007) in terms of area burned. Large wildfires in 2017 scorched tens of thousands of hectares (though local data under-reported this) and strained the country's response capacity. By contrast, 2018 and 2020 were low-impact years. The overall trend in the 2010s was fewer fire ignitions thanks to improved prevention and possibly depopulation of rural areas, but extreme climate conditions occasionally produced big fire seasons.

Table 11. *Number of fire cases and burned area 2007 – 2023.* ***Data source:*** *European Commission, Forest Fires in Europe, Middle East, and North Africa, JRC technical reports 2007 - 2023*

Year	No. of fires	Burned area (ha)	Year	No. of fires	Burned area (ha)
2007	163	127943.71	2016	21	5037.72
2008	68	19254.33	2017	223	42168.04
2009	27	7606.86	2018	14	3280.27
2010	35	8154.67	2019	111	11838.9
2011	200	53308.75	2020	129	19909
2012	158	54130.7	2021	329	31275
2013	9	1233.47	2022	307	19591
2014	4	457.46	2023	80	6012
2015	19	3777.62	2024[1]	168	46623
	TOTAL			**2065**	**461599.5**

2021–2024: The early 2020s have seen a worrying resurgence of wildfire activity, influenced by climate extremes. After a moderate 2020, Albania experienced back-to-back severe fire seasons. 2021 was catastrophic: 329 wildfires burned an estimated 31,275 ha of land, the worst devastation since 2007. Multiple large blazes raged across the country in summer 2021, including in Gjirokastër, Vlorë, Kukës and the Karaburun-Sazan Protected Area, forcing evacuations and causing loss of life. The following year, 2022, remained challenging - EFFIS satellite data show about 19,600 ha burned in 2022. By contrast, 2023 was relatively less severe, with approximately over 6,000 ha affected. Unfortunately, 2024 has proven to be an unprecedented wildfire year. By the end of 2024 season, wildfires had burned roughly 46,600 ha of forests (≈1.4% of Albania's forest area) in 168 separate fire events – making 2024 the largest annual burned area in at least a decade. In fact, 2024's forest fire damage was nearly eight times higher

[1] In absence of the annual report for 2024, the data for this year are received from the website: https://forest-fire.emergency.copernicus.eu/apps/effis.statistics/estimates (EFFIS Annual Statistics for Albania)

than 2023's and even surpassed the infamous 2021 season. EFFIS data confirm that 2024 was among the top five worst fire seasons on record (ranking behind only 2007 and a few earlier extreme years).

As shown in the figure 33 below, approximately 75% of all burned area in the country (2007-2023) has been in forests and other wooded land, with most of the remainder (around 20%) in other natural vegetation such as shrublands and pastures. Agricultural lands typically account for only 5.5% of the annual burned area, and direct impacts on urban or built-up zones are minimal. This reflects the fact that fires often start and spread in remote or wild landscapes rather than in croplands or settlements. However, when fires do encroach on farms or villages, the consequences can be severe (see socio-economic impacts below).

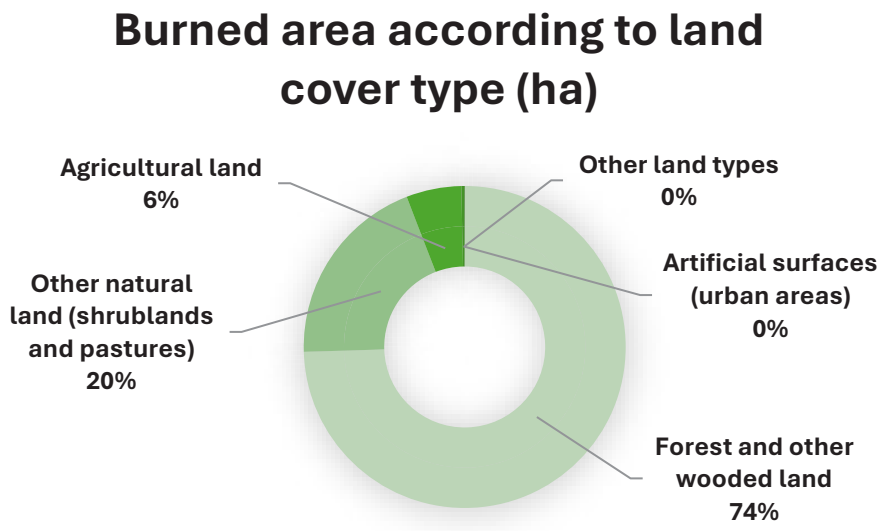


Figure 33. *Distribution of total burned area in Albania by land cover type (2007–2023). Over three-quarters of the area burned by wildfires was forest or wooded land, while around 20% was other natural vegetation (shrubs, grasslands). Farmland and artificial surfaces comprised only a small fraction.* ***Data source:*** *EFFIS annual reports 2007-2023.*

V.2. Causes and Seasonality of Landscape Fires

Human activity mostly instigates wildfires in Albania. Studies reveal that over 90% of recent forest fire incidents are due to human activities, where the common ignition sources include agricultural burning of crop residues or pasture, a traditional practice that sometimes remains unregulated, as well as careless open fires or cigarettes. There have been also cases where arson and intentional ignition for land-use modification have also been recorded. In contrast, natural causes like lightning represent a negligible factor in Albania's fire statistics, consistent with patterns seen across the Mediterranean region. Previous studies in Albania have shown that 29 percent of forest fires were caused by carelessness or negligence, 61 percent by unknown reasons; 9 percent by arson; and only 1 percent by unusual events and lightning. However, it should be recognized that even those forest fires classified as "caused by unknown factors" can be considered to have been due to 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. These values don't differ so much from the other data of Mediterranean countries.

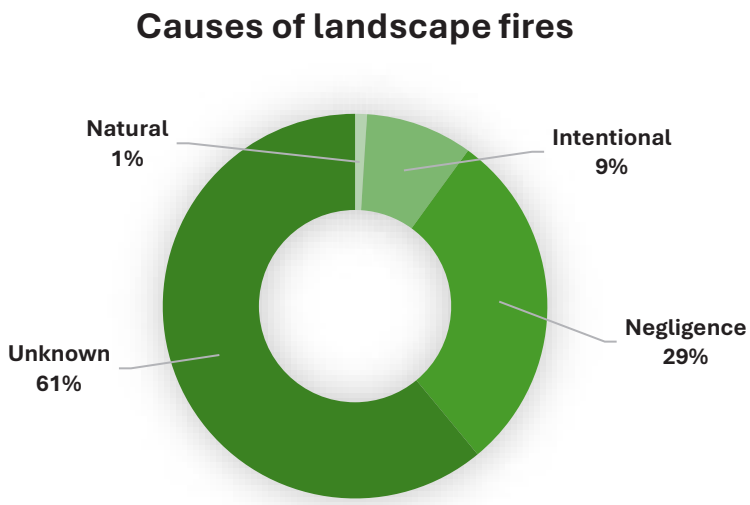


Figure 34. *Causes of landscape fires in Albania.* ***Data source:*** *UNDP, 2003*

Poor land management has heightened the risk of fire. The deterioration of agricultural grazing and forest management in the post-1990s led to the buildup of dry vegetation fuel in various places. The interplay of this element with rugged terrain accelerates the rapid propagation of a fire upon ignition. The fire season in Albania usually runs from late spring through summer (May to August), when hot and dry weather conditions prevail. July and August are the months when the peak fire occurs. During severe heatwaves (e.g. August 2021 and August 2023), multiple wildfires started simultaneously across the country. Prolonged droughts have extended the burning season into September or even October in some years. Furthermore, strong winds, common in mountainous and coastal areas, may intensify flames and impede firefighting efforts. Global warming is likely to augment the frequency of extreme weather patterns. Recent record high temperatures and droughts in the Western Balkans have been linked to more catastrophic fire seasons. Combination between human ignition sources and environmental pressures characterizes Albania's wildfire regime, whereby most flames are initiated by human activities, yet proliferate significantly under weather conditions conducive to fire.

V.3. Socio-Economic and Environmental Impacts

Landscape fires in Albania exert considerable socio-economic and ecological effects. Wildfires are known to devastate forest resources, pastures, and protected natural habitats, thereby compromising biodiversity and ecosystem services. Wildfires frequently consume pine and oak forests, mediterranean shrublands, and pastures in Albania resulting in the loss of flora and fauna. Soil quality degrades by repeated burning causing nutrient loss and erosion, while also releasing significant carbon emissions and smoke that deteriorate air quality.

Experts warn that in some areas, intense fires have caused irreversible damage – the soil's regenerative capacity is lost and forests may not naturally regrow. According to national data, fire is a leading driver of deforestation in Albania: for instance, in regions like Shkodër, Dibër, and Vlorë, a large share of tree-cover loss in recent decades is attributed to wildfire activity.

The economic impacts of wildfires are very high relative to Albania's GDP. Direct losses include the timber value of burned forests, destroyed fruit orchards or olive groves, killed livestock, and damage to infrastructure (power lines, etc.), but there are also indirect costs that arise from erosion, flooding risk,

and long-term forest recovery efforts. The European Forest Fire Information System has developed methods to estimate these costs. In the severe 2021 fire season, the economic damage was estimated at over €160 million. The disastrous summer of 2024 inflicted about €261 million in damages (considering reforestation and land restoration needs). These figures are significant, taking into consideration the total GPD of Albania. Nonetheless, beyond monetary cost, wildfires also impact rural livelihoods - communities lose animal pastures, beehives, and other natural resources to fire. Tourism can suffer as well when fires affect scenic areas or protected parks (for example, the Karaburun Peninsula blaze in 2021 blackened a coastal national park, discouraging visitors).

Landscape fires have taken a human toll as well. Fortunately, large casualty events are rare, but there have been fatalities and many close calls. In August 2021, fast-moving fires near Gjirokastër claimed the lives of at least two residents (one from smoke inhalation and another from burn injuries) and forced the evacuation of several villages. Several firefighters and soldiers have been injured in the line of duty during wildfire suppression operations. During intense fire outbreaks, hundreds of people have been temporarily displaced from their homes – for example, villages in the Drino Valley (Gjirokastër) and Kurvelesh area were evacuated in 2021 as flames approached.

Residents who annually witness flames endangering their homes experience significant psychological stress. For instance, the devastating fires of 2022–2023 destroyed dozens of houses, agricultural structures, and even a cultural monument.

These effects highlight Albania's emergency response capability pressure. Many municipalities have few old fire engines and few firefighters. Military troops with shovels and water backpacks and Army helicopters for water drops regularly fight major flames. Albania received firefighting aircraft from European partners under the EU Civil Protection Mechanism between 2021 and 2024 to combat wildfires. Local officials and volunteers can suppress minor fires, but rugged terrain can hinder ground response. These challenges have led to requests for more fire prevention and response funding, including better early warning systems, contemporary firefighter gear, and better agency cooperation.

V.4. Conclusion

The period 1990-2024 demonstrates a complex historic trajectory of landscape fires in Albania. In the 1990s, frequent but small fires prevailed; the 2000s brought a trend of fewer, but far larger fires (culminating in the devastating 2007 season); the 2010s saw overall improvement, yet with episodic severe flare-ups; and the early 2020s have ushered in new extremes (2021 and 2024) likely influenced by climate change. Cumulatively, the impact has been enormous: EFFIS records show that between 2007 and 2023, wildfires burned roughly 461,600 ha of forest in Albania across 2,065 fire events. When pastures and other lands are included, the total burnt area is even larger. Wildfires have thereby affected a significant portion of the country's landscape, imposing hundreds of millions of euros in damages and untold ecological loss.

The vast majority of these fires are anthropogenic, highlighting the urgent need for public awareness, stringent enforcement against arson, and improved land-management practices. Simultaneously, rising temperatures and arid summers are augmenting the inherent fire danger, an issue anticipated to intensify in the next years. In the absence of enhanced preventative, preparedness and response strategies, the socio-economic repercussions of wildfires may persistently escalate for Albania. Recent legislative measures, including new legislation on civil protection and initiatives to enhance firefighting capabilities, are progressing well. To address Albania's persistent wildfire issue and safeguard its populace and landscapes, it is imperative to implement enhanced preventative strategies (education, vegetation management), bolster firefighting capabilities, and foster regional collaboration.

VI. Landscape Fire Risk Assessment

Landscape fires are a significant and growing hazard to Albania's environment, economy, and society. This chapter aims to deliver a thorough risk assessment of landscape fires in Albania, integrating data from national entities including the NCPA, NAPA, MoE, municipalities, and international sources. The assessment includes the characteristics of wildfire hazards, the exposure of people and property, vulnerabilities, and the geographical spread of wildfire risk across Albania.

The climate characteristics of Albania create conditions conducive to wildfires, especially in the lowland coastal and hilly areas of southern and western Albania. The primary fire season typically occurs in the summer months (June–September), marked by high temperatures and widespread dry conditions. Climate change is exacerbating these conditions: forecasts indicate that by 2030-2060, the fire season in Albania could last approximately one month longer, with an expected rise in both the frequency and intensity of fires. Albania is expected to be among the Mediterranean countries most affected by increased fire activity due to climate change.

VI.1. Landscape Fire Hazard Profile

Historically, Albania has endured frequent wildfires. From 1990-2020, there were on average about 385 wildfires per year, burning an estimated 2,340 hectares of forest and pastureland annually. However, year-to-year variability is very large. Figure below shows the annual number of reported wildfires from 2006 to 2020, illustrating the sporadic nature of fire occurrences – with severe fire years interspersed among quieter years.

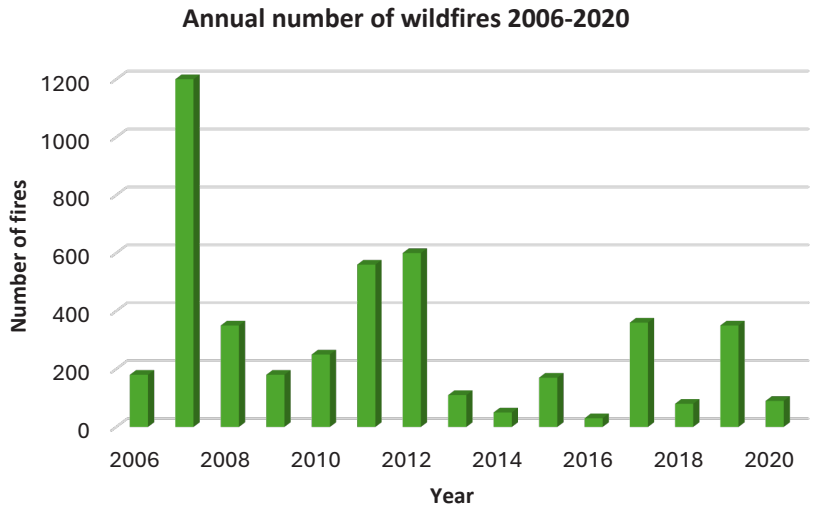


Figure 35. *Annual number of wildfires in Albania (2006–2020), showing high inter-annual variability.* ***Data source:*** *MoD, NCPA.*

In contrast to 2014 and 2016, which witnessed less than 50 fires each, Albania suffered an intense outbreak in 2007 (with almost 1,190 fires reported), 2012 (600 fires), and 2019 (356 fires). These variations often are linked to human activity and summer weather extremes (such as heat waves or droughts).

In an average year, Albania records approximately 200–400 wildfires that burn a total of 1,000–3,000 hectares of land. During extreme fire seasons, however, burn areas can spike dramatically – for instance, in 2011–2012, over 50,000 hectares were scorched each year during severe summer droughts. The most severe recent fire seasons (2007, 2012, 2017) can be attributed to prolonged heat and drought conditions, leading to an abundance of dry fuel. Also, the summer of 2021 was notably severe, with 329 wildfires documented and 31,275 hectares of land burned that year. In the summer of 2022, Albania recorded 887 fire events nationally from June to mid-September, indicative of the severe heat and dry conditions that year.

Primary drivers of wildfire hazard in Albania include both natural and human factors. Prolonged summer droughts, heat waves, and strong winds are natural contributors that increase ignition likelihood and fire spread. These factors have been worsening with climate change, as noted above. However, the overwhelming majority of wildfires in Albania are human-caused (anthropogenic). Studies show that approximately 84% of forest fire events in 2021 were caused by human activities (Lushaj, S., & Kucaj, E., 2024). Common ignition sources are the carelessness of people: unattended campfires, burning of agricultural residues, discarded lit cigarettes, and arson or intentional burning to clear pasture. For instance, shepherds sometimes set fires to regenerate pasture, and illegal clearing of land by fire is a persistent issue. Only a small fraction of fires starts from natural causes (e.g. lightning is rare in summer). According to Albania's NCPA, in 2021, about 31% of fires were deliberately set and the rest were due to negligence or accidents. Enhanced human awareness and behaviour are essential for the reduction of hazards.

In many areas, land-use changes (e.g. farmland abandonment in hilly regions) have led to thick undergrowth and dry biomass accumulation, which increases fire intensity and spread once ignited. Albanian forests, especially pine and shrub communities, can burn intensely if not managed – and lack of vegetation management has been identified as a risk factor by the authorities. Steep and rugged terrain in much of the country (approximately ¾ of Albania is mountainous) further exacerbates the hazard: fires in mountainous terrain spread fast upslope and are difficult for firefighters to access and contain.

In summary, Albania's wildfire risk is marked by recurrent summer fires, significant inter-annual variability, and an increasing tendency of more perilous fire seasons due to climate change. Combination of dry Mediterranean summers and mostly human-caused ignition sources creates a persistent yearly danger and without significant prevention efforts, the country will continually experience huge wildfire catastrophes that may rapidly surpass local response capacities.

VI.2. Exposure to Landscape Fires

Almost the entire territory of Albania is affected by wildfires. 95% of municipalities have experienced at least one forest fire during the last 20 years according to the World Bank report, underscoring the country's widespread vulnerability to fire hazards.

However, the degree of exposure varies by region depending on land cover, land use, and population distribution. It can be emphasized that the environmental exposure is significant, even due to the extensive coverage of fire-prone vegetation across Albania's territory.

The country's forest and pasture lands account for approximately 1.9 million hectares, or 65% of Albania's land area. When agricultural lands are included, roughly 90% of Albania's area consists of natural or agro-ecosystems that could potentially burn. In other words, the vast majority of the landscape – from dense alpine forests to Mediterranean shrubs and grasslands – is exposed to wildfire hazard. This includes

12 National Parks and numerous protected areas (managed by NAPA) that host valuable biodiversity. Wildfires regularly intrude into protected areas as well, "they pose serious threats to protected areas and wildlife habitats", as noted by Albania's environmental agencies. For example, recent fires have impacted several national parks, such as Llogara, Karaburun-Sazan Marine Park, Shebenik, etc., destroying forest habitats and threatening endemic species. Every summer, NAPA and RAPAs have had to deal with multiple fires in national parks. This shows how vulnerable important ecosystems are.

Agricultural assets are also quite sensitive. During severe summers, flames regularly move onto croplands, orchards, and olive groves, causing economic loss for the farmers. It is estimated that 23% of Albania's cropland area is already under medium to high wildfire risk under current climate conditions. This metric – derived from World Bank risk models – highlights that nearly a quarter of agricultural land (e.g. grain fields, olive plantations) lies in zones prone to burning. Notably, fires set to clear stubble or pasture sometimes escape control and burn crops. In summer 2022, for instance, fires burned dozens of hectares of olive groves and vineyards in counties like Fier and Vlora (as documented in damage reports).

In terms of human exposure, Albania's rural population and WUI communities are most at risk. About 35-40% of Albanians live in rural areas (depending on definition) and many villages are adjacent to forests, shrublands, or pasture that can carry fire. Houses on the outskirts of towns abutting wildland are directly exposed when fires encroach. An analysis by the World Bank identified 10 municipalities with the highest wildfire risk – these are largely mountainous, heavily forested areas with dispersed settlements. The most at-risk municipalities include Pukë, Fushë-Arrëz, Mirditë (in the northern Alps), Malësi e Madhe (northwest), Kukës (northeast), Himarë, Delvinë, Finiq (southern coastal mountains), Pustec (southeastern lake region), and Memaliaj (southern interior). Residents in these areas have experienced frequent fires and occasionally needed evacuation. Even in more developed counties, certain pockets face wildfire exposure – e.g. the suburban hills of Tirana and Durrës have seen brushfires threaten homes during dry spells. Overall, tens of thousands of people live in communities that have some level of landscape fire exposure each summer.

It is important to note that while the exposure (in terms of geographic area and population) is broad, the direct economic exposure is relatively limited compared to some hazards. Forest fires primarily affect rural and wildland areas – meaning that large industrial or commercial assets are rarely damaged. Reported economic losses from forest fires have been modest: for example, from 1995–2015 a total of only 13.4 million lek (approx. €134,000) in damage was officially recorded. This figure is low because it accounts mainly for the (undervalued) timber and direct property losses. The indirect and ecological losses, however, are much higher. Landscape fires cause "land degradation, loss of biodiversity, and air pollution (smoke and harmful gases)" that impact communities and natural capital. For instance, soil erosion and landslides often follow fires on steep slopes, threatening infrastructure and livelihoods downstream. Furthermore, when fires encroach on utilities (power lines, etc.) or cultural heritage sites (some archaeological parks are in landscape fire-prone zones), those assets become part of the exposed elements as well.

In conclusion, Albania's exposure to wildfire hazard encompasses a vast portion of its land area and a significant share of its population. Although there are forests or shrublands that can burn in almost every county, the northern and southern highlands are the most vulnerable because to the abundance of combustible vegetation and the intermixed settlements. Agricultural lands and protected areas substantially contribute to the country's exposure profile. Fortunately, Albania's major urban and industrial centres (e.g. Tirana, Durrës) are less directly exposed, which limits potential economic damages – but even those areas suffer indirect impacts (e.g. haze, disrupted tourism) when fires rage in surrounding districts.

Exposure Key Points: Approximately 65% of Albania's territory is forest/pasture and approx. 90% is wildland or farmland susceptible to fires. Nearly every municipality (95%) has experienced fires, with mountainous districts in the north (Shkodër, Kukës, Lezhë) and south (Vlora, Gjirokastër) having the greatest exposure. Thousands of rural homes, farms, and protected areas lie in high-risk zones. A significant portion (23%) of crops is in landscape fire-prone areas.

VI.3. Wildfire Fire Risk Classification and Regional Distribution

Wildfire risk is commonly defined as a function of hazard (likelihood/intensity of fires), exposure (elements at risk), and vulnerability (susceptibility/coping capacity). Using this holistic view, certain regions in Albania can be classified as having higher overall wildfire risk than others. Both national assessments and independent studies have evaluated the spatial distribution of wildfire risk.A 2022 Forest Fire Risk Assessment Report by the NCPA, supported by UNDP, analysed wildfire risk nationally (the RESEAL project) and produced a risk classification map. Similarly, researchers at IGEO (Jaupaj et al., 2023) conducted a five-year study of wildfire forecasts and outcomes by prefecture, creating a Wildfire Hazard Index Map for Albania. These efforts converge on the finding that wildfire risk is not uniform across Albania – it is concentrated in specific areas that consistently experience high fire hazard and have significant values at stake.

According to the wildfire hazard index mapping (2017–2021) by Jaupaj et al. (2023) (figure 36), the highest risk prefectures were Fier, Elbasan, Vlorë, and Dibër. This result reflects both the frequency of high fire danger days and the occurrence of actual fire events in those regions, as well as the local exposure/vulnerability. For example, Fier Prefecture in the southwest has extensive agricultural lands and some lowland forests that see frequent summer fires (some of which are human-caused for land clearing) – it recorded numerous fires in the study period, giving it a top hazard score. Elbasan Prefecture in central Albania includes large forested areas in its eastern part (around Librazhd) plus industrial assets and communities at the WUI, combining high hazard and high exposure. Vlorë Prefecture (southwestern Albania) contains the hot, dry coastal and hilly zones (Himarë, Sarandë, etc.) where severe fires have occurred almost every summer, threatening olive groves, villages, and tourist sites. The Dibër Prefecture, in the northeast, has extensive, repeatedly burned pine forests near the Lurë National Park. This, combined with limited fire response access for its communities, significantly raises the prefecture's fire risk level.Meanwhile, the World Bank's analysis using a network-based risk index (by CIMA Foundation) at the municipality identified 10 high-risk municipalities (mentioned above in section 6.1) and rated most of them at a risk level of 3 or above on a 6-point scale. These are clustered in the northern Alps (Shkodër and Kukës counties) and the southern coastal range (Vlora and Gjirokastër counties). Notably, Shkodër County (containing Pukë, Malësi e Madhe, etc.) and Kukës County (Kukës municipality) are consistently highlighted for high wildfire risk due to dense conifer forests and difficult terrain combined with socio-economic vulnerabilities. Vlorë and Gjirokastër counties (with municipalities like Himarë, Delvinë, Memaliaj) have a history of large fires in shrublands/pine forests and similarly rank high in risk. Figure 37 illustrates these regional risk patterns, with the northern and southern extremes of the country generally facing higher wildfire risk, and the central-western lowlands facing moderate to lower risk.

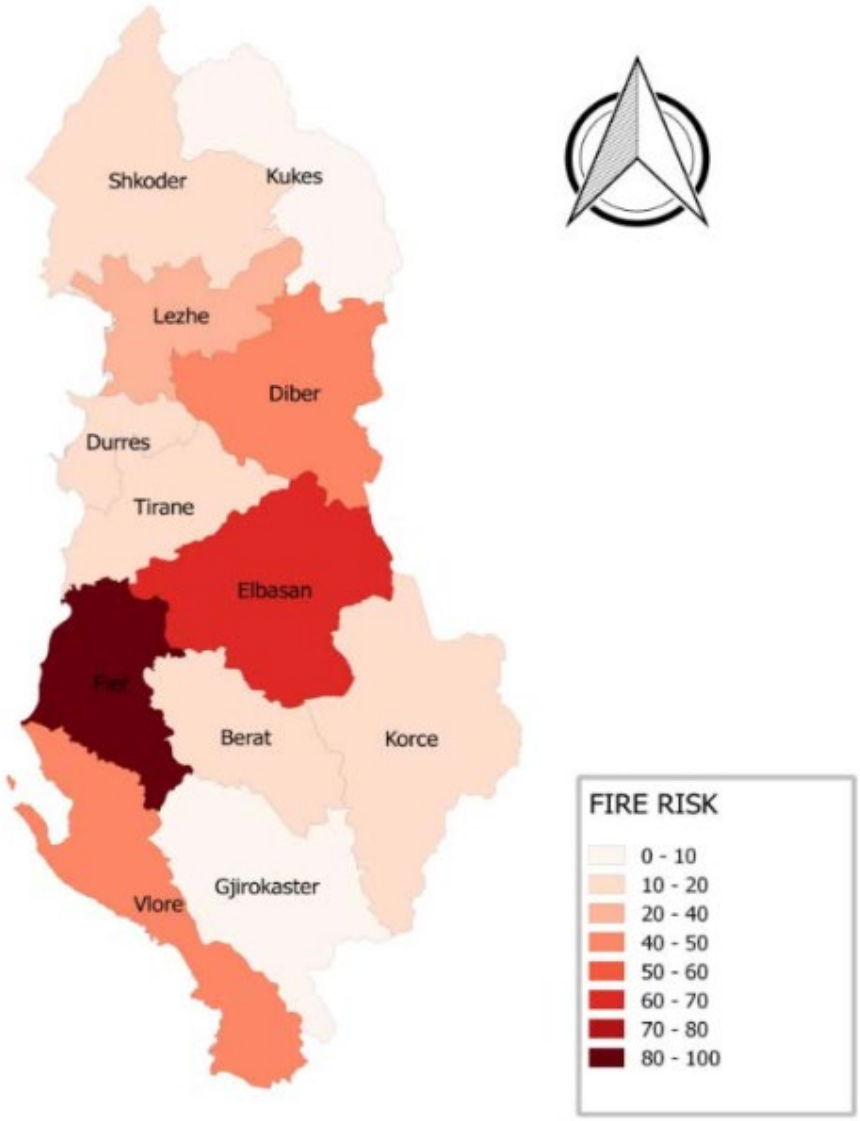


Figure 36. *Fire risk map of Albania.* ***Data source:*** *Jaupaj et al., 2023*

Combining these insights, we can delineate a national wildfire risk classification roughly as follows:

- High-Risk Zones: Mountainous, forest-rich regions with frequent fire weather and limited suppression resources. This includes much of the North (prefectures of Shkodër, Kukës, Lezhë, Dibër) and parts of the South (prefectures of Vlorë, Gjirokastër, and eastern Berat/Elbasan). These areas regularly experience large fires. The presence of villages, infrastructure (roads, transmission lines), and valued ecosystems in these zones means the potential impact is high. For instance, Shkodër had the largest number of fire outbreaks in 2022 (179 fires June–Sept) and one of the largest burnt areas, while Vlorë was close behind (171 fires in the same period) – reflecting their high risk.
- Moderate-Risk Zones: Areas with intermediate fire occurrence and/or lower exposure. Portions of central Albania fall here – e.g. Korçë Prefecture (southeast) has significant forests but also better water availability and less frequent extreme heat, leading to moderate hazard; Berat Prefecture (south-central) has a mix of farmland and forest but fewer large fires historically. Durrës Prefecture (western coastal plain) experiences occasional wildfires in its hinterland hills (e.g. brushfires in Krujë or hills east of Durrës city) but generally on a smaller scale, so risk is moderate.

- Lower-Risk Zones: Predominantly urban or cultivated areas with relatively little wildland. Tirana Prefecture, despite some forested parks and hills, is largely urbanized and benefits from concentrated firefighting resources; it sees few large wildfires (wildfire risk is considered low relative to other regions). Similarly, parts of the low coastal plains (intensively used for agriculture or urban settlements) have less continuous wild vegetation to sustain large fires – these areas have a lower risk profile, though not zero (peat fires in drained marshlands or agricultural fires can still occur).

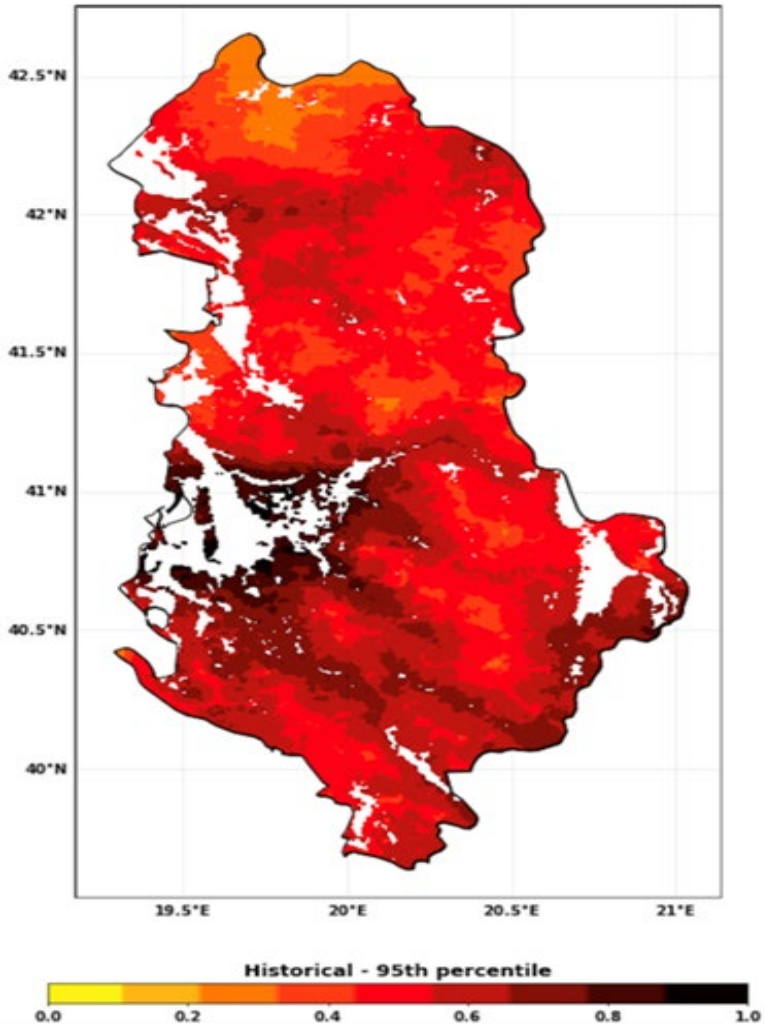


Figure 37. *Fire risk map based on FWI climatological data (20 years) with an original resolution of 0.25 degrees combined with higher resolution data (0.005 degrees) for the Albanian territory provided by Hysa (2021).* ***Data source:*** *UNDP, 2022 – Wildfire risk assessment in Albania*

It is important to emphasize that "lower risk" does not mean "no risk" – even Tirana had brushfires on the outskirts during a 2020 heatwave (quickly controlled), and Durrës has had fires in its pine forest beach areas. But comparatively, the risk index is highest where flammable landscapes, ignition sources, and vulnerabilities coincide: remote rural districts with extensive forests/pastures and limited firefighting capability.

From a national planning perspective, identifying these high-risk zones allows targeted risk reduction measures. For example, the government has prioritized Shkodër, Lezhë, Kukës, and Vlorë counties for new lookout tower installations and community fire education programmes, given their high risk. The NCPA's risk mapping is being used to guide resource allocation, such as pre-positioning army helicopters or heavy machinery near high-risk areas during peak season. Additionally, a national wildfire risk index is being

integrated into spatial planning - developments (like new tourism resorts or infrastructure) in high-risk zones are being required to include fire mitigation (cleared buffer zones, etc.) as a condition for approval.

In conclusion, Albania's wildfire risk is highest in the northern Alpine and southern coastal-mountain belts, moderate in central and eastern regions, and lower in the highly urbanized west. However, given the country's size and the intermixing of human and natural environments, virtually every region must remain vigilant. Wildfire risk is dynamic - a particularly dry summer could elevate the risk even in normally moderate zones. The national risk classification map (in development) will be a living tool that agencies update as conditions change.

Risk Distribution Key Points: High wildfire risk concentrates in forest-heavy mountain areas - notably the Albanian Alps (north) and southeastern mountains - where a combination of frequent fire weather, substantial fuels, and vulnerable communities exists. Central regions have moderate risk, and mainly urban/coastal zones have lower risk. This classification is guiding Albania's mitigation efforts, with emphasis on protecting high-risk communities and landscapes.

VI.4. Vulnerability and Impacts

While the hazard and exposure are high, Albania's vulnerability to wildfires – i.e. the susceptibility of communities and ecosystems and their capacity to cope – is a crucial factor that elevates the overall wildfire risk. Several dimensions of vulnerability are considered: physical, social, institutional, and environmental.

Physical vulnerability in wildfire context refers to how likely assets are to be damaged when exposed. Albanian rural housing stock often consists of older, flammable construction (wooden roofs, etc.) that offer little resistance to encroaching fire or flying embers. Many villages do not have defensible space (cleared vegetation) around structures, increasing the chance of homes igniting if wildfire reaches the settlement. Critical infrastructure in remote areas (such as isolated power lines, small hydropower stations, etc.) is also vulnerable – a wildfire can easily damage wooden poles or cause outages. Cultural heritage sites like hilltop castles or churches set in wildland areas can be scarred by fire due to lack of specific protection measures; the Ministry of Culture has noted that heritage sites surrounded by forests are "rather vulnerable in (forest) fires". On the positive side, the human vulnerability in terms of casualties has historically been low – Albania has not seen large loss of life from wildfires in recent decades, thanks, in part, to effective evacuations and the fact that fires mostly burn wildlands. However, there have been injuries to firefighters and villagers, and the constant threat requires vigilance.

Socio-economic vulnerability is significant, especially among rural and economically disadvantaged populations. Many high-fire-risk areas (e.g. mountain villages in Pukë, Kukës, etc.) have ageing populations and limited economic means. These communities have less capacity to prepare for or recover from fire disasters. For instance, few rural residents have insurance coverage for wildfire damage, and rebuilding a burned home or replanting lost orchards can impose severe financial hardship. Additionally, there is a low level of public awareness of wildfire risk and safety measures. Surveys indicate that "the population is largely unaware of the risks and how to act in case of fire". Until recent years, fire prevention education was minimal. This lack of awareness leads to behaviours that increase vulnerability – such as improper burning of debris, failure to clear flammable materials around homes, or attempting late evacuation. Cultural practices (like lighting outdoor fires) persist without adequate precaution. Recognizing this, NCPA and partners have begun public awareness campaigns to build a "culture of prevention", but it remains a challenge. Another aspect of social vulnerability is health: wildfire smoke can affect large populations even outside the burn area. During the severe fires of 2021-2022, thick smoke blanketed cities like Tirana and Shkodër on some days, exacerbating respiratory issues especially for vulnerable groups (elderly, children). The health sector must be prepared for such indirect impacts.

Institutional vulnerability (and capacity) is a critical issue identified in Albania's disaster risk management system. Responsibility for fire management is shared across several bodies: municipal Fire Protection

and Rescue Services (urban fire brigades), forest service entities (under the Ministry of Environment or Agriculture) for forest monitoring, the National Civil Protection Agency (NCPA under the Ministry of Defence) for large-scale emergency coordination, and the National Agency of Protected Areas (NAPA) for fires inside protected areas. While the framework exists, these institutions face resource and coordination constraints:

- *Under-resourced local firefighting units*. Each municipality is the first responder to fires in its territory, but many lack adequate equipment (fire engines capable of off-road use, water tanks, personal protective gear) and have limited personnel. Fire stations in rural areas are few and far between; response times to remote villages or forested mountains can be long. As the World Bank observed, "municipalities still lack the capacity and institutional structures to effectively fulfil their mandate to prevent and mitigate incidents", leading to frequent need for national assistance. For example, during the 2021 fires, the Albanian Armed Forces and NCPA had to intervene in dozens of incidents that local services could not handle.
- *Underdeveloped early warning and monitoring systems*. Albania does not yet have a nationwide automated wildfire detection network (e.g. lookout towers with cameras or satellite-based alert system integrated domestically). The Institute of GeoSciences (IGEO) does produce a daily Wildfire Risk Forecast (WRF) using the European RISICO fire danger model, disseminating maps of high-risk areas to AKMC and local authorities. However, on-the-ground monitoring is mostly manual. The National Civil Protection Strategy notes "Albania does not yet have a permanent monitoring and signalling network for forests". This gap means some fires are reported late, when they are already large. It also hampers strategic preparedness (knowing when/where to pre-position firefighting resources).
- *Coordination between agencies and levels of government needs improvement*. The current system has been described as lacking a centralized mechanism for fire emergency management. In practice, multiple agencies may operate in silos – forest authorities, local fire brigades, military units, and volunteers might all tackle a fire with only ad hoc coordination. Recent reforms (the 2019 Law on Civil Protection) aim to strengthen unified command under NCPA for large emergencies, but implementation is ongoing. During the 2022 fires, reports noted some confusion in roles between municipalities and prefectures in mobilizing resources. The Civil Emergency Plans at county and municipal levels are being updated to explicitly address wildfire scenarios, which should reduce this vulnerability over time.
- *Limited financial and logistical capacity*. Firefighting in Albania relies mostly on ground crews. The country does not own dedicated water-bomber aircraft; it must request aerial firefighting support through the EU Civil Protection Mechanism in major emergencies (as it did in 2021 when EU partners sent helicopters to assist). Budget allocations for wildfire management have historically been modest - "investments in fire protection are limited, and there is a need for dedicated funds for forest fire risk management". Limited budget affects everything from firefighter training (many local personnel have not received specialized wildland fire training) to fuel management (little funding for prescribed burning or mechanical thinning of forests). This makes the country more vulnerable when extreme conditions strike.

Environmental vulnerability overlaps with hazard, but it is worth noting that certain Albanian ecosystems are more fire-prone and less resilient. For instance, the pine forests in the mountainous south (e.g. in Gjirokastër and Vlora counties) contain highly resinous tree species that can lead to crown fires. After a severe burn, these areas may suffer from erosion and be slow to regenerate, extending the environmental damage. Additionally, invasive flammable grasses can colonize burned areas, increasing the possibility for future ignitions. The combination of extended summer drought, heat, and terrain (steep slopes) means that once a fire starts in these ecosystems, it can quickly become intense and outpace suppression efforts. As noted by Lushaj, S., & Kucaj, E., (2024), "high temperature and low rainfall during the summer, as well as the lack of tools [and] mountainous terrain" made fire extinguishing difficult in recent events – leading to larger burn scars and more damage to soil and watersheds.

The impacts of landscape fires in Albania, given the vulnerabilities above, can be summarized as follows:

- *Ecological Impacts*: Land degradation, loss of forest cover and biodiversity are significant outcomes. Each year, thousands of hectares of forest are degraded by fire; between 2001 and 2023, Albania

lost approximately 19.8 thousand hectares of tree cover due to fires (second only to illegal logging as a cause of deforestation). Fires threaten endangered fauna (e.g. Balkan lynx habitat) and release carbon emissions. Recovery is slow – natural forest regeneration on burned land can take decades, and invasive species often take hold, altering habitats.

- *Economic Impacts*: Direct economic losses have been moderate (e.g. a few million Euros per decade in timber, crop, and property damage), but indirect losses are larger. Wildfires affect livestock pasture (farmers can lose grazing for seasons), reduce tourism appeal (scenic areas charred, outdoor recreation curtailed in fire season), and impose firefighting costs. A World Bank analysis suggests the increasing fire activity and heat extremes could harm agriculture and infrastructure if trends continue - for instance, by 2050, climate change may reduce annual rainfall 10% and increase drought periods, which "will increase the risk of fires and damage to agriculture and infrastructure".
- *Social Impacts*: Wildfires occasionally force evacuations of villages. They also pose health risks from smoke. The psychological impact on rural residents - seeing traditional forests and pastures destroyed - is not negligible. On the other hand, Albania has not experienced wildfire-related mass casualties, which is a testament to the response efforts and perhaps a bit of luck with wind patterns keeping fires away from dense settlements.

In terms of capacity to adapt or cope, Albania is taking steps to reduce vulnerability. The government's National Strategy for Disaster Risk Reduction 2023-2030 emphasizes improving wildfire risk assessment and planning, including a recommendation to "draft a document on wildfire risk in Albania that includes a risk map, as an instrument for spatial planning and development". Strategic projects are underway to strengthen firefighting capacities - for example, acquiring modern equipment for municipal fire services, training volunteer firefighters, and developing an EU-standard wildfire response module. There are also reforestation and forest management programmes aimed at restoring burned areas and creating fuel breaks (led by the Ministry of Environment with international support). Over time, these measures should reduce vulnerability by making communities more resilient and fires easier to contain.

Vulnerability Key Points: Albania's wildfire vulnerability is heightened by limited firefighting resources and difficult terrain, as well as low public awareness and preparedness. Rural communities have scarce capacity to cope financially with fire losses, and ecosystems are fragile in the face of repeated burns. However, ongoing reforms (civil protection strengthening, community education, etc.) aim to mitigate these vulnerabilities. The lack of fatalities in recent fire events reflects some resilience, but the escalating fire regimes pose a serious test to Albania's adaptive capacity.

VI.5. Conclusion

The fire risk profile of Albania's landscape is shaped by the interplay of its Mediterranean climate, topography, and human activities. The interplay of extended dry seasons, elevated temperatures, and land abandonment has heightened fire vulnerability across various regions, especially in the northern and southeastern mountainous areas and along mid-elevation forest-pasture mosaics.

The national risk assessment, utilizing data from official sources and EFFIS, indicates a consistent increase in fire frequency and burned areas over the last twenty years. Annual variability is influenced by weather extremes. However, the exposure of vegetation and human assets remains consistently elevated. Socio-economic vulnerability, particularly in rural municipalities with constrained firefighting resources, exacerbates risk.

Despite advancements in mapping and early-warning systems, several structural deficiencies remain, including fragmented data collection, inadequate integration of remote sensing products, and insufficient validation of local vulnerability indicators. Addressing these gaps necessitates ongoing collaboration among scientific institutions, national agencies, and municipalities, as well as the implementation of standardized methodologies aligned with the EU Civil Protection Mechanism framework.

VII. Existing Projects

For many years already, Albania has participated in various national and international initiatives focused on wildfire risk management. These encompass cross-border initiatives such as FIRE-PREP, DISSIWMS, and TO BE READY, regional programmes including IPA Floods & Fires, as well as national efforts like RESEAL and EU-World Bank technical assistance for fire risk management. Projects emphasize early warning systems, equipment enhancements, cross-border collaboration, training initiatives, and community-driven restoration methods, such as drone seeding. Their collective efforts have improved Albania's preparedness, bolstered institutional capacity, and fostered innovative strategies for wildfire prevention and recovery.

VII.1. Cross-Border Cooperation Projects

Project title	**Improved Forest FIRE PREParedness in Greece and Albania (FIRE-PREP)**
Status	Finished (2022)
Duration	July 2020 – December 2022
Budget	€2,499,235.98 total
Donor	European Union (Interreg IPA CBC Greece–Albania 2014–2020)
Implementers	Municipality of Berat (Lead Partner, Albania); Ministry of Defence – National Civil Protection Agency (Albania); Ministry of Environment (Albania); Hellenic Fire Corps Headquarters (Greece)
Description	Enhanced Albania–Greece cooperation on wildfires through joint training, new 4×4 forest fire engines, rehab of fire station infrastructure, and coordinated preparedness planning
Link	https://keep.eu/projects/24270/Improved-Forest-FIRE-PREPar-EN/#:~:text=Project%20name%20,PREP

Project title	**Developing & Implementing Smart and Sustainable Integrated Wildfire Management System (DISSIWMS)**
Status	Finished (2024)
Duration	Jan 2022 – Dec 2024
Budget	€946,285 total
Donor(s)	European Union (Interreg IPA CBC North Macedonia–Albania 2014–2020)
Implementers	Protection and Rescue Directorate of N. Macedonia (Lead) with Albania's National Civil Protection Agency (Ministry of Defence) and local firefighting units in Struga (MK) and Librazhd (AL)
Description	Established a joint ICT-based early warning system for forest fires (including drones, sensors/cameras on Mount Jablanica), renovated fire command centres in Librazhd and Struga, and conducted cross-border wildfire training and exercises
Link	https://keep.eu/projects/30864/Developing-and-Implementing- EN/#:~:text=Summary%20of%20the%20achieved%20results%3A, integrated%20system%20with%20complete%20equipmentintegrated%20system%20with%20complete %20equipment"

Project title	"TO BE READY" The flood, big fire forest, prediction, forecast and emergency management
Status	Finished (2022)
Duration	2019 – 2022
Budget	€5,893,686.49 total
Donor(s)	European Union (Interreg IPA CBC Italy–Albania–Montenegro 2014–2020)
Implementers	Lead – Civil Protection Department of Molise Region (Italy); Partners – Civil Protection of Puglia Region (Italy), Ministry of Interior – Directorate for Emergency Situations (Montenegro), Ministry of Defence (Albania); plus, Albanian Ministry of Interior as associate partner
Description	Developed joint wildfire and flood emergency management protocols and training across Italy, Albania, Montenegro. Delivered a shared prevention & intervention model for forest fires, a transnational network of disaster-response operators, and an ICT platform for cross-border risk data sharing
Link	https://toberready.italy-albania-montenegro.eu/#:~:text=Status

VII.2. Regional Programmes and Multi-Country Initiatives

Project title	RES2FIRE – Models and Tools for Enhancing the Resistance and the Resilience to Wildfire in Natural Protected Areas and Wildland-Urban Interfaces
Status	Ongoing
Duration	01 July 2024 – 30 June 2027
Budget	€1,192,509.38 total
Donor	European Union / INTERREG IPA ADRION Programme - the transnational cooperation programme for the Adriatic-Ionian region.
Implementers	A consortium of 9 partners from several countries. According to the project's partner list: Centre of Integrated Geomorphology for the Mediterranean Area (Italy) - Lead Partner; Institute for Protection and Ecology of the Republic of Srpska (Bosnia and Herzegovina); AVMap GIS Digital Applications S.A. (Greece); KREO Association (Albania); University of Western Macedonia (Greece); Municipality of Kočani (North Macedonia); Institute for Development and Innovation (Serbia); Prlekija Development Agency (Slovenia); Kozara National Park (Bosnia and Herzegovina)
Description	The RES2FIRE overall objective is to harmonize and transfer models and tools for climate change adaptation by increasing resilience to forest fires. This addresses the need for spatial planners, forest managers and decision makers in the IPA ADRION region to adopt a more effective knowledge framework for prevention and preparedness aimed at reducing the risk of forest fires. The expected change will be an improved institutional capacity to reduce the spread and severity of forest fires especially in the IPA countries.
Link	https://res2fire.interreg-ipa-adrion.eu/

Project title	IPA FLOODS AND FIRES - EU support to flood prevention and forest fires risk management in the Western Balkans and Turkey
Status	Finished (June 2024)
Duration	2020 – 2023 (36 months)
Budget	€5,000,000 total
Donor(s)	European Commission (DG ECHO, under EU Civil Protection Mechanism)
Implementers	Consortium led by the Italian Civil Protection Department, with civil protection agencies from Sweden, Slovenia, Romania, the Czech Republic (Moravian-Silesian FRS), plus CIMA Research Foundation (Italy) and others
Beneficiaries	Albania and five other Western Balkans & Turkey
Description	Strengthened regional capacities for flood and forest fire risk management. In Albania, technical assistance for wildfire risk assessment was provided, Ground Forest Fire Fighting (GFFF) modules and cross-border fire response protocols were established, and regional wildfire exercises were organized
Link	https://www.euzatebe.rs/en/eu-programs/ipa-flood-and-fires#:~:text=Officially%20launched%20in%20November%202020%2C, that%20unfolds%20for%2036%20months

VII.3. National Capacity Building Projects

Project title	Resilience Strengthening in Albania (RESEAL)
Status	Ongoing (Phase I 2020–2024; extended to 2026)
Duration	Jul 2020 – Dec 2026
Budget	€4,666,266 total
Donor(s)	Government of Albania, Government of Sweden (Sida), Government of Portugal and UNDP
Implementers	United Nations Development Programme (UNDP), in partnership with Albania's National Civil Protection Agency (Ministry of Defence)
Description	A comprehensive Disaster Risk Management capacity project with significant wildfire components. RESEAL has supported the development of Albania's National Disaster Risk Reduction Strategy 2023–2030 and Civil Emergency Plan, delivered a fully equipped mobile command centre for wildfire response, and conducted large-scale wildfire simulation exercises (e.g. "Pishë-Poro 2024") to test inter-agency readiness. It also invested in training, equipment upgrades, and Albania's successful integration into the EU Civil Protection Mechanism in 2023
Link	https://www.undp.org/albania/projects/resilience-strengthening-albania-reseal#:~:text=

Project title	Strengthening Fire Risk Management and Search & Rescue Capacity
Status	Ongoing
Duration	September 2024 – August 2026
Budget	€500,000 total (EU grant through UCPM Technical Assistance Facility)
Donor(s)	European Commission (DG ECHO) in partnership with World Bank GFDRR
Implementers	World Bank (GFDRR) in cooperation with Albania's Ministry of Interior and National Civil Protection Agency
Description	A targeted project assessing Albania's firefighting and rescue services and formulating a national roadmap to strengthen wildfire management. It reviews Albania's fire protection capacity, maps wildfire risks, recommends investments (equipment, training, community engagement), and lays groundwork for a larger follow-up investment in modernizing Albania's fire and search-and-rescue capabilities (Part of the EU–World Bank TAFF initiative to bolster disaster preparedness).
Link	https://www.gfdrr.org/sites/default/files/2024-10/TAFF_2024_Project%20Fiche_Albania_Oct.pdf

Project title	National Forest Fire Information System (NFFIS) and Nature-based Solutions for Disaster Risk Reduction (NbS-DRR)
Status	Ongoing
Duration	June 2024 – June 2029
Budget	N/A
Donor(s)	Japan International Cooperation Agency (JICA)
Implementers	National Civil Protection Agency
Description	A 5-year project supporting Albania in creating an integrated emergency management system in the country and develop the capacities of government agencies for early warning for forest fires and other natural disasters. Through this Technical Cooperation Project, Japanese experts will be dispatched to Albania, for assisting NCPA in implementing the National Forest Fire Information System (NFFIS) and adopting Nature-based Solutions for Disaster Risk Reduction (NbS-DRR). Through Project activities, nature-based solutions will be introduced through piloting in Bovilla water catchment area, water storage for the capital Tirana. Aiming at disaster risk reduction, a stabilization of soil runoff and sedimentation in the basin would be targeted. NFFIS is expected to be developed, tested, and operationalized to monitor forest fires. Institutionalization of NFFIS and NbS-DRR and civil protection in Albania is expected to contribute to regional and global frameworks such as Western Balkans Cooperation Initiative, EU Civil Protection Mechanism, and Forest Europe process.
Link	https://www.jica.go.jp/about/basic/structure/overseas/balkan/others/__icsFiles/afieldfile /2025/03/11/JICA_Albania_202412_1.pdf

Project title	ALBAdapt - Climate Services for a Resilient Albania
Status	Ongoing
Duration	July 2024 – June 2031
Budget	$ 40.3 million
Donor(s)	Green Climate Fund (GCF), Government of Germany (through GIZ), Swiss Government (SECO/SDC), Government of Albania
Implementers	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH (Accredited & Executing Entity) in partnership with Albanian institutions including the National Civil Protection Agency (NCPA) and the Institute of Geosciences (IGEO)
Description	This project addresses these challenges by promoting the generation, coordination, and effective use of climate information across various development sectors. It aims to establish a National Framework for Climate Services (NFCS) and develop a fully functional and well-resourced National Meteorological and Hydrological Service (NMHS) that complies with World Meteorological Organization (WMO) standards. The project also includes the implementation of a people-cantered Multi-Hazard Early Warning System (MHEWS) and the foundation for ecosystem-based approaches to climate change adaptation (EbA) and disaster risk reduction (Eco-DRR).
Link	https://www.greenclimate.fund/project/sap041

Project title	Piloting Direct Seeding with Aerial Drones for Forest Fire Restoration
Status	Finished (2024)
Duration	Jul 2023 – Sep 2024
Budget	€40,000 total (GEF Small Grants Programme)
Donor(s)	Global Environment Facility – Small Grants Programme (UNDP)
Implementers	"MEET" Centre (local environmental NGO in Korçë), with support from UNDP/GEF SGP
Description	An innovative community-based project that reforested 200 ha of fire-scarred land using seed-bombing drones. It tested drone dispersal of tree seeds (coated vs. uncoated) over burned forest areas in Korça, engaging local volunteers and students in seed collection and monitoring.
Link	https://sgp.undp.org/spacial-itemid-projects-landing-page/spacial-itemid-project-search-results/spacial-itemid-project-detailpage.html?view=projectdetail&id=32830#:~:text=%20Start%20Date%3A

VIII. Swot Analysis

A SWOT Analysis (Strengths, Weaknesses, Opportunities, and Threats) serves as a strategic tool in environmental and disaster management planning, facilitating the evaluation of internal and external factors that impact system performance. In LFM, SWOT functions as a diagnostic framework that identifies effective elements within the national system, highlights gaps and limitations, and assesses how external factors – such as policy reforms, international support, or climate change – may influence future outcomes.

The Strengths denote the internal capacities, assets, and institutional mechanisms of the system that improve effectiveness, including a clear legal framework, inter-agency coordination, and established operational infrastructure. Weaknesses denote internal limitations or deficiencies that hinder performance, such as resource shortages, fragmented data systems, or inadequate technical expertise. Conversely, Opportunities encompass external enabling factors, including access to European cooperation programmes, technological innovations, and international capacity-building initiatives, which can be utilized to enhance the system. Threats include external risks or pressures that could hinder progress, such as the impacts of climate change, socio-economic decline in rural regions, and the rising frequency and intensity of fires.

The SWOT approach systematically analyzes four dimensions, offering a comprehensive overview of Albania's landscape fire management system by integrating institutional, operational, ecological, and social perspectives. This approach enables stakeholders to transcend isolated observations and perceive the system as an interdependent structure characterized by the dynamic interaction of policies, capacities, and environmental conditions.

This analysis provides the basis for the strategic guidelines outlined in the following chapter, ensuring that the recommendations are grounded in evidence, tailored to the context, and consistent with national priorities and best international practices. The SWOT framework effectively converts complexity into actionable insights, thereby assisting Albania in enhancing its development of an integrated, risk-informed, and climate-resilient fire management system.

VIII.1. Prevention

The prevention phase in Albania is supported by a robust legislative framework and the predominance of publicly owned forests, which theoretically facilitates coordinated risk reduction measures. Significant strengths encompass the presence of legislation and strategies focused on fire prevention, as well as the capacity to execute these measures on state-managed lands. Enforcement gaps and limited public awareness – considering that most fires are human-caused – and inadequate vegetation management have impeded prevention efforts. There are opportunities to utilize international support, engage the community, and implement modern techniques, such as fire-resilient landscaping and enhanced enforcement, to enhance prevention efforts. Simultaneously, increasing climate risks, characterized by extended and intensified fire seasons, along with enduring practices such as agricultural burning, continue to threaten effective prevention efforts in Albania.

Strengths	Weaknesses
- Comprehensive legal framework: Albania has laws on forests, pastures, civil emergencies, and fire protection that mandate preventive measures. - Predominantly public forest ownership: (around 97% state-owned), enabling centralized implementation of prevention strategies. - Presence of institutional structures (forestry agencies, civil protection) responsible for fire prevention and monitoring. - Hazard risk assessment and planning efforts exist (e.g. protected area management plans include fire risk measures). - Rising stakeholder awareness and periodic public campaigns on fire risks (multi-agency and NGO initiatives).	- **Inadequate enforcement of preventive regulations**: Legal provisions are not consistently implemented at local levels, often existing only nominally. - **Limited public awareness and cultural practices**: Numerous fires originate from negligence or intentional field burning, highlighting deficiencies in public education. - **Insufficient prevention measures**: Lack of early-warning systems, biomass fuel reduction, low forest accessibility etc. - **Insufficient resources for prevention**: Budget allocations for preventive measures, such as clearing fire breaks and community outreach, are limited, with most resources directed towards reactive responses. - **Overlapping responsibilities and coordination deficiencies**: Multiple institutions (forestry, environment, municipalities) are responsible for prevention duties, resulting in communication challenges and inconsistent local implementation.
Opportunities	**Threats**
- International support and funding: Leverage EU and international programmes (EU Civil Protection Mechanism, World Bank, etc.) to finance and strengthen fire prevention projects. - Public awareness campaigns: Expand education, training, and community engagement (e.g. involve schools, local volunteers) to change fire-use practices and promote a culture of prevention. - Improved technology: Adopt new tools like remote sensing, GIS-based fire risk mapping, and drone surveillance for early detection of ignitions in high-risk areas. - Afforestation and land management: Implement afforestation/reforestation with fire-resilient species and maintain fuel breaks (especially in the wildland-urban interface) to reduce future fire risk. - Legal and policy enhancements: Strengthen penalties for illegal burning and arson and harmonize overlapping laws to create a clear, enforceable national wildfire prevention plan.	- **Climate change:** Warming temperatures and more frequent droughts are lengthening the fire season and increasing fire weather extremes, heightening the risk of large fires despite prevention efforts. - **Human factors and negligence:** Continued use of fire for land clearing (agricultural residue burning, pasture renewal) and instances of arson remain a constant threat, as human activity ignites most wildfires. - **Rural depopulation:** Ongoing migration from rural areas can lead to land abandonment, resulting in unchecked accumulation of vegetation (fuel) and fewer local stewards, which exacerbates fire danger in neglected landscapes. - **Economic and political constraints:** Economic hardship or shifting political priorities could reduce funding and attention for preventive measures, undermining long-term fire risk reduction. - **Expansion of the wildland-urban interface:** Development and illegal construction at the edges of forests increase ignition sources and the number of people and properties exposed to fires, complicating prevention and enforcement efforts.

VIII.2. Preparedness

Albania has taken gradual improvement steps regarding preparedness through a reformed disaster risk management system and investments in equipment, yet significant weaknesses persist. In 2019, the National Civil Protection Agency was established, and the country has been integrated into European systems (EU Civil Protection Mechanism) since, indicating the strengths that provide the foundation for organized preparedness. However, there exist weaknesses such as underdeveloped early warning systems, uneven local response capacities and weak inter-institutional coordination. These weaknesses often make small fires escalating without prompt action and local authorities frequently require national assistance. To strengthen preparedness, important opportunities exist through international funding, advanced technologies and regional training collaborations. Yet, threats such as rugged terrain, increasingly extreme fire seasons, and limited financial resources continue to challenge Albania's readiness to effectively respond to wildfires.

Strengths	Weaknesses
- Established civil protection framework: Law 45/2019 created a contemporary structure for disaster management, including the National Civil Protection Agency (NCPA), to coordinate preparedness and response. - Institutional setup: Dedicated agencies like NCPA, NFA and NAPA have mandates in fire management, providing a basis for organized preparedness. - Some equipment upgrades: In recent years, local firefighting units have received new fire engines and gear through government and donor programmes, improving capacity in certain municipalities. - Access to data and forecasts: Albania benefits from regional early-warning tools (e.g. EFFIS fire danger forecasts) and has some statistics/ databases to inform planning. - EU integration: As a member of the EU Civil Protection Mechanism, Albania can participate in training, knowledge exchange, and receive rapid international assistance when needed, enhancing overall preparedness.	- **Incomplete early warning system**: The country's wildfire early warning and monitoring system is not yet fully developed, lacking modern technology, robust infrastructure, and comprehensive data collection for fire risk monitoring. - **Insufficient local capacity**: Many municipal fire/ rescue services lack adequate training, personnel, and specialty equipment for wildland fires. Even with some improvements, local units often struggle to handle incidents without external support. - **Coordination gaps**: There is no strong centralized coordination mechanism specifically for wildfire emergencies – cooperation between national and local authorities can be ad hoc, and roles and protocols among institutions are sometimes unclear. - **Resource limitations**: Funding for preparedness is limited – the national budget for civil protection is often insufficient for extensive training programmes, public drills, or maintaining equipment, leading to gaps in readiness at all levels. - **Data and knowledge shortfalls**: A centralized database of fire incidents and impacts is lacking or is not regularly updated, which makes it difficult to learn from past fires or strategically plan preparedness measures.

Opportunities	Threats
- International capacity-building: Leverage donor projects and partnerships (e.g. World Bank/ GFDRR technical assistance, UNDP, etc.) to train firefighters, develop risk maps, and improve institutional coordination. - Advanced technology adoption: Implement modern tools such as drones for early fire detection and reconnaissance, satellite-based fire monitoring, and improved communication systems to boost preparedness and situational awareness. - Regional cooperation: Enhance collaboration with neighbouring countries for joint training exercises, information exchange, and mutual aid agreements (building on Albania's existing regional agreements) to collectively improve readiness. - Community engagement: Develop volunteer firefighter networks and community education programmes – tapping local knowledge and willingness to help can improve initial attack and preparedness in remote areas (e.g. forming local brigades, volunteer ranger programmes). - Policy improvement: Update and enforce building codes and land-use planning in fire-prone areas (e.g. creating defensible space around settlements) and integrate climate change scenarios into disaster planning to future-proof preparedness efforts.	- **Challenging terrain**: Albania's mountainous, rugged geography means many fire-prone areas are hard to access. Remote villages and steep forests are difficult to cover in preparedness plans and pose serious challenges during real emergencies. - **Climate change impacts**: More frequent heatwaves, longer dry spells, and high winds are increasing the likelihood of severe wildfires that test the limits of current preparedness measures. Extreme conditions may outpace the scenarios for which plans have been made. - **Concurrent disasters and strain on resources**: Albania faces multiple hazards (earthquakes, floods, etc.); a major wildfire season could coincide with other emergencies, straining limited emergency resources and diverting attention from wildfire preparedness. - **Financial and economic constraints**: Economic downturns or competing budget priorities can threaten sustained investment in training, equipment maintenance, and preparedness programmes, leaving plans under-resourced when needed most. - **Social factors**: Migration and demographic changes (youth moving abroad or to cities) reduce the pool of volunteers and local expertise. Meanwhile, expanding settlements in wildfire-prone areas (often informally) increase the vulnerable population and complicate evacuation and preparedness logistics.

VIII.3. Suppression

During the suppression phase, Albania utilizes a mix of local firefighting units and national-level assistance to address wildfires. Principal strengths include the network of local fire brigades, which are established in every district, and the capacity to deploy military forces and international aid during extensive fires. These provide a foundation for response initiatives. Nonetheless, firefighting capability is compromised by considerable deficiencies: equipment often lacks modernization, staff levels and specialized training are inadequate, and the nation's challenging topography hinders prompt suppression in several regions. Despite these limitations, there are possibilities to increase suppression capacities through advanced technology (drones, 4x4 fire engines), regional collaboration and investments in LFM infrastructure and training. Firefighting has become more difficult. In case of intense fire seasons with several concurrent ignitions may overwhelm the capacity of the present response system. Also, fire control initiatives may be rendered ineffective in the event of future extensive conflagrations if financial resources and adjustments are not allocated in a timely manner.

Strengths	Weaknesses
- Established firefighting structure: Every municipality in Albania has a firefighting unit (first responders), providing a basic nationwide response network for fire outbreaks. - National support mechanisms: The National Civil Protection Agency and Ministry of Defence can coordinate large-scale responses, mobilizing additional forces (including army personnel and helicopters) when local units are overwhelmed. - International aid agreements: Albania has formal agreements and good cooperation with neighbouring countries (e.g. Italy, Greece, Turkey) to receive aerial firefighting assistance (water bomber aircraft, helicopters) during major wildfires. Being part of the EU's civil protection network allows rapid access to assistance in crises. - Emergency communication: The 112-emergency call system is in operation, enabling the public to quickly report fires and mobilize responders, which is crucial for swift suppression. - Experienced personnel: A core of professional firefighters and officers has experience with wildland fires. Their local knowledge of terrain and fire behaviour, though not uniform nationwide, has been valuable in past incidents.	- **Outdated equipment and infrastructure:** Many firefighting units rely on old or inadequately maintained trucks, pumps, and gear. Firefighting equipment is often obsolete and insufficient, hampering effective suppression and firefighter safety. - **Limited aerial firefighting capacity:** Albania possesses very limited dedicated aerial resources (no fire-dedicated airplanes and only a few helicopters). This means the country must depend on external assistance for air support, causing delays when multiple big fires erupt simultaneously. - **Insufficient personnel and training:** There is a shortage of specialized wildfire personnel. Smaller municipalities have few firefighters, and overall manpower is stretched thin during peak fire periods. Training in wildland fire tactics and safety is not yet at optimal levels across all units. - **Difficult terrain and access issues:** The country's mountainous topography and lack of forest road access in some regions make it hard for ground crews to reach and contain fires quickly. Remote fires often spread longer before any intervention can arrive. - **Coordination and communication issues:** During major incidents, coordination between various agencies (local fire brigades, civil protection, military, forest service) can be challenging. Differences in communication systems and unclear incident command structures have led to less efficient suppression efforts in some cases.

Opportunities	Threats
- Modernization investments: Upcoming projects and funding (e.g. the World Bank/GFDRR initiative) offer a chance to upgrade firefighting infrastructure – acquiring modern firefighting vehicles, protective equipment, and building new fire stations to improve response coverage. - Technological aids: Embrace new technologies such as drones for real-time fire mapping and hotspot detection, satellite-based fire monitoring for situational awareness, and use of fire retardants or other innovative suppression techniques to increase effectiveness. - Regional and international cooperation: Strengthen joint firefighting exercises and mutual aid with neighbouring countries. Participating in EU-organized training or regional drills can improve skills. In emergencies, quicker deployment of EU and regional assistance (through the EU Mechanism or bilateral ties) can be ensured by pre-planning and agreements. - Community involvement: Engage local communities in suppression efforts – for instance, training volunteer firefighting teams in rural villages and establishing community fire watch programmes could provide an auxiliary force and early alerts in remote areas. - Integrated fire management: Use suppression planning as part of a broader strategy – e.g. create fuel breaks and water points in high-risk zones, integrate grazing or controlled burns to reduce fuels, so that when fires do occur, they are easier to contain.	- **Severe fire seasons:** Climate projections indicate longer and more intense fire seasons for Albania. In years with extreme heat and drought, the number and size of wildfires could overwhelm even an improved suppression capacity, leading to greater losses. In 2021, for example, 329 wildfires burned over 31,000 hectares, straining responders. - **Multiple simultaneous events:** The possibility of many fires igniting in different regions at once (due to lightning storms or human causes in heatwaves) is a major threat – resources can be stretched thin, leaving some fires inadequately attended and growing larger. - **Funding instability:** If economic conditions or political changes curtail the promised investments in firefighting, the modernization of equipment and hiring of personnel may fall behind the rising demand. Lack of maintenance or funding for fuel (for trucks, aircraft) can also cripple suppression efforts when they are most needed. - **Firefighter safety and attrition:** More intense fires pose greater risk to firefighters' lives. Hazardous conditions (including unexploded ordnance in certain former military areas or landmine zones) and extreme fire behaviour can lead to accidents. High risk and burnout could result in experienced crew members leaving, reducing the effective forces available. - **Environmental factors:** High winds and rough terrain can negate even well-prepared suppression plans by rapidly spreading fires beyond containment lines. Additionally, any failure in communication systems (possibly due to fire damage to infrastructure) during an incident could severely hamper coordinated suppression efforts.

VIII.4. Post-Fire Management

Although it is still the least developed phase of the fire management cycle, post-fire management and recovery is becoming more widely acknowledged in Albania as an essential step. Emerging strengths include current protected-area management regimes that recognize the need for restoration and experimental replanting projects. The rehabilitation of burnt landscapes faces several challenges,, such as insufficient coordination, limited funding and resources for replanting, and inadequate technical expertise for large-scale ecosystem restoration. Post-fire recovery strategies are systematically constrained. Albania can improve post-fire management through the implementation of global restoration initiatives, the application of innovative, cost-effective rehabilitation techniques, and the involvement of NGOs and local

communities in replanting efforts. Failure to act at this juncture presents a significant risk. Consequently, areas affected by fires will face negative and irreversible impacts that are likely to exacerbate due to climate change. Additionally, failure to restore forests in a timely manner may lead to an increase in invasive species or unauthorized land-use changes following fire events. To ensure the complete recovery of Albania's ecosystems and communities from wildfires, it is essential to enhance post-fire management strategies.

Strengths	Weaknesses
- Recognition of restoration needs: There is growing awareness at policy and community levels that burned areas require active management. Recent large fires have spurred initiatives to rehabilitate affected sites (e.g. national calls for tree planting after fires). - Pilot reforestation projects: Innovative projects have begun, such as the 2023 *Pishë-Poro* forest restoration pilot using seed balls, marking the first use of a low-cost afforestation method in Albania. These pilots provide experience and hope for scalable restoration techniques. - Protected area frameworks: Many of Albania's national parks and protected landscapes have management plans that include post-fire restoration guidelines, which can be activated when fires occur. This provides a template for response in ecologically important areas. - Human capital for recovery: Albania's academic institutions, environmental NGOs, and volunteer networks (youth and student groups) are a potential asset – they have shown willingness to participate in post-fire activities (e.g. volunteering for tree planting and erosion control), which can be built upon. - Legal provisions: Existing forestry laws mandate replanting or natural regeneration in burned forest lands (to prevent land-use change), establishing a legal basis for post-fire restoration (even if enforcement of these provisions needs improvement).	- **Scarce funding and high costs:** Post-fire rehabilitation is chronically underfunded. Traditional reforestation is expensive – estimated at €10,000–15,000 per hectare in Albania – and dedicated funds for restoring burned forests are limited, resulting in many burned areas not being reforested or stabilized after fires. - **Lack of a comprehensive post-fire strategy:** There is no dedicated national plan or protocol solely for post-fire management. Efforts to assess damage, prevent erosion, and restore ecosystems are often ad hoc and uncoordinated, varying by region and agencies involved. - **Limited technical capacity:** Albania has a shortage of specialized expertise, tools, and materials for large-scale ecological restoration. For instance, there are limited tree nurseries and seed supplies for native species, and techniques for soil stabilization (like mulching or check dams) are not widely employed after fires. - **Monitoring and follow-up gaps:** Burned areas are not consistently monitored in the years after a fire. This weakness means emerging problems – such as invasive plant spread, pest outbreaks in weakened forests, or ongoing erosion – may go unnoticed and unaddressed, undermining long-term recovery. - **Community recovery support lacking:** Affected communities (farmers, landowners) receive minimal support or guidance after fires. The lack of formal programmes for economic aid or incentives to restore land can lead to abandonment of burnt lands or unsustainable practices like over-grazing, impeding regeneration.

Opportunities	Threats
- International restoration initiatives: Albania can tap into global and regional programmes for forest landscape restoration (e.g. UNECE's Forest Landscape Restoration mechanism, EU Green Deal funding, or climate finance for carbon sequestration through reforestation) to gain financial and technical support for post-fire recovery efforts. These initiatives can bring expertise and resources for large-scale reforestation and erosion control. - Innovative low-cost methods: The success of pilot projects like the seed-ball planting in burned areas demonstrates new, cost-effective methods for reforestation. Scaling up such nature-based solutions and experimenting with drought-resistant native species or assisted natural regeneration could greatly improve restoration outcomes at lower cost. - Community and NGO engagement: There is substantial potential to involve local communities, schools, and environmental NGOs in post-fire actions. "Citizen reforestation" campaigns (tree planting days, adopt-a-forest programmes) not only provide manpower for restoration but also raise public awareness and stewardship for the recovered forests. - Resilient landscape planning: Post-fire periods offer an opportunity to "build back better" environmentally. For example, burnt forest areas could be replanted with a mix of fire-resilient species or managed as mosaic landscapes (including firebreaks or agricultural strips) to buffer against future fires. Integrating lessons from the fire into land-use planning can increase future resilience. - Research and knowledge exchange: Collaborating with international experts and local researchers to study post-fire regeneration in Albania's climate will yield better practices. Enhanced knowledge (e.g. which tree species regenerate best in certain regions, how to prevent landslides after fires) can guide more effective recovery projects in the future.	- **Environmental degradation:** Without effective post-fire intervention, burnt areas face soil erosion, landslides, and flooding due to vegetation loss. Each heavy rain on a deforested slope can wash away fertile soil, leading to long-term loss of productivity and downstream impacts on water quality and infrastructure. This degradation can be difficult to reverse if not addressed quickly. - **Loss of biodiversity and ecosystem services:** Severe fires can push ecosystems past tipping points. Key native species might not return, allowing invasive species to colonize burnt areas. This can result in permanent changes in habitat, reduced biodiversity, and the loss of ecosystem services (like water retention, carbon storage) that forests provide. - **Climate change feedback loop:** Burned forests release carbon and, if not regenerated, cease to act as carbon sinks. With climate change bringing more fires, there is a risk of a feedback loop where forests cannot recover fast enough, contributing to a cycle of increased warming and fire risk. Additionally, a hotter, drier climate may impair natural regeneration or make young seedlings more vulnerable, hampering restoration. - **Land-use change pressures:** After fires, pressure often mounts to convert burned land to other uses (such as grazing or construction), especially if enforcement of reforestation laws is weak. Such conversions, often illegal, threaten permanent forest loss. They also can increase risk of future hazards (e.g. erosion or greater fire risk in mismanaged lands). - **Socio-economic impacts on communities:** If post-fire recovery is neglected, communities that depended on the forest (for tourism, products, or livelihoods) may suffer long-term economic decline. This can lead to depopulation or over-exploitation of remaining natural resources, creating a socio-economic downward spiral in regions hit by big fires. These stresses can reduce public trust and willingness to cooperate in future fire management efforts.

IX. Landscape Fire Management Guidelines

Based on the SWOT analysis, this chapter provides some practical guidelines for addressing the identified gaps and insufficiencies in Albania's fire management system. The guidelines are structured according to the four phases of the fire management cycle: Prevention, Preparedness, Suppression, and Post-Fire Management and are designed to be pragmatic, implementable and responsive to Albania's socio-economic and ecological landscape, incorporating insights from national institutions (NCPA, NAPA, MoE, municipalities) and international best practices (EU Civil Protection Mechanism, FAO, UNECE, etc.).

IX.1. Prevention

- *Improve the implementation of legislation and penalties for illegal use of fire.* Existing legislation is strong in theory, but inconsistently implemented. Therefore, increasing inspections and penalties for illegal burning of agricultural residues or arson could deter hazardous activities. Empowering National Territorial Protection Inspectorate and municipalities with resources for implementation is essential.
- *Promote community awareness and educational campaigns.* Most fires result from negligence or deliberate ignition. National initiatives including educational institutions, agricultural organizations and the media can change behaviour. Successful examples from the Mediterranean countries show that the risk of fire decreases when people understand the risks.
- *Establish a fire event database.* A national-level fire event database should be created to support education, zoning and risk prediction.
- *Integrate fire protection measures within land use and forest planning.* Local plans should include firebreaks, grazing corridors, construction and maintenance of forest roads, buffer zones surrounding settlements and forestry practices, including thinning and pruning, should include fuel reduction strategies, especially in pine and oak forests that are vulnerable to crown fires. Rigorous implementation of the Law 57/2020 "On Forests", Article 13, point 3 by local government units should be prioritized.
- *Promote traditional land management practices that mitigate fire risk.* Sustainable practices such as grazing, coppicing and use of biomass for energy can potentially reduce fuel loads. Also, through financial incentives for forest owners and municipalities to manage understory vegetation will result in reduction of biomass accumulation.
- *Use technology for prevention.* GIS-based fire risk maps, remote sensing and use of drones for monitoring illegal fires are recommended. NCPA and IGEO can include these technologies in risk assessments and public alerts.

IX.2. Preparedness

- *Upgrade early warning systems and risk forecasting*. A national wildfire early warning system, integrating IGEO forecasts, EFFIS data and local weather inputs should be operationalized. Alerts should be adapted for municipalities and communities in at-risk areas.
- *Establish a centralized platform for fire incidents*. A centralized platform for fire incidents should be developed, interoperable between NCPA, NFA, NAPA, GDFPR and municipalities.
- *Increase training and capacity of local firefighter units*. Local firefighting brigades need specialized training for forest fires. Logistical and financial support of the National Training Centre at the Security Academy and the use of annual training modules (aligned to EU GFFF standards) are necessary and will improve their readiness for wildfire suppression. A separate firefighting unit dedicated to forest fires within municipal firefighting service, associated with relevant legal authorizations, is recommended.
- *Invest in equipment and infrastructure for preparedness*. Modern fire engines, protective gear, water tanks and firefighting tools should be strategically distributed across high-risk municipalities. In addition, rehabilitation of old fire stations and building up regional storage depots will improve readiness.
- *Simulation exercises and joint drills*. Regular inter-agency wildfire exercises involving municipalities, NCPA, forest agencies, armed forces and volunteers will test the response systems and improve coordination. Table-top and field exercises should be mandatory before each fire season.
- *Strengthen regional and cross-border cooperation*. Albania should continue joint programmes with Greece, Kosovo, North Macedonia and Montenegro for joint training, cross-border fire monitoring and resource sharing. Integration into EU Civil Protection training programmes should be maximized.
- *Engage local communities and volunteers*. Creating volunteer fire brigades in rural villages, especially near protected areas, because local knowledge and rapid mobilization are invaluable in early suppression when official resources are delayed.

IX.3. Suppression

- *Modernize fire suppression equipment and technology*. Outdated vehicles and tools should be replaced by modern fire engines capable of off-road operation, water transport systems and communication equipment. Drone supervision and real -time fire maps must support decision-making during suppression.
- *Enhance the aerial firefighting capacity*. Albania should have its own firefighting aircraft fleet (Canadair and/or helicopters), but until completed, agreements with EU and neighbouring states must be formalized for rapid deployment. Leasing seasonal helicopters or contracting private operators could reduce dependence on late arrival assistance.
- *Establish clear incident command structures*. A unified command system (ICS model) must be adopted nationwide, clarifying the roles of municipal brigades, NCPA, armed forces and forest agencies. This will reduce confusion and delays in large incidents.
- *Increase the safety and training of firefighters*. Provide firefighters with personal protective equipment (PPE) suitable for wilderness conditions and implement training in fireline safety, evacuation protocols, and coping with extreme fire behaviour.

- *Pre-position resources ahead of high-risk periods*. Firefighting units, military support, and volunteer brigades should be pre-positioned in historically fire-prone areas such as Vlora, Gjirokastra, Shkodra, Kukës, etc., during heat waves and/or anticipated droughts.
- *Expand community involvement in fire suppression*. Basic training of rural residents in firefighting (e.g. safe use of tools, creating fire lines) can provide added assistance. However, safety protocols should be prioritized to avoid civilian casualties.

IX.4. Post-Fire Management

- *Develop a national post-fire recovery strategy*. A dedicated framework for assessing fire damage, prioritizing restoration sites, short-term and long-term measures, and mobilizing funds quickly after major fires is needed, to also include an annually updated register of burned areas.
- *Ensure sustainable financing for restoration*. A post-fire rehabilitation fund, financed by the government and donors to support reforestation, land stabilization and community recovery projects, should be established to secure rehabilitation of burned areas.
- *Adopt innovative restoration techniques*. Pilot projects using drones, seed bombing, and assisted natural regeneration should be expanded. These are cost-effective compared to traditional planting and are better suited to Albania's rugged terrain.
- *Prevent land-use change in burned areas*. Strict enforcement of laws against converting burned forests into pastures or construction sites is crucial. SCA (State Cadastre Agency) and NFA should monitor land titles and enforce restoration obligations.
- *Strengthen community participation in restoration*. Local NGOs, schools and forest owners' associations can be mobilized for tree planting, erosion control and monitoring of burned areas. This increases ownership and sustainability of restoration measures.
- *Monitor and research post-fire impacts*. IGEO, universities and NAPA should collaborate to study regeneration dynamics, soil erosion and biodiversity recovery in burned landscapes. Lessons learned should inform prevention and preparedness.

These guidelines help to address Albania's most pressing gaps in fire management by focusing on prevention of ignitions, strengthening preparedness, improving suppression capacity, and ensuring effective post-fire recovery. Their implementation requires a whole-of-government and whole-of-society approach – engaging ministries, agencies, municipalities, NGOs, and citizens. With climate change expected to exacerbate wildfire risk, Albania's ability to adapt its landscape fire management system will be crucial to safeguard people, ecosystems, and national development.

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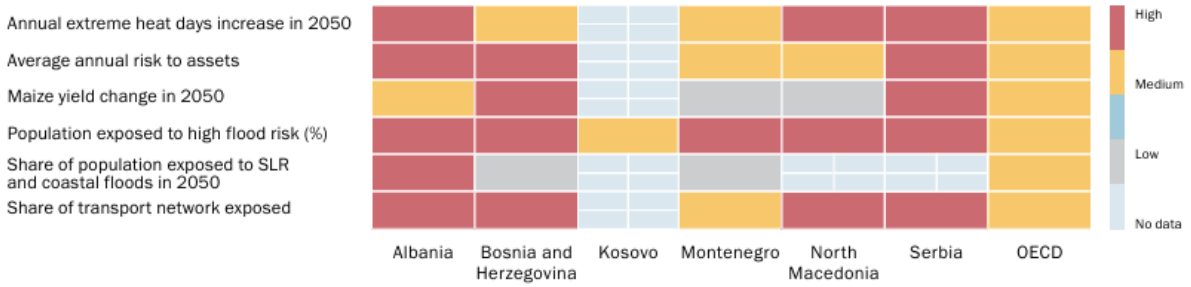
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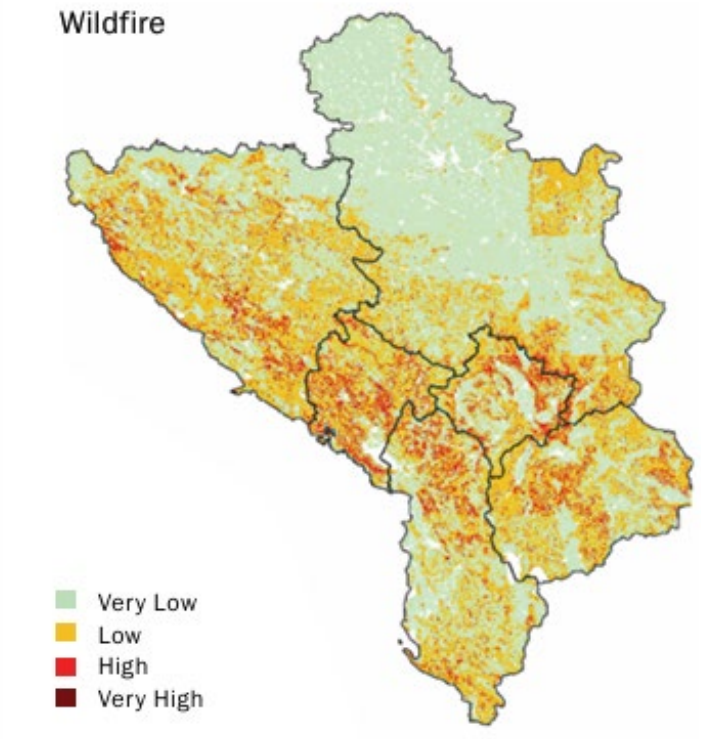
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XI. Annexes



Climate risk and vulnerability in the Western Balkans, compared to EU and OECD countries. Data source: Western Balkans 6, Country Climate and Development Report. World Bank Climate Change Group, 2024

Annex1. *Climate Risk and Vulnerability in the Western Balkans*



High wildfire risk in cross border mountainous regions. Data source: Source: Western Balkans 6, Country Climate and Development Report. World Bank Climate Change Group, 2024

Annex2. *Map of Wildfire Risk in the Western Balkans Cross-Border Region*

Annex 3. *Firefighting Capacities of Municipalities of Albania*

No.	Municipality	Human capacities	Firefighting vehicles	Various pumps	Generator	Boats	Air compressor/ AP3	Fireproof foam (in stock)	Other firefighting tools and equipment
1	Shkoder	34	9	30	4	2	1 compressor 12 AP3	600 L	1 ladder truck, 1 van, various hand-held fire extinguishers
2	Pukë	15	5	8	1		3 AP3	20 L	accident equipment, various hand-held extinguishers
3	Fushë Arrëz	14	3	8	1		3 AP3	30 L	various hand-held fire extinguishers
4	Vau Dejës	17	3	12	1		1 AP3		various hand-held fire extinguishers
5	Malsi e Madhe	20	5	11	1		2 AP3	100 L	1 rescue vehicle
6	Kukës	42	3	17	1		2 compressors	200 L	pneumatic rescue equipment
7	Has	14	2	8			3 AP3	60 L	various fire extinguishers
8	Bajram Curri	16	2	6	1		1 compressor 2 AP3	50 L	various hand-held fire extinguishers
10	Dibër	21	2	15	1		2 AP3	120 L	1 rescue vehicle equipped with the relevant tools, various extinguishers.
11	Mat	14	3	6			1 compressor, 2 AP3	60 L	1 detector, various extinguishers
	Klos	14	1	1				100 L	various fire extinguishers
12	Bulqizë	14	1	8	1		8 AP3	60 L	1 steel cable, 1 lifeline, 4 rope hooks, 5 safety belts, 2 foam fire extinguishers
13	Lezhë	28	2	18	1	2	4 compressors	150 L	2 iron scissors, 2 hydraulic hoses
14	Mirditë	16	2	10	1		1 compressor	50 L	hydraulic opener, wrench, rope, water backpack, tubes, flexible
15	Kurbin	17	3	7	1		2 compressors	250 L	1 rescue truck, 1 electric chainsaw, 5 fire extinguishers, 2 suction hoses, various fire extinguishers

16	Tiranë	166	15	60	3	1	2 compressors, 30 AP3	300 L	1 ladder truck, 1 pickup, 2 complete rescue vehicles, chainsaws, various tools, etc.
17	Kamëz	40	2	6	1		4 AP3	100 L	rescue tools and equipment, various extinguishers
18	Vore	18	2	6	1		2 AP3	250 L	1 water truck, 1 chainsaw, 1 rescue kit
19	Kavaje	17	4	12	1		1 compressor	80 L	various rescue tools, various -held extinguishers
20	Durrës	40	7	21	2	2	1 compressor 5 AP3	300 L	1 ladder truck, 2 water trucks, 1 ambulance, 1 chainsaw, pneumatic rescue tools and equipment
21	Shijak	14	3	7				100 L	1 chainsaw, 1 transport vehicle
22	Krujë	17	2	10	1		1 compressor	100 L	Various rescue tools
23	Rrogozhinë	14	2	6			2 AP3		extinguishers, suction hoses, simple rescue tools, various tools
24	Elbasan	30	6	18	2		5 AP3	300 L	1 ladder truck, 1 water truck,1 small truck
25	Librazhd	14	3	11	1		2 AP3	50 L	1 chainsaw, 1 ambulance, hydraulic shears, various hand tools
26	Gramsh	15	4	6	1		1 compressor, 4 AP3	100 L	1 chainsaw, 1 ambulance, rescue equipment, various hand tools
27	Prrenjas	14	1	8			1 AP3		various hand-held extinguishers
28	Peqin	14	2	6					various hand-held extinguishers
29	Belsh	14	2	7					various hand-held extinguishers
30	Cërrik	14	3	8	1			50 L	Simple rescue equipment
31	Berat	34	6	10	2	2	1 compressor, 4 AP3	150 L	1 ladder truck 1 rescue vehicle
32	Kucovë	14	1	8	1		3 AP3	200 L	simple rescue equipment, various extinguishers

33	Skrapar	15	4	7	1		2 AP3, 2 compressors	60 L	simple rescue equipment, various extinguishers
34	Ura Vajgurore	17	1	7	1		1 compressor, 2 AP3	75 L	1 chainsaw, fire extinguishers and simple rescue equipment
35	Polican	14	4	6	1		1 compressor, 2 AP3	50 L	1 water truck, rescue equipment, hand-held extinguisher
36	Korcë	31	6	30	2		2 AP3	150 L	1 aspirator, rescue tools and equipment, various extinguishers, etc.
37	Pogradec	14	3	7	1		2 AP3	50 L	1 water truck, rescue tools, various extinguishers
38	Ersekë	14	4	7	1		3 AP3	30 L	1 chainsaw, fire extinguishers and simple rescue equipment
39	Devoll	15	2	4			1 AP3		various hand-held fire extinguishers
40	Maliq	14	2	8	1		2 AP3	200 L	simple rescue tools, hand-held extinguishers
41	Pustec	14	1	6					1 water truck, fire extinguisher
42	Fier	30	4	12	1	2	2 AP3, 2 compressors	100 L	rescue tools and equipment, various extinguishers
43	Patos	14	1	8	1		1 compressor		various fire extinguishers
44	Ballsh	14	1	7				100 L	simple rescue tools and equipment, various fire extinguishers
45	Divjakë	14	2	10			6 AP3	200 L	rescue tools and equipment, various fire extinguishers
46	Lushnjë	14	2	14	1		8 AP3	300 L	1 pneumatic device for accidents
47	Rroskovec	14	1	8					simple rescue tools, various hand-held fire extinguishers
48	Vlorë	34	7	30	2	2	1 compressor, 4 AP3	300 L	pneumatic equipment, 1 chainsaw, rescue tools and equipment, various hand-held fire extinguishers

49	Himarë	14	3	9	2	4 AP3	100 L	Various fire extinguishers, rescue tools and equipment
50	Sarandë	17	3	15	1	1 compressor, 4 AP3	100 L	4x4 vehicle, rescue tools and equipment, various fire extinguishers
51	Delvinë	14	1	8	1	2 AP3	50 L	1 rescue vehicle, rescue tools and equipment, various fire extinguishers
52	Finiq	14	3	10	1			simple rescue tools, various fire extinguishers
53	Selenice	14	2	6				simple rescue tools, various fire extinguishers
54	Konispol	14	2	6	1			simple rescue tools, various fire extinguishers
55	Gjirokastër	30	4	14	1	4 AP3	200 L	2 jeeps, 1 pickup truck, 1 van, 1 excavator, rescue tools and equipment, various fire extinguishers.
56	Permet	14	2	11	1	2 AP3, 2 compressors	100 L	simple rescue tools and equipment, various fire extinguishers
57	Kelcyrë	14	2	6			20 L	1 chainsaw, 1 ladder, 1 rope, various hoses, life jacket, foam sprayer
58	Tepelenë	14	1	12	1	2 AP3, 2 compressors	150 L	karel pump, iron shears, rescue tools, iston, hydraulic nozzle
59	Memaliaj	13	1	6		3 AP3		simple rescue tools and equipment, hand-held fire extinguishers
60	Libohovë	14	1	6		2 AP3		simple rescue tools and equipment, hand-held fire extinguishers
61	Dropull	14	1	6		1 compressor	60 L	simple rescue tools and equipment, hand-held fire extinguishers

Firefighting capacities of municipalities of Albania. Data source: National Fire Risk Assessment, 2023