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Proceedings of an International Seminar organized by the Timber Committee of the United Nations Economic Commission for Europe
Held at Warsaw, Poland, at the invitation of the Government of Poland
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edited by

T. van Nao

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FOREWORD

Tran Van Nao (Editor)

The last decade has witnessed a seriously increasing incidence of forest fires in many countries. Substantial economic and ecological losses have been incurred, although the estimation of total damage assessment has often been inaccurate. This has been due to the lack of standardized methods for collecting data on fire occurrence and area burnt, as well as information such as the value of the vegetation destroyed and restoration costs, and the implications for recreation, tourism and other social activities.

The Mediterranean region was initially considered one of the most vulnerable to forest fires because of its dry climate and strong winds. No region is immune to forest fires, however, and damage has been especially severe in areas where pine is the predominant species.

Although forest fires are normally considered a national problem, they become an international one when they occur in border area forests or when the ecological impacts are felt over long distances. The potential for forest fires exists in every country - unless it is a complete desert - and for this reason, there is a need to promote better understanding of the fires, and closer cooperation between countries in controlling them.

At the invitation of the government of Poland, a Seminar on forest fire prevention and control was held in Warsaw from 20 - 22 May 1981, under the Chairmanship of Mr. A. Szujecki (Poland). Experts from 20 countries participated. The purpose of the Seminar was:

- to increase public awareness of the danger of forest fires and the need for more effective prevention and control measures;
- to help countries improve prevention and control methods through an exchange of experience and opinions between specialists;
- to improve techniques of restoring productivity and environmental functions to fire-damaged forest land.

In certain areas this Seminar supplements the work of the FAO/UNESCO Technical Consultation on Forest Fires in the Mediterranean Region held in France in 1977 in collaboration with the International Union of Forestry Research Organizations (IUFRO).

Papers submitted to this Seminar and included in the present collection were written by highly qualified specialists with experienced backgrounds in different countries in the problem of forest fires.

It is hoped that those concerned with environmental conservation and the protection and development of natural resources, as well as those more directly concerned with the forest fire problem itself, will find this publication useful.
Overview of forest fire problems (Item 3 of the Agenda)

Discussion leader: Mr. Tran Van Nao (FAO)

During the discussion, participants expressed considerable interest in the collection and presentation of forest fire statistics being carried out at present on an experimental basis by the Joint FAO/ECE Working Party on Forest Economics and Statistics. Such information would be especially useful for comparing data between countries where forestry conditions are similar. It was considered that this work on statistics should be developed and the quality of information improved, e.g. in respect of assessing the value of losses. It was recognized that basic statistical information is most important for planning fire prevention and control.

The papers on the forest fire situation in various regions showed that conditions are rather different between natural forests in Northern America, man-made forests in northern, eastern and central Europe and the arid forests in the Mediterranean area, where the risk is highest.

In most countries the underlying trend of the incidence of forest fires has been steeply upwards over the past decade, although there were marked year-to-year fluctuations.

Climatic factors and population density and behaviour play an important role in all countries. Weather extremes from time to time make forests highly vulnerable to forest fires and may cause heavy losses which continue to be a major preoccupation of many countries in spite of progress in fire prevention and suppression equipment, organization and methods. There is obviously a need to exchange practical experience gained and to continue research in forest fire problems, comprising ecological, economic, technical and social aspects.

Fire risk evaluation and development of forest fires (Item 4 of the Agenda)

Discussion leader: Mr. P. Delabraze (IUFRO)

During the discussion a detailed description of the Canadian system based on verified scientific data was given. Laboratory tests are supplemented by tests in the field. This method is used for determining:
- meteorological factors and their consequences
- fuel moisture content
- coefficients of transition from laboratory results to tests carried out on an area of about 0.5 hectare.

In Spain the old system, which has been in use for the past 20 years and improved two years ago on the basis of the Australian model prepared by Mac Arthur, is applied. The importance of the wind factor for Spain made it necessary to introduce several changes into the method of calculations. ICONA (Forest Service) prepared, on the basis of the Australian model, a disc representing the criteria of forest fire risk evaluation together with the classification into forest fire types. It is worth taking local forecasts into account.

Detection, planning, organization and techniques of forest fire control (Item 5 of the Agenda)

a) Detection systems (Item 5.1)

Discussion leader: Mr.P. Delabraze (IUFRO)

In response to the prospects presented by the speaker as concerns the use of television, aircraft with infra-red equipment, satellites, etc., the delegation of Italy described experiments carried out in the Alps, the need to place cameras on mountain tops and the interference caused to official television programmes. The preparation of a monitoring system with low GHZ frequency had made it possible to solve these difficulties, and two experimental monitors today control an area of 45,000 hectares. This equipment is supplemented by a meteorological radar, which each day supplies charts of precipitation per km².

A multilingual terminology used by technicians dealing with forest fire problems was also presented: on the basis of definitions in English, equivalents are given in French, Polish and Russian. The participants were requested to submit any corrections or amendments which might improve this useful work. The extension of the terminology to cover other languages (e.g. Spanish) was desirable.

b) Planning, organization and techniques of forest fire control - recent and prospective developments (Item 5.2)

Discussion leader: Mr.G. Calabri (Italy)

The papers presented by experts from various countries showed that an adequate planning of fire-fighting measures, based on probability and gravity of fires and taking into account physical, social and economic conditions, is essential for successful forest fire control.
Different hand tools, as well as mechanized ground and aerial equipment, can be used efficiently according to the size of fires and local conditions; but in practically all countries, because of the relative scarcity of rural population, forest fire control requires more and more special forest fire services with properly trained and experienced men.

Ground control tends to rely on the use of water wherever it is available, by means of specialized all-terrain vehicles, motor-pumps and hoses. Special clothing and personal protective equipment as well as a reliable communication system are extremely important to ensure safe and successful work.

Aircraft have become essential for forest fire protection in many countries, because of the gravity of fires and difficult accessibility of many forest areas. Light airplanes and helicopters are used to detect and fight small fires by rapid initial attacks, larger aircraft to support control of major fires. A close coordination between ground and aerial forces is indispensable to maximize efficiency and to minimize risks.

Various types of chemicals, such as retardants and foaming agents, are being increasingly used. The application of long-term retardants has become established in some countries especially for aerial applications.

The use of Electronic Data Processing (EDP) varies greatly from country to country, but there are important prospects for its development in the near future. Highly sophisticated equipment (satellites, new remote sensing technology, radar applications) appear promising as a means to enhance forest protection.

There is a need for co-operation between countries with regard to the sharing of aircraft in cases of emergency.

c) Training and prevention of accidents (Item 5.3)

- France prepares a summer fire campaign and distributes the tasks amongst the individual specialists. Since 1972 it has ensured permanent training for officers and technicians.
- It welcomes representatives from other countries for training at special sessions.
- Poland trains the personnel of the forest services, firemen and soldiers. Combined exercises make it possible to check the practical application of the training received.

- In Italy, training in fire suppression techniques is given at a forestry school near Rome. It is also felt that information should be given to tourists, farmers and forest workers in view of the special risks they present.

- Cyprus accepts students from the Mediterranean area and Africa; special training is given in fire suppression.

- The representatives of FAO and ILO informed the seminar of international co-operation in this field and gave examples of special training in Chile, Thailand, Senegal and Korea.

The exchange of manuals and publications, the provision of experts and the training of specialists would be most welcome.

With regard to safety, there is particular concern in North America in regard to the training of pilots and the precautions to be taken to prevent accidents during large fires, involving the use of a large number of aircraft. The representative of Canada mentioned personal protective equipment for ground staff not only against fire itself but also to make them visible at a distance.

Individual protection by non-flammable clothing was discussed: its effectiveness depends on the nature of the fire (speed and intensity of fire spread).

Safety requirements should also be carefully observed in carrying out prescribed burning. If this is not done, serious accidents may occur, as happened in a specific case in Canada in 1979, when eight people died.

Silvicultural and biological measures to reduce fire risk; consequences of fire and restoration of damaged areas (Item 6 of the Agenda)

- Measures to reduce forest fire risk; restoration of damaged areas; impact on the ecosystem (Items 6.1 and 6.2)

Discussion leader: Mr. C. van Wagner (Canada)

Information was provided on a large variety of predominantly silvicultural methods aiming at decreasing the fire risk in Central and Southern Europe. The scope for such measures, if systematically applied, is much larger than had hitherto been thought. An example was given of research carried out in Brazilian pine stands, where controlled burning appears promising to prevent wild fires. Furthermore,
the manifold repercussions of forest fires on the ecosystem were analysed. It was regretted that shortage of time did not permit discussion of this item in detail.

- Forest fire insurance (Item 6.3)
  Discussion leader: Mr. P. Delabaze (IUFRO)
  The presentation described the very sophisticated Swedish system which includes either a comprehensive insurance policy covering both fire risk and storm damage, or just fire losses. About 80% of private forests are insured, in most cases under the comprehensive policy.

Public information in forest fire prevention and control (Item 7 of the Agenda)
  Discussion leader: Mr. C. Van Wagner (Canada)
  In the absence of the author, this paper was not presented at the meeting but the problems it raised were treated during a discussion in which participants from various parts of the ECE region took part. It was noted that public information was undoubtedly important but not always effective. In certain situations and localities the announcement of critical fire danger through the mass media might even have negative consequences. Prescribed burning might also make it difficult to explain why wild fires must be prevented. It is therefore important to study the effects of propaganda by, among other things, carrying out social studies.

  There was general agreement that the most important means of publicity was instruction of school children, which in turn required teachers to be kept sufficiently informed of the problems involved. In addition, information spread through members of youth organizations, civil defense units or the armed forces participating in fire-fighting etc. appears to be important. Several speakers also underlined the necessity to agree on regionally or sub-regionally acceptable uniform fire prevention symbols.

Conclusions and recommendations (Item 8 of the Agenda)
  The seminar noted with great concern that the seriousness of the forest fire problem had increased considerably over the past decade or so in many countries. Although the number and area of forest fires varied greatly from year to year, depending on climatic and other factors, the underlying trend of both had been steeply upwards. While
resources allocated to prevention and control had also increased, they had proved insufficient to change this trend.

The economic and ecological damage caused by forest fires varied in extent from country to country, for climatic, demographic, social, economic and other reasons, as well as because of differences in the composition of the forest resource itself. While the countries in the southern part of Europe were especially vulnerable to the forest fire hazard, no country was immune and every country had to tackle the problem taking into account its own specific conditions.

Nevertheless, the seminar considered that there was scope and need for a considerable expansion in international co-operation and exchange of information and experience within the framework of the Joint FAO/ECE/ILO Committee on Forest Working Techniques and Training of Forest Workers. of IUFRO, or other appropriate organizations. It therefore agreed on the following recommendations for the Joint Committee's consideration:

(A) The Joint Committee should establish a team of specialists from interested countries to plan and execute work in areas falling within the Joint Committee's competence. Among the many topics from which such a team might select certain questions for priority attention, the seminar listed the following:

(i) Collection and dissemination of information on the organizational structure and division of responsibilities for forest fire control;

(ii) preparation of a bibliography on selected studies, articles, etc. relating to forest fire prevention and control;

(iii) preparation of a directory of research institutes and other bodies or individuals concerned with research on forest fires (in collaboration with IUFRO);

(iv) preparation of internationally accepted warnings signs and symbols about forest fires (important because of the growth of international tourism);

(v) organization of a systematic arrangement for the exchange of information between countries on new developments in ground and airborne equipment for the protection of the forest against fire;

(vi) collection and dissemination of information on methods of and material used for informing the public about forest fires.
The Joint FAO/ECE Working Party on Forest Economics and Statistics' attention should be drawn to the seminar's strong support for its work on forest fire statistics. Particular matters which the Working Party might examine included:

(i) the improvement of the comparability of data;
(ii) the possibility of drawing up guidelines for the estimation of the value of losses from forest fires, both tangible and intangible;
(iii) the possibility of extending the statistical coverage to countries outside the ECE region, notably those with extensive areas of coniferous plantations.

The attention of IUFRO, national research institutes and other appropriate bodies should be drawn to the following areas where research work could usefully be expanded or initiated:

(i) the influence of silvicultural methods on forest fire behaviour and forest fire danger;
(ii) the impact of fire on the forest ecosystem;
(iii) methods of mapping of forest fire risks and the relation between such maps and other ecological mapping;
(iv) models for predicting forest fire danger;
(v) models of fire behaviour and prediction of fire behaviour in both natural and man-made forests.

The seminar also felt that in extension of its proposal under (A) (iii) above, information should be collected and disseminated on research programmes, with a view to promoting co-operation between countries.

The seminar stressed the importance of:

(i) training for supervisors and workers in the methods and use of equipment for fighting forest fires. It would be useful to have an exchange of relevant training material, possibly organized by the team of specialists mentioned under (A) above;

(ii) improving safety for forest fire-fighters by issuing safety guidelines, providing appropriate clothing and equipment and by proper training. A further concern was protecting the general public from forest fires, partly by educational and propaganda means to alert them to the danger.

It would greatly assist the planning of prevention measures to know more about motivation and attitudes of people who cause wild fires, arson and negligence being the most serious causes. A study might be undertaken on this topic.
Legislation and regulations on forest fires varied greatly from country to country. It would be of interest to carry out a comparative study in this area.

This seminar had in certain respects followed on the work of the FAO/UNESCO Technical Consultation on Forest Fires in the Mediterranean Region (in collaboration with IUFRO), held in France in 1977. Participants agreed that meetings such as these two were very valuable as a means of exchange of experience and information and for establishing contacts between specialists. With regard to proposals for future activities, it noted with satisfaction:

(i) the Joint Committee's intention to organize another seminar on forest fires, probably in 1985, which the Government of Portugal had kindly offered to host and which would concentrate on southern European aspects of the problem. It considered that several of the findings of the present seminar would be suitable for more detailed study at the next seminar and suggested that the proposed team of specialists could provide the necessary link between the two seminars;

(ii) the inclusion of a project on forest fire control in the proposals for new activities formulated by the UNDP/ECE Intergovernmental Consultation on the UNDP Regional Programme for Europe in the Third Programme Cycle, 1982-1986, held in Geneva from 11 to 13 May 1981. It considered that such a project, which would be directed towards promoting co-operation among the European countries covered by the programme, could be of considerable value.

Forest fire problems are an important area in which knowledge and experience gained within the ECE region could be applied elsewhere. The Joint Committee and its member countries should bear this in mind when following up its proposal for the transfer of technology to the other regions.

The seminar extended its deep appreciation to the Polish Forest Research Institute and other collaborating bodies in Poland for preparing the draft of a four-language glossary on forest fires. It expressed the hope that it could be carefully reviewed and revised, in consultation with the group dealing with this question as a follow-up to the 1977 FAO/UNESCO Technical Consultation, referred to in sub-para. (G) above, and also taking account of relevant terms and definitions in existing glossaries.

In view of the high quality of the papers prepared by specialists for the seminar, it was recommended that the documents be de-restricted and that the secretariat discuss with the Polish authorities possible ways and means of publishing the proceedings.
Other business (Item 9 of the Agenda)

Participants at the seminar unanimously expressed their profound appreciation for the excellent arrangements by the Polish organizers of the seminar, the study tour on 18 - 19 May and the visit to the Forest Research Institute in Warsaw and Sekocin on 22 May, as well as for the generous hospitality offered by the Government of Poland.