



## **The Portuguese National Plan for Prevention and Protection of Forest Against Fires: The First Step**

### **The problem**

The ecological, economic and humanitarian consequences of the wildfires in Portugal in the last few decades – since 1980, more than 2.7 million hectares (ha) were burnt, equivalent to one third of the national territory – make us think over the dimension of the problem and its destructive potential. Particularly after the year 2003, when the state of national disaster was declared, setting forest fires in Portugal as top subject in the political, social, economic and environmental agenda.

The economic, social and ecological consequences of the wildfires which, in average, destroy every year more than 150,000 ha of forest land (afforested, shrub and rangelands), are piling up and will be felt along several years to come. Direct and indirect impacts upon the life of people, on the competitiveness of the pinewood, cork oak and eucalypt industries, the quality of water resources, the fauna, the soil fertility, biodiversity, preservation of natural values and the other environmental services rendered by the forest areas such as the landscape, the sequestration of carbon, among others. The country is, thus, impoverishing year after year.

It has been frequently stated that fires are the main threat for the Portuguese forest. The rate of forest being burnt (afforested, shrub and rangelands) is about 2.7% per year, whereas in European countries the average is lower than 1%: In Spain, for instance, where vegetation and weather conditions are similar, that value does not exceed 0.6% per year. In 2003, 20 persons were killed, 2500 buildings were damaged, 7000 farmers suffered severe losses, and 40,000 land owners saw 423,000 ha burnt, which is to say that 8% of forest (5% of the national territory). Perhaps, that is the reason why in 2003, forest fires as began to be regarded as a national problem. It stands as a landmark in the history of the Portugal's forest and civil protection. The ashes revealed another country, old, forgotten and depressed, part of a reality repeatedly noted and focused in studies and diagnoses made by Portuguese and foreign experts.

Several important political and strategic essays recognized that forest can perform a structural role in the future of the country, particularly as far as environment, water resources, rural development, nature preservation, biodiversity, tourism, energy and land use policies are concerned. Therefore, in a country where 68% of its territory is occupied by forest areas (3.3 million are afforestations and 2.2 million of shrub and rangelands), one can easily come to the conclusion that the sustainability of those areas is of the utmost importance for the country and the life quality of the coming generations.

In Mediterranean ecosystems fire has performed an important role in the ecology of vegetal and animal communities, and its total exclusion is not desirable. However, along the last 25 years, its severity, intensity and frequency have increasingly destroyed the landscape. Especially when 97% of ignitions are caused by humans, and fires become catastrophic events of huge dimensions that no one wishes. The average of 25,000 ignitions which occur every year are a result of social and economic conflicts and tensions existing in agricultural and forest territories, mainly at their interface. They are related to land-use policies and instruments that lead to an inappropriate use of fire, negligence, and in arson by the rural population or peri-urban areas. The rural exodus, the lack of active management in agricultural and forest properties, the absence of efficient prevention policies and, on the other hand, the exaggerated emphasis put on suppression policies have led to the accumulation of fuel and the promotion of its vertical and horizontal continuity, resulting in larger and more severe fires.

Up to 2003 when the burnt area reached exceptionally high values, society acted towards the forest fires in a non systemic and reactive way, producing legislation and injecting more money and material means in order to solve the problem. These isolated and uncoordinated measures did not produce satisfactory results as it was to be confirmed in 2003 and 2005.

After 2003 the response was more organized and systematic. The structural reform of the forest sector started. In 2004, 124,000ha burnt, and after a very dry winter in 2005, the burned area reached 320,000 ha. After the summer of 2005, which ended in the 320,000ha burnt (5%, includes afforested, shrub and rangelands) the new Government (which had won the election in February) presented several solutions related with organization and fighting resources. One can easily understand that, in a general way, it is too early to expect results or to come to the conclusion that they have been either or efficient, inefficient or not sufficient. Whatever the effective result may have been or will be, a new cycle in forest protection has begun, with investments per ha quadruplicated in ten years and doubled in the last two years, despite the results do not have any correlation with those figures. If we compare with other countries we might say that with similar budgets (normalized by risk and forest area), we are among the worst in the world, so the system is not effective or efficient and there are a lot of opportunities to improvement. A fair evaluation of the system and his performance would be welcome, although previous reports have unanimously recognized that the tragic situations experienced in the last years were not only due to adverse weather conditions, but to some other causes, particularly structural ones. Several reports have been pointing the problems and solutions since early eighties. In recent years, a good example to quote is the report presented by Beighley and Quesinberry (2004) that wonder if the protection of forests and rural areas is a national priority and how much does the Portuguese society values his forests? They conclude that, because their 2004 report falls on the heels of three previous reports from American wildland fire experts, delivered in 1982, 1996, and 2003, and many of the same recommendations existed in all four reports.

In the next years Portugal will have to face the double ageing of the population of the inner regions, the abandon of agriculture marginal lands and the worsening of weather conditions. If, in the short time the presence of conjectural events continues, namely the insufficient forest management, the difficulties in exerting authority and law enforcement, the weaknesses in the system of fire detection and alert, the lack of training at commanding levels and the inefficiency of fire prevention and fighting systems we can tell that the National System for the Defence of the Forest against Fire is still extremely vulnerable to environmental factors which surpass the usual climatologic standards and so it will be highly feasible to foresee a catastrophic fire season, that might be equal or worse than the one that occurred in 2003 or 2005. Although we can not foresee when, I strongly believe that will happen. However, if changes that improve technical and structural aspects already discussed and presented in the past are implemented, Portugal will be able to minimize losses from the repetition of the tragedy of these devastating years.

### **Does the problem of forest fires have a solution?**

To change a problem that reached exceptional proportions to a low magnitude event that do not disturb the sustainable development of national vital economic activities (form today's 150,000 ha annually burned area we must come to 50,000 ha/year, including afforested, shrub and rangelands) is a complex and apparently difficult task. Nevertheless, several countries have been able to reduce the severity and the frequency of forest fires which were reaching scaring proportions. After a catastrophe, they implemented actions that eventually transformed that terrible *momentum* into an opportunity. We can point out as an example the North and South of France, the whole Spain, particularly Galicia and Andalusia, and Chile. Those examples, with similarities with Portuguese situation, are well described study cases and lessons must be understood us. After the tragedy, each country managed the political situation, and politicians, strongly supported by a technical approach, made dramatic and structural changes at all organization levels.

We notice that in countries where successful changes occurred, those ones have come out from solutions designed by holistic approach, with a central planning and decentralized operations, where a strict control of the defined standards, responsibilities are clearly identified and objectives were quantified. These were simple solutions, based on low cost/benefit analysis, where the skills of the personnel and hand tool coordinated team work all the year round (prevention and suppression).

According to several experts, in Portugal there are all the pieces of the puzzle necessary to build one of the best forest defence systems against fire in the world, however, the same report notices the absence of a plan and a strategy that makes them work in an integrated way (Beighley and Quesinberry, 2004).

## **Which are the most important trends?**

For the future, several threats are identified. In the following lines the main negative trends are summarized:

### **Macro-economics**

- The problem of the fragmentation of small dimension real estates, without an effective management and the fact that the authorities (local, regional and central) are unable to interfere over private properties in an effective way.
- The tendency of rural exodus, with its multiple consequences regarding the management and protection of the forest, anticipating the decrease of active population.
- Globalization, which will bring down the profit margins and the competitiveness of agricultural and forest cultures, lowering the local and regional products and the attractiveness of the primary sector.

### **Increase of ignitions and fuel accumulation**

- The afforested, cultivated or uncultivated areas of the metropolitan communities of the northwest and littoral centre regions, Lisbon and from Sines to Algarve no longer have their original functions. Their owners are now expecting to get higher profits from their urbanization or sale for some other purpose. The increase of urban/forest interfaces, owing to the pressure of urbanization, the building of structures in the forest spaces, and the use of those spaces by populations who are “not educated” for fire and unaware of the origins of ignition will cause more frequent and urban-forest interface, that are hard to extinguish.
- Increasing climate variability, most likely a consequence of regional climate change, is indicated by a greater frequency and duration of heat waves.
- The loss of competitiveness of the forest sector and of agriculture will lower the owner’s profits, thus negatively affecting investments in fuel management.
- The tendency for a higher abandon of agriculture in the surroundings of the inland villages where double ageing is a reality, bring about the increase of uncultivated forest spaces with high quantities of fuel loads.

Nevertheless, some opportunities that contradict these trends can be identified and regarded as positive trends:

### **Improvement of present-day macro-economic and social environment**

- Society will be more alert to environmental issues and will promote and support solutions that reduce the causes of fire.
- The promotion of forest management as a strategic objective will have positive effects on employment in depressed zones.
- The profitability of forest and agricultural areas as producers of goods and services besides those related to wood, such as game, leisure, biodiversity, carbon sequestration and other environmental services, will revitalize the economy of some farms and woods, also as well as tourism.

### **Reduction of ignitions and fuel accumulation**

- The decrease of population in inland zones reduces the origins of careless ignitions and intentional causes due to conflicts.
- The strategies to reduce the energetic dependence from oil, promotes the use woody fuel as renewable energy source.
- The technological development causes productivity profits in resource management, of information and decision support, allowing profits in operative efficiency and efficacy at the level of prevention, pre-suppression and suppression.

### **The strategy for the Future**

In line with recommendation of experts and previous reports and studies the Law N° 156/2004 (replaced by Law N° 124/2006) foresees the conception of a National Plan of Prevention and Defense of the Forest against Fires, to be approved by the Government. In December of 2004, a team of experts was contracted to produce a technical proposal. They worked in close collaboration with all the institutions and major stakeholders were involved. Two reports were presented. The first report provides a diagnosis and a strategic analysis, encompassing several issues, such as analysis of major public policies that has important role in the fire problem, analysis of previous measurements of

prevention, pre-suppression, suppression and recovery, analysis of communications, logistics and information technologies and analysis of organization, human resources and training. The second report presented a plan or technical solution that was engineered to achieve by 2010 a 0,8% average annual burned area rate. That mark, considered among the majority of users as a waterline for the sustainability of the Portuguese forest. To achieve that value a strong effort in assuring that prevention is effective was highly needed and recommended, instead, one more time, focus the attention over the suppression. The plan didn't mean a revolution but an intelligent evolution of system that have collapsed. The plan meant a supported change where actions were quantified, organization needs forecasted, procedures re-engineered, resources, pointers, milestones, economics, calendar, budget and an implementing plan or road-map were presented. Those two reports were delivered to the Government in February and September 2005, respectively, and for those who read Portuguese a full version can be downloaded at <http://www.isa.utl.pt/pndfcj> .

The technical proposal was approved but unfortunately was not fully adopted by the authorities and Government. To accommodate the institutional inertia and resistance and due to political needs the Government adapted the contents of the technical proposal, maintaining the focus in the suppression capabilities, instead of adopting an organization that as focused in promoting an effective and efficient prevention programs, as proposed in technical study. The plan was published in April 2006 and it can be downloaded at <http://www.dgrf.min-agricultura.pt/v4/dgf/ficheiros/20060329120518PF.pdf> .

The Government believes that with the approved plan, that defines a strategy and articulated set of shares to promote active forest management, will be enough to achieve a gradual reduction of forest fires to a rate of 2% area burned annually by 2012, which means 100,000 ha/year (afforested lands, shrub and rangelands). To reach that goal some actions (not all presented in the technical study) were grouped in five strategic objectives:

1. Increase the resilience of the territory to forest fires;
2. Reduce the incidence of fires;
3. Improve the effectiveness and efficiency of fire suppression and fire management;
4. Recover and rehabilitate communities and ecosystems;
5. Adapt the actual structures to an efficient and functional management system.

Despite the technical problems it has, the plan reflects the need of a concrete and persistent shared action on education towards fire management, the improvement of risk management instruments, as well as the development of IT systems to manage and link the structures of prevention, detection and combat, with the overall aim of strengthening the operational capacities.

### **Will the strategy and the Plan solve the problem? Will it work?**

Although the 2% burnt annual rate is too high for the sustainability of the Portuguese forests (2% means that – in average – the same hectare is burned every 50 years) it means that by 2012, at that burning rate, it will a different forest, from today. This plan is the first common effort for the future and it should be regarded as a tool and not as a final document. What is important in the plan is the process of planning, as stated by Dwight D. Eisenhower. The approved plan stands for a solution that I think is not enough, because insists in previous paradigms that have collapsed recently, and several critical actions are not included. For example, training, R&D or a budget are not presented. Although if, every year, the plan is evaluated to check if actions are being implemented as planned, and the changes are defined that need to be made for the coming years in order to built a more balanced programme, the plan will work as a tool and an accountable system. This would be in the spirit of the draft version of the Fire Management Code that was recently published by the FAO (<http://www.fao.org/forestry/firemanagementcode>).

To conclude, I strongly believe that the future of Portuguese forest lies on the successful integration of the different public policies that interfere with the forest, bringing together the different interests at all the levels, and reaching an agreement of all the partners on a common action, for example tax reduction and fiscal incentives for actions promoting silviculture operations and education of people.

In order to reduce the social conflicts that are often in the origin of ignitions and of the accumulation of fuel, future lies on the correct promotion of land use, on the development of an effective management and correct treatment of forest and agricultural lands, assuring that the purpose of that use is to improve their social utility (production of wood, fruit, game, and pastures biodiversity, carbon fixation, tourism, water and energy) incorporating the best techniques and practices of engineering on the management and planning areas, reducing the fuel load and its vertical and horizontal continuity.

In order to cope with the climatic conditions that are favourable to the spreading of fire and cannot be influenced by human action, the future lies in the education of the population, and if all the above fails, and if a fire occur, the future lies on the capacity of the system to act readily and efficiently, with trained personnel operating on a safe way, with the best techniques and tactics, minimizing the impact on the most efficient way at the lowest operative cost.

To maintain the sustainability of forest, agricultural and urban spaces after the destruction by fire, if all the above fails, the future lies on the capacity to recover the destroyed potential in the shortest time and at the lowest cost, reducing unwished impacts and profiting of the opportunity to correct the causes that led to its loss and improve endurance and resilience to similar phenomena.

Maintaining the focus in the solutions, the future lies in the accountable functioning of institutions and agents, who should work as a team, on a cooperative and constructive way, steadily pursuing their objectives, maximizing the similarities and minimizing the differences, making efforts, at the national, regional and local level, to find synergies and come to an agreement upon common strategies.

## **Reference**

Beighley, M., and M. Quesinberry. 2004. USA-Portugal Wildland Fire Technical Exchange Project. Final Report, 13 August 2004.

### **IFFN contribution by:**

Tiago Oliveira<sup>1</sup>  
Rua Alexandre Ferreira, nº 30 – 1esq.  
1700 Lisboa  
Portugal

e-mail: [timol007@yahoo.com](mailto:timol007@yahoo.com)

---

<sup>1</sup> From April 2005 to June 2006 Tiago Oliveira was the Forest Advisor of the Minister of Agriculture and one of the leading expert team members that worked in the technical proposal National Plan for Prevention and Protection of Forest Against Fires. Presently he works at a private forest company.