INTERNATIONAL FOREST FIRE NEWS

No. 3 - July 1990

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Food and Agriculture
Organization of the
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CONTENTS

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Written contributions are welcome (see inside cover page).

CALL FOR CONTRIBUTIONS

Readers of the International Forest Fire News are warmly invited to send written contributions to the editor (address on front cover). These may be in the form of concise reports on activities on wildland fire management, research, public relations campaigns, recent national legislation related to wildfire, reports from national organizations involved in fire management, publications, personal opinions (letters to editor). Photographs (black and white) and graphs, figures and drawings (originals, not photocopies, also black and white) are also welcome.

The deadlines for submitting contributions to the biannual issues are: **15 May** and **15 November**.

EDITORIAL

Wildland Fire Science and Biomass Burning Science: New Cooperative Approaches

In my previous Editorial in the December 1989 issue I tried to highlight the new perceptions of the importance of wildfires in global ecological processes.

A new term, "biomass burning", has recently entered the terminology of wildland fire science, a term which had not been included in the Multilingual Wildland Fire Terminology (published by FAO in 1986). What does "biomass burning" mean? Is it different from "wildland fire"?

The perception of "biomass burning" originated in atmospheric sciences and covers all combustion processes of or in organic matter, such as wildland vegetation), organic terrain, agricultural residues, and fuelwood and charcoal (for cooking and heating as well). The scope of " biomass burning science" (a new term proposed here) goes far beyond the traditional perspective of wildland fire scientists. This is not only because of the consideration of a wider range of organic matter and combustion processes, but also because of the overall role of these renewable sources of energy and emissions in global atmospheric processes. Thus the scope of biomass burning science is not restricted to near-ground air quality. It aims rather to look into the global carbon cycle, the sources and sinks of carbon, especially in relation to the problem of global climate change.

The new generation of biomass burning scientists, coming from atmospheric chemistry, climatology and space-borne remote sensing, is seeking to create a point of contact with the "traditional" field of wildland fire science. And vice-versa. There is a real need to link up both fields of science. This year, however, it did not work too well. In the USA two major scientific conferences were held simultaneously. The Conference *Fire and the Environment: Ecological and Cultural Perspectives*, held at the University of Tennessee, was an all-embracing classical conference on wildland fire issues. In the same week, a couple of hundred kilometres away, an international conference on *Global Biomass Burning* was held in Virginia. While the first conference was sponsored mainly by agencies and groups from forestry (University of Tennessee, US Forest Service, Society of American Foresters, and others), the other was supported by the American Geophysical Union and NASA.

At first glance these recent activities of fire scientists look uncoordinated. A closer look reveals that a series of common multidisciplinary projects already has been initiated. The International Global Atmospheric Program (IGAC), a core project of the IGBP, has included the terrestrial fire research component into its research strategies. Several national and international research campaigns in atmospheric chemistry have added the ground-based component; the activities are concentrated in West Africa (savanna fires) and in the Amazon Basin (forest conversion fires).

The globally increasing rate of wildfires requires immediate national and international responses. The cooperative programs between the ground and sky scientists offer an excellent opportunity to strengthen the impact of the community of researchers on the policy making bodies.

Johann G. Goldammer

COUNTRY NOTES

AUSTRALIA

Australian Fire Research in Progress: Register No. 1-1989

A register of fire research projects carried out in Australia by State forest services, State parks and wildlife services, CSIRO, and other state and federal authorities has recently been published by CSIRO Division of Forestry and Forest Products and the Standing Committee of the Australian Forestry Council. The register contains detailed descriptions of 206 research projects undertaken by 60 research and management organizations, and is the most up-to-date summary of fire research in Australia.

Each entry contains a project title, period of study, name and address of organization, names and telephone numbers of project leaders and contact officers, the locality, vegetation type and dominant species association in which the research is carried out, objectives, methodology, present status of the research, a list of any unpublished reports, and categories of research.

Organization, project leader/contact officer, subject and dominant species indexes are provided to facilitate access to project details of specific interest. Topics cover a wide range of fire research including a number of long-term monitoring studies and important reference sites.

The register may be purchased for $A 30.00 (including postage):

From: Bush Fire Research Section

Address: CSIRO Division of Forestry & Forest Products
P.O. Box 4008
AUS-Canberra, A.C.T. 2600

Tel. 61-62-818370

PEOPLE'S REPUBLIC OF CHINA

New Forest Fire Management Course at Nanjing Forestry University

Nanjing Forestry University in the City of Nanjing, the capital of Jiangsu Province, is the centre of education and forest research in South China. The students attending the course on forestry come from all over China, but mainly from the East.

Before 1985 forest fire control issues were of minor importance within the various courses. In 1985 it was proposed to set up an independent course on "Forest Fire Control" in order to meet the teaching needs in this subject. At present the forest fire control course is compulsory for the specialization in Forest Protection. A textbook on "Forest Fire Management" for undergraduate students has just been completed.

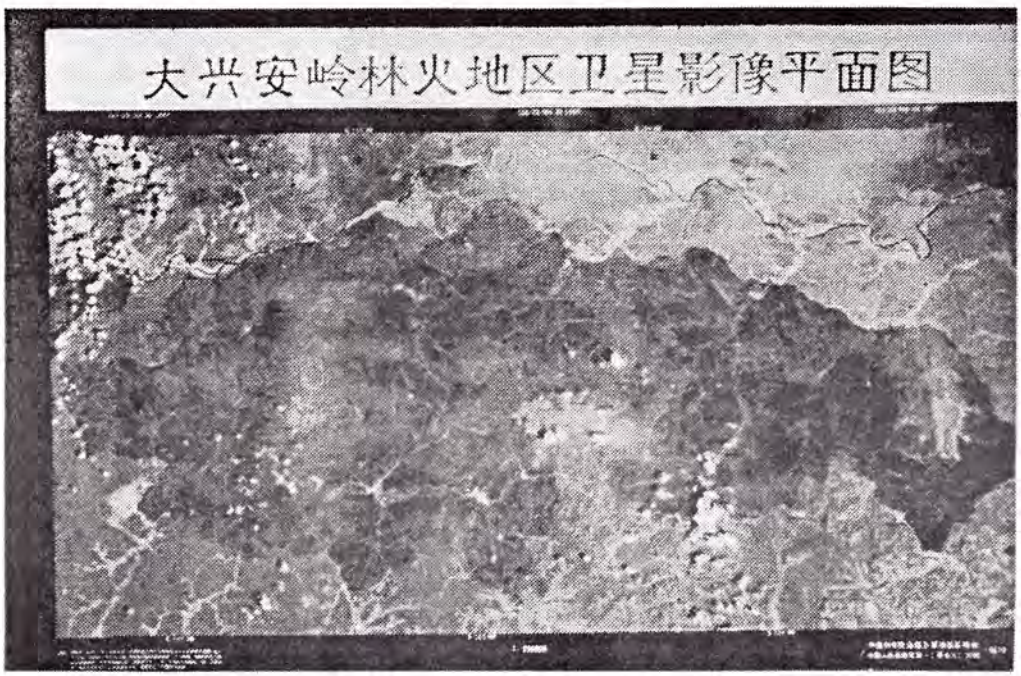
Future research will focus on the development of fire management and silviculture planning for the southern forest regions, design of fire management plans for scenic and recreation forests and forest parks, fuel inventories (fuel description and fuel mapping and studies on the causes of wildland fires).

From: Mr. Hu Bojiong

Address: Entomological Research Station
Department of Forestry, Nanjing Forestry University
Nanjing, P.R. China

Fire Ecology of the Montane-Boreal Coniferous Forest

A common research project between the Northeast Forestry University at Harbin (Heilongjiang Province), Forest Fire Research Laboratory, and the University of Freiburg, Section Fire Ecology and Fire Management, at Freiburg (Federal Republic of Germany) is aimed at determining the role of natural firest in the ecology of the montane boreal coniferous forest in the Daxinganling mountains, Northeast China. This region was affected by the large-scale wildfires of 1987 which burned a total of more than 1.3 million ha of forest land and left behind 200 people killed by the fire and more than 50,000 homeless.



Satellite imagery of the montane-boreal coniferous forest in the Daxinganling Mountains, Northeast China. The Heilong River in the upper part is the borderline with the USSR

After an exploratory phase in 1988, the Sino-German research project became operational in its first phase in 1989-1990. Its main preliminary findings are the establishment of fire history and fire regimes in various forest types of the region which have been affected by natural fires since pre-settlement times. The research programme is sponsored by the Volkswagen Foundation and supported by the Universities of Harbin and Freiburg.

From: Mr. Xueyin Di

Address: Vice Head, Department of Forestry
Northeast Forestry University
Harbin, 150040 Heilongjiang
People's Republic of China

Johann G. Goldammer (address on cover page)

TURKEY

In a recent report on "Turkish Forestry in the 150th Year of its Establishment" and in the report "Forest Fire Prevention and Combat Activities in Turkey" (prepared for the International Wildland Fire Conference, Boston, 1989) some information and data are given on the forest fire situation. For a better understanding the report underscores that 23,169 rural settlements are situated in the wildland-residential interface (either in the forest, on the edge of the forest, or within a distance of 10 km from the forest edge). Approximately one third of the population of Turkey is living in these settlements (ca. 13 million according to the census of 1980). About half of the known causes of fires are related to negligence (e.g. shepherds' campfires, camps, cigarettes). The other half of known causes are intentional fires (e.g. land clearing, arson). About 1 % of fires are due to lightning. Approximately 50 % of all fire causes are unknown.

In the period 1937-1988 a total of 44,337 forest fires were recorded on 1,365,000 ha of forest land (853 fires on 26,250 ha annually, with an average area burned per fire of ca. 31 ha). The fire data from 1973 to 1987 are summarized in the table below. In 1988 more than 15,000 ha of forests were burned in the Mediterranean Aegean and Marmara regions of Turkey. In the long-term average, 41 % of the recorded fires occurred in the Aegean, 24 % in the Mediterranean, 22 % in the Marmara region and the remaining 13 % in other regions.

Turkey: Forest Fire Statistics for the Period 1973-.987

Year	Number of Fires	Area burned (hectares)
1973	1208	17002
1974	769	14743
1975	811	17516
1976	702	5171
1977	1615	43076
1978	1122	13233
1979	1300	34122
1980	1092	10248
1981	982	5740
1982	950	4018
1983	968	3556
1984	1433	7358
1985	1793	26006
1986	1526	11037
1987	1310	10746

Sources: The Turkish Forestry in the 150th Year of Establishment, General Directorate of Forestry. Publ. No. 673, Ankara 1989, Serial No. 30.

Forest Fire Prevention and Combat Activities in Turkey. Report prepared for the International Wildland Fire Conference, Boston 1989, by the Department of Forest Protection and Fire Prevention, General Directorate of Forestry, Ministry of Agriculture, Forest and Village Affairs, Ankara, 1989, 24 p.

Among other subjects the report contains information on various fire management activities:

- Fire Detection

  809 fire observation towers have been set up (of the 961 towers planned). Some of the towers are supplied with solar energy.

- Fire Breaks

  By end of 1988 a total of 10,268 km (of 21,664 km planned) of fire safety roads (9-15 m wide) had been set up. The total length of fuel breaks (60-120 m wide) was 6,959 km (27,899 km planned)

- Forest Roads

  Of the 144,425 km of total length of forest roads planned for forest management and improvement of access for fire fighting, a total of 107,000 km had been built by end of 1988.

- Fire Suppression Teams

  In 1988 more than 17,000 forest fire fighters were engaged in 640 initial attack teams and 148 stand-by forest fire brigades.

- Airborne fire detection and control

  Three fixed-wing water bombers, one reconnaissance plane and six helicopters for transport of fire fighters are used at present.

- Ground Tankers

  A total of 82 ground tankers with a capacity of 2,000 l of water and 200 l of foaming agent are operating at present.

- Artificial Water Sources

  In those areas where water supply is scarce, artificial ponds have been constructed (totalling 81 at end of 1987).

- Forest Fire Meteorology

  A total of twelve fire meteorology stations have been set up.

- Communications

  Within the area of responsibility of the General Directorate of Forestry 3,312 transceivers had been set up by end of 1987. A total of 41,647 km of telephone lines are available for fire management use.

UNITED STATES OF AMERICA

First Fire Suppression Course - Quintana Roo, Mexico

The Destruction of Hurricane Gilbert

On September 14, 1988 Hurricane Gilbert, one of the most powerful hurricanes of this century, blasted the northeastern coast of the Yucatan Peninsula of Mexico with winds which approached 200 miles per hour (320 kph). The Cancun District of the Mexican State of Quintana Roo was particularly hard hit. Fifty per cent of the vegetation was destroyed over an area of 200-300 thousand hectares and 10-30 % of the vegetation was destroyed over an area of 600-900 thousand hectares. The cubic volume of wood lost was estimated to be about 60 times the normal average annual removal from the state.

Prolonged Drought and Unprecedented Large Fires

Between May and July, 10 fires burned more than 96,000 ha (240,000 acres). The fires were man caused, either through carelessness of farmers burning the jungle under slash and burn agriculture or tourists travelling the highways in the blow down area. Fire control efforts were hampered by difficult access problems (lack of roads); a severe regional drought which extended well into the normal rainy season; and a tremendous fuel accumulation of dead and down trees and vegetation caused by Hurricane Gilbert.

Study Group on Fire Management, North American Forestry Commission

At the 23rd Meeting of the Study Group on Fire Management, North American Forestry Commission, held in Cancun, Mexico during October 1989, the Mexican delegation proposed that the group sponsor a course to train local volunteers and forestry officials in basic fire suppression skills. The idea was unanimously approved by the Canadian and United States delegations and course planning began immediately. Subsequently, the course was sponsored by the Secretaria de Agricultura y Recursos Hidraulicos, the USDA Forest Service, and the US Agency for International Development Office of Foreign Disaster Assistance.

The First Fire Suppression Course

The First Fire Suppression Course for Quintana Roo was conducted from 15-25 January 1990 in Cancun, Mexico. There were six days of intensive classroom study and three days of extensive field exercises. Sixty participants attended and subjects taught included: fire suppression strategies; fuels management; organizing for initial attack and extended attack; use of hand tools and aerial equipment; fire detection; fire behaviour; and fire prevention. The forestry officials in Quintana Roo are fully trained to organize and conduct a very effective fire management programme.

International Co-operation

Mexico assigned 12 highly qualified instructors, one of whom served as the course coordinator. All of these instructors were graduates of one of the previous 4 Latin American Fire Suppression courses sponsored by the United States Office of Foreign Disaster Assistance and the Forest Service.

The U.S. Forest Service provided 4 instructors, one of whom was the course organizer, 100 student notebooks and 100 copies of the Spanish versions of the Fire Line Handbook and Organizing for Initial Attack.

The U.S. Office of Foreign Disaster Assistance provided about $7000 worth of tools such as drip torches, belt weather kits, compasses, and other safety equipment.

Reasons for success

This fire suppression course was extremely successful because:

(a) A steering committee meeting was held in October, 3 months prior to the course to: a) plan and organize the course curriculum; b) select field exercise locations; c) select plots for prescribed burning exercises; and d) find classroom space.

(b) The tremendous amount of coordination and organization done by Roberto Martinez and Gilbert Galiote from the Secretary of Agriculture and Water Resources, and Pat Velasco, Forest Service.

(c) The teaching abilities of the 12 Mexican instructors and their hard work during the course to teach both the theorical and practical aspects of fire management. All Mexican instructors were graduates of the Latin American Fire Suppression Course sponsored by the USDA Forest Service and the Office of Foreign Disaster Assistance.

(d) Mexican instructors, who had gained fire suppression experience during the 1989 Quintana Roo fire season, were used to teach the courses. This was definitely what made the course so successful. These individuals knew the area, knew how the fires behaved, knew which suppression strategies were successful and which were not, and were knowledgeable about local forestry personnel.

Regional Fire Suppression Courses in Mexico

Because of the success of the Quintana Roo Fire Suppression Course and the interest it generated throughout Mexico, the Secretaria de Agricultura y Recursos Hidraulicos is now organizing and developing regional fire management courses for other locations within Mexico. Each course will be about 11 days long, with 8 days of classroom study and 3 days of extensive field exercises. The level of instruction for the regional courses will be equal to that of the 4th International Course conducted in Mexico City in 1988. These regional courses will significantly increase the effectiveness of the fire management organization throughout all of Mexico.

Mexico looks to the Future

From a core of a few graduates of the First Latin American Fire Suppression Course, Mexico has rapidly built a cadre of highly skilled and qualified instructors. These instructors and the people they are training are quickly building up an effective fire management organization within the Mexican Secretary of Agriculture and Water Resources.

From: Mr. Paul Weeden

Address: Defense and Emergency Operations Specialist
Fire and Aviation Management, USDA Forest Service
P.O. Box 96090
USA-Washington, DC 20090-6090

NEWS FROM ECE/FAO

Seminar on Forest Fire, Land Use and People

Advance information about this seminar, to be held in Athens, Greece from 28 October to 1 November 1991, is given in the section on meetings planned for 1990-1991 (page 14).

ECE/FAO Forest Fire Statistics

IFFN No. 2 (December 1989) presented some country statistics on the number and area of fires on forest and other land in 1987 and 1988. These were extracted from the Forest Fire Statistics 1985-1988, then in preparation and subsequently issued in the spring of 1990 (ECE/TIM/51). Copies are available free of charge:

From: ECE/FAO Agriculture and Timber Division
Palais des Nations
CH - 1211 GENEVA 10

The tables and figures below summarize at the all-European and North American levels the country data given in the publication.

Number, area and average size per year of fires on forest and other land 1980-1988

	1980	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*	*1987*	*1988*	*1980-88 average*
Total number of fires (1000)										
Europe	38.2	46.3	38.8	34.6	42.3	54.3	36.4	39.8	48.2	42.1
- southern Europe a	30.2	41.0	29.1	26.3	32.2	47.6	28.3	34.5	40.2	34.4
North America	164.8	199.3	110.6	104.1	191.0	147.9	145.8	158.4	164.0	154.0
Total area of fires (1000 ha)										
Europe	541.2	768.5	451.1	504.7	397.2	1058.3	581.5	447.6	515.1	585.0
- southern Europe a	530.0	760.0	438.3	495.1	379.6	1049.8	570.9	440.1	505.7	574.4
North America	6076.2	7105.1	2277.1	1987.7	1995.3	2882.8	2241.6	3102.7	3635.5	3478.2
Average area of fire (ha)										
Europe	14.2	16.6	11.6	14.6	9.4	19.5	16.0	11.2	10.7	13.8
- southern Europe a	17.5	18.6	15.0	18.8	11.8	22.1	20.2	12.7	12.6	16.6
North America	36.9	35.6	20.6	19.1	10.4	19.5	15.4	19.6	22.2	22.1

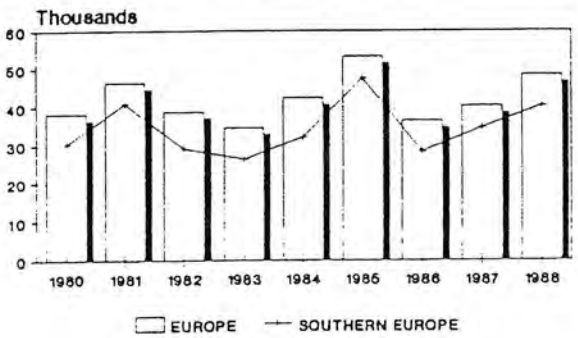
a Cyprus, France, Greece, Israel, Italy, Portugal, Spain, Turkey and Yugoslavia.

Number, area and average of fires
(1985-1988 average)

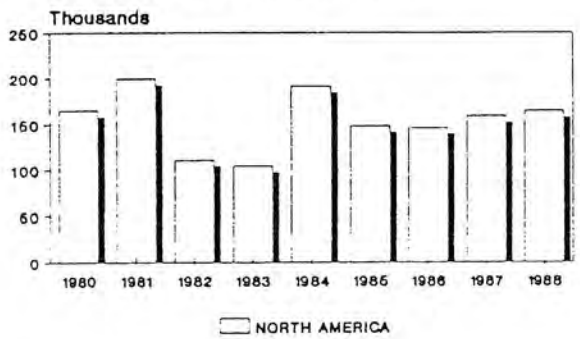
	Number		*Total area*		*Average area*
	(1000)		*(1000 ha)*		*(ha)*
Total Europe	44.7	100.0%	650.6	100.0%	14.6
Southern Europe [a], of which.....	37.7	84.3%	641.6	98.6%	17.0
- Spain.....	9.4		259.0		27.4
- Italy	13.4		145.9		10.9
- Portugal.....	7.1		87.0		12.3
- Greece	1.4		69.1		50.8
- Yugoslavia.....	1.2		29.1		24.1
- France.....	2.7		26.9		10.1
- Turkey.....	1.5		16.5		11.0
North America.....	154.0	100.0%	2965.6	100.0%	19.3
- Canada.....	9.5	6.2 %	1028.3	34.7%	108.1
- USA.....	144.5	93.8%	1937.3	65.3%	13.4

a Cyprus, France, Greece, Israel, Italy, Portugal, Spain, Turkey and Yugoslavia.

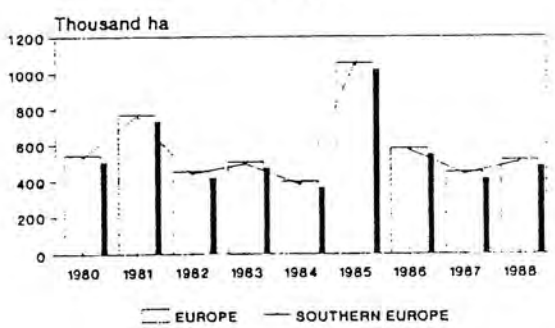
Number of fires
Europe



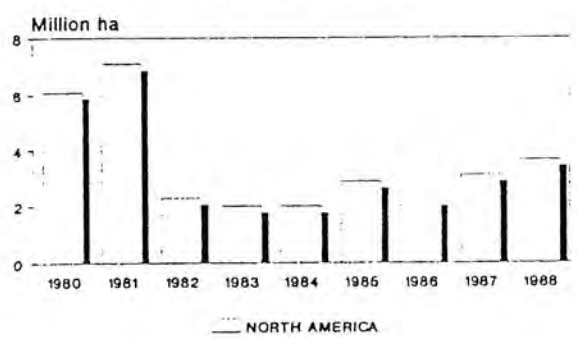
Number of fires
North America



Area of fires
Europe



Area of fires
North America



FAO PROJECTS

India: FAO Modern Forest Fire Control Project

The project was operational between 1984 and 1990 and its objective was to devise, list and demonstrate principles and techniques of prevention, detection and suppression of forest fires. The project was funded by external assistance through UNDP (ca. US$ 5.12 million for equipment, tools, expert services, training and fellowships) and a Government of India contribution of ca. Rs 86 million (for administrative support, personnel, infrastructure, operational costs).

Main technologies involved were construction of fire towers, radio communication, hand tools, mechanized equipment (caterpillars, slip-on units) and air operations (fixed-wing fire detection plane, helicopter with helibucket for aerial fire suppression). It was recognized that modern fire control techniques should be extended. Initially the equipment/tools were imported. Most of them are now manufactured in the country (hand tools, detection equipment). Their specifications have been standardized. A fire danger rating system and a new fire reporting system have been designed for the country.

The average size of fire in the base year was 190 ha in the project area of Maharashtra and has been brought down to a range of 25 to 30 ha. The percentage of large-size fires (i.e. 120 ha or more) has come down from 44 to 3.15 %.

From: Mr. J.P.L. Srivastava

Address: Ministry of Environment and Forests
Barrack No. 6, Bikaner House
Shahjahan Road
New Delhi, India

FAO's Programme on Forest Fire Protection: A Review of Activities for the period 1970-1989

At the International Wildland Fire Conference held in Boston, July 1989, FAO presented a summary review on its international activities in the wildland fire sector between 1970 and 1989. The Regular Programme provides technical support to FAO-assisted projects and to the organization of meetings, workshops and seminars. The main forest fire seminars were held in Europe:

- FAO/UNESCO Technical Consultation on Forest Fires in the Mediterranean Region (France 1977);
- FAO/ECE/ILO Seminar on Forest Fire Prevention and Control (Poland 1981);
- FAO/ECE/ILO Seminar on Methods and Equipment for the Prevention of Forest Fires (Spain 1986).

Training courses are normally provided through the Field Programme. However, since last year training courses are now being held at regular intervals in Spain and are organized by ICONA (Instituto Nacional para la Conservacion de la Naturaleza, Spain), in collaboration with FAO and CIHEAM (International Centre for Advanced Mediterranean Agronomic Studies). Announcements of these courses will be made through the International Forest Fire News (see IFFN No. 2 - December 1989).

The report contains additional information on publications such as the Wildland Fire Management Terminology (FAO Forestry Paper No. 70). This terminology provides precise definitions of English fire management terms with equivalent terms in Spanish, Italian, German and French.

The summary of the Field Programme activities reveals a total of 66 assisted projects during the period, with a total expenditure of ca. $12 million. Practically all projects have produced one or several reports, some of them of lasting value. Of the 106 field documents produced in the period, the most important are listed in the review.

The author of the FAO review presented at the International Wildland Fire Conference in Boston is:

Mr. Jan Troensegaard
Senior Forestry Officer, Plantations & Protection,
Forest Resources Division, Forestry Department
Food and Agriculture Organization of the United Nations
Via delle Terme di Caracalla, I - 00100 Rome

MEETINGS HELD IN 1989-1990

AUSTRALIA

Australian Workshop on Bushfire Meteorology and Dynamics

The topic of "Bushfires: Meteorology and Dynamics" was the subject of a workshop held in Canberra, Australian Capital Territory (A.C.T.), on September 28-29, 1989. The Australian National University (ANU) was the venue. Over 70 people attended the workshop which was held in conjunction with the Simulation Society of Australia's (SSA) Eighth Biennial Conference.

The workshop, which was preceded by the three-day conference, was sponsored by the Australian Meteorological and Oceanographic Society, the Australian Mathematical Society, and the National Bushfire Research Unit (NBRU) of the Commonwealth Scientific and Industrial Research Organization (CSIRO). Dr. Tom Beer, CSIRO Division of Atmospheric Research, Private Mail Bag No. 1, Mordialloc, Victoria 3195, served as the workshop's principal organizer.

The workshop was designed to bring together meteorologists, mathematicians and fire modellers. Furthermore, it aimed to act as a forum for the discussion of future analytical, theoretical and experimental requirements for a better understanding of the dynamics of bushfires, the effects of meteorology on fires and the effects of fires on meteorology.

Fifteen presentations were made during the two-day workshop, which concluded with an open forum on research needs in bushfire meteorology and dynamics. The editor of the Pergamon Press journal **Mathematical and Computer Modelling** has agreed to a special issue containing the papers presented at the workshop. For further information contact Dr. Beer at the address given above.

From: Mr. Martin E. Alexander

Address: Visiting Fire Researcher
National Bushfire Research Unit
CSIRO Division of Forestry & Forest Products
P.O. Box 4008
AUS-Canberra, Australian Capital Territory 2600

UNITED STATES

Symposium on Trace Gas Emissions, 14 November 1989

A one-day Symposium on Trace Gas Emissions Associated with Tropical Biomass Burning was convened in Washington, D.C., on 14 November 1989 to present the current state of research and understanding about trace gas emissions from biomass burning. The symposium was supported by the Office of Policy Analysis of the US Environmental Protection Agency and supported, and Logistics were provided, by the Center of Global Habitability, Columbia University. The symposium brought together scientists from many disciplines and countries to brainstorm about a coherent and coordinated research strategy to reduce uncertainties in trace gas emissions from this source. This meeting followed the Freiburg Conference on Fire in the Tropical Biota (May 1989; see IFFN issue No. 1) and is in complete agreement on the need for immediate action in this region. It is also in concert with the emphasis of "Impact of Tropical Biomass Burning on the World Atmosphere", a project of the International Global Atmospheric Chemistry Programme (IGACP) which is a core project of the International Geosphere-Biosphere Programme (IGBP).

The 31-page report "Strategy for Improving Global Estimates of Trace Gas Emissions from Tropical Biomass Burning" has been prepared by the three convenors of the symposium, Inez Fung, Chris Justice and Yoram Kaufman. Governments or research bodies interested in this report should contact either the editor of the IFFN or write directly to:

Mr. Chris Justice
University of Maryland Associate
NASA/Goddard Space Flight Center
Code 923
USA - Greenbelt, Maryland 20771

Chapman Conference on Global Biomass Burning

As announced earlier the "Chapman Conference on Global Biomass Burning: Atmospheric, Climatic and Biospheric Implications" was held in Williamsburg, Virginia, 19-23 March 1990. A very comprehensive and disciplined programme with a total of 124 contributions was presented in 14 sessions. The main topics were:

- The view of biomass burning from space
- Gaseous and particulate emissions from biomass burning in the tropical, temperate and boreal zones
- Historic and prehistoric perspectives of wildland fires
- Global budgets of biomass burning (carbon, nitrogen, ozone)
- Biomass burning, the Greenhouse Effect, and climate
- Particulates, their optical properties and transport
- Chemistry and transport: theory and measurements.

The conference was attended by 183 scientists from 11 countries. A group meeting on the "Impact of Tropical Biomass Burning on the World Atmosphere Project", an activity of the International Global Atmospheric Chemistry Program (IGAC), was convened by M.O. Andreae (Max-Planck-Institut for Chemistry, Biogeochemistry Department, Federal Republic of Germany) on the weekend following the meeting. The "Ad-hoc Working Group Fire Ecology" joined the common session. Both will come up with a report soon.

The convenor of the Chapman Conference is preparing the edition of the Conference proceedings which will be published in early 1991.

From: Mr. Joel S. Levine

Address: Global Biomass Burning
The MIT Press, Massachussetts Institute of Technology
USA-Cambridge, Massachussets 02142

The address of the editor's office is:

Mr. Joel S. Levine
205 William Claiborne
USA-Williamsburg, Virginia 23185

MEETINGS PLANNED FOR 1990-1991

ITALY

Meeting on "Fire and Vegetation", Naples, 12 October 1990

The Institute of Botany of the Faculty of Agriculture, University of Naples, is organizing a meeting on "Fire and Vegetation" during the 1990 annual symposium of the Italian Botanical Society. The meeting, to be held in Naples on 12 October 1990, will provide a general introduction to the subject by presenting some study cases related to different ecosystems. The aim is to improve the understanding of the topic and to stimulate new research in Italy where fire ecology has not yet received appropriate attention.

From: Mr. Stefano Mazzoleni

Address Universita di Napoli
Istituto di Botanica Generale e Sistematica, Facolta di Agricoltura
I - 80055 Portici

Tel. 39-81-274356
Fax 39-81-470843

PORTUGAL

Conference on Forest Fire Research, Coimbra, 19-22 November 1990

Although all deadlines for contributions are already past, here again is information on the Forest Fire Research Conference in Portugal.

The conference will provide a platform for presenting results of scientific research, and discussing methodologies and the possibilities to increase international co-operation. It will be followed by a short course on "Prediction of Forest Fire Behaviour" given by Richard Rothermel (Missoula, USA), 23 and 24 November 1990. The programme of the course covers basically the BEHAVE programme and GIS issues.

The deadline of hotel reservation request is 1 October 1990. Those having only now learned about the conference should contact the organizer as quickly as possible by telefax or phone:

Address: Grupo de Mecanica dos Fluidos
D.E.M.-F.C.T.U.C.
Universidade de Coimbra
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Fax 351-39-22268
Telex 52826 CMFUC P

UNITED STATES OF AMERICA

11th Conference on Fire and Forest Meteorology, Missoula, Montana, 16-19 April 1991

The Eleventh Conference on Fire and Forest Meteorology is sponsored by the Society of American Foresters, the American Meteorological Society, the USDA Forest Service, Intermountain Research Station and the University of Montana, School of Forestry. The conference will be held from 16 to 19 April at the Holiday Inn, Missoula, Montana.

The theme of the conference is Computer Applications in Research and Management. Papers are solicited in the areas of remote sensing and GIS, fire and atmospheric interactions, ecosystem modeling and quantitative ecology, climate change and fire severity, and large-scale fire behaviour. Contributions are also solicited on traditional subjects such as fire meteorology and climatology; inventory, modeling, and prediction of fuel properties and fire potential; and effects of fire on air, soil, water and vegetation.

Sessions will be structured to permit both oral and interactive poster presentations. Papers will be published in proceedings without reference to method of presentation.

Abstracts of 250 words or less must be submitted no later than 1 September 1990. You may indicate preference for either oral or interactive poster presentation. The organizing committee will make the final choice. Authors will receive notification of acceptance and instructions for preparing camera-ready papers on or about 15 September 1990. Draft final papers are due on 15 February 1991 for review of format and layout. Final papers are due at the meeting.

Those wishing to give a contribution or to attend the meeting without giving an active presentation should contact:

Patricia L. Andrews
USDA Forest Service
Intermountain Fire Sciences Laboratory
P.O. Box 8089
USA-Missoula, Montana 59807

Tel. 1-406-329-4827
Fax 1-406-329-4863

or

Donald F. Potts
School of Forestry
University of Montana
USA-Missoula, MT 59812

Tel. 1-406-243-6622
Fax 1-406-243-4510

UNITED KINGDOM

Third International Symposium on Fire Safety Science, Edinburgh, Scotland, 8-12 July 1991

The Third International Symposium on Fire Safety Science will be held at the University of Edinburgh, Scotland, United Kingdom, 8-12 July 1991. Papers are solicited in all areas of fire safety science, e.g.

- Fire Physics
- Fire Chemistry
- Smoke Toxicity and Toxic Hazards
- Statistics, Risk and System Analysis
- People-Fire Interactions
- Detection
- Suppression
- Structural Behaviour
- Fire Problems
- Translation of Research into Practice

The deadline for submission of papers was 31 July 1990, but further information on documentation, participation, etc. may be obtained from:

Mr. S.-E. Magnusson
Department of Fire Safety Engineering, University of Lund
P.O. Box 118, S - 221 00 Lund (Sweden)

Mr. T. Kashiwagi or Mr. J.G. Quintiere
Center for Fire Research, Building 224, Room B250
National Institute of Standards & Technology
USA-Gaithersburg, Maryland 20899

Mr. Y. Uehara
Department of Safety Engineering, Faculty of Engineering
Yokohama National University
156 Tokiwadai, Hogogaya-ku
J - Yokohama-shi, Kanazawa 240 (Japan)

GREECE

Seminar on Forest Fires, Land Use and People, Athens, Greece, 28 October-1 November 1991

The 18th session of the Joint FAO/ECE/ILO Committee on Forest Technology, Management and Training, held in Munich (Federal Republic of Germany), gave the go-ahead for the above seminar, to be held at the invitation of the Government of Greece. Besides the Joint FAO/ECE/ILO Committee, the seminar will be sponsored by the FAO Committee on Mediterranean Forestry Questions - Silva Mediterranea and the International Union of Forestry Research Organizations - IUFRO.

The provisional programme is as follows:

1. Land use and fire risk

1.1 Interface of forest, agricultural land, wildlands and residential areas (description of landscape pattern, ecology, climate and fire risk)

1.2 Social, economic and cultural aspects of forest and wildland fires (description of fire causes)

2. Reducing the forest fire hazard

2.1 Fuel management (methods: mechanical, chemical, prescribed burning, prescribed grazing)

2.2 Silvicultural methods (including restoration/reforestation planning of burnt areas/lands)

2.3 Policies and legislation (financial aid, regulations, extension, public information)

In addition to basic (invited) papers, voluntary papers will be accepted, and the authors given time, so far as possible, to introduce them. An information note with further details of the programme, which will include study visits, organizational arrangements and registration form, will be circulated later. Those wishing to be kept informed about the seminar should contact:

ECE/FAO Agriculture and Timber Division
Palais des Nations
CH - 1211 Geneva 10 (Switzerland)

Tel. (22) 734-60-11
Fax (22) 734-9825
Telex 28-96-96

RECENT PUBLICATIONS

Slash and Burn: Farming in the Third World Forest

Shifting cultivation is a way of life for tropical forest peoples the world over. In practice, it is characterized by the constant rotation of fields between periods of cultivation and periods of fallowing, a cycle of which the major steps are clearing, burning and cropping. Fire is the indispensable tool of the shifting cultivator, almost the only method whereby cut vegetation can be cleared from a forest site and the soil prepared for cultivation with, among other benefits, the deposit of a layer of nutrient-rich ash. However, frequent resort to burning as prelude to farming can also change the face of the land dramatically, and derived savannas and grasslands often mark the result of uncontrolled and indiscriminate use of fire. Such areas, often thus removed from cultivation by traditional methods, may become unproductive for both farm and forest economies.

Fire for the shifting cultivator in the tropical forest is an economizer of energy, yielding the maximum return for a minimum of effort. But it is also, and perhaps for these reasons, a focus of ritual, taboo, and other traditional sociocultural practices. Contemporary politics and economies in the Third World today threaten to erdicate not only shifting cultivation and the use of fire upon which it depends but the way of life that supports it.

This thoughtful and penetrating study of the use of fire in forest agriculture in the tropics demands that politicians and economists not disregard the ecological soundness of traditional methods of cultivation or the cultures of their practitioners.

William J. Peters & Leon F. Neuenschwander Slash and Burn: Farming in the Third World Forest The University of Idaho Press, Moscow, Idaho, 156 p., ISBN 0-89301-123-1

Prescribed Burning in California Wildlands Vegetation Management

Fires are a necessary part of the natural cycle in many areas of the world. They redistribute nutrients from fallen wood or dead undergrowth; they are critical for the germination of certain seeds; they prevent the build-up of massive quantities of fuel on the ground, which causes very hot and destructive fires. Human suppression of fire has interrupted these natural functions and actually made fires more catastrophic when they occur.

Harold Biswell's decade of research and field experience have been a major factor in developing new policies of controlled or prescribed burning to mimic or reintroduce the natural fire cycle. Biswell not only presents a historical and ecological perspective on his work, but also provides an introduction to the principles and practices of prescribed burning, which apply far beyond California. He includes careful directions for planning, timing and conducting burns safely, which will be useful for ranchers and other private land owners as well as wildland managers, timber growers, and plant and wildlife specialists. The story of the role of fire will also interest teachers and environmentalists concerned about the stewardship methods for the land. And the efficacy of prescribed burning in reducing the danger of massive fires should interest all public policy makers.

Harold H. Biswell. Prescribed Burning in California Wildlands Vegetation Management. University of Los Angeles Press, Berkeley-Los-Angeles-London, 255 p., ISBN 0-520-06482-8

Natural and Prescribed Fires in the Pacific Northwest Forests

This new book, edited by John Walstad, Steven Radosevich and David Sandberg, represents a comprehensive summary of what we know about fire and prescribed burning in the Pacific Northwest of the United States. The issues surrounding the control and use of fire in the Pacific Nortwest are complex and controversial. Deciding whether fire is likely to be beneficial or harmful in specific situations is very much a matter of judgement and experience. This book provides the state-of-the-art information to guide the decisions of the forest manager and policy maker.

Setting prescribed fire in the Sierra Nevada forests

Twenty-two chapters prepared by a group of 29 authors cover topics ranging from the role of fire in natural ecosystems to the practical application of fire in managed forests and rangelands, including environmental impacts and mitigation measures.

J.D. Walstad, S.R. Radosevich & D.V. Sandberg (eds.). Natural and Prescribed Fire in Pacific Northwest Forests. 336 pages, 36 photographs, 47 line illustrations, ISBN 0-87071-359-0

Address: Oregon State University Press
Waldo Hall 101
USA-Corvallis, Oregon 97331-6407

Tel. 1-503-754-3166

Les Feux de forêts. Mécanismes, Comportement et Environnement

The new book by Louis Trabaud, published in French, is entitled *"Forest Fires: Mechanisms, Behaviour and Environment"* and follows the principle **know forest fires well - for better control**. Thus it is necessary to know the mechanisms which determine fire risk, fire behaviour and the impact of fire. Trabaud's approach is based on scientific expertise from France and other regions of the world.

In 280 pages and seven chapters the book covers all basic aspects of fire typology, principles of combustion, fire behaviour, the different fuel types and the factors determining fire occurrence and fire behaviour (atmospheric conditions, meteorological and topographical factors).

The synthesis of information given by the book allows those responsible for fire fighting to develop a diagnostic view and to adopt the relevant strategy. The aim of the book is to increase efficiency in the utilization of suppression techniques, safety for personnel and the necessary methods of fire prevention. The book is directed at all groups involved in wildland fire fighting, fire brigades, foresters, the military, voluntary fire fighters and the people living in the zones of wildland fire risk.

From: Mr. Louis Trabaud *"Les Feux de Forêts"*

Address: France-Selection
9-13, Rue de la Nouvelle France - B.P. 118
F - 93303 Aubervilliers Cedex

Codice di comportamento per gli agricoltori contro gli incendi

What are the causes of forest fires, what are the effects of wildfires on nature, the forest plants and animals? How can farmers and all those living in the wildland/residential interface contribute to prevent forest fires? How does fire behave, what are the basic suppression techniques? Answers on all these questions are given by the *"The Agriculturist's Code of Behaviour against Forest Fire"* (in Italian). This new booklet, prepared by the "Centre of Agricultural Studies, Environment and Territory" (CESTAAT), is aimed at providing basic information on fire causes, the negative effects of wildfires, fire behaviour, fire prevention and suppression techniques. The Appendix provides relevant sources of Italian State and Provincial laws related to the wildfire problem. Potential readers of this booklet will be all those who are not yet familiar with the forest fire problem. The book was prepared by Giuseppe Pucci, Secretary of the Italian Association of Timber Producers "Assoboschi".

From: Mr. G. Vinciguerra, President

Address: Associazione Nazionale dei Produttori Boschivi e di Piantagioni da Legno
Corso Vittorio Emanuelle 101
I - 00186 Rome

I campeggiatori non devono accendere fuochi

Protecting People and Homes from Wildfire in the Interior West

The 213-page proceedings of a symposium and workshop held in Missoula, Montana, examine a wide range of issues associated with protecting homes from fire. Although the title is specific to one region of the United States, the information is readily applicable to any other area where a wildland/urban interface exists.

Workshop sessions surveyed the high cost of wildfire damage, presented state-of-the-art approaches to meeting the threat, and developed recommendations for homeowners, government agencies, fire personnel and the business community. Other topics included how to help on overcoming political constraints, building cooperative efforts, working with homeowners and developers, using land-use planning, employing fire-resistant construction and landscape techniques, and fire fighting techniques. The proceedings are available from:

U.S. Forest Service, Intermountain Research Station
Publications Office
324, 25th Street
USA - Ogden Utah 84401

Tel. 1-801-625-5437

New Publications from the Fire Research Institute

International Journal on Wildland Fire

In April 1990, this new quarterly, refereed, scientific journal, devoted solely to issues in wildland fire was announced. The Chief Editor, Canadian ecologist Ross W. Wein, has assen.bled an international editorial board with representatives from Australia, Brazil, Canada, France, Federal Republic of Germany, South Africa, USA and the USSR. The board is now accepting manuscripts dealing with any issue related to wildland fire science, management or technology. At our current schedule, the first issue will be mailed in the fall of 1990. Subscriptions are US$ 50.00. Please address questions regarding manuscript submission or subscription to the Journal of Wildland Fire to the Fire Research Institute (address below).

The International Journal of

Wildland Fire

science technology management

New International Directory of Wildland Fire

This new directory contains over 500 pages of names, addresses and telephone numbers. Updated annually, it now includes 4915 managers, 3104 academics, 1161 women in fire, 2434 organizations, 844 vendors and consultants, 1680 educational institutions, 2266 libraries, 177 granting agencies, 451 journals and newsletters involved in research, management or publishing concerning wildland fire. Keywords are included to indicate area of interest. The directory is US$ 34.50 in paperback and US$ 250.00 on disk. The editors are accepting advertisers. Write to address below.

New International Bibliography of Wildland Fire

The International Bibliography of Wildland Fire contains over 40,000 references to publications concerning all areas of wildland fire science, including science, management and technology. Articles on urban interface, silviculture, remote sensing, fuels, biomass, air quality, ecology, fire history and more are included. Each entry is keyworded to indicate subject matter and region discussed. The bibliography is updated annually and available on diskette. Publication date is June, 1990. The bibliography is US$ 60.00 (add $ 5.00 in Canada and $ 8.00 elsewhere). Diskettes are US$ 150.00.

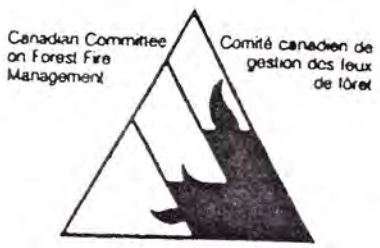
Please write to: Fire Research Institute
P.O. Box 241
USA-Roslyn, Washington 98941-0241

FROM REGIONAL NEWSLETTERS

Foam Applications for Wildland & Urban Fire Management

The latest newsletter (Vol.2, No.3, 1989) which is a publication of the National Wildfire Coordinating Group (USA) contains some reports on recent research and guidelines on use of foam in wildland fire suppression, e.g.

- Single engine driven compressed air foam system (CAFS)
- Evaluation of flow proportioner with a medium expansion foam nozzle
- Interim guidelines for aerial application of foam on forest fires
- Effectiveness of ground-applied CAFS in Alaskan wildland fire suppression
- Bibliographic information on recent foam literature and reports, and
- A complete bibliography of all articles in the previous six editions of the newsletter.



Setting up a foam barrier for control of surface fires (Federal Republic of Germany)

Wildfire Strikes Home

Starting with the January/February 1990 edition (Vol.4, No.1), the **Wildfire Strikes Home** newsletter features regular news coverage, including **National Wildfire Coordinating Group Notes** and **Wildland Fire Management Briefings.** With this expanded scope a new name for the publication is needed. The readers are invited to help suggest a proper new title. The editors also call for information and materials from all readers for future publications. Those interested in the new, enlarged scope of this North American wildfire bulletin should write to:

Wildfire News & Notes
National Fire Protection Association
1 Batterymarch Park
USA - Quincy, Massachussetts 02269-9101

L'Entente en Direct

100,000 flying hours and nearly 200,000 drops of suppressants.

Pilot Jean Lion and his TRACKER 14 has accomplished the 100,000th flying hour of water bombers since the beginning of the operations of the "**Pélicans**" in Marignane, 24 June 1963. In this period the fleet of French fire birds, the CATALINA, CANADAIR CL 215, GRUMMAN TRACKER and recently arrived FOKKER F.27, have dropped 191,379 loads of fire suppressants, representing 992,329 tons of water, retardants or foam.

This note was taken from the French triannual Bulletin for Information and Liaison of the Interdépartemental Entente for the Protection of Forest against Fire (L'Entente interdepartementale en vue de la protection de la forêt contre l'incendie), No.18, February 1990.

LETTER TO THE EDITOR

From Cong Lai, New York, USA. **"The Deforestation in Yunnan Province, People's Republic of China"**

Yunnan, a mountainous province with a complex geological structure, is located in southwestern China bordering on Vietnam, Laos, Burma and India. The relatively low latitude and varied topography provide this province with a wide range of climate, which in turn results in an abundance of forestry resources, from tropical rain forest and seasonal forest, temperate evergreen and deciduous forest to boreal forest. Approximately 25 % of this province is covered by forest. Of these forests, the tropical and sub-tropical forests located in west-southern Yunnan are the most important as well as the largest tropical and sub-tropical ecosystem in China. Because of the favorable living conditions provided by long hours of daylight and abundant rainfall, the huge virgin jungles are rich in plants and animals. There are more than 400 species of birds and 540 species of land animals: on third and one fourth respectively of the total number in China. Many of them, such as peacok, hornbill, Asian elephant, golden-hair monkey, and south China tiger, are quite rare. There are more than 4,000 plant species, including coffee, cocoa, rubber, shellac, cinchona and other rare plants. This region also produces many important economic and ornamental plants, such as rice, tea, camelia and azalea. Therefore, the area is known as the "Green Treasure of Tropic Cancer" and "The Kingdom of Plants and Animals of China".

With the economic development and increase in population, the situation has changed greatly in recent decades. The tropical rainforest as well as the sub-tropical forest area are acutely endangered as are similar rain forest areas elsewhere on the planet. Taking the Xishuangbanna area, a typical tropical forest zone of China, as an example, recent study shows that the deforestation of this area is serious. In the last thirty years, the proportion of the forest area has fallen from 62 % (1,200,000 ha) in the 1950's to 29 % (470,000 ha) in the 1980's. Similar to the other rainforest areas on the earth, the causes of deforestation in this area can be divided into several categories: (1) deforestation for cultivable land to meet the demand of economic development and population increase; (2) deforestation for fuelwood to meet the local people's requirements; (3) destruction by forest fires; and (4) deforestation for timber harvesting. The analysis indicates that out of 3.2 million m3 of wood lost from this area annually, 17.18 % is due to creation of land for cultivation, 36.21 % is used as firewood, 26.87 % is destroyed by forest fires and 19.69 % is used for timber.

In another county, Tengchong, the situation is similar. Out of the 610,000 m3 of wood consumed yearly, only 9.7 % is used as timber, most of which (75 %) is used as fuelwood. Felling trees to meet fuel demand has become an increasingly important factor of deforestation, especially in recent years. If we do not take the necessary steps to stop further deforestation, the **"Green Treasure"** will disappear in local people's ovens and will become a memory. Also, observation shows that with the decrease in forest area, the climate of this area has changed: both the annual mean temperature and the temperature variations have been increased; the relative humidity decreased; and rainfall decreased in the wet season, but increased in the dry season. We are thus facing new challenges in the search of the solution to the above problem.

In the Xishuangbanna area, scientists are setting up an artifical plant community to help protect and rebuild those ecosystems being destroyed or in the process of destruction. Nationwide, the first **"Forest and Wild Animal Protection Law"** has been passed by the Chinese government. But things are still getting worse, forests are getting smaller and the ecosystems are endangered. To protect the forests, **WHAT CAN WE DO?**

Mr. Cong Lai
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