

WHAT ARE THE OPINIONS OF FORESTERS IN PORTUGAL REGARDING FIRE? RESULTS OF A QUESTIONNAIRE.

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Abstract

Portugal has a problem with forest wildfires. Through out the years, the number of fires and area burned has increased. Forest engineers are one of the professional groups most involved in the prevention of wildfires, not only in the field of preventive silviculture but also in the area of rural extension.

Some of the objectives of this work are to know the opinions of these foresters regarding:

- The major threats to the Portuguese forests;
- What should be done to prevent wildfires in Portugal.
- Adequacy of Prevention/detection/extinction of wildfires in Portugal;
- On what situation fire can be used as a working tool and who should be allowed to use it;

To achieve these objectives, a questionnaire was sent by post to more than 600 technicians that work in the forest sector, and that include in their work fire prevention, and/or forest protection and management and/or professional training. These technicians belong to Forestry associations, Municipalities, Ministry of Agriculture (includes forest services) and Ministry of Environment (includes natural areas with the status of nature conservation). The response rate was 39% (246 responses).

In the opinion of these technicians all the aspects of wildfire are not dealt with in a proper way in prevention (96% of answers), detection (56,9%) and extinction (84,9%). Fire should be used as a working tool especially on fuel management, however, only forest fire-brigades (82%), forest technicians (80%) and fire-fighters (60%) should be allowed to use it. A discussion is provided on the reasons justifying these opinions.

Introduction

Forest wildfires are a major problem to Portugal. This problem requires a strong policy of prevention. The prevention can be done by two different approaches. The first concerns the public fire education and awareness, since more than 50% of the wildfires in Portugal are due to careless or criminal behaviour. The second depends directly on preventive silviculture, with fuel reduction, selection of species and many others actions.

The forest technicians are one of the most active actors in this scenario. They give technical support to forest owners, rural extension in terms of forest management not only for the production of wood or other products, but also to prevent from wildfires, among others activities. The main objective of this research is to know the forest technicians opinions about fire and wildfire, about what should be done to prevent/reduce these disasters, as well as how it can be done and who should do it. With this purpose an inquiry send by post to the technicians that work in the forest sector was used.

The questionnaire

The public used for this study were the technicians of the forest sector, which include in their line of work *fire prevention*, and/or *forest protection* and *management* and/or *professional training*. Unfortunately they are not identified on a list, and it was used the book “Anuário Florestal de 2003” where all the associations, enterprises, institutions related to the forest sector are listed. Some addresses and names of the people to whom the inquiry could send were suggested by other technicians of the subject area and by some federation of forest owners.

The institutions selected to this study were:

- Forest Owners Association (Ass_For) and “baldios” Council (CDB)- These are private institutions that work directly with forest owners and give them technical support;

- General Directorate of Forests (DGF) and Regional Directorate of Agriculture (DRAg). - These public institutions also give technical support, the guidelines to forest prevention, define forest politics and many others functions;
- Institute of Nature Conservation (ICN).- It is the public entity that superintend Portugal natural areas;
- Municipalities (Aut).- This is the local power with responsibilities on preventive silviculture (roads, population awareness, land management, among others)

Method and Sampling

After some previous interviews with some technicians from the chosen institutions, there were sent 658 inquiries mainly by post considering:

- On the Forest Owners Association (Ass_For) and “baldios” Council (CDB) worked 1, 2 or 3 technicians;
- To the General Directorate of Forests (DGF) the questionnaires were delivered by hand to all the technicians who belonged to the Forest Protection and Conservation Division;
- To ICN, we’ve sent by post and by hand the inquiries to all the forest interlocutors of the Natural Protected areas;
- To the Regional Directorate of Agriculture (DRAg) were sent by post to all the sections that work on forest protection, valorisation and conservation, between 8 or 9 inquiries;
- All the municipalities received one inquiry.

The total number of questionnaires sent was 658. Although we’ve received 280, the valid ones were only 230 – 38%. Of the 50 non-valid answers, 31 belonged to municipalities’ that, had no forest technicians, and the rest were from technicians that did not work at the previous chosen area.

According to Steel (1980), for an infinite population, with a confidence interval of 95%, a sample with 230 inquiries, has an error of 10%.

Results and discussion

Figure I present the age ranges and sex of the interviewed technicians. The majority of the answers (81,5%) belonged to technicians that fall in the less than 40 years old group. There were more male answers (51.3%) than females (47.8%). However, in the age group less than 30 years old, there is an inversion of sex percentages, with the females presenting more answers. This inversion is due to the fact that nowadays there is an increase in the percentage of women’s at the graduations, even in courses that were classified as male predominant.

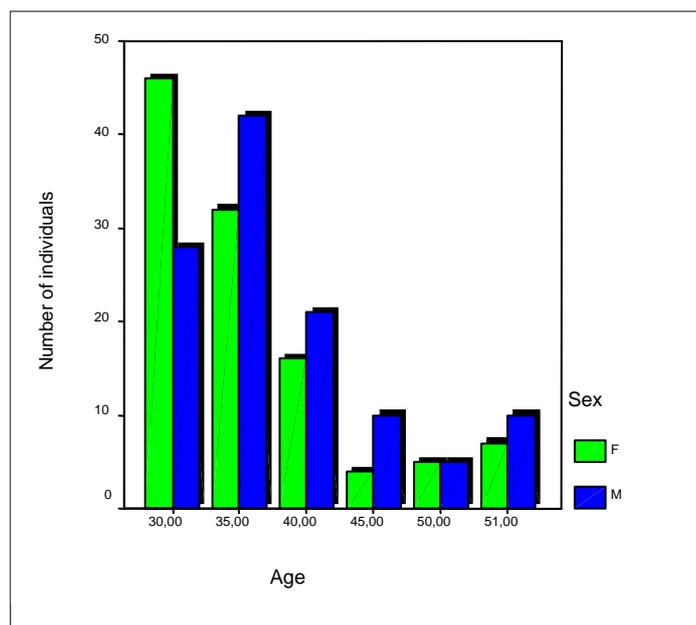


Figure I – Number of individuals who answered the inquiry by sex and age range.

The question: *Which are the major threats to the Portuguese forests*, with 20 options where the technicians should identify and classify each threat according to 1–non-existence of threat to 5–huge threat, showed that to the technicians the major threat is “Forest Fires” (97,7%), followed by “Lack of long term forest planning” (93,5%), “Abandonment of the rural areas” (81,4%), “Lack of protection of the slow growth forest” (77,1%), “Logging bigger than forest growth” (71%), “Small forest property” (70,8%), “Lack of government laws” (63,8%). The forest fires were classified as the biggest threat to the Portuguese forest. The official causes of the fires and the opinions of the technicians (Figure II) (DGF, 2003) were analyzed.

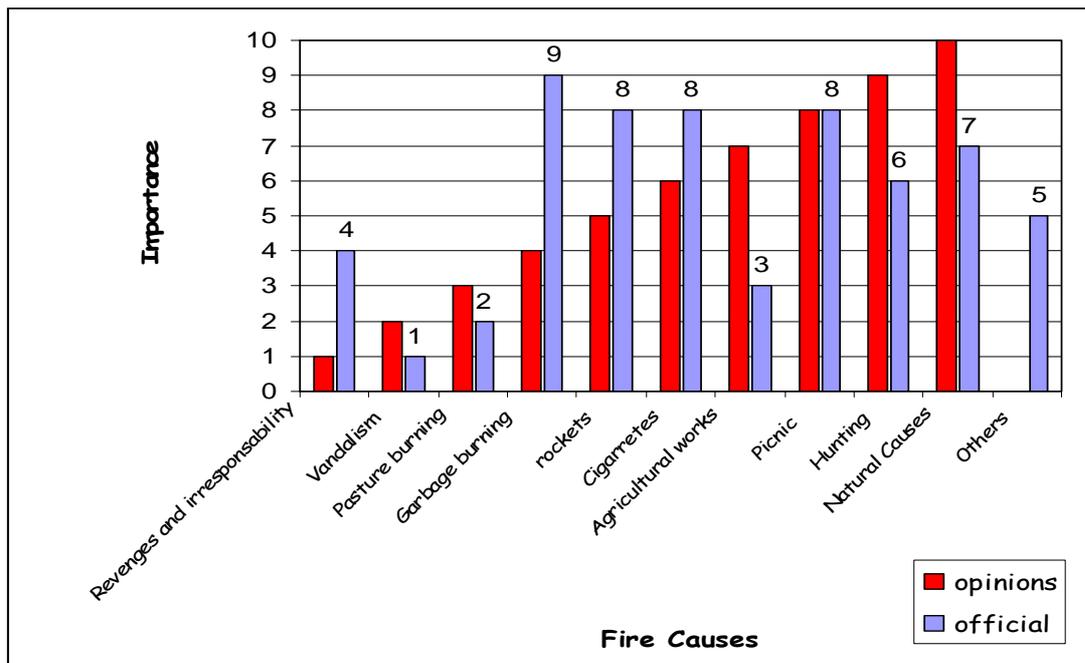


Figure II – Relation between the official causes of the fires and the opinions of the foresters. (legend: 1 – the cause more important; 10 – the cause least important)

There are some disparities between the official causes of the fires and the opinions of the technicians. The largest differences are between garbage burning (quite important for technicians, and considered officially the least important) and agricultural works (considered officially quite important, but not very important to the technicians). This difference can be explained with the large percentage of the official cause “others” (33%), when the real causes were not able to be identified.

After the threats and the causes being identified and classified, followed the question *what should be the measures to prevent wildfires*, with the possibility to select three off 11 options that they consider more important. The measure more chosen was “the general public awareness and education” (55.9%), followed very closely by “plantation in mosaic” (50.7%), “selection of species with less susceptibility to fire” (40,6%) and only 32.8% choose “understory cleaning”.

Even though the technicians did not refer “prescribed fire” as one of the important measures, 99.1% agree that *fire can be used as a working tool*. Especially on three different *situations*, such as: prescribed fire (90.3%), fighting wildfires (88.1%) and pasture management (40%). The major opinion was that fire can be used by “fire-brigades” (84%), followed closely by the opinion that “forest technicians” (81.8%) and then “fire fighters” (60%) could also use it.

Portugal has a Mediterranean influence with a very close history with fire. The question “*do you agree that we should completely suppress fire in our forest ecosystems*” was completely disagreed by 51.6% of the technicians. The Qui-square test showed differences between the three groups of graduation – Forestry with 3 years study; forestry with 5 years study; other areas of knowledge. The group with 5 years study disagreed more with this sentence than the

other two, with 8 degrees of freedom and the critical value $p < 0.01$. This difference is more evident with the question “**do you agree that wildfires are always negative in an ecological point of view**” ($df=8$, $p < 0.004$).

The technicians consider that the **biggest damage caused by wildfire** is in first place, the loss and injury of human lives, in second place the loss of biodiversity, followed by soil erosion and the loss of goods and houses.

Asking if **there’s enough research about forest fires** in Portugal, and if **this new knowledge is well used for a better and more efficient forest management**, although 50.9% agree with the first sentence, 67.3% disagree with the second.

The opinions regarding the **adequacy of prevention, detection a fire fighting** are not very favourable as we can see on Table I.

Table I – Answers regarding adequacy of prevention, detection and fire fighting.

| | |
|------------------------------------|---|
| Adequacy of prevention | NO – 98.7% |
| More than 20 groups of explanation | No preventive silviculture (26%) |
| | No forest management in a long term (19%) |
| | Lack of environmental awareness by: Government; forest owners and general public. (22%) |
| Adequacy of detection | NO – 60.5% |
| More than 30 groups of explanation | Lack of human resources (9%); |
| | We need more means and with more precision (using new technologies) (40%) |
| Only 4 justifications | YES - 39.5% |
| | Adequacy of the means and in a correct number for a good detection (50%) |
| Adequacy of fire fighting | NO – 89.9% |
| More than 30 groups of explanation | Lack of specialized technicians / low fire-fighters specific training (26%) |
| | Lack of means / not knowing how to use those means (15%) |
| | We need to improve the fire-fighters coordination/organization during wildfires (9%) |
| | Improve the coordination and the information between all entities at a regional and local level, starting on detection and ending at fire fighting (7%) |

To the question “who can contribute to the resolution of the environmental and the wildfire problems”, a list of 11 groups with the possibility to choose three for each theme was given. On Table II it can be observed that to solve the environmental problems, it is the central power with the government and the Ministry of the environment who received the biggest trust of the foresters as well as the local power with the municipalities. The individual citizen is slightly more trustable than the environmental organizations. Regarding the wildfires problem, is the forest owners association that receive the more confidence from the technicians, and in this point the

females are the ones that trust more (76.4%) than males (62.3%) (Qui-square test, $df=2$, $p<0.009$). Also the entities where the foresters work were reflected on this choice (Qui-square test, $df=5$, $p<0.001$). More than 70% of the technicians that work on Ass_For., Aut., and DGF, chosen this item, differing from ICN, CDB and DRAG, with less than 55% of the selections.

The Government for the Forest wildfires has more confidence than the Ministry that works with the forest. This could be because various ministries own forest, and her management and laws belong to the ministry of agriculture, and the fire fighting belongs to the Ministry of Internal Affairs.

Table II – Who can contribute to the resolution of the environment and wildfire problems.

| | Environment (%) | Forest wildfires (%) |
|------------------------------------|------------------------|-----------------------------|
| Government | <u>52.7</u> | <u>60.4</u> |
| Ministry of the Environment | <u>55.5</u> | 9.5 |
| Ministry of Agriculture | 16.8 | <u>51.4</u> |
| Municipalities | <u>47.7</u> | <u>51.8</u> |
| Citizen (individual people) | <u>33.2</u> | 25.2 |
| Environmental organizations | 30.5 | 6.8 |
| Scientists | 10.5 | 6.3 |
| Forest Owners Associations | 17.3 | <u>68.5</u> |
| Enterprises | 5 | 6.3 |
| Media | 21.4 | 16.7 |
| Schools | 26.8 | 11.7 |

Conclusions

This research has the objective to understand the opinions of the technicians that work in the forest and on the fire prevention regarding fire in Portugal. What we can see is that they do know and understand this problem. However there are many ideas that we don't know if they are correct because of the lack of data regarding prevention, detection and fire fighting.

With this research now we have clues to follow different roads to prevent fire, like better training of the technicians since there are some significant differences between 3 or 5 years of study.

This is only a small part of a PhD thesis, so there is a lot of work to be done and to give a small contributes to prevent wildfires in the Portuguese forest.

Acknowledgements

I would like to thanks all the technicians who answer to the inquiries

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