



Bulgaria

Analysis of the Problems Connected to Forest Fires in Bulgaria

Introduction

The forest lands in Bulgaria comprise of 3,914,355 hectares (ha) and occupy 34% of the territory of the country. 3,398,307 ha (86.8%) of those are wooded areas; 138,671 ha (3.5%) are to be afforested; the unproductive forest lands are 295,832 ha (7.6%); and the forest pastures are 81,545 ha (2.1%). A significant part of the forests are artificially afforested during the last 50 years with coniferous plantations – 747,471 ha (corresponding to 19.1% of the area of forest lands, or 22.0% of the area of wooded lands).

The total volume of wood in the Bulgarian forests has been calculated to 526.1 million m³. Bulgaria ranks 19 in woodiness in Europe. About 29% (1 million hectares) of the forests have their anthropogenic creation – they have been created through forestation of eroded or erosion-threatened forest lands and abandoned agricultural lands. Even this data show the significance of the Bulgarian forests not only at the national and regional scale, but as a part of the European green environment (system). When one adds the extremely precious biodiversity, which was kept in the forest ecosystems, one could say that Bulgaria is an important element of the world's forest treasure.

1. Characteristics of the fire situation in the country

Forest fires have never been a serious problem in Bulgaria when we look at the past thanks to the natural and climatic conditions in the country. They have become a problem and a threat during the last ten years and in the period 1999-2001 they were a real disaster. The basic reasons for that are:

- The global climate warming in the last decade;
- The social and economic changes in the country during the process of transition towards market economy;
- The change in the organization of the activities in the forestry sector;
- The unsuitable tree species composition (high percentage of coniferous plantations, untimely thinnings of the plantations and young stands);
- Few and outdated fire-fighting equipment;
- The lack of a reliable fire reporting and prognosticating system;
- The imperfect legislation (regulatory base) which causes the ineffective coordination between the different state and local authorities for the extinguishing of fires;
- Insufficient participation from the public organizations and the public as a whole.

2. The effect of forest fires on the society and the ecology during the 1990s

The dynamics of forest fires in the country shows that in the end of the nineteenth and the beginning of the twentieth century 3,000 hectares were burnt on average per year, until the middle of the twentieth century – around 1,600 – 1,800 ha and during the 50s and 60 of last century – around 800 – 1,000 ha per year. During the last ten years the problem became a crisis and in the period 1999-2001 – it could be classified as a real disaster. All in all from 1999 to 2001 113,400 ha forests were burnt (around 3.9% of the whole territory of the country) and in 2001 alone 57,400 ha were burnt. In the year 2000 alone one third of the fires covering a half of the area burnt until that year were burnt.

The analysis of the preconditions, reasons and factors leads to the conclusion that Bulgaria is joining the Mediterranean region with traditionally high risk of forest fires according to the parameters of the risk of fires on its territory. The consequences of the fires in the Sakar Mountain had the dimensions of a local ecological catastrophe, but the ones that followed during the next two years led those to the scale of a national natural disaster. The damages were not only economical ones but on a much bigger scale – inestimable damage on the conditions for the plants, led to erosion and destruction of the soils, to disturbing of the warmth and moisture balance of the ecosystems, to changes of the basic tree species, to the flora composition and the phytocenological structure, to change on the water flow character, to worsening of the sanitary condition of the neighboring unburnt stands, to sudden decrease of the CO₂ absorbing capacity of nature – all in all to total or partial destruction of the existing biocenosis.

Most of the fires on coniferous forests affected the whole trees and permanently harmed them (68%), which need artificial reforestation. The burnt deciduous forests are in the same condition (15%).

The regeneration of the harmed forest ecosystem could become reality in two ways:

- natural – for several dozens of years (in some cases 100-200 years) depending on the type of fire and the character of the burnt areas;
- through forestation, which decreases the regeneration period significantly and in some cases is the only possible solution.

It should be stated that if intensive erosion processes are allowed, the regeneration of the environment in its previous condition is practically impossible.



Figure 1. Extreme ecological damages by wildfires have been noted in high-altitude vegetation such as this *Krummholz* in a mountain range near Sofia. Photo: GFMC.

3. Data of the forest fires for the periods 1980-1990 and 1991-2002

Statistical forest fire data are provided in Tables 1 and 2. The comparison of the data for the last two decades shows a drastic change in the fire situation in forests – the number of fires and the mean burnt area have increased 35 times. As it is obvious – the increase is not measured in percent but in tens of times. The data shown here are not extreme ones just for some of the years but are mean values for the last decades. Despite of the analyses made so far it is difficult to explain the comparison between the parameters of the fire situation in forests. If we take for an example the years 1991 and 200: the number of fires has increased 23 times and the mean area of a fire has increased 5 times, while the burnt area has increased 112 times!

Table 1. Forest fire statistics for Bulgaria for the period 1980-1989

Year	Total number of fires	Total burnt area, ha	Burnt forest lands, ha	Other territories, ha	Caused by human activities, number	Natural causes, number	Unknown causes, number
1980	67	173	173		57	1	9
1981	81	199	199		65		16
1982	110	168	168		85	1	24
1983	47	126	126		37		10
1984	51	98	98		16		35
1985	100	1151	1151		48	1	51
1986	57	340	340		37		20
1987	81	301	301		38		43
1988	101	462	462		53		48
1989	63	223	223				
Mean	75.8	324	324		43.6	0.3	25.6

Table 2. Forest fire statistics for Bulgaria for the period 1990-2002

Year	Total number of fires	Total burnt area, ha	Burnt forest lands, ha	Other territories, ha	Caused by human activities, number	Natural causes, number	Unknown causes, number
1990	208	1041	1012	29			
1991	73	511	471	40			
1992	602	5243	4154	1089			
1993	1196	18164	10147	8017			
1994	667	18100	9708	8392			
1995	114	550	527	23			
1996	246	2150	1933	217			
1997	200	595	472	123	51	4	145
1998	578	6967	6060	907	147	6	425
1999	320	8291	4198	4093	84	9	227
2000	1710	57406	37431	19975	385	18	1307
2001	825	20152	18463	1689	187	19	619
2002	402	6513	5910	603	150	7	245
Mean	547.5	11221	7745	3476	163	10.5	495

4. Organizations responsible for the protection of forests from fires

Obligations of the National Forestry Board

The National Forestry Board, its bodies and units take part and control the execution of the obligations and the activities for the protection of forests and lands from fires.

Preventive measures

Direct organization and execution of the fire protection activities in forests and forest fire fighting is being undertaken by the State Forest Districts and the Fire and Emergency Agency (Article 121, paragraph 4 of the *Law for the Protection of Forests from Fires*).

During the season with high risk of fires the State Forest Districts employ fire observers that are equipped with communication devices (Article 121, paragraph 5 of the *Law for the Protection of Forests from Fires*).

The State Forest Districts prepare an annually updated action plan for the activities needed for the protection from fires and also action plan for forest fire suppression (Article 121, paragraph 7 of the *Law for the Protection of Forests from Fires*).

Forest fire suppression

The Head of the National Forestry Board issues an order defining the season with high risk of fires – article 121, paragraph 5 of the Forest Act (usually it lasts from April till October).

When a fire breaks out in the forests the director of the State Forest District is in charge of leading fire suppression activities until the moment when the fire service arrives on site.

It is compulsory for the foresters to take part in forest fire suppression (Article 77, paragraph 6 of the Forest Act and article 126, paragraph 1 of the *Law for the Protection of Forests from Fires*).

The bodies of the NFB follow the instructions of the National Fire and Emergency Safety Service (NFESS) in the Ministry of Interior and assist them in doing their duties (Article 119 of the Forest Act and Article 97, paragraph 1 of the *Law for the Protection of Forests from Fires*).

Expenses for the extinguishing of forest fires

The expenses for the extinguishing of forest fires are to be paid by the owners of the forests excluding the costs for the National Fire and Emergency Safety Service (Article 218, paragraph 1 of the *Law for the Protection of Forests from Fires*).

Obligations of the NFESS

The NFESS is a specialized body in the Ministry of Interior, which executes fire emergency control, fire suppression and emergency safety actions (Article 108 of the Forest Act).

The fire-extinguishing activities consist of:

- Working out of plans for liquidating the consequences of incidents;
- Immediately sending of staff and equipment on the announcement of fire;
- Limiting and extinguishing of fire;
- Defining the ways, methods and means for the extinguishing;
- The rescuing of people and property;
- Paramedic help to the injured people;
- Organisation and transport of the injured people to a hospital (Article 110 of the *Law for the Protection of Forests from Fires*).

Obligations of the municipalities and city councils

The mayors of municipalities and towns organize groups for the extinguishing of forest fires yearly, then they send the lists of names to the State Forest Districts and to the regional department of the NFESS before the beginning of the season with high risk of fires, they organize the transport of these groups and of other local participants in the extinguishing to the fire place (Article 125, paragraph 1,2 and 3 of the *Law for the Protection of Forests from Fires*).

Obligations of the regional state administrations

The organization, the basic functions and tasks of the state institutions, the local institutions and the regional state administrations, the trading enterprises and sole trader companies for non-admission, limitation and liquidation of the consequences of emergencies, averages and disasters are defined by the Statute-book for the organization and activities for the prevention and liquidation of the consequences of emergencies, averages and disasters – adopted with an Act of the Council of Ministers No. 18 of 23 January 1998.

5. Regulation of controlled burning of vegetable residuals

Currently the starting of a fire outside the precise places in forests is forbidden (Article 77, paragraph 3 of the Forest Act). It is forbidden to clear clear-cut areas by burning and other activities with fire in the forests during the season with high risk of fires (Article 124 of the *Law for the Protection of Forests from Fires*).

A basic problem in the country is the regulations adopted in 2000 for the revocation of the Law for the Protection of Agricultural Lands (LPAL) in its part concerning the burning of stubble-fields that had been used for decades.

What are the results of that?

During the period 1996-1999 the forest fires destroyed several dozens of thousands of hectares of forests. In early 2000 Article 6, paragraph 1 of the LPAL was revoked. That regulation had provided the possibility for conducting prescribed burning on stubble-fields and for reducing other vegetable residuals in agricultural lands, which had to be done on the basis of a permit from the phytosanitary and Fire Safety institutions. The mayor of the town or village had to supervise the prescribed fires. After the revocation of this regulation the number of uncontrolled fires and the area burnt in forest lands increased rapidly. It reached hundreds of thousands hectares per year. According to the statistics of the NFB during the last 5 years more than 80 % of the forest fires had been caused by fires started outside the wooded territory.

In this case we have to be realistic and professional in addressing this problem and perform as described in the following. Agricultural lands, that have been abandoned for years and aimed to be put in use again, have to be ploughed twice. The first ploughing has to be done deep. Then they have to be tilled twice or three times and in some cases they have to be treated with herbicides too. Obviously the burning of these lands is the easiest way of clearing them and that is what their owners or tenant farmers prefer. The grinding of the straw and other vegetable refuse after harvesting the yield could be done with the usage of special grinding devices, which are also too costly for most of the farmers. The gathering and taking of the vegetable residuals that can not be used for fodder out of the agricultural lands is also unprofitable.

In this situation there is a lot of uncontrolled and irresponsible starting of fires that created the preconditions for the starting of fires.

We think that the solution of the problem is a compromise one – the adoption of a interim decision for the permission of planned, well-organized and controlled burning of such areas.

At the same time efforts are made for the creation of suitable conditions for the construction of enterprises for processing of the excess biomass and its utilization for the production of energy, fodder, etc. Farmers must be encouraged to gather and sell the biomass that is of no use for them. This would help to solve the problem.

6. State policy in the field of forest fires

At present the National Forestry Board (Ministry of Agriculture and Forests, the Government) is facing the problem to regenerate the areas burnt during the period 1999-2001. This has to be done due to two basic reasons:

Ecological – The damage of the forest ecosystems and their environment and the danger of further degradation, e.g. increasing erosion, phytosanitary problems, etc., call for rehabilitation measures.

Legislative – the Forest Act does not allow a reduction of the existing land coverage by woody vegetation (Article 7, paragraph 2) and demands the regeneration of forests after a fire to be completed within two years (Article 43).

The protection of the stands located next to burnt forests is also a new problem for our forestry. Due to the scale of forest fires it gains bigger significance for the successful regeneration of burnt forests and non-admission of the ecological damage both for the damaged trees and also for the neighbouring stands.

Reforestation currently conducted are still not sufficient both for the routine needs and for the burnt areas.

After the forest fires suitable conditions are in place that favour mass outbreaks of different pests and their spread to the neighbouring unburnt forests, thus worsening their phytosanitary condition.

The mix of different forest ownerships (state, municipality, private and other) and the different management of the forested lands (NFB and the Ministry of Ecology and Waters) also lead to the complication of the problem. It is especially complex in private forests. Data shows that 15% of the burnt forests are privately owned and 22% owned by municipalities. The lack of funding, qualification and readiness in the private owners for the fast regeneration of the forests and the little dimensions of their property impede the efforts for the regeneration of the burnt forests very much. The necessity of legislative and other forms of encouraging, stimulating, consulting and training of non-state forest owners with the aim of creating awareness and active participation for the execution of the reforestation.

Altogether the main aims of the policy include the creation of public awareness for forest fire prevention and the regeneration of forests damaged by fires with the help of the whole society.



Figure 2. A series of national round tables and workshops for the development of a National Fire Management Strategy were held between December 2001 and October 2002, supported by the Bulgaria-Swiss Forestry Programme (BSFP) and the Global Fire Monitoring Center (GFMC). Photo: BSFP.

References

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