



Background information

Forest fires in the Mediterranean:

The Mediterranean has been identified by WWF and IUCN as one of the most important regions in the world for its outstanding biodiversity features. Mediterranean forests, situated in a transitional zone between the European, African and Asian continents, are one of the planet's centres of plant diversity, with 25,000 floral species representing 10% of the world's flowering plants on just over 1.6% of the Earth's surface. They also play host to an amazing faunal diversity.

But the Mediterranean forests are also under serious threat, with forest fires, in most cases deliberately set, playing a major role in their degradation and bringing about huge social, economic and environmental effects.

There is a strong need to put in place an effective policy of prevention to address the root causes of this phenomenon.

The issue

The Mediterranean region is heavily affected by forest fires; every year more than 50,000 fires burn an estimated average of 600,000 - 800,000 hectares, an area comparable to the island of Crete or the island of Corsica, and equal to 1,3 - 1,7 % of the total Mediterranean forests.

While small-scale fires may be part of the natural dynamics and the management of the natural resources, large-scale forest fires throughout the region have increased during the last few decades, mainly as a consequence of the rapid land-use changes, socio-economic conflicts and the competing interests characterising the Mediterranean region in the last decades.

EU Mediterranean countries – Spain, Portugal, Italy and Greece – have been particularly affected: the average total burnt area in these countries has quadrupled since the 60's.

Of all the forest fires in the Mediterranean, human induced ones, mostly due to deliberate lighting of forest fires and negligence, account for more than 95%.

As a result of the intensification of forest fires, the capacity of the Mediterranean ecosystems to naturally regenerate in many areas has been reduced, while extensive areas are being affected by biodiversity loss, soil erosion and water scarcity.

Indeed, forest fires aggravate soil erosion, leading ultimately to desertification. This also leads to huge economic costs.

In Spain, one of the Mediterranean countries most affected by forest fires, about 44% of the territory is affected by some kind of erosion and 18% (about 9 million ha) loses more than 50 tonnes of soil per hectare per year (t/ha/year), a level considered as the critical load for erosion (ICONA, 1991).

The cost of the direct impact of erosion on the environment in Spain has been estimated at 280 million Euros per year, and the cost of rehabilitation at about 3,000 million Euros over a period of 15 to 20 years.

The current warming climate trend in the Mediterranean region, which is also reducing the capability of Mediterranean forests to accommodate the fires and the trend itself, further aggravates the risk of forest fires.

Underlying causes of forest fires

In most cases, the causes of human-related fires remain unknown, primarily to deliberately avoid allocating responsibility for the damage and paying damage costs. This is the case of forest fires provoked by sparks from power lines, which in many cases are deliberately considered as from unknown origin.

In order to properly tackle forest fires, it is of the utmost importance to identify the underlying causes of this phenomenon, which WWF/IUCN identifies as follows:

Collapse of rural systems and land-use changes

The traditional rural socio-economic systems that once characterised the Mediterranean region have collapsed during the last few decades; as a result, rural abandonment spread in the north (for e.g., in Spain, Italy and Greece), and rural mismanagement and overexploitation of nature resources in the south (for e.g., in Turkey, Lebanon and Cyprus).

In parallel, huge and very rapid land-use changes have occurred, implying urbanisation, coastal tourism development and infrastructure construction. The rapidity of the changes did not leave room for the required resources and efforts to allow people to adapt to the changes in a sustainable way.

There have been several consequences of these trends in land-use change.

Decreased market value for timber

As a result of the collapse of rural economies, the market value of the timber and non-timber forest resources has significantly decreased, with subsequent (legal or illegal) pressure from landowners on the local authorities for authorisation to convert rural land into urban land, in order to get higher revenue.

On the other hand, fire can be a way to mobilise the timber market, provoking the logging of burnt trees and the selling of timber not affected by fires at much lower prices.

Land-use conflicts

Land-use changes have been accompanied by severe land-use conflicts. Fire has been consequently used as a tool to convert rural land into urban land, or to appropriate land - mainly in countries where property boundaries are not clearly established -, or to carry out unregulated hunting activities.

In other cases, fire has been a way of affirming right of use, as for instance when the establishment of protected areas restricts users' rights.

Lack of economic compensation

Forest owners are often not adequately recognised for their contribution to the preservation of forests, and also have to bear the additional costs for preventive measures due to new external services (such as cleaning forest land around power lines¹, roads, etc.) brought about by new land uses.

There is a lack of appropriate land-use management practices for fire risk prevention to be carried out year-round. These practices would allow to create favourable conditions related to the different land uses of the territory that help avoid forest fires during the high-risk season, and provide jobs for fire fighters throughout the year. Currently, forest fire fighters are temporarily hired only during the summer season and, in some cases, a perverse system has taken place, in which sometimes fire fighters put fire in order to maintain their jobs.

Loss of a direct link between man and his environment

The decrease in the rural population in the north, further aggravated by a lack of adequate economic incentives, and the trend of urban population increase all over the Mediterranean countries have led to the loss of a direct link between the population and its natural environment and of a proper knowledge on how to manage and prevent forest fires, once an integral part of the traditional rural systems. As a result, the capacity to effectively contain small-scale fires, which could rapidly become large-scale uncontrolled fires, is scarce.

On the other hand, in the existing rural systems traditional fire management practices related to pastures, agriculture and hunting have been maintained, which turn out to be harmful under conditions of rural abandon (high quantity of dry biomass, few people with knowledge on how to react to fire).

¹ Power lines and roads are recorded as having a significant role in forest fires in the recent years in Turkey, Spain, Greece, and Italy. The rate of forest fires caused by power lines in Turkey were: 3% in 1997, 15% in 1998, 2% in 1999.

Degradation of Mediterranean vegetation

Moreover, extensive areas of very valuable and ecologically important Mediterranean vegetation have been subject to a rapid and intense transformation: the expansion of dense secondary forests and scrubs in the north, the fragmentation and degradation of the few mature forest remnants in the south. These degraded and secondary forests and scrubs are characterised by the accumulation of high quantities of dry wood, which makes the vegetation much more inflammable and sensitive to fire events.

Increase in number of visitors to forests

Mass tourism development with related secondary homes' boom in the Mediterranean countries has provoked an increasingly seasonal presence of visitors to forest lands. These visitors typically have little knowledge of the forest environment and sometimes provoke accidental small fires (from smoking, cooking, etc.) that can easily turn into a large fire if not treated properly. An occurrence further aggravated by the easy access to remote areas as a consequence of widespread road construction, subsequently making it difficult for forest managers to monitor and be aware of the location of people in the forest land and to intervene when necessary.

Inadequate regional, national and local policies

At an international level, the implementation of subsidies for rural development from the EU (i.e., the Common Agriculture Policy) is unintentionally promoting land uses (i.e., artificial plantations), which foster increased fire risk.

There is a lack of adequate policies to assess fire risk in land-use planning and to encourage the participation of all the stakeholders (public administration, local authorities, land-users, land owners) in fire prevention.

Also, national policies promoting or not clearly banning land conversion from forest to urban use are widespread in many Mediterranean countries, and fires are used as an excuse for this change; moreover, the cadastre of many countries is either incomplete or does not exist at all. This generates ownership disputes and conflicts over rights of use, provoking fires by arson and negligence.

On the other hand, due to the lack of adequate regulations at a national level, harmful agricultural practices, such as burning harvested fields or grasslands, have been maintained.

The situation is further aggravated by the fact that laws or administrative tools, to punish those responsible for forest fires or to ensure that the costs of damage are recovered, are inadequate or ineffectively applied.

Institutional failures

These are mostly represented by the weak co-ordination existing among different institutions responsible for fighting fires, and by the lack of adequate participation and involvement of national and local stakeholders in the fire fighting chain, from prevention to restoration.

Moreover, there is a lack of specific training and appropriate tools for forest fire fighting by most of the actors (firemen, army, volunteers) involved.

Political instability

During conflicts and wars that are still devastating large parts of several Mediterranean countries, fires are a frequent event.

Climate change

The current climate change trend in the Mediterranean is provoking longer summer droughts and intensification of these droughts even out of season. Also, extreme weather events, such as periods of high temperatures, strong air dryness and very strong winds, as well as sudden storms with heavy rainfall in only few hours (an amount similar to the annual average rainfall in some areas), are becoming frequent. As a result large-scale forest fires are fostered, with consequent soil erosion in burnt areas further aggravated by the heavy rains.

One day of high temperatures, combined with very low humidity and strong winds is enough for fires that start to lead, in few days, to 500,000 hectares of burnt land equalling the land surface of the region of Liguria. This was the case of the forest fires that ravaged Spain in 1985, 1989, 1994, burning from 400,000 to 500,000 ha each time – and now again and including Portugal, Italy and France in particular.

Concrete priority actions needed

The root-causes of Mediterranean forest fires are very complex as they are related to different socio-economic and policy forces.

So far, government responses to forest fires have tended to focus on suppression and on investing in expensive technological solutions (such as water-bombers) to fight fires instead of investing in adequate preventive measures. Instead of alleviating forest fire problems, these solutions have perhaps increased the scale and magnitude of forest fires.

Effective prevention policies are needed to address the root causes of forest fires, actively involving all the relevant stakeholders in the land-use planning and management of their territory.

Put in place an effective fire fight chain

A balanced fire management system should be considered as an integral part of landscape planning in all Mediterranean areas at high risk from forest fires, and should comprise prevention, preparedness (prediction - with scenarios on where and when forest fires could be stronger in critical moments - and pre-suppression - specific actions for areas at higher fire risk), response (suppression/fire fighting) and recovery (restoration).

This would mean:

- Analysing the fire “problem” including the vulnerability of an area to fire through a measured and balanced process that considers ecosystem needs, social and economic circumstances and cultural aspects.
- Assessing related needs of the area, from prevention to restoration;
- Providing the necessary land-use planning measures, both in terms of preventive management practices and stakeholders’ responsibility in managing fires;
- Identifying priority actions for each component of the fire management system throughout the year – Prevention, Preparedness (to fight fires), Response (fire fighting) and Recovery (restoring ecosystems, habitats and assets);
- Involving public administration organisations and all different social and economic actors directly and indirectly affected by fires. This could be achieved by raising awareness, building capacity, clearly assigning roles and effective co-ordination for timely and effective fire management process.

It is important to highlight that, in order to be successful, a fire fighting initiative should invest most of its resources and efforts at the early stage of the fire fighting chain: Prevention.

Some specific actions urgently needed

1. Serious commitment from governments to determine the causes of all forest fires, to identify those responsible and to make sure that costs of the damage is recovered.
2. A common and adequate understanding by the governments of what prevention really means and an adequate definition of “forest fire”. Indeed, usually prevention is wrongly related to pre-suppression, and as a result most of the funding is allocated to pre-suppression and fire fighting. Priority should be given instead to economically support real preventive measures, such as stakeholders’ participation and training, the recovery of rural management systems to perform a preventive role, and legal and well-organised prescribed burning to reduce fuels where ecologically appropriate.
3. Adequate landscape level planning policies integrating forest fire risk assessment in all development plans related to the different economic sectors operating in a rural area, and promoting integrated sustainable rural development as part of the preventive measures.
4. Reinforcement or establishment (when missing) of adequate laws and regulations prohibiting forest land conversion to urban use after fires, denying hunting rights to land owners using illegal fire practices, regulating wood from burnt areas in the timber market to avoid price speculations, and reforming agricultural regulations to manage fire use and burning practices, preventing the use of these practices in sensitive areas or during the high-fire risk season.
5. Introducing effective environmental and rural development actions within the EU agricultural subsidy policies. Subsidies should promote the development of functional landscapes, in which both sustainable

agroforestry systems and mature and highly-valuable forests (both in terms of biodiversity and socio-economic value) help reduce the ecosystem's vulnerability to fires.

6. Evaluation from governments of the total economic costs of forest fires. Both direct and indirect loss, including human lives, houses, infrastructures, natural resources and biodiversity as direct losses and ecological degradation, water shortage, soil loss and many other aspects as indirect losses, should therefore be taken into account.
7. Evaluating in economic terms the additional services offered by forests to society and other economic sectors (electricity, dam and road companies, tourism industry). Then providing adequate income to compensate for the additional work and costs generated by these services to the forest owners, for works, which are part of the preventive measures against fires.
8. Creating job opportunities for fire prevention all the year long as part of the diverse management practices in a rural area.
9. Securing the cadastral bases in all the countries and making them publicly available.
10. Awareness raising campaigns targeted to different sectors of society (tourists, land owners, farmers, shepherds, etc) and educational activities (i.e., training about forest values and appropriate behaviour to prevent fires and react after fires start) to foster active participation.

Some figures on Fires

Only few – tens to hundreds – of the average 50,000 fires per year, are responsible for the majority of the total burnt forest land.

Italy: From 1970 to 2000 300,244 forest fires took place in Italy, destroying a total surface of 3,641,962 ha (12% of the country territory), 1,649,099 ha of which was forest land (19% of forest land). Forests now cover about 8.7 million ha, or about 28% of Italy. Sardinia is in the forefront, with 160,000 ha burnt from 1970 to 1990.

In year 2001, 7,134 forest fires occurred, affecting a total surface area of 76,427 ha, 32,241 of which was forest land. 2002: 3,348 forest fires occurred, affecting a total surface area of 28,261 ha, 13,507 of which was forest land.

Source: Italian State Forestry Corps.

Spain: An average of 221,390 ha (almost 10% of the total forest cover) were burnt annually between 1982 - 1995. In only 10 years (1985-1995) the total surface of burnt forest land has been 2,665,671 ha, equal to the island of Sicily. Every year 20,000 forest fires take place in Spain. Only 1% of those responsible for these fires are punished.

France: Between 5,000 and 20,000 forest fires each year; 18,000 ha burnt during year 2000. In 2001, 17,970 ha were burnt as a result of 2,786 fires.

Turkey: \$10 million was the damage from forest fires in 1999.

Greece: In 1997 alone 150,000 ha were lost; in August 2000 the Island of Samos lost the whole of its brutia pine, which provided islanders with their only alternative income to tourism. Moreover, after the devastating fires of summer 2000, more than 50% of all bookings from tourists for 2001 were cancelled.

Portugal: 77,428 ha burnt in 20 years (1978 – 1997).

Algeria: 32,766 ha burnt from 1978 to 1991.

Mediterranean forests

- 25,000 floral species, 30,000 if sub-species are included.
- This represents 10% of the world's flowering plants on just over 1.6% of the Earth's surface.
- 13,000 endemic plants: the second richest area in endemic flowering plants in the world, just after the tropical Andes.
- Only 17% of the original 82% forest cover still exists.