

# **INTERNATIONAL CROSS SECTORAL FORUM ON FOREST FIRE MANAGEMENT IN SOUTH EAST ASIA**

**JAKARTA, INDONESIA, 7 – 8 DECEMBER 1998**

## **REPORT OF THE MEETING**

The International Cross Sectoral Forum on Forest Fire Management in South East Asia, hosted by the Government of Indonesia and jointly co-sponsored by the Japan International Co-operation Agency (JICA) and the International Tropical Timber Organisation (ITTO) met in Jakarta, 7 – 8 December 1998, with the specific goals to :

- gather information concerning the causes of forest fires and their impacts on humans, bio-diversity, and the environment;
- review existing land use conditions and to consider further input to land-use management reform;
- analyze institutional development and the integration of current efforts to overcome the impacts caused by forest fire;
- develop technology for forest fire prevention and management;
- develop a policy and mechanism (including institutional development) to improve regional efforts to anticipate the trans-boundary impacts of forest fires; and
- develop guidelines for the drawing up of a National Action Plan for the management of forest fires and their associated impacts, applicable at the local, national and regional levels.

216 participants from 17 countries and 8 international organisations, representing a wide range of disciplines attended the Forum. The Forum was organised into plenary, one at the beginning and another at the end, and working group sessions. The participants were divided into three groups to discuss Forest Fire Prevention; Forest Fire Control and Rehabilitation; and Trans-boundary Issues. A total of 39 papers on various aspects of forest fire were presented at the forum.

This report summaries the outcome of the forum, including findings and recommendations.

## **1. PREAMBLE**

Wildfires have been present on earth since the development of terrestrial vegetation, playing a significant role in maintaining biogeochemical cycles and disturbance dynamics in some ecosystems. Fire and ecosystems have interacted through out time influencing such ecosystem functions as: recycling nutrients, regulating plant succession and wildlife habitat, maintaining biological diversity, reducing biomass and controlling insect populations and diseases.

Taking a cue from nature, early humans used fire as a tool to alter their surroundings and later to prepare land for cultivation. Use of managed fire became a common practice in land conversion activities. However, once out of control, fire can lead to long-term site degradation and other detrimental impacts.

The recent major fires in Indonesia and elsewhere coincide with El Nino events; and therefore El Nino has begin blamed for the damage and devastation caused by these fires. El Nino is a weather phenomenon, which aggravates the forest fire danger situation, by creating drought conditions conducive for the spread of wildfire. El Nino by itself is not a sufficient cause for forest fire; and major fires have taken place in Indonesia not simply due to El Nino, but due to a much more complex interaction of human-induced conditions, which, among others, include availability of dry fuel load (caused by wasteful logging, land clearing), providing the material to feed the conflagration and an ignition source.

The forest fire scene in Indonesia is characterised by conditions emanating from negligence and linked both to subsistence and commercial activities. They are, among others: large scale logging, leaving a high percentage of residues in the forest, which in drought years become highly combustible; land clearing practices of HTIs, plantation companies and small holders using open, broad cast fires to dispose off the clearfelled materials cheaply; careless use of fire by grazers, NWFP collectors, campers and others; intentional fires for staking land claims, or for other reasons. These have caused increased frequency of forest fires.

The situation is exacerbated by other constraints. They include, interalia, the following: weaknesses in policies, legislation (including rules and regulations), and their implementation/enforcement; lack of funds and facilities; weaknesses of organizational structure and coordination; unclear authority and functions; inadequate infrastructure, lack of trained personnel, insufficiency of equipment; reluctance/resistance, to adopt zero-burn techniques of land preparation on the part of land owners, or low-impact logging on the part of concessionaires; inadequacies in forest fire management exemplified by lapses in monitoring, fire-danger warning, fire protection/prevention measures, pre-suppression planning and preparedness, and firefighting capability; poverty, social conflicts and lack of incentives for the local community to participate in

forest fire protection; and lack of awareness; institutional inability to learn lessons from past experience.

Fundamental changes in these framework conditions are required for long-term control and reduction of forest fires.

During the two spells of wildfires between September 1997 and May 1998, an estimated 6 to 10 million ha of land was burned. Official figures of forests burned is about 800,000 ha, covering primary forests, secondary forests, peat swamp forests, national parks and forest plantations. These catastrophic fires and the associated haze resulted in profound impact on economic, ecological, physical and social environment in the ASEAN region. Millions of tonnes of biomass, including timber and NWFPs were consumed by the fires. Physical infrastructure was destroyed. It affected industrial production; resulted in fishing decline; caused loss of biodiversity, disrupted commerce; registered sharp fall in tourism revenue. During the worst haze, atmospheric pollution index reached above 850 in some parts of Indonesia and Malaysia, while a reading of 300 – 500 is considered most hazardous. Health of some 70 million people in six countries were affected. The total estimated value of economic and social damages is about US\$ 6 billion. While these figures help to provide the magnitude of the calamity, many of the deleterious effects of fire on Indonesia's tropical rain forests cannot readily be cast in economic terms.

The 1997 – 98 fire event, from its very beginning, led to several initiatives at national, regional and international levels. Many countries and international organisations provided emergency assistance in cash and kind, including equipment, materials, medicine, service of fire fighters, and so on. The Indonesian Government reactivated and strengthened the Forest and Land Fire Control Centres at national and provincial levels and Executive Units and Fire Brigades at subdivisional and local levels. The National Coordination Committee on Forest and Land Fire Control, with BAPEDAL serving as its secretariat, was given the responsibility to: coordinate monitoring of hot spots appearing on NOAA weather satellite images, carry out surveillance, provide early warning about fire danger, transmit information and guidance regarding action to be taken at the local level and so on. Since the fire event was declared a disaster, the BAKORNAS PB undertook the overall responsibility of coordinating the activities of various agencies including activities such as water bombing and cloud seeding. In spite of it, the fire suppression efforts suffered from organisational and communication weaknesses, and it was the onset of rains that finally extinguished the fire.

At the regional level several initiatives were taken to address the problem of transboundary haze pollution – such as establishment of Haze Technical Task Force, regular meetings of the ASEAN Environment Ministers and ASEAN Senior Officers on Environment, formulation of ASEAN Regional Haze Action Plan and its implementation; and coordination of ASEAN regional level actions with support from ADB.

At the time of 1997 fires, there were four important forest fire projects ongoing (funded by GTZ, EU, JICA and ITTO) and another (UK) with a major fire related component. There are now over 35 projects (including the ongoing, new, and pipeline projects), supported by bilateral donors, UN agencies, international NGOs and others. Most of the current projects are of short-term scope, investigating the underlying causes, or addressing specific aspects, of actions required – e.g. capacity building, biodiversity conservation. A trend in new projects is the high emphasis given to sophisticated remote sensing technology for monitoring and fire prediction, compared to practical pre-suppression and suppression activities, particularly to strengthen the capability of field offices and concession units. There are also no projects which seriously address the issue of post-fire forest rehabilitation.

Integrated Forest Fire Management (IFFM) is essential to control the damaging role of fire without unduly curtailing its beneficial aspects and to reduce the intensity of fires in cases of fire events. Scientific and planned actions for fire protection, monitoring, prediction and prevention, fire-danger warning and preparedness for fire suppression, supported by appropriate policies and strategies are essential. Forest rehabilitation, a post fire activity, is a vital component of IFFM.

IFFM can be treated in three specific phases: (i) pre-fire planning and fire prevention involving fire breaks, fuel load control, weather monitoring, fire risk assessment and early warning, equipment development, enforcement and surveillance, training in firefighting, research and extension, and infrastructure development; (ii) fire suppression, covering fire detection; quick communication; organisation of fire crews; and (iii) post fire rehabilitation and management, covering fire inventory and classification and rehabilitation planning. In all these aspects it is necessary to strengthen institutional framework, research and public education. It is also crucial that the technology adopted is appropriate and local participation is guaranteed through proper incentives.

The concept of IFFM recognises the traditional beneficial role of fire; it integrates the local people and communities in the system of fire management planning and implementation; it appropriately balances the level of technology; it calls for improved knowledge about resources and fire risks.

Avoiding wild fires, and capacity to quickly contain fires if started are indicative of good fire management. The participants noted with appreciation that an integrated action plan for forest and land fire management in Indonesia is ready in draft form. This plan has incorporated the action proposals contained in the National Haze Action Plan prepared under the auspices of the Regional Haze Technical Task Force.

## **2. FOREST FIRE PREVENTION**

Knowledge about, and analysis of, causes, both predisposing and immediate, of forest fires is important to design and implement measures of fire protection. Efforts to prevent

forest fires call for several related actions to control the causes of fire involving: clearing of fire lines around forest blocks; reduction of fuel load by prescribed burning; establishment and maintenance of green belts; weather monitoring and fire danger assessment rating; mapping of fire-prone areas for special surveillance; fire classification, generation of management data/information, fire modeling; creation of public awareness, provision of incentives for community participants/cooperation, and so on. Preparedness for potential fire event is an aspect of fire prevention and involves control of ignition sources, development of infrastructure and communication facilities, equipment development, assessment of training needs, crewed development training and demonstration, etc. However Forest Fire Prevention is a weak area in Indonesia. The participants heard with interest the experiences of the different donor-assisted forest fire management projects and how the projects are attempting to address the constraints. While remote sensing facilities for mapping and monitoring are available centrally there is lack of an appropriate communication system to convey urgent fire related information to the field.

Evidence shows that there has hardly been any serious fire in the undisturbed primary forests, which strengthen the view of the ecologists that in the tropical rain forests fires are almost excluded, due to fuel characteristics and its moist condition.

### **3. FOREST FIRE CONTROL AND REHABILITATION**

Forest fire control or suppression involves action during the fire, whereas rehabilitation is a post-fire activity. The series of activities under forest fire control include surveillance/observation, detection, quick action to put out the fire (involving organisation/mobilisation and dispatch of the crew), fire fighting logistics, and fire suppression. The response time and the effectiveness of suppression depends on the speed of relaying correct information, about the fire and the organisational formalities involved. Under the existing system in Indonesia, official channels of communication are very slow. Tools/equipment and trained crew are crucial for fire control. The tools/equipment should be simple, adaptable and compatible. However, the equipment available now are of poor standard and there are very few trained fire fighters; and are hardly provided with any protective gear. Regular drills and demonstration are lacking. There is need to considerably strengthen local level field capability for fire fighting, but there is little motivation or incentive. There is much less preparedness to control fires in peat forests which also burns below ground and causes excessive smoke.

Lack of effective and meaningful coordination has been a serious problem during the 1977-98 fire disaster. Aerial support for fire fighting (e.g. water bombing) provided as part of emergency assistance was also not effective. Helicopters and fixed wing planes have their role in fighting, provided they are well integrated into the system. On the other hand, if there is no effective and efficient system in place to prevent, control and combat fires at site, any amount of technological inputs elsewhere will not be of much use. Balancing of equipment, technology and training are required for optimising benefits.

Mopping up of the burned area is to undertaken before a post fire inventory and classification is carried out. Plan of action for follow up has to be decided accordingly – for example, to salvage the usable materials, to carry out sanitary operations, to rehabilitate the area by natural regeneration or artificial means, etc.

Post-Fire rehabilitation often turns out to be a major investment activity. For lack resources this important aspect of forest fire management is often neglected, leaving remnants as a source of fire for in a not too long distance future.

#### **4. TRANS-BOUNDARY ISSUES**

Fires do not respect national (in some cases, even natural) boundaries. Fires can spread between countries sharing common land boundaries. Smoke/haze caused by fire often spread far and wide, as was experienced during the 1997-98 forest fires in Indonesia, when it affected at least six countries in the region.

Trans-boundary haze pollution is an environmental hazard caused by fires, particularly by clusters of peat fires. Haze consists of smoke, smoke condensation and particulate matter. While the health of millions in the region was affected by fire, over 40,000 persons were hospitalized for respiratory and other haze-related ailments. Its long-term impact on health of exposed children and elderly are yet unknown.

The effect of haze on light and visibility also impacted on economic production (both manufacturing and agricultural), transport, tourism and so on. Haze-caused accidents resulted in loss of lives. Several gaseous compounds in the haze are likely to affect global environment and climate. Quantitative evaluation impacts was however limited due to fragmentary character of the particle measurement data and methodological problems.

Inter-governmental efforts of ASEAN countries in addressing trans-boundary atmospheric pollution has resulted in a Regional Haze Action Plan which was approved for implementation in December 1997. The Regional Haze Action Plan has three major components – namely Monitoring, Prevention and Mitigation, subdivided into 20 activity groups and 50 specific actions.

Transboundary issues related to haze pollution, among others, involve the need for studies on the nature and intensity of haze, nature of pollutants and their effects; surveillance of incidences of diseases; health assessment studies, medical emergency services; dissemination of information; policies on haze mitigation, regional coordination of activities. There is clear need in the health sector for long-term planning to mitigate the effects of forest and land fires, supported by a national coordination of infrastructure development, equipment and skills for air quality monitoring, health effect

alleviation, community awareness raising and education programs, structured data collecting systems and rapid response mechanisms.

## 5. RECOMMENDATIONS

The forum made the following recommendations:

### **General:**

Institutional weaknesses are a paramount factor causing inefficiencies of forest fire management. The situation calls for several measures to reorient and strengthen the institutions and institutional instruments for ensuring integrated and sustainable forest fire management, involving:

- Policy reforms on aspects touching on forest fire management directly and indirectly, and assigning of appropriate priority for forest fire management. Clear policy relating to land management and land clearance which takes into account the land requirements for various purposes is an important aspect in this regard.
  - Appropriate revision/reformation of laws, rules and regulations and their effective implementation to support integrated forest fire management (IFFM).
  - Organizational reforms to facilitate effective and efficient functioning of sustainable forest management including IFFM, which would call for definition of clear functions, devolution of responsibility and authority, meaningful decentralization and smooth and speedy flow of information.
  - A comprehensive and integrated National Fire Plan within the overall framework of National Forest Programme, preferably following a landscape planning concept, and specifying priorities locations, time schedules, scope and objectives, costs and benefits and so on.
  - Adequate provision of funds.
  - A single-window coordinating mechanism, fully rationalized to be capable of addressing all situations eventualities.
  - National fire management guidelines and specific/detailed manuals for component activities such as fire protection, prescribed burning, equipment maintenance, fire fighting operations etc.
- The countries are urged to consider the establishment of a national fire management unit/agency, with wider scope and responsibility, within the existing (or reformed) system of public forest administration.

- Undertake capacity building for IFFM covering related human resources development, development of science and technology, infrastructure, equipment and facilities.
- While acknowledging that theoretical and practical aspects of fire management need to be balanced in any curriculum for education and training, the forum underlined the importance of practical, field-oriented training and continuous periodic drills for fire crew. Facilities available in Fire Academies can be adapted suitably, and/or additional and adequate facilities for forest fire fighting would need to be established, depending on the situation. In addition to the regular fire crew, there is need to impart training in forest fire fighting to voluntary fire forces, police and military, Fire and Rescue Services and Staff of Private Sector and NGOs.
- Considering that forest fire related research has suffered from neglect in developing countries, and to steadily improve the system of IFFM, funds, facilities and expertise be provided for undertaking research relating to the various IFFM related aspects such as climate variation, fire monitoring, fire danger assessment, fuel characteristics, fire suppression measures, equipment systems, problems of specific vegetational types (e.g hill forests, peat swamps), fire proneness, smoke impacts, rehabilitation silviculture and so on. A related consideration is acquisition of technology from outside, suitably balanced to the situations in the country.
- Appropriate participatory mechanisms be developed to obtain participation/cooperation of local people, communities private sector and NGOs in fire prevention and suppression activities. Local people can be enlisted as voluntary fire wardens and voluntary fire fighters. Improved incentives including honorarium, access to resources and entrepreneurial opportunities, provision of off-farm income earning activities should be provided to promote participation.
- Raising of peoples awareness and extension on forest fire management are required to motivate people to prevent and mitigate forest fires.
- Pilot scale practical demonstration of IFFM can serve multiple objectives of practical training, awareness creation and research.
- The forum stressed the need for increased donor support, through financial and technical assistance, for forest fire management and of improved donor coordination to improve effectiveness.
- Regional cooperation and collaboration in forest fire and haze related activities needs to be sustained and strengthened.
- Mobilization of additional resources for IFFM is an important requirement and can be achieved through innovative measures such as objective oriented taxes/charges, surcharges on postage stamps/rail and air tickets, and targeted funding facilities.

- With respect to Indonesia's programme on forest fire management, the participants appreciated the concept and content of the newly prepared draft of the Integrated Action Plan for Forest and Land Fire Management in Indonesia, which has incorporated and refined the action proposals contained in the National Haze Action Plan; and stressed that the plan should be made implementation without delay, duly providing budget allocation, defining responsibilities and establishing a clear time frame.

### **Forest Fire Prevention**

- Prevention is one of the most effective ways to tackle forest and land fires. And it should be made effective and efficient in all its aspects.
- Sophisticated satellite/monitoring technology provides crucial information and speed which can be continually up dated. In order to be useful, it is necessary to link the system (e.g. satellite/remote sensing, GIS) with local (on site) information needs. In this regard it is necessary to standardize data gathering, processing and forwarding/receiving systems.
- Establish and improve the system of fire risk assessments, fire danger warning, and code of public behavior in high fire danger situations.
- Discontinue to the extent feasible, conversion of natural forests into plantations of into other forms of land uses.
- Promote public good will to the cause of forest protection through help to solve local land tenure issues to relieve, local grievances caused by forestry regulations, to provide resource access and so on.
- Wherever selective cutting is used unavoidable, establish and observe appropriate annual allowance cut and restricting to low intensity of removal; practice low impact and waste-free harvesting systems.
- Rationalize shifting cultivation practices through introduction of improved agro-forestry system, off-farm employment opportunities, equity participation in local enterprises and so on, to wean away farmers from destructive practices.
- Promote measures of poverty alleviation targeting the communities living in and around forest areas to support food and income security.
- Optimize size and terms of forest concessions to ensure improved fire protection measures and related infrastructure facilities.

- Establish land clearance and management regulations to introduce fire permit system for open burning, to promote zero-burn land preparations and other environmentally sound practices.
- Establish a system of fire belts/green belts around forest management units/blocks as well as other practical measures of fire protection and control.
- Develop and enhance buffer zones for protected areas with the dual objectives of fire prevention and habitat protection.

### **Forest Fire Control and Rehabilitation**

#### **Forest Fire Control.**

- Improve the system, and capability of fire surveillance and fire detection.
- Establish permanent fire crew and keep them in good fitness and field training to fight fire when it occurs. The fire crew be strengthened by local volunteers, where required. Their training should include exposure to problems of different forest types (e.g. peat swamp, coal seams and terrain savannah).
- Adequate amount of different types of tools, equipment (transport, firefighting, communications) and materials be procured and kept in good condition and readiness. The equipment should be balanced according to the level of skill and training of the crew, and should be simple and compatible to meet the needs.
- Involve local people, private sector and NGOs in the different aspects of fire control as appropriate.
- Emphasis of forest fire control should be on strengthened field capability, with other systems suitably tuned to it.

#### **Rehabilitation**

- Fire events be followed by a detailed assessment and classification of impacts in order to design appropriate salvage and rehabilitation operations, to establish priorities and to develop/apply proper silvicultural and logistical measures.

## **Trans-boundary issues**

On regional co-operation:

- Strengthened regional co-operation in addressing transboundary pollution and related issues, including collaborative programmes and exchange of information e.g meteorological data.
- On health aspects: conduct analysis of substances/components of haze and their injurious impacts on human health in the short and long term ; establish monitoring network for collection of data on basic parameters of fire and haze; study linkages of air quality and health; establish system to inform public on pollution level and precautions required; create emergency medical services wherever necessary.
- On air quality: improve capability to monitor air quality and disseminate information.
- On meteorology and weather monitoring: promote management of relevant meteorological data and analysis of fire-weather relationship conduct integrated studies on climate variability/change; support provision of improved early warning and hot spot information; conduct studies on “mood swings” of El Niño and on how to internalize the information for effective IFFM.
- Conduct research on other socio economic impacts of haze pollution.
- Participate in international initiatives of wider significance in the area of science and technology (e.g capacity building and training) and research initiatives such as SEAFIRE under the international Geosphere-Biosphere Programme.

## **6. CONCLUSIONS**

In summary the recommendations of the meeting are related to actions to fill in gaps or to strengthen the existing capability under the following important areas: capacity building; pilot demonstration (model forest for IFFM, fire suppression training, participatory methodologies); community participation (through incentives, income earning activities, involvement in production enterprises); rehabilitation of burned areas (through sanitary operations, salvage fellings and replanting); rationalization of shifting cultivation (incorporating agroforestry, skill development, crafts); optimizing the size of forest concessions (to ensure scientific management); formulation of national forest fire plans; establishment of regional and international cooperation on trans-boundary issues related to forest fire.

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