

ECONOMIC COMMISSION FOR EUROPE  
FOOD AND AGRICULTURE ORGANIZATION  
INTERNATIONAL LABOUR ORGANISATION

RESTRICTED  
TIM/EFC/WP.1/SEM.35/2  
26 November 1991

**SEMINAR ON FOREST FIRE PREVENTION,  
LAND USE AND PEOPLE**

Athens (Greece), 29 October -  
2 November 1991

Original: ENGLISH

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**REPORT OF THE SEMINAR**

(as approved by the seminar)

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## INTRODUCTION

1. The seminar on forest fire prevention, land use and people was held in Athens at the invitation of the Government of Greece from 29 October to 2 November 1991. Participants from the following countries attended: Albania, Bulgaria, Cyprus, France, Germany, Greece, Israel, Italy, Poland, Portugal, Spain, Turkey, United States of America and USSR. The following intergovernmental organization was represented: the European Economic Community (EEC). The following non-governmental organization was represented: International Union of Forestry Research Organizations (IUFRO).

2. The seminar was addressed by Mr. D. Katsoudas, General Secretary for Forests and Natural Environment in Greece on behalf of the Minister of Agriculture, Mr. S. Alexandris, General Director of Development and Protection of Forests and Natural Environment, and Mr. T.J. Peck, Director of the FAO/ECE Agriculture and Timber Division, Geneva.

### ADOPTION OF THE AGENDA (Item 1 of the agenda)

3. The provisional agenda as set out in TIM/EFC/WP.1/SEM.35/1 was adopted.

### ELECTION OF OFFICERS (Item 2 of the agenda)

4. The seminar elected Mr. V. Frangos (Greece), Chairman and Messrs. J. Goldammer (Germany) and T. Karlikowski (Poland), Vice-Chairmen.

5. The seminar agreed to the nomination of the following discussion leaders:

- Item 3 (a) Mr. P. Efthymiou (Greece)
- Item 3 (b) Mr. F. Castro Rego (Portugal)
- Item 4 (a) Mr. S. Pyne (USA)
- Item 4 (b) Mr. A. Desmartin (France)
- Item 4 (c) Mr. A. Papastavrou (Greece)

### INTRODUCTION TO THE SEMINAR: LAND USE AND FIRE RISK (Item 3 of the agenda)

#### (a) Interface of forests, agricultural land, wildlands and residential areas

6. Under this item, papers were presented by Messrs. J. Goldammer (Germany), D. Kailidis (Greece), Ms. A. Scipiani, who introduced a paper prepared by the Servizio Antincendi Boschivo (Italy), Mr. R. Szczygiel (Poland), Mr. A. Papajannopoulos (Greece), Mr. R. Bobev, who introduced a paper by Mr. Y. Kurpanov (Bulgaria), and Mr. E. Sakellaridis (Greece). 1/

7. The discussion showed that there was a wide range of interacting factors which contributed to the forest fire hazard, including migration of rural populations to urban areas, housing, increased tourism, cadastral problems, strong winds, low humidity, high temperatures, the accumulation of combustible material in the forests, grazing and agricultural practices.

1/ A complete list of basic and voluntary papers presented to the seminar is provided in Annex I.

8. There was general agreement that common terminology on forest fires acceptable to all countries was needed. It was considered that, as a basis for improving forest fire prevention, it was necessary to understand better the competition and tensions caused by conflicting forms of land use. The factors which led to arson such as personal economic interests and conflicts over land use were quite well understood, but the ways of dealing with them, including legislation, should be studied in more detail, and measures introduced as a matter of urgency.

(b) Social, economic and cultural aspects of forest and wildland fires

9. Under this item, papers were presented by Messrs. A. Papastavrou (Greece), F. Castro Rego, who introduced a paper by Mr. L. Lourenço (Portugal), Messrs. M. Yücel (Turkey), A. Pirolo (Italy) and M. Villamueva Gonzalez (Spain).

10. The discussion showed that there was a general consensus among participants that, in order to be effective, preventive measures against fires had to involve the local population. It was essential to analyse the causes of fires, together with local geographic conditions, before developing information and educational campaigns to raise awareness of the issues among the identified target groups. Education should already start at the elementary school level.

11. There was also the need to improve and develop communication with populations in rural areas in order to motivate them to take care of and conserve their forests. It had been demonstrated that properly controlled grazing and agriculture in and near forest areas could be effective as forest fire preventive measures. The local populations concerned should be involved in the policy-making process and needed to be convinced that measures, which might seem to be restrictive in the short-term, were in their own best long-term interests. Management regulations needed to be strictly applied.

12. It was agreed that an internationally accepted methodology for assessing forest fire damage needed to be developed, which incorporated both tangible and intangible losses.

**REDUCING THE FOREST FIRE HAZARD (Item 4 of the agenda)**

(a) Fuel management

13. Papers were presented by Messrs. G. Eftichidis, V. Varela and P. Andreakos (Greece), G. Xanthopoulos (Greece), A. Dimitrakopoulos (Greece), G. Keidar, who introduced a paper by Mr. O. Bonne (Israel), and F. Castro Rego (Portugal), who introduced a paper by Mr. J-C. Vallette (France).

14. During the discussion that followed, it was pointed out that in modern societies the utilization of fossil fuels and the high cost of harvesting small-sized wood had reduced the demand for wood energy. One consequence had been the tendency for woody biomass in the forest to accumulate.

15. The opinion was expressed that the extent of the changes affecting the forest had often been underestimated. These changes had also involved the interfaces between agricultural and forest land and between built-up areas and forest land.

16. Forest fire prevention should be integrated within a forest fire management system, which in turn should be part of a more general land management system. Fire management was considered a task which should be carried out by properly trained workers.

(b) Silvicultural methods

17. Under this item, papers were presented by Mr. P. Efthymiou, who introduced a paper Mr. S. Dafis (Greece), and Mr. J-J. Manterola (France). Mr. P. Lex (Germany) presented a video film on forest fire control techniques in the former German Democratic Republic.

18. The discussion showed that silvicultural techniques may or may not be effective forest fire preventive measures. The need to carry out research in this field directed specifically to Mediterranean conditions was stressed. Silvicultural techniques presently being applied in southern Europe were mostly oriented towards production which was not always the primary objective in these countries; the techniques needed to be more directed towards forest protection and in particular towards reducing fire danger.

19. The relation between thinning operations and fire management was pointed out. In most cases it was not economic to remove pre-commercial thinnings from the forest. On the other hand, studies had clearly shown the direct relationship between wood left unharvested in the forest and increased forest fire hazard.

20. Partial subsidies for the clearance of undergrowth had proved not to be an attractive incentive for private owners: more effective inducements needed to be found.

21. The positive and negative effects of other techniques such as grazing and prescribed burning were also discussed. Research and training on appropriate techniques should be intensified.

(c) Policies and legislation

22. Papers were presented by Mr. R. Vélez (Spain), Ms. M. Lemasson (European Community), Messrs. A. Sherbakov (USSR), J-C. Bussy (France) and E. Diamantis (Greece).

23. Discussions under this item took place in informal groups (see paras. 49-53 below).

**CONCLUSIONS AND RECOMMENDATIONS (Item 5 of the agenda)**

A. Conclusions

24. The seminar took place shortly after the Oakland-Berkeley, California (USA) fire in which 22 people died and 3400 dwellings were destroyed or severely damaged in one of the worst incidents of a forest fire in a residential area. In offering their deep condolences to the families affected, the participants recalled that this disaster is but the latest in the long history of forest fires, which had caused heavy losses of life and property throughout the world. The event had added urgency and relevance to the discussions at the seminar.

25. In 1990, there were about 65 000 forest fire outbreaks in Europe causing damage to nearly 700 000 hectares of forest and other land. The damaged areas in the USSR and North America were even greater; in these regions a substantial number of fires were caused by lightning. About 95 % of the outbreaks in Europe occurred in the southernmost countries of the region and, among the known causes, all but a small percentage were the result of human negligence or arson. This demonstrated the importance of the theme of the seminar linking forest fire prevention with land use and people.

26. Among the principal factors which increase forest fire danger in the Mediterranean region are rural depopulation, resulting in the less intensive use of the forest, changes in land use, tourism and the wish for second homes. Very often, there has been a marked accumulation of combustible biomass which has increased the likelihood of a fire, once started, reaching a high and destructive intensity.

27. The participants agreed that the health slogan "prevention is better than cure" equally applied to the forest fire problem. Prevention had to involve all those connected with the forest, including municipalities, forest services, fire brigade services, forest owners, farmers, shepherds and visitors. A primary objective must be to get them involved through a continuing process of information exchange and participation. Much of the problem arises through conflicts over land use, and it is compounded in some countries by uncertainties created by the absence of land registration and official maps showing ownership boundaries.

28. In developing policies and strategies to strengthen prevention measures, forest services and others involved are often handicapped by a number of factors, including inadequate legislative authority and the means to apply it, including funds, and insufficient information on such matters as the precise causes of fire outbreaks, the ecological role and impact of fires and the dynamics of fuel accumulation.

29. The seminar recognized the need for an integrated strategy for forest fire prevention and suppression, a clear definition of roles and allocation of responsibilities and coordination between the various national, regional and local agencies concerned with forest fire prevention and suppression, a situation which does not exist everywhere today. To ensure proper understanding between different parties at the international and national levels, there also needed to be harmonized terminology, classification and definitions of terms relating to forest fires.

#### B. Recommendations

##### - Addressed to the Joint Committee

30. The Joint Committee should maintain and even intensify its activities concerned with forest fires through the organization of seminars and workshops and the work of a team of specialists. Activities should include:

- a seminar on prevention and suppression of large scale forest fires. (The delegation of Turkey expressed its interest in organizing this seminar);

- arrangements to promote the continuing exchange of information among country specialists through educational visits, training workshops, etc.;
- development of better public information methods (it was noted that this conformed with an initiative by the FAO European Forestry Commission on public relations);
- support for the countries of central and eastern Europe in transition in the forest fire sector, e.g. through training workshops and exchange of equipment;
- selection of species and silvicultural methods to reduce fire danger;
- development of methodologies for evaluating fire losses (tangible and intangible).

31. The Joint Committee should collaborate with other international organizations dealing with forest fire questions in the region (Silva Mediterranea, IUFRO, the European Community and others) with a view to reducing the calendar of meetings on the topic. (There did not appear to be duplication of work, but just too many meetings).

32. The seminar welcomed the publication of the FAO/ECE International Forest Fire News in English with a Spanish edition; consideration might be given to extending its coverage, languages and readership.

33. Some of the above activities could be undertaken by a new team of forest fire specialists.

- Addressed to member countries

34. There is a need for national legislation and policies relating to land use and environmental protection, including forestry, to be better coordinated with a view to reducing conflicts and misunderstanding over land use issues. This coordination could be achieved through the establishment of national and regional coordinating bodies, having the overall understanding and responsibility for the protection of ecosystems, which should be an integrated part of the entire system of land use, including forest, management. Financial support for programmes relating to land use and the environment should similarly be coordinated.

35. In view of the long growing cycle of forests, consensus needs to be reached among political groups on the long-term policy towards forest protection. They should also understand that forests are a major component of the natural environment and in consequence their management and protection should be appropriately supported.

36. Agencies concerned with forest fire prevention and control need to strengthen their public relations services and establish ways of involving the public, especially local populations, in the planning and implementation of programmes. Education and training programmes should give more attention to forest fire questions.

37. Clear guidelines need to be developed for forest fire prevention strategies for protected areas, such as National Parks and nature reserves.

38. Policies and management practices which result in the accumulation of biomass need to be reviewed in the light of the consequences of fire outbreak. Possibilities should be explored for maintaining forest biomass at levels that are ecologically sustainable while avoiding undue fire danger, including increased utilization of woody biomass for industrial or energy purposes and increased browsing by farm animals.

39. Plans for forest fire prevention and control should be developed at the community level, involving the municipal authorities, fire brigade services, local offices of the forest service and other land use agencies, forest owners and the local population.

40. Closer collaboration should be established between neighbouring countries to ensure effective coordination of forest fire prevention and suppression activities.

41. In order to keep more personnel in the countryside available for fire prevention and suppression activities, measures should be taken to diversify employment opportunities in agriculture, forestry and tourism (pluri-activity). Employment of trained forest workers on a permanent basis could also contribute to this objective.

42. Countries should consider the greater use of motorized patrols during periods of high fire risk, because of their proven deterrent effect.

43. Greater use should be made of computer-based systems to provide objective fire hazard predictions.

44. More care should be taken in the design and construction of fuelbreaks and firebreaks to respect ecological conditions, especially the prevention of soil erosion.

- Addressed to research institutions and IUFRO

45. Research in the field of forest fire behaviour, ecology, suppression and prevention needs to be put onto a long-term basis to provide the necessary continuity. There is also a need for a framework to be established for regular region-wide cooperation between institutes dealing with these problems. This would assist in the freer exchange of information and researchers.

46. IUFRO should be invited to cooperate with FAO in up-dating the latter's Multilingual Wildland Fire Management Terminology and in preparing other versions in other languages, e.g. Russian and Portuguese.

47. The establishment of permanent experimental plots would be valuable for the collection of long-term data series on fire-affected sites.

48. Specific topics on which further research could usefully be undertaken are:

- preventive silviculture;
- fuel management and the utilization of biomass;
- methods of evaluating fire losses, especially intangible losses;
- land use conflicts;

- meteorology modelling and fire hazard prediction;
- crown fire behaviour;
- effect of drought on fire risk and fire behaviour;
- fire-resistant species;
- long-term ecological impact of forest fires and of successful prevention of forest fires;
- counterfire techniques.

**OTHER BUSINESS (Item 6 of the agenda)**

49. Two discussion groups were organized to deal with the following topics:

- (i) Coordination and cooperation between different services responsible for forest fire questions

50. There was general agreement among the participants that a good coordination between the various administration units was vital. The importance of ensuring collaboration with Governmental environment agencies was especially stressed.

51. Attention was paid to the cooperation and coordination between agencies working with fire suppression and those working with fire prevention regarding both activities and allocation of resources.

- (ii) Forest policies related to changes in land use; and policies for increasing biomass utilization and reducing fuel

52. Fuel accumulation was considered to be mainly the consequence of the abandonment of forest land. Where fuel had accumulated, lightning tended to become more important as a cause of fire.

53. Subsidies were mentioned as one way to promote biomass as wood energy, as well as the need for research on less expensive techniques for extracting biomass from the forest.

54. The participants expressed their deep appreciation to the authorities of Greece for the excellent organization of the seminar and the study visit to the forest districts of Corinthia and Argolis in north-eastern Peloponnese (see Annex II), as well as the generous hospitality offered.

55. The seminar considered that the papers presented would be of interest to a wider audience and requested the secretariat and the host country to examine the possibility of issuing the proceedings.

**ADOPTION OF THE REPORT OF THE SEMINAR (Item 7 of the agenda)**

56. The seminar adopted the draft report, presented by the secretariat, with the amendments which have been incorporated in the present document.

ANNEX I

LIST OF PAPERS PRESENTED TO THE SEMINAR 1/

Item 3 Introduction to the seminar: land use and fire risk

- General

Mr. D. Kailidis (Greece)	Forest fires in Greece	R. 3 (E)
State Forest Service (Italy)	Social, economic and cultural aspects of forest fires in Italy	R.10 (F)

Item 3(a) Interface of forests, agricultural land, wildlands and residential areas

Mr. J. Goldammer (Germany)	Land use and fire risk : the interface of forest, agricultural land and residential areas	R. 6 (E)
Mr. R. Szczygiel (Poland)	The influence of weather factors on forest fire risk	R.11 (E)
Mr. A. Papajanno- poulos (Greece)	Socio-economic reasons and cyclic climatic changes are jointly responsible for the current forest fire outbreak	V (E)
Mr. Y. Kurpanov (Bulgaria)	Protection des forêts contre le feu en Bulgarie; rendre les forêts moins combustibles	V (F)
Mr. E. Sakellaridis (Greece)	Forest fire protection, land use and fire risk	V (G)

Item 3(b) Social, economic and cultural aspects of forest and wildland fires

Mr. C. Papasta- vrou (Greece)	Social, economic and cultural aspects of forest and wildland fires in Greece	R.13 (E)
Mr. L. Lourenço (Portugal)	Aspects sociaux, économiques et culturels des incendies de forêt et de friche au Portugal	R.14 (F)
Mr. M. Yücel (Turkey)	Social, economic and cultural aspects of forest fires in Turkey	V (E)
Mr. A. Pirollo (Italy)	Aménagement du territoire et risque d'incendie: l'interface entre la forêt et les zones agricoles, en friche et résidentielles	V (F)

1/ Basic papers submitted in time before the seminar were presented in the series TIM/EFC/WP.1/SEM.35/R. (E= English, F=French, R=Russian); voluntary contributions (V) (in one of the official languages or G=Greek).

Mr. M. Villamuera (Spain)	Le programme municipal de prévention des incendies forestiers de la Diputacion de Barcelone	V (F)
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Item 4      Reducing the forest fire hazard

- General

Mr. G. Eftichidis, Mr. V. Varela and Mr. P. Andreakos (Greece)	Data base management system for forest fire prevention	R. 2 (E)
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Mr. G. Xanthopoulos (Greece)	Wildland crown fire hazard assessment	R. 4 (E)
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Item 4(a)      Fuel management

Mr. A. Dimitrakopoulos (Greece)	Fuel management planning for accomplishing fire prevention and forest policy objectives in the Mediterranean region	R. 8 (E)
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Mr. O. Bonnef (Israel)	Methods of fuel management in Israeli forests	R. 1 (E)
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Mr. F. Castro Rego (Portugal)	Fuel management	R.12 (E)
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Mr. J-C. Vallette & Mr. E. Rigolot (France)	Intégration des techniques de débroussaillage dans l'aménagement de défense de la forêt contre les incendies	V (F)
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Item 4(b)      Silvicultural methods

Mr. S. Dafis (Greece)	Silvicultural measures for forest fire prevention and rehabilitation after fires	R. 7 (E)
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Mr. J-P. Hétier & Mr. J-J. Manterola (France)	Gestion des incendies de forêt dans les espaces naturels protégés	V (F)
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Item 4(c)      Policies and legislation

Mr. R. Vélez (Spain)	Forest fire prevention: policies and legislation	R. 5 (E)
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Ms. M. Lemasson (CEC)	The forestry activities of the European Community	R. 9 (F)
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Mr. A. Sherbakov (USSR)	Agriculture and forest fires	V (R)
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Mr. J-C. Bussy (France)	L'assurance et la gestion forestière	V (F)
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Mr. E. Diamantis (Greece)	Policy and legislation	V (G)
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## ANNEX II

### REPORT ON THE STUDY VISIT

On Friday, 1 November 1991 participants visited the Forest Districts of Corinthia and Argolis in north-eastern Peloponnese. The problems being faced in this forest area were considered to be a good practical illustration of the theme of the seminar.

The proximity to a large urban centre such as Athens is causing heavy pressure for residential and secondary home construction. The tourist industry has developed largely due to the many archaeological sites as well as the scenic seashore. The main species in the forests is Aleppo pine, Pinus halepensis, which is very vulnerable to fire. These reasons contribute to increase the fire danger together with infrastructural problems and legal problems, such as the confused property rights question.

Most of the forest has been well preserved, however, because the local population living near or in the forest is involved in resin production. The resin collectors working permanently in the forest are most effective guards and the best fire fighters during fire incidents. The forest of Soficon is especially renowned for its resin productivity, the highest in Greece, and for its well preserved condition. The annual production amounts to 800 m.t. and the average yield per tree is 2 1/2 kg. This is considered a good example of positive human endeavour, in line with the seminar's discussions.

Fire statistics for the last 40 years in the Soficon forest show that while the number of fire outbreaks has tended to decrease slightly, the average area per fire has passed from 2 ha to 37.5 ha. This is considered to be linked to the decline of the resin collection activity, which is today only one third of the volume in the 1950s. Subsidies for resin production are needed to avoid depopulation and to compensate those who by their activity are preserving the forest. Investments for fire prevention infrastructure are also required.

During the study visit participants had the opportunity to observe other economic activities taking place near or within a typical Greek forest, such as agriculture and grazing. Post-fire effects were also observed such as the damage caused to forests and subsequent natural regeneration.