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# Analysis and Assessment of Flora and Fauna in the Southern Part of Albania

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## ABSTRACT

The forest flora is the most marvellous wreath and ornament of the earth ecosystem in the region of Gjirokastra. It is the greatest earthbound potential because it protects the ground and the water, it improves the microclimate, it protects the agricultural crops, and it favours tourism, hunting and re-creation activities. It charms the environment after all. The ecosystem of Gjirokastra region has been changing a lot for the last 50 years as a result of wide historical, socio-economic, political and demographical factors, which in return have helped in its latest physiognomy. The fulfilment of social and economic needs of the community should be realized within the product boundary of forest ecosystem and the protection of their biological potential. The multifunctional, sustainable and integrated use of forests is exceptionally necessary; the forests are the only biotype, able to realize the dynamic development of ecosystem, which actually is exposed to danger. The existence of original and untrod forests is of a great importance.

## 1. INTRODUCTION

The southern Albania has many beaches for the development of mass tourism. This article describes the resorts and provides information that will help you to plan a vacation and enjoy the beauty of southern Albania. Changes in the southern region of Albania during the last century have been significant and noticeable. Tourism is now a mass phenomenon in southern Albania.

*The main objectives of the study are:*

- to contribute to the recognition as full performance of the biodiversity in time and space;
- to identify the main factors that accelerate the biodiversity;
- to synthesize the results of studies conducted by specialists from different disciplines and define the main directions of activity for tourism development;
- to present the scientific breakthroughs on the practical problems of tourism development and regulation of forms of rural areas.

*The importance of the study lies in:*

- better knowledge of the condition and performance of the biodiversity in the southern region;
- identification of problems created by previous practices for tourism development;
- proposed models for the rational use of space and natural and human resources, tourism development and guaranteeing the preservation of the environment and rural landscape values of the southern part of the region.

At the beginning of the paper there is a general picture of the area taken under the study, methods and methodology of field work in the office, sources of information and level of reliability data.

Using these methods it has enabled the achievement of research outcomes, issuing findings and realistic suggestions and explain the development of sustainable tourism in the southern region.

## 2. GEOGRAPHICAL FEATURES, SIZE AND BOUNDARIES OF GJIROKASTRA REGION

Gjirokastra region lies on the inner part of the southern mountainous region with a south-east important position, bordered and linked with Greece at two frontier zones; "Kakavia" and "Tre Urat". It is not more than 60 km far from Janina, 160 km far from Igumenica port and 60 km far from Saranda. They connect it with Italy and the north Mediterranean countries.

Gjirokastra region makes up to 10 % of the surface and 3.7 % of the Albanian population with a border line length of 297 km (11 km out of it are river borders).

The region is bordered with other four ones with a land border length of 225 km. It is bounded by Berat to the north-west (58 km border line), by Fier to the north (21 km border line), by Korça to the north-

east and east (47 km border line) and by Vlora region to the south and south-west (99 km border line).

The Greek border line (72 km) counts at the very lower reach of Sarandaporos River (the right stretch of the upper Vjosa reach) which snakes through the territory of the Republic of Albania.

Some ancient authors, like Hesiodit have written about agriculture and stock breeding on these territories, Epir and South Italy since the 8<sup>th</sup> century BC [6].

In addition, Plin has written about precia and balisk grape quality, the way they are transformed into wine and raki [6].

The Vjosa valley has been the cradle of ancient civilization.

The oldest route, being frequently used by Illyrians and Romans [2, p. 61] was built (in the 8<sup>th</sup> century BC) on the bank of the Vjosa, too.

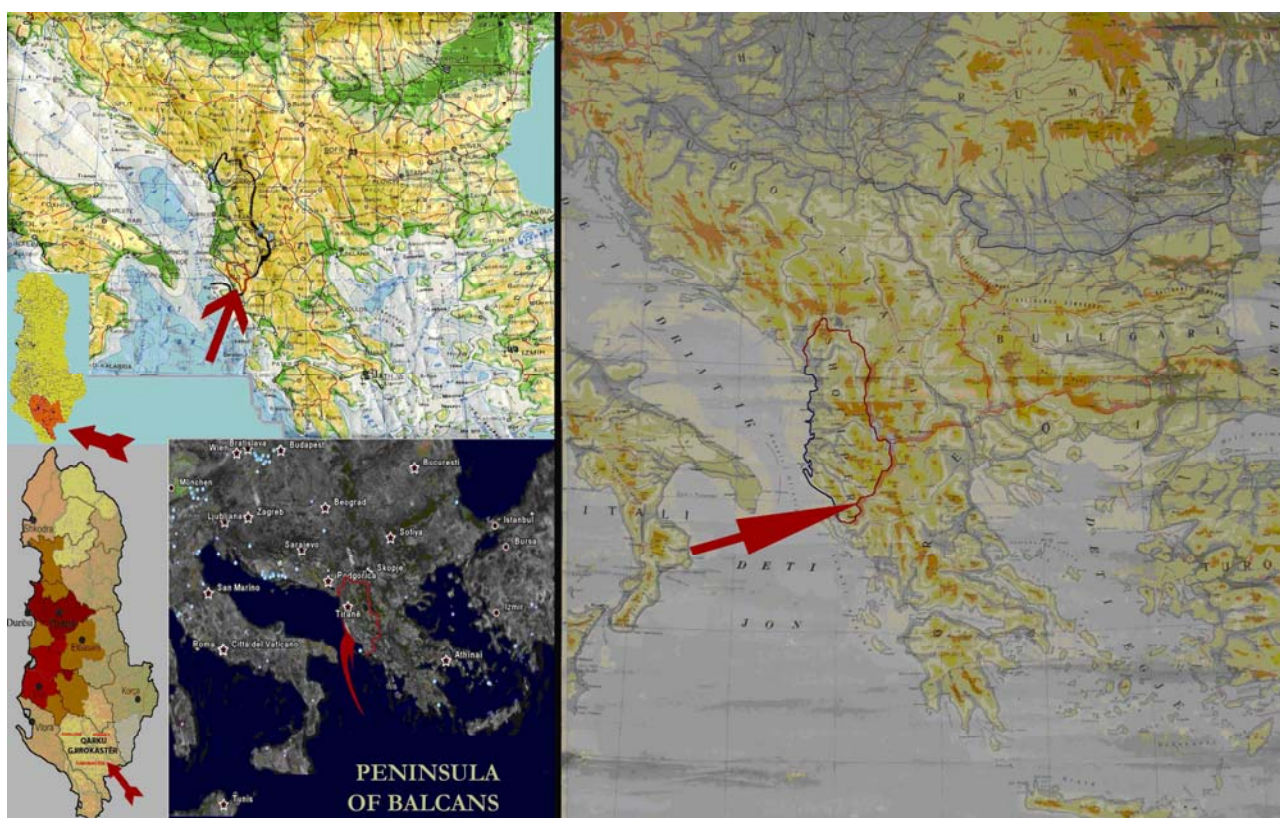


Fig. 1. The map of geographical position of Gjirokastra region.

## 3. FLORA AND FAUNA IN GJIROKASTRA REGION

### 3.1. General features of flora

To study the vegetable and animal world has a practical and theoretical importance to the sustainable development of the region, because it helps to determine the wood supply, the medical herbs, the decorative and the ether-oil plants, the wild animals etc. It helps to determine the platform of an environmental

protection and the improvement of landscape values as well, to serve a better fashion to the regional inhabitants. The edafic, pedologic, biotic, topographic, climatic and lithologic conditions have determined the development of a rich flora and fauna with environmental, landscape and economic values in Gjirokastra region.

A large number of plants belongs to the Mediterranean and Balkan endemic and sub endemic group. A lot of places with high biological values, a rich

flora and fauna and of a great national and international importance are especially found along the river valleys. The biodiversity in Gjirokastra region means two aspects: the genetic (the species variety) and the ecologic (the variety of ecosystems).

The diversity of climatic and land conditions have made it possible to have a variety of choices: 179 types of woods and bushes out of 208 found in Albania.

About 71% of all types are found in Gjirokastra and Përmeti, while 52% are found in Tepelena.

The forest vegetation covers 86061 ha or 29.8% of the regional surface, with a volume of the timber about 6472000 m<sup>3</sup>, out of which 2164000 m<sup>3</sup> as building timber and 4308000 m<sup>3</sup> as firewood (table 1). Meanwhile the average production capacity is 75.2 m<sup>3</sup>/ha.

Table 1. Balance of timber at Gjirokastra region.

Years Denomination	1989				2004			
	Region	Gjirokastra	Përmeti	Tepelena	Region	Gjirokastra	Përmeti	Tepelena
Natural growth (m <sup>3</sup> )	72,000	20,000	38,000	14,000	77,000	20,000	40,000	17,000
Balance of wood cutting/growth	1.0:1.3	1.0:1.5	1.0:1.2	1.0:1.2	1.0:1.1	1.0:1.0	1.0:1.1	1.0:1.1
Volume (000 m <sup>3</sup> )	6,572	1,900	4,020	652	6,472	1,542	4,038	892
Building timber (000 m <sup>3</sup> )	2,195	530	1,465	200	2,164	445	1,475	244
Firewood (000 m <sup>3</sup> )	4,377	1,370	2,555	452	4,308	1,097	2,563	648

A natural forest growth has been noticed in the last years in Përmeti and Tepelena areas. Besides, the volume of building timber and firewood has been increasing, because the inhabitants have been restricted to having other ways of heating.

However, the balance has been in the favour of cutting, harming seriously the forest property. The vegetation values are multifarious: an important component of the natural environment, the climatic, ecological, environmental, aesthetic, tourist, recreational, social and economic value. Besides, the vegetation prevents the landslides on the steep terrains.

Before 1990, when wood was considered the only and main heating material, Gjirokastra region met its own needs and partially that of Fieri and Korça considering the firewood.

After 1990, this need has been decreasing as a result of the rural mass exodus and the alternative use of gas, oil, electric power and coal, instead.

Today, the regional wood stock satisfies 85% of the rural population needs for heating.

Until 1990, the timber products included sticks for tomatoes, tools handles, willow sticks to produce export strands and coal.

Today, these products have ceased to be produced and they belong to the private sector.

The annual balance between the natural cultivation of timber and the fire wear and tear is a negative one based on natural harms (floods, snow and avalanches), and human ones (the illegal cutting, deforestation, grazing etc) (table 2).

About 49.2% of the surface of the main vegetation habitats in the region is covered by the wood formations with predomination of hornbeam and low oak, 38.4% with the Italian oak and holly bush predomination and only 12.4% with the others.

About 38.6% of the vegetation habitats are common in Gjirokastra area, 32.4% at Përmeti and 29% at Tepelena (table 3). The bush forest occupies a surface of 45.6% of the regional unit.

Table 2. The main vegetation habitats at Gjirokastra region in percentage.

Denomination	Region	Gjirokastra	Përmeti	Tepelena
1. Inhabited surfaces, arable land, water and unproductive terrains	2	0.5	0.5	1
2. Alpine pasture with herbage predomination	4.3	4.3	-	-
3. Wood formations with plane trees predomination	0.8	0.5	-	0.3
4. Wood formations with hornbeam and low oak predomination (oak and bush types)-associated habitats	49.2	15.3	16.9	17
5. Wood formations with Italian oak and holly bush predomination	38.4	16.8	11.2	10.4
6. Wood formation with The Macedonian fir tree predomination.	2.5	0.4	2	0.1
7. Wood formation with the black pine and the Macedonian fir tree predomination	1.4	0.8	0.6	-
8. Wood formation with the Mediterranean oak predomination	0.9	-	0.9	-
9. Wood formation with the beech and the Macedonian fir tree predomination (Associated crop)	0.3	-	0.3	-
10. Bush formations (thorn bushes) at pasture land	0.2	-	-	0.2
Total	100	38.6	32.4	29

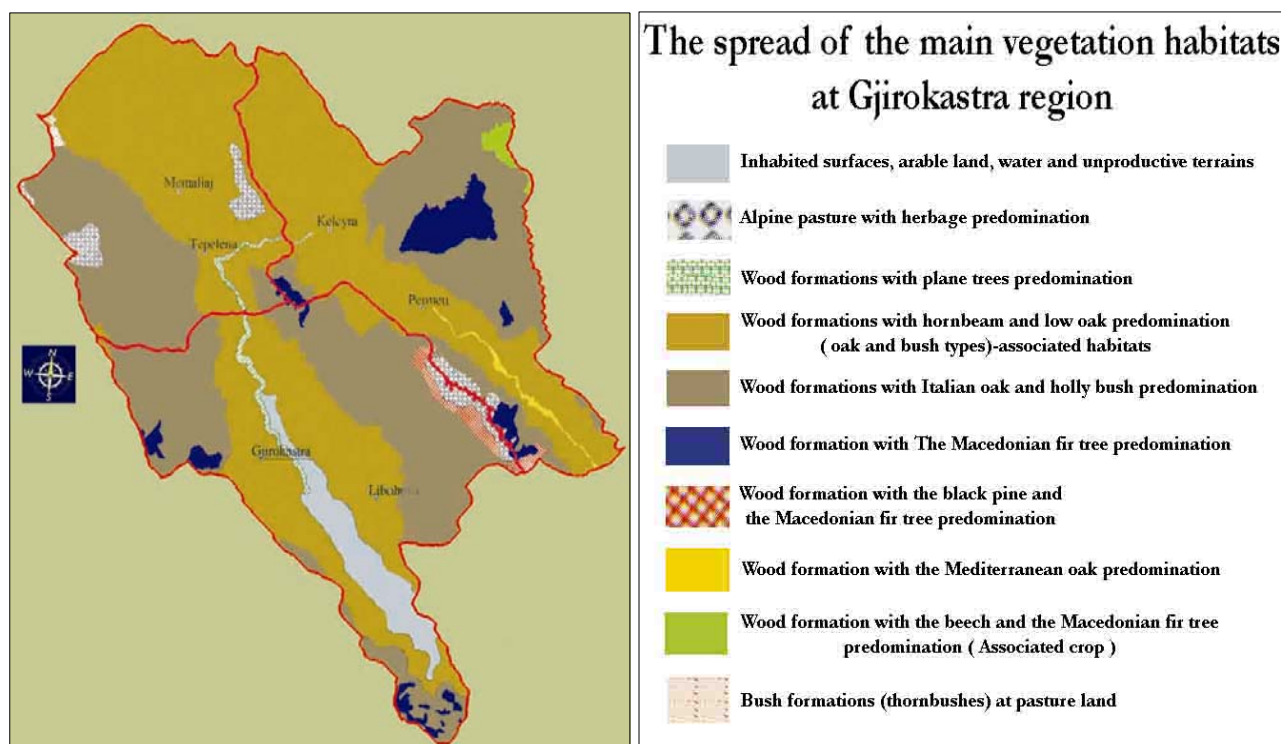


Fig. 2. The map of the main vegetation habitats at Gjirokastra region.

The higher percentage predominates in Përmeti area (48.2%) and Tepelena area (51.7%).

The greater surface is occupied by Caducous in Gjirokastra (50.9% of the forest unit). Regarding conifers, the greater surface is mainly occupied by the

fir trees (45%) and the Mediterranean pine (43.1%), regarding caducous, the oak trees (66.3%), whereas when it comes to bushes, berry trees and hornbeams they cover 63.9% of the total surface.

Table 3. The forest unit structure at Gjirokastra region (in ha).

Denomination	1989				2004			
	Region	Gjirokastra	Përmeti	Tepelena	Region	Gjirokastra	Përmeti	Tepelena
Wood unit	85,200	29,500	38,400	17,300	86,061	30,471	38,340	17,250
a). Coniferous	9,160	3,800	3,660	1,700	8,281	3,080	3,760	1,441
Black pine	852	270	467	115	985	270	600	115
Mediterranean pine	4,582	1,770	1,493	1,319	3,570	1,050	1,460	1,060
Fir tree	3,726	1,760	1,700	266	3,726	1,760	1,700	266
b). Caducous	38,910	15,900	16,110	6,900	38,520	15,520	16,110	6,890
Beech	660	-	660	-	660	-	660	-
Oak	25,580	8,300	12,630	4,650	25,540	8,260	12,630	4,650
Poplar	100	60	-	40	30	-	-	30
Others	12,570	7,540	2,820	2,210	12,290	7,260	2,820	2,210
c). Bushes	37,130	9,800	18,630	8,700	39,260	11,871	18,470	8,919
Berry trees	12,720	770	9,190	2,760	12,720	770	9,190	2,760
Hornbeam	12,360	3,710	5,800	2,850	12,360	3,710	5,800	2,850
Others	12,050	5,320	3,640	3,090	14,180	7,391	3,480	3,309

### 3.2. The vegetation belts in Gjirokastra region

Five vegetation belts of different features are common in Gjirokastra region:

a). The belt of bushes and Mediterranean forests, which lies at an altitude of 600 m and occupies 49.8% of the regional forest surface. This vegetation grows on grey-brown soil of the Vjosa and Drino valleys. It is divided into two types:

- the leafy bushes (berry trees, heather, forsythia, laurel, purple junipers), which are common on the river valleys of Krasi, Qesarati, Lopësi, Mezghorani, Këlcyra, Lower Dropulli, the lower course of Luftinja, Bënça and Maricaj river. They occupy the greatest surface of this belt;

- caducous bushes, which are mostly found along the valleys of Vjosa and Drino, consist mainly of

hornbeams and willows, but also of Mediterranean forests of pines, oaks etc.

The forests with cluster and black pine, with cluster pine and nonendemic kinds, are located in the hills of Libohova, Dropolis, tepelena, hills of Memaliaj, Buz, Krahes and in the valley of Vjosa. The forests of Mediterranean oaks are found in the Upper Dropolis, Krahes and Luftinje. The plant associations of this level have a vast economic use as fire-wood, pasturage and as medicinal plants. Before the 90-s, gorse was used for making baskets, and heather was used for making pipes, children's toys and also for carving. Strawberry-tree was used for making raki (Albanian alcoholic drink), whereas laurel, widely spread in the region of Benca, is used as sweet herb and medicinal plant, in the food industry. Many kinds of flowers help the development of beekeeping. Cutting, burning and over-pasturing in process, have caused damage in almost 20% of the surface of plant coverage, especially the forests with cluter pines in the massive of Mali i Gjere (Broad Mountain), hills of Libohova, Valare and Tepelena.

b). The level of oaks, is the most important, as it covers 42% of the forest surface in the region of Gjirokaster. It lies in the altitude of 600-1000 m, in the belt of brown lands. The most common are the oaks and ash-trees, which construct important forest massifs in Pogon, Kardhiq, Zagori, mountain of Nemercka, Dangelli, Carcove, Petran and Piskova; which are now being used legally and illegally.

There are even small areas with chestnuts which are used as construction material, etc. Limetrees are widespread in the region of Tepelena; its flowers are collected and exported as medicinal plants.

This plant level is considerably damaged by human interference, because it is located very near the inhabited rural areas and is used as fire wood, food for animals during the winter, and also as construction material.

c). The level of Mediterranean Fir trees, covers 7.3% of the forest surface of the region and is located in the altitudes of 1000-1500 m above sea level, in the belt of the mountainous brown and gray lands . The fir-tree of Macedonia and Greece has high biological values and constitutes forests in Upper-Dropolis (fir-tree of Sotira), Kardhiq, Fushebardhe, Zhulat, Prongji, Zagori, Hotove, Petran-Carcove, Buza e Bredhit, Luzat-Qender and Kurvelesh (fig. 3).

This belt is a little developed in Tepelene, Bence, Nivice, Peshtan, Luzat and Hormove. Fir-tree is used as construction material and also for taking out resin. This level substitutes the level of beech, which constructs a small massif on the northeastern area of the mountain of Nemercka, in the region of Permet.

The forest of Grehot (the commune of Carcova) in Nemercka, in the altitude of 1400 m, is located in 45 acres and has biological and environmental values. There could be found 5 kinds of fir-tree, 4 kinds of beech, 1 kind of white hornbeam and other associations.



Fig. 3. Llufa of Kurvelesh-The pine and fir forest of Kurvelesh.

The National Park Fir-tree of Hotova, which is located in the altitude of 400-1600 m, is remarkable for the bio-diversity which is formed by 20 kinds of forest trees and 25 kinds of bushes. The unique ecological and touristic values make it one of the most special parks in the Balcans.

d). The Level of Hormoqi is located in the altitudes of 1500-1800 m and covers 0.9% of the forest surface of the region. The main kinds of the trees are the black pine, mountain maple-tree, a special kind of fir-tree and mountain pine, located in Kardhiq in about 230 acres, and in Kerre (a part which is damaged by fires).

e). The level of pasturage and sub-alpine bushes is located in the mountain ranges of Trebeshine-Dhembel-Nemercke, Shendelli-Lunxheri-Bureto and Murgane-Mali i Gjere-Shtugare. It is the highest plant level (1800-2484 m above sea level) and covers 36.4% of the total surface of the region.

It is very rich in herbaceous plants, which form summer natural pasturages of great nutritious values, used by sheep and goats which give quality products (bio-products); these products are much required in the other countries.

Besides the herbaceous plants, the bushes like hawthorn and juniper can be found.

The valley of Vjose-Carcove has got two characteristics: it is the only region in Albania where the formation with red briar is found (in Permet with a surface of 42 acres) which is endemic bush vegetation, with high biological and scientific values. The Macedonian fir-tree is found to the belt of Mediterranean bushes.

This formation is widely spread in Greece, the Jonian and Egean Archipelago. At the banks of the river we could find bushes, like willows which give a special association to the Balkan Peninsula. In addition, the forests of plane trees are common to be found along the banks and hillsides of the Vjosa River.

Some habitats, like the fir tree, are very rare and threatened with extinction; therefore it is aimed to considering this zone with a special local status and ecotourist function.

### 3.3. The medical herbs, the ether-oil and decorative plants

In conformity with the article 500 of the Convention "On the protection of flora, the wild fauna and the natural environment of Europe", approved by Law Nr.8294, date 02.03.1998, with the DKM no. 804, date 04.12.2003, it's prohibited the collection of more than 307 flora protective species, 80% of which are said to be found around Gjirokastra region.

They are the mountain tea-plant, the nut, the wild cherry, the black and white common elder, the ash, the gooseberry, the orchis, the laurel etc. There are around 120 medical and fragrant herbs around Gjirokastra region, 30 of which are found in Çajupi area.

The second forest products not from woods are famous for their active and aromatic substances with economic, recoverable, honey and decorative values.

A higher interest is shown to 15-20 medical plants. Collecting, selecting, processing, distilling and producing essence centres have been set up since 1973 at some agricultural cooperatives, forest enterprises very close to the density of such medical plants; in Fushëbardha, Libohova, Sotira etc.

The essence of sage, haw thorn, basil, oregano, pine and fir used to be produced, while the rest of the herbs were being exported.

Among the tanifere plants, worth mentioning are: the forsythia, the heather, the sumach, the ash, while the medical ones are: the sage, the hawthorn, the balsam, the poppy etc.

The herbs and their essence have been known since the ancient times. The Turkish chronicler, who visited Albania in 1770, wrote that these herbs were being collected by specialists and popular doctors of Gjirokastra and Përmeti, such as, Xherah of Buhali, who used to give prescription charges for diseases. The nature conditions being convenient, the farmers have cultivated at the lowland zones a lot of ether-oil plants with great economic value, such as, rosemary, basil and lavender. The sage is commonly found at the mouth of Këlcyra, Dhëmbeli and Petran-Çarshova area. The oregano, savoury and the mountain tea-

plants are common everywhere, especially in Postenan, Gërhot, Vjosa valley, Miçan and Nemërçka.

After 1990, the collection of sage has started at the Communes of Buzi, Kurveleshi, Lopësi, Qendër Tepelena and Krahësi by the company Alb-Dukros.

The same thing is done in Frashëri, Zagoria and Pogoni, too. Doing this kind of work, it means that a family makes a profit of 100-300 thousand lek/year.

According to the International Union of Conserving the Nature (IUCN), Gjirokastra region has got [3]:

- extinct species such as: the wild chestnut, the decorative plant (the boneset) and a medical plant (the gentian) which used to be common in Nemërçka mountain;

- species probably exposed to extinction, like the horsetail of Boldaçi, a decorative plant found in Nemërçka mountain (trigonella) and the yew at Zagoria area;

- more than 20 species exposed to threaten such as: the juniper, the orchis, the origano, the sage, the mountain tea plant, the linden tree, the black common elder etc;

- two medical herbs easily found: the wild parsley and scolopendra;

- more than 21 rare species, which are mainly found at the mountainous region (table 4).

The forests of Gjirokastra region are of great importance because they are part of the environmental and life component, they are supply of heating, industry, building, communication; they are entertaining and relaxing centres, tourist and hunting ones; they are a solid protection against erosion; they are essential foodstuffs sources for animals and bees (83.5% of this surface).

### 3.4. Fauna in Gjirokastra region

Fauna of this region has 13% of the rare species in Albania. This territory supplies favourable conditions to growing an interesting wild fauna, with various and all-sided values. Its most important species are the wild rabbit, the mountain grouse, the wild pig, the wild goat, the wolf, the jackal, the deer, the marten, the fox, the quail, the woodpigeons and a lot of other rare fowls with economic, scientific and ornamental values. Hunting means sports tourism and a source of income for the local business and the forest sector.

This regional area is considered the last destination for the migratory birds which feather their nests to find breeding-grounds in Albania [table 5 here].

The hunting unit consists of the surface and supporting capacity of the migratory and native wild fauna. The arable land, totally 1571.5 ha, out of which 908 ha in Gjirokastra, 376.5 ha in Përmeti and 287 ha in Tepelena is not considered to the hunting unit surface.

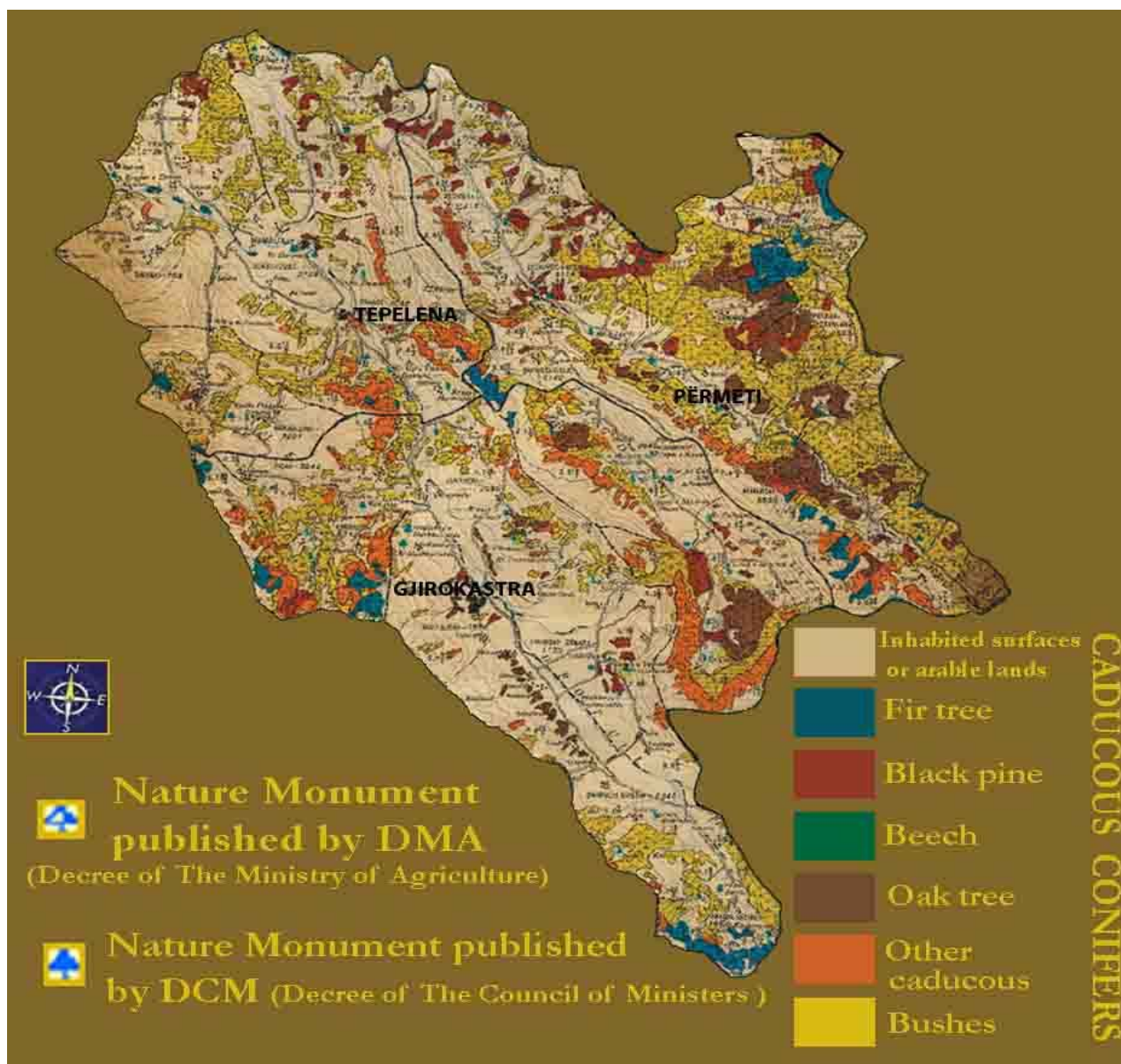


Fig. 4. The forest map according to specie.

Table 4. The main ether-oil plants at Gjirokastra region.

Denomination	The spread unit in ha				The dry potential product in tons			
	Region	Gjirokastra	Përmeti	Tepelena	Region	Gjirokastra	Përmeti	Tepelena
Sage	9,157	5,957	4,100	3,200	1040	1,040	716	559
Savory	5,738	5,388	2,350	350	317.2	317.2	138.3	20.6
Laurel	62	57	63	5	2	2	3	0.5
Origano	29,456	17,456	13,600	12,000	647.7	647.7	504	444.8
Purple juniper	11,557	7,557	9,270	4,000	551	551	676	291.6
White thorn	33,283	28,783	8,500	4,500	31.2	31.2	9.2	48
Linden	344	214	235	130	7.5	7.5	8	5
The wild rose	27,921	25,921	14,200	2,000	46.4	46.4	30	4.5
Boneset	68	58	45	10	8.8	8.8	10	2.5
Gooseberry	5,035	3,785	4,500	1,250	4	4	5	1
Orchis	3,951	2,251	1,950	1,700	2.6	2.6	2.2	2
Mountain tea	20,421	11,421	10,200	9,000	61.8	61.8	58	56

Table 5. The cadastral registration of the hunting unit at Gjirokastra region (in ha).

Denomination	Region Gjirokastra	Area Gjirokastra	Area Përmeti	Area Tepelena
The total registered surface	288,432	113,740	92,958	81,734
The hunting unit surface	278,287	112,832	91,520	73,935
The surface of legal hunting	230,620	87,756	83,570	59,294
The surface of illegal hunting	47,667	25,076	7,950	14,641

The surface of illegal hunting takes only 17.1% of the region. It shows that the greatest space with rare species is exposed to illegal hunting.

The unit of illegal hunting is greater at the pasture space (25.5%) and at the forest one (16.1%). Almost 98% of the agricultural unit is counted within the total hunting unit and only 9.1% of it is prohibited.

This clearly shows that the greatest percentage is barren land. On the other hand, it proves no interest on the farmers and no care and coordination between the agricultural and forest inspectors to improving and maintaining the arable land as a property for forthcoming generations.

### 3.4.1. The land fauna, the groups, the representatives and their geographical spread

#### *The mammals*

The dark-grey bear is found among the Forests of Hotova and Frashëri, rarely found on the eastern face of Nemërçka and in the mouth of Këlcyra. Protection is provided and its hunting is illegal. The wolf is the most common rapacious animal found at the inner mountaneous areas, thickly covered with bushes, trees and coarse grasses, with pastures, sheep and goats. Worth mentioning is Zagori, Lunxhëri, Pogon, Biovizhda, Nemërçka, Gjinkari and Kaludhi. Its hunting is legal, but seasonal with the only aim to maintain the necessary biological balances. The fox is widely spread at the bush belt in Lunxhëri, Pogon and Zagori. The jackal is common along the Vjosa valley, from Qesarat to Kalivaç of Tepelena. It is a species under protection. The lynx is widely spread in Lunxhëri. The wild cat is found everywhere, especially in Kreshova and Trebeshina, among the forests of Hotova, Frashëri, Qarishta, Peshtan, Luzat and Hormova. Its hunting is prohibited.

The beaver and the marten live mainly in the remote mountainous areas covered with forests, like Mezghoran and Bënçë. Their hunting is allowed with a legal permission. The badger is found at the bush belt, especially along the valley of Zagoria, Sheper, Pagri, Fratari and Maricaj. The otter is familiar at the ponds of Drino and Vjosa. Its hunting is allowed with a legal permission, too. The skunk and the weasel are found

everywhere, but their hunting is prohibited. The wild pig is common to be found at the hillside area, among the oak forests in the mountains of Nemërçka, Trebeshina, Peshtan, Selcka, Luzat and Bënça. Its hunting is prohibited. The deer is familiar on the eastern side of Nemërçka and Trebeshina (Buhal, Gjinkar, Deshnica), along Këlcyra mouth, among the bushes of Alipostivani, Mokrica, Hormova, Bënçëa Shqeria, Buhal-Gjinkari, in the forest of Hotova, Lupcka, Bënja, in the mountain of Postenan, at the fir trees of Iljara and Çarçova. Its hunting is prohibited. The wild goat is widely spread in the mountains of Nemërçka (at the top of Strakavec), Mali i Gjerë, Trebeshina and Çajupi. It is very rare, therefore it is under protection. The wild rabbit is commonly found in the mountain of Bureto, at the black foot, in Lunxhëri, along the valley of Pogon, Trebeshinë, Shëndëlli etc. Its hunting is only prohibited at their breeding season.

#### *The Birds*

Gjirokastra region is rich in water and land birds, migratory and non-migratory ones. The mountain eagle and the hawk are birds of biological and symbolic importance, but they are rarely found, therefore they are under protection.

The mountain grouse is spread at the mountainous areas of the region, such as Malëshova, Miçan, Salari, Sinanaj, Progonat, Mezghoran, Kashisht, Maricaj etc. It is shot for food and sport because of its beauty, but its shooting is allowed with a legal permission. The field grouse is seldom met along the Vjosa and Drino valley. It is threatened to extinction because of the illegal shooting. The quail, the snipe and curlew, the owl and the wild pigeons are bred in Qarrishta, Bënja etc. Their shooting is allowed with a legal permission. The heath cock is familiar among the oak forests, but it is very scarce, therefore its shooting is prohibited. The sparrows, the rooks, the jack-daws and the storks are very rare.

#### *Fauna of caves and underground waters*

It is very rich. Worth mentioning are the bats found at the Pigeons cave in Bënja, at the caves of Lek Peta in Progonat, in Lunxhëria and Nemërçka.

#### *The Water fauna*

It is very rich, especially the river one. Among the most familiar fishes lurking in the waters of Vjosa and Drino, we could mention the barbel, the blackfish, the mullet, the wrasse, the bull-head, the sardine and the eel. The trout is common at the clear and freshwaters of Bënça, Lengarica, Kardhiqi and Zagoria. The trout of Bënça is very special throughout The Balkans for its speckles and its rare taste. At the artificial reservoirs, the carp and the bull-head are easily and quickly cultivated. The mallard is found in the rivers of Vjosa, Drino and Bënça. The river basin of Vjosa is known for its amphibians which lend a hand with the extinction of harmful insects. The frogs are of a great economic importance; therefore they are a target for fishing (table 6).



Table 6. Fauna which kindles interest at Gjirokastra region.

Type	Number				Herd for 100/ha				Geographical spread
	Region	Gjirokastra	Përmeti	Tepelena	Region	Gjirokastra	Përmeti	Tepelena	
Wild rabbit	2,157	1,146	513	498	1.3	1	1	2	Picar, Golem,
Wild pig	53	49	-	4	0.3	0.4	-	0.2	Kardhiq, Mal i Gjerë,
Fox	4,024	2,683	794	547	2	2.4	1.5	2	Lunxhëri, Dropull,
wolf	234	51	95	88	0.5	0.05	0.2	1.3	Rrëzë Libohovë, Çajup,
Mount. grouse	5,655	3,636	655	1,364	4.2	7.1	1.8	3.8	Zagori, Pogon,
Bear	9	-	9	-	-	-	-	-	Trebeshinë, Dhëmbel,
Beaver	744	360	384	-	-	-	-	-	Nemërçkë, Grehot,
Wild cat	74	28	46	-	-	-	-	-	Bredh Kala, Bubës,
Deer	51	26	21	4	-	-	-	-	Çarçovë, Grykë Draçovë,
Wild goat	42	12	28	2	-	-	-	-	Leskovec, Pylli Hotovë,
Badger	444	143	206	95	-	-	-	-	Frashër, Koblarë,
Jackal	10	-	-	10	-	-	-	-	Zavalan, Petran,
Otter	56	12	40	4	-	-	-	-	Qilarisht, Pacomit,
Heath cock	8	6	-	2	-	-	-	-	Raban,Buz,
Field grouse	2	-	-	2	-	-	-	-	Krahës, Kurvelesh, Sinanaj, Dragot,Dukaj, Luzat

#### Rare and threatened fauna

The wild fauna is being threatened by the illegal shooting.

Before 1990, hunting was strictly controlled by the state and the hunters were organized in groups. People who belonged to the Hunters State Association were permitted to keep guns [7]: (Regulations of the Ministry of Agriculture No. 4 dt 30-05-1969: "On hunting" and the list of animals and wild poultry, killing or capture of which in any ways was forbidden, like wild goat, roe deer, bear, lynx, or wild cats, weasels, wild cock and hen, field grouse, snipes, griffons, eagles, sparrow hawks, cuckoos, woodpeckers of all kinds, storks, rig-doves, bee eaters, owls, pelicans, long eared owls, except he little owls".

In the region of Gjirokastra ther can be found 420 rare species, which make up 13% of the rare species in Albania and are under danger [8, p. 111]:

- 5 in 93 kinds of poultry (5.4%), out of 320 kinds in the country;
- 18 kinds of reptilian (100%), out of 37 kinds in the country;
- 10 out of 15 kinds of amphibians and reptiles in the country;
- 24 kinds of vertebrates;
- 5 kinds of fish in the fresh waters out of 11 in the country (45% of the kinds).

We could bring up three categories of hunting areas:

- areas where hunting is completely and forever prohibited;
- areas where hunting is exercised only with the approval of the Ministry of Agriculture, Food and Consumer Protection and where grazing and forest exploitation is prohibited;

- areas where hunting is exercised only with the approval of the forest directorate.

The district forest directorates announce yearly the prohibited reserves in order to protect the rare species:

- Çarçova, for the mountain grouse, the wild rabbit and the deer;
- the forest of Hotova, where a lot of animals and birds of great values, seek their shelter to survival. Worth mentioning are the dark-grey bear, the deer, the pig, the wild cat and the wild rabbit, the wolf, the pigeon, the mountain grouse and the wild heath cock;
- Krahës – Qesarat – Izvor – Zhapokikë – Lopës - Rabie, for the rabbit, the grouse and the marten;
- Dhëmbel, with the ecosystem of the mountain grouse (a rare bird throughout Europe), with a colony of 8-10 grouses/100 ha;
- Peshtan – Luzat - Bënça, for the deer, the pheasant, the wild pig and the wild rabbit;
- Bënça - Selcka, for the wild pig;
- Radat - Çatistër, for the rabbit and the deer;
- Sinanaj - Salari, for the mountaneous wild grouse with the colourful feathers;
- Rabie – Gllava – Levan - Allkomemaj, for the wild rabbit;
- Rapavica – Çajup – Ndëran - Zhej, (an important and genetic area for fauna and flora).

Most important are: the deer, the wild pig and the wild goat, the mountain grouse, the wild heath cock, the rabbit, the fox, the badger and the wolf.

To conserve the wild fauna, it's important to hire the forests and pastures (state property) out to people (fig. 5).



Fig. 5. The hunting unit (in ha).

#### 4. THE NATURE MONUMENTS IN GJIROKASTRA REGION

They bear scientific, didactic, ecologic, aesthetic, spiritual and exploring values for the scholars and the tourists. With conformity to law “The Protection of the Cultural Monuments and the Rare Nature Properties”, No. 4927, date 24.02.1971, 27 objects were declared as nature monuments at Gjirokastra region. The Oak tree of Kardhiqi and The Fir tree of Sotira were declared Nature Reserve in 1976.

The greater number of nature monuments is found at the communes of Pogoni, Zagoria, Upper Dropulli, Lunxhëria, Qendër Libohova, Cepo and Picari in Gjirokastra; in Çarçova, Frashëri, Petran, and Qendër Piskova in Përmeti; in Kurvelesh, Qendër Tepelena, Krahës and Lopës in Tepelena (fig. 6).

In conformity with the Law 8906, date 06.06.2002, 106 monuments were declared at the region out of which 47 in Gjirokastra, 30 in Përmeti and 29 in Tepelena. The bio-monuments (the objects of living nature) are the first category and they make up 52% of the monuments (Legal acts in Albania No. 676, dt 20.12.2002). The geo-monuments (the objects of

earth) are the second category and make up 48% of the monuments (table 7).

Table 7. Monuments of nature.

Number	Region	Gjirokastra	Përmeti	Tepelena
Total	106	47	30	29
Biomonuments	51	27	10	14
Geomonuments	55	20	19	16
Percentage	Region	Gjirokastra	Përmeti	Tepelena
Total	100	44.4	28.3	27.3
Biomonuments	48.1	25.5	13.2	9.4
Geomonuments	51.9	18.9	15.1	17.9

The largest number is met in Gjirokastra (19% of the geo-monuments and 25.5% of the bio-monuments).

The nature geo-monuments bear unique values as a source of various scientific information. However, the mineral Law “The search, the exploration and the exploitation of minerals”, No. 7796, date 17.02.1994, foresees no maintenance and protection of the fossil and unique minerals [4].

The geo-morphological monuments are shaped as a result of the atmospheric agents:

- (the mountain passes), the lakes and the limestone depressions, the canyons, the pyramids and the erosion waterfalls;
- they are shaped as a result of the river erosion activity: (the canyons and the river mouths), the limestone (the caves);
- because of the complex things: (the limestone fields);
- because of a neotectonic origin: (the river terraces).

The hydrological monuments are the mineral water source of Glina and the spa waters of Bënja.



Fig. 6. Area of Lopës.

## 5. THE NATURE PARKS AND ECOTOURISM IN GJIROKASTRA REGION

After 1993, when the environmental Law was drafted, the system of Protective Areas (The annual Statistics, INSTAT, 2003) was organized at the region with conformity to the criteria of the International Union of Conserving the Nature (IUCN) (table 8).

The scientific nature reserve of Kardhiqi oak forest (with various types of Mediterranean birds and mammals with a surface of 1800 ha).

The Fir tree of Sotira (nature monument with characteristic features of the Macedonian one, with a surface of 1740 ha), the nature monument in Zheji, the National Park with the Firtrees of Hotova (rich in biodiversity: more than 20 forest woods, more than 25

medical herbs, big mammals, like the wolf, the dark grey bear, the deer, the wild pig; with a surface of 1200 ha) (fig. 7).

The all bear scientific, ecological, material, spiritual, social and high national values. *The national parks exercise three main functions:*

- a protected area;
- an area where traditional activities may be organized;
- an entertaining and relaxing area.

Four other new areas are suggested to being managed and protected as natural sources for relaxation and entertainment (Drino-Sotira, Vjosa-Çarçova valley, the black water of Këlcyra and the multiple use area of Piskali-Sheqeri in Kolonja and Përmeti district).

Table 8. The protected areas according to the categories of management (IUCN).

Region	Protected areas	Kategorizimi	Denomination	Surface in ha	Approved
Gjirokastra	Kardhiqi	I	Scientific nature reserve	1800	15.01.1996
	Fir tree of Sotira	III	Nature monument	1740	15.01.1996
	Zheji		1500	15.01.1996	
Përmeti	Fir trees of Hotova	II	National Park	1200	15.01.1996



Fig. 7. The fir-tree of Hotova.

## 6. SUGGESTIONS

We need to improve and revive the forest unit to have a pleasant ensemble of ecological, social and economic functions.

The intellectual potential of the region should exploit and protect the natural resources. It should be

environmentally organized making rationally use of the forest and pasture resources as flora and fauna reserve.

We should lessen the complete risk of woodcutting in order to avoid the drastic loss of land and the climatic changes.

We should realize the protective ambition of fauna through trainings with the local authorities.

Among other suggestions we recommend:

To restrict buildings within the forest environment.

To declare other nature reserves for animals and birds threatened with extinction.

To conserve the forest wreaths in the inhabited areas.

To take care of the boundary areas of forests with high interest from the biological diversity point of view.

To stir policies, so that people could be forest-conscious.

To implement practical forest issues about the regional ecosystem.

To carefully conserve and manage the Albanian western geo-monuments because they offer great possibilities for the socio-economic life and the tourist growth

## 7. CONCLUSION

The favourable geographical position of Gjirokastra region determines Mediterranean features of the landscape which are written on the rocks variety, on the climatic and hydrologic respect, on the land features and last on flora and fauna. The nature ecosystem is the ecological balance and the lung of the foundation stone. The vegetation is spread into belts which form diminishing circles as the area gets higher in altitude. Each vegetation belt is typed to its soil, its number of woods, bushes and plants. The territory

originality is displayed on the high historical values, on the archaeological, structural, ethnographical, cultural and landscape resources, as well. After 1990 (especially after 1997), the crisis reflected negative consequences on the regional biodiversity. The human mind pressure on the environment brought forward harm and damage to the forest and pasture ecosystem. The brutal human factor threatened the habitats to distinction and already brought an end to vegetation. A large number of plants are exposed to danger, as a result of a biological balance loss from grazing and illegal picking of medical plants. Opening new lands on steep terrains and frequently having conifer fires means the same, too. The ecotourism of Gjirokastra region is unique for the natural and original values it bears.

## REFERENCES

- [1] \*\*\* (2022) Legal acts in Albania No. 676, dt 20.12.2002, *The declaration for Protected Area of the Natural Monuments in Albania*.
- [2] **Lole, Dh.** (2000), *Përmeti until 1912*, Tirana.
- [3] **Mullaj, A.** (1995), *The red book, The rare plants of Albania threatened to extinction*, Tirana.
- [4] **Serjani, A.** (2003), *The geo-monuments and geo-tourism in Albania*, Tirana.
- [5] \*\*\* (2003), *The annual Statistics*, INSTAT, Tirana.
- [6] \*\*\* (2005), *The Encyclopaedia of Tepelena*, Tirana.
- [7] \*\*\* (1969), *The official gazette* 30 June, No. 5.
- [8] \*\*\* (2005), *The strategy of development in Gjirokastra region*, UNDP, Tirana.