

# Europe: Development and Fire<sup>1</sup>

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## Abstract

In response to socio-economic changes in recent decades, such as rural depopulation, concentration of the population in urban areas, and priority shifts in forestry policy, the risk of fires in the countries of southern Europe is on a rise. Until now, the large investments made in fire suppression resources have produced acceptable results. However, ecological, economic, demographic and political conditions have led to more and more difficult situations involving more frequent large fires. Multilateral assistance between countries and the development of a regional prevention policy should, in the immediate future, be the focal point for international cooperation in response to this shared problem.

## Introduction

When one speaks of forest fires in Europe, one automatically refers to the Mediterranean Basin region. Although fires do, of course, occur in northern and central Europe, their impact is very limited in comparison with those in the southern countries.

Fires in the Mediterranean Basin more than just a consequence of long periods of drought; they can also be considered an indicator of the socio-economic differences between the different areas comprising the Mediterranean Basin and their respective levels of development. The highest number of fires and the most extensive areas are reported in the Mediterranean countries in the north of the basin (Europe). This tendency appears to be extending from the northwest to the east, to the countries that hope to join the European economic space (Croatia, Bulgaria, Rumania, Turkey, Israel). Development will perhaps allow them to enter more quickly in the “fire club” currently consisting of Portugal, Spain, France, Italy and Greece!

Socio-economic change in recent decades influences the risk of fires, given that it increases the flammability of the ecosystems. The changes with the greatest repercussions are:

- a) **Rural depopulation**, which leads to neglected areas of land. These areas are then invaded by natural and spontaneous vegetation that burns with a greater flammability. In addition, the aging population staying behind also increases the risk, given that traditionally farmers and shepherds burn the land themselves to control vegetation.
- b) **Concentration of the population in urban areas**, which widens the wildland/urban interface. The growing vegetation in the surrounding areas can eventually increase the risk to new residences (first or second homes).

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- c) **Shifts in priorities in forestry policy**, which formerly were centred on the production of wood and other raw materials, are currently focused on nature conservation, landscape conservation and recreation. The decrease in timber removal and logging in some areas have led to increased amounts of biomass in woodlands, and hence increased flammability.

The reduced frequency of fires in the south and east of the Basin, where these changes have not occurred, contrasts noticeably with the high risk present the European countries of the basin.

To counter such a risk, during the last two decades the countries of the “fire club” have greatly improved their fire suppression resources at a high economic cost, with apparently acceptable results. Nevertheless, the possibilities of continuing to make large investments to combat the continued worsening of the problem seem almost expended. Thus, new approaches to forest fire defence are required to improve the strategies of prevention and suppression.

## **Determining factors**

### ***Ecological factors***

Weather conditions and the way in which weather has been modified by the climate change do not seem to be leading to any lessening of the long periods of drought (3 – 6 months) in which vegetation becomes readily burnable. In addition, an increase in dry storms in those periods has been observed. As this coincides with extensive accumulation of fine fuels in the fields due to rural desertion, it could lead to highly intense fires in many zones at the same time.

### ***Economic factors***

The economic value of forest areas in the Mediterranean climate is lower than in any other sector, due to the slow growth of the species present and the scarce demand for the products that can be obtained from the land, except for cork.

Spain, with forest land counting for more than 50 percent of national territory, only obtains 0.15 percent of its GDP from the forest land.

The low direct economic value discourages investments that could improve the productivity of the land. In Spain, the forestry sector only contributes 5 percent to the environmental market (ASEMFO 2002).

The risk of forest fires is an additional negative factor for the economy. Until now it has not been possible to establish—not to mention consolidate—a fire insurance system that facilitates the process of obtaining credits and, as a result, investments.

Unfortunately, the environmental values in the forest areas are not able to attract capital investments geared toward high profitability.

### ***Demographic factors***

The Mediterranean Basin is a region with a growing population; from 1950 to 2000, the population grew from 225 million people to 450 million. Projections

indicate that by 2050 it could reach 600 million (Plan Bleu 2003). However, this population is concentrated in the coastal areas and in some built-up urban areas inland.

Specifically, the urban population for the entire Basin constituted 60 percent of the total population in 1970 and reached 70 percent in 2000.

In the countries in the north of the Basin, the proportion is already at 90 percent. That is, rural areas are emptying and the mountainous woodlands, in particular, can already be considered deserted.

The current elevated migratory movements do nothing to alter this situation, given that immigrants settle mainly in urban areas and in highly-productive agricultural zones (that is, areas with the most employment opportunities).

By way of example, in Spain the active rural population (number of jobs), decreased from 1,600,000 in 1988 to 800,000 by 2002 (ASEMFO 2003).

In the short term, the desertion of rural areas leads to neglected land where natural regeneration takes over. During many years this land will present a high flammability.

In addition, a low population also means lack of labour for carrying out forestry work in general and fire protection work in particular.

### ***Political factors***

The situation described in the above points is naturally not attractive enough to interest politicians in woodland protection. However, the urban population's demand (through voting) for environmental protection has contributed to the establishment of permanent protection programs as one more of the services offered by the **welfare state**.

Nevertheless, these services suffer the usual defects of such an approach: firstly, priority is given to the **most urgent matters** (fire suppression), which barely leaves resources available for the **most important matters** (prevention).

Secondly, government intervention generates **passiveness among the population** on one hand, and, on the other hand, **a demand for impossible results** in extreme danger conditions not clearly understood by the public.

### **Results of suppression work**

As stated above, the majority of resources are centred on fire suppression, with the general criteria that **all fires must be put out**. The U.S. policy of **allowing fires to burn in some areas (natural prescribed burning)** is not considered a possibility under any circumstances.

The large amount of property and goods to be protected in urban areas, as well as the development of fire services in those areas, has in many cases led to responsibility for fire suppression being transferred to those services, disassociating it from forestry activities.

As this shift in responsibility has not been accompanied by a specialization in forestry techniques, it has led to rather long periods of lack of coordination and inadequate results. Gradually, however, the concepts of forest fire behavior and

the specific techniques of fire-fighting have become more widespread and there is a greater coordination among fire services and forest management services.

The **principle of total fire suppression** and, fortunately, the availability of economic resources, has led to important improvements in the training and equipping of personal, as well as the spread of use of aerial resources. Each summer more than 400 aircrafts aid in suppressing forest fires in the European Mediterranean countries.

The results of these works are listed below. The percent of burned forest area in the at-risk area (national woodland surface area in Portugal, Spain, Southern France, Italy and Greece) is used as an indicator.

| Country        | Year |      |      |      |      |      |      |      |      |       |
|----------------|------|------|------|------|------|------|------|------|------|-------|
|                | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003  |
| Portugal       | 2,61 | 5,73 | 3,00 | 1,03 | 5,35 | 2,39 | 5,39 | 3,78 | 4,19 | 15,80 |
| España         | 1,62 | 0,53 | 0,22 | 0,36 | 0,49 | 0,30 | 0,70 | 0,34 | 0,39 | 0,50  |
| Sur de Francia | 0,77 | 0,34 | 0,11 | 0,42 | 0,38 | 0,44 | 0,64 | 0,54 | 0,70 | 2,30  |
| Italia         | 0,85 | 0,57 | 0,72 | 1,27 | 1,73 | 0,77 | 1,26 | 0,94 | 0,50 | 1,06  |
| Grecia         | 0,82 | 0,39 | 0,36 | 0,75 | 1,60 | 0,27 | 2,38 | 0,44 | 0,09 | 0,05  |

Curiously, these results are not accompanied by a cost-efficiency analysis.

The **principle of total fire extinguishments** mentioned above means that all available resources are concentrated to fight a fire with the sole objective of minimizing damages at any cost, even if the cost is greater than the potential damages.

## Budgets allocated for forest fire protection

There is no database charting the investments made to protect against forest fires. Nevertheless, it can be estimated that the five E.U. Mediterranean countries invest more than 2.5 billion euros per year in prevention and suppression. 60 percent of this figure is earmarked for suppression equipment, personal and operations, and the rest is allocated for preventative works.

## New and old problems

The forest fire databases (MMA 2001, CE 2003, ECE/FAO 1998, Vélez 2000) show that forest fires are a permanent seasonally-based problem in the Mediterranean region.

Despite rural depopulation, the majority of fires continue to be caused by the traditional practices of burning for agricultural and farming purposes (burning of agricultural waste, burning of dry pastures). Winter fires in mountainous areas (the Cantabrian Mountains, the Pyrenees, the Alps) at times spread over a great area. Accordingly, fire services, which usually focus on the summer months, are forced to modify their strategies to include resources that are readily mobilized in winter as well.

Some of the recent fires caused by the burning of pastures have their root in the Community Agriculture Policy subsidies for encouraging the mountain economy, namely subsidies for extensive cattle raising.

In cases where the owner of the livestock is not the owner of the land, the former sometimes burns the terrain uncontrollably so that the goats, sheep, etc. keep producing not only meat and milk, but also cash subsidies.

The accumulation of fuel in large expanses of abandoned land, sets the right conditions for large fires. In addition, lightning, which until a few decades ago was a less common cause, can increase the incidence of large fires in these large expanses of land.

The tragic seasons of 1994 in Spain and 2003 in Portugal and France were caused mainly by the combination of lightning and extensive accumulation of fuels in the woodlands.

As is foreseeable, intense erosive effects appear after large fires (Vélez 2000). It is an example of a chronic problem aggravated in recent times.

A new problem, which is becoming increasingly visible each new summer season, is the risk of fire in the wildland/urban interface.

This problem, which was considered specific to other areas of the world such as California and Australia, is becoming more worrisome as construction is occurring in forest areas, namely of first or second residences either on the coast or in the mountains near large cities.

Disasters that destroy houses and take the lives of the residents are becoming more and more common.

Fire services are therefore forced to concentrate on protecting homes and no longer focus on protecting the vegetation.

Preventative legislation for this problem is either inexistent or insufficient. Consequently, it is foreseeable that this problem could reach catastrophic importance.

## **International Coordination**

Constitutionally, the European Union lacks a forestry policy, as such a policy was not contemplated in the Treaty of Rome. Nevertheless, in the last decade some movements have filled this gap, such as the European Parliament's approval of a Forestry Strategy and the approval of a Reforestation Program for poorer agricultural areas.

In addition, a series of Regulations for Prevention of Forest Fires was in place from 1985 to 2001. These Regulations were supported by very small funds (an average of 12 million euros per year in the last decade distributed between 6 countries).

These Regulations are only a token support for certain preventive actions and have lead only to the creation of a very limited European forest fire database.

In 2003 the new Regulation (Forest Focus 2003) was approved, which will provide 13 million euros per year to the forest monitoring network, the forest fire database, and other preventative measures. This extends to the 15 current member

states plus the candidate countries. That is, E.U. support for prevention of forest fires has been reduced even further.

It is necessary to note that no Community contribution is provided for suppression operations. Rather, there is strong solidarity between neighbouring countries through bilateral and mutual assistance agreements (FAO 2000).

In recent years, the availability of aerial resources has made such operations more frequent. Accordingly, it is necessary to regulate their use through revising and renewing agreements and endeavouring to establish homogenous coordination regulations, i.e., a regional Emergency Management System (EMS).

The FAO/Silva Mediterranea Committee is promoting the elaboration of these regulations (Taller Zaragoza 2003).

## Prospects

The problems identified (section 1) and the determining factors (section 2) are not caused by conditions of the forest itself. Rather, the forest simply suffers from these problems and factors, and reflects them in the form of forest fires.

Although global development for the forest sector has many advantages, it also has a serious drawback: greater frequency of devastating fires.

As discussed in section 3, Europe has a powerful fire suppression infrastructure and an acceptable database, but significant improvements are needed in some countries. Likewise, although a small group of researchers of forest fires does exist, their findings have only limited repercussion on the operating services in the sector.

Preventative silviculture is clearly insufficient, as are both the environmental education programs aimed at urban population and those aimed at rural populations.

New problems in the wildland/urban interface may motivate society to demand that greater attention be paid to prevention, in the form of effective actions and not only rhetorical declarations.

The saturation of suppression resources and their ever-growing cost can influence this as well. During the 1990s, aerial resources were developed by taking advantage of the low cost of restricted aircrafts of military origin, both from the U.S. and from Eastern countries.

The new regulations regarding aircraft safety are making it necessary to introduce technological improvements for both security and efficiency, which leads to significant supplementary costs. This will limit the possibility of further expansion of the aerial resources currently used.

The most obvious possibilities for improving the system can only be found in a conjunction of preventative actions reducing the frequency of fires and limiting their intensity through silvicultural treatments reducing biomass accumulations.

In these conditions, the improvement of the quality of fire suppression services, with well-equipped, well-trained and well-organized personnel applying specific forest fire fighting techniques, will make it possible to maintain and improve the results discussed.

In order to make this improvement of services a reality, it is crucial to maintain a high level of personal security through a wide-reaching system of personnel

certification and recognition. Such a system would also facilitate operations of multilateral assistance among countries. Given the current environment of globalisation, such operations are likely to be more and more frequent.

## **References**

- ASEMFO, 2003.- III Estudio de inversión y empleo en el Sector Forestal, Asociación Nacional de Empresas Forestales, Madrid, 68 pp.
- European Commission, 2003.- Forest fires in Europe, 2002 Fire Campaign, European Commission, JRC, Ispra, 33 pp.
- European Commission , 2003.- Reglamento (CE) 2152/2003 del Parlamento Europeo y del Consejo, 17 noviembre 2003, sobre seguimiento de los bosques y de las interacciones ambientales en la Comunidad (Forest Focus), DOUE, 11-12-2003, Brussels.
- ECE/FAO, 1998.- Forest fire statistics 1994-1996, United Nations, Geneva, 19 pp.
- FAO, 2002.- Legal frameworks for forest fire management: International agreements and national legislation, Forestry Department, Rome, 59 pp.
- FAO/Silva Mediterranea CIHEAM, 2003.- Workshop on Multilateral Assistance against Forest Fires in the Mediterranean Basin, Zaragoza, CD Edition.
- Ministerio de Medio Ambiente 2001.- Los incendios forestales en España. Decenio 1991-2000, DGCN, Madrid, 50 pp.
- Plan Bleu, 2002.- Les espaces boisés méditerranéens, Jean de Montgolfier, Plan Bleu, Paris, 192 pp.
- Vélez, R. et al, 2000.- La defensa contra incendios forestales. Fundamentos y experiencias, Ed. McGraw-Hill, Madrid, pp 2.1-2.8; 3.1-3.15

