

# **The IFFM/gtz Strategy to Prevent Forest Fires in East Kalimantan**

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## **1. INTRODUCTION**

In 1997/98, Indonesia, particularly East Kalimantan once again experienced a prolonged ENSO (El Niño Southern Oscillation) drought that lasted more than 10 months. With only a short rain interval of two weeks in December, these were prime conditions for extended wildfires. Efforts to put out these fires had only a marginal effect. At the peak of the event, more than 2000 small and large fires were burning. Due to the severity of the drought, even with international-support the situation was beyond the existing Indonesian fire fighting capability.

Initial results of an IFFM/gtz study gave a total of at least 5 mio ha of burnt area (Siegert F. & Hoffmann A. 1999). This amount exceeds by far the area burnt in 1982/83 (Schindele et al. 1989). The direct impact was immense not only in Indonesia but also in neighbouring countries. The negative effects of haze and smoke affected people particularly in Malaysia and Singapore and of course in Indonesia itself. Disturbances to shipment and aviation occurred and airports had to be closed down intermediately. The fires damaged and reduced Indonesia's unique tropical forests, impoverishing flora and fauna and their generative potential. A "savannazation" process has been accelerated which has negative effects on the soil resources and their nutrient cycles, the water retainment capacity of the soils, the local climate, and more. Indirectly, the fires have potentially contributed to global warming and climate change. The losses for the Indonesian timber industry are estimated to reach hundreds of millions of dollars contributing to the already reeling Indonesian economy. Living conditions for many people in local areas, particularly in the interior of East Kalimantan have worsened<sup>1</sup>. El Niño will reoccur on average every 3-4 years. Further extended fires will follow if no immediate efforts are made to prevent them.

*Start prevention now during the rainy season instead of waiting until the next drought.*

## **2. BASIC THOUGHTS CONCERNING FIRE PREVENTION IN EAST KALIMANTAN**

The background to fire prevention is pretty clear: Fires are human-caused in East Kalimantan. This consequently means that long-term awareness campaigns and training concepts are necessary - without neglecting to build-up suppression capacities on government, concession and village levels.

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<sup>1</sup> Reports with more information about impacts of the 1997/98 fires were given by Schweithelm (1998), Yeager (1998), Fredriksson (1998), Heil (1998), and others. See also earlier reports on 1982/83 fires by Boer (1989), Goldammer (1996, 1993, 1990), Lennertz & Panzer (1984), Mayer (1986, 1989), Schindele, Thoma & Panzer (1989), and others.

The following can be derived as general IFFM activities for forest fire prevention in the province:

- Raise awareness concerning the impact of forests fires on man and nature (education aspect).
- Strengthen fire management capacities in the province (organisational aspect).
- Contribute to village development ("pengembangan desa") in forest areas and support social forestry programs for conflict solving (self-help approaches, social aspect).

### **Fire Causes**

Looking at the fire causes in East Kalimantan it is obvious that many fires were triggered through land use conflicts between timber/non-timber companies and local villagers but also through carelessness of small-scale and large-scale fire users. A general lack of awareness on all levels of the society concerning the negative impacts of fires contributes to this. On the other hand, some companies, particularly palm oil companies took advantage of the dry conditions in 1997/98 and converted forests with fire as the cheapest tool available to clear land.

### **Fire Management Organisation**

The last year's fire disaster shows that Indonesia is generally still lacking of a functional organisation structure to fight fires effectively. Cooperation and co-ordination to deal with the 1997/98 blaze was far from being optimal. By today, there is still no major effort made to institutionalise fire management and particularly fire prevention tasks, though basic structures have been installed long ago (PUSDALKARHUTLADA). Hence, a cooperation network between the different concerned government agencies is necessary, which operates on each level in the province. The forest, agriculture, environment, education, transmigration, and research sector have to be among the first, each taking over fire prevention tasks in their particular field, under the umbrella and co-ordination of the local government. The work of NGOs in different fields at local level needs to be acknowledged and integrated, too. Finally, this network has to be linked with the national level. Based on this, action plans for fire prevention can be carried out according to the development of the fire danger index and other fire prediction sources as those provided by IFFM/gtz for the Province of East Kalimantan. Without a functional organisation network, fire prevention will not be sustainable and will therefore not have long lasting effects.

### **Readiness in terms of fire management organisation**

The problem of an institutionalisation process of fire management within the Indonesian government bodies and private sector, including NGOs, is that several government agencies are involved. This is predominately the forestry and state crops department, the environmental control agency, the finance ministry, the agricultural department, the metrological service, the education sector and many more [siehe Organisationsdiagramme Edy Marbyanto dll.].

### **Local Communities**

Grass-root approaches are the backbone of fire prevention concepts and capacity building processes. Hence, organising villagers in a participatory way and providing for training are the first essential steps to plant "fire prevention seeds" into villages adjacent to forests, accompanied by campaigns and other education activities. IFFM/gtz trains villagers together with the forestry department and encourages them to form village fire crews. Basic fire fighting hand tools are provided to such crews. They should then play a key role also for fire prevention activities like campaigns, training, and suppression activities on village level together with the local government and forest concession companies. One objective is that these villagers co-operate closely with trained fire crews of the provincial forestry service. This concept has to be integrated into a broader scale of village development programs, basically combined with social forestry activities like participatory boundary mapping and the setting-up of village co-operatives in a bottom-up approach in general. Such activities have to be in line with approaches towards the solution of land tenure conflicts. The fire problem in Indonesia should be reason enough to improve spatial development planning processes towards the integration of all stakeholders, including local communities.

*A pre-condition to prevent wildfires is that social problems occurring in the course of land use rights and tenure, are addressed and solved through the participation of all stakeholders, including local communities in land use planning processes (development planning). This should happen on district level rather than on provincial or national level.*

### **HPH/HPHTI and Agro-Plantations**

Most of East Kalimantan's forests are managed by timber concessions (HPH/HPHTI). In the past, the fire management issue has rather been neglected by these companies with the consequence that many of them were not prepared for fires spreading into their forests and finally destroying valuable resources. It is obvious that these forests are now even more susceptible to fire and, dependant on the severity of damage, create major fire hazards for the next drought to come. There is a strong commitment to sustainable forest management by the Ministry of Forestry and Estate Crops (MoFEC). Low-impact logging and reduced annual cutting are major issues to be implemented by timber companies towards sustainability. Fire management planning has to be a substantial part of such forestry policy for concession areas. Sustainable forest management will not be possible without fire management.

Hence, concession companies need to establish an effective organisation within their structure and have to adjust their fire prevention and fighting capacity to the local conditions. Technical measures like the building of fire breaks have to be a part of reforestation and rehabilitation planning. For fire prevention timber companies need to co-operate with local communities and neighbour concessions. The PMDH program (Pembinaan Masyarakat Desa Hutan/village community development activities by concessions) needs to be adjusted to and extended towards inclusion of the fire management issue.

## **Incentives**

It is rather unrealistic that fire prevention becomes an important issue if there are no long-term incentives for that. This has to be considered in the fire prevention work together local villagers, with government officials, and companies operating in East Kalimantan. As a short-term incentive, IFFM provides training and equipment to all stakeholders, which is the crucial start of an awareness and capacity building process provided to the target groups and also to the mediator groups. On the long run, a fire management career system has to be established .

The following incentives need to be considered for fire prevention:

- career opportunities in fire management within the forestry department but also paid job opportunities (volunteer fire prevention crews, village trainers, etc.). This goes hand in hand with a functional fire management organisation structure.
- on village level: awards for outstanding fire prevention performance given to a village in a certain area (district level, organised by the Provincial Environmental Impact Management Agency together with the district forestry service and NGOs).
- fire management issues more explicit included in the indicator catalogue for forest management certification.
- "Si Pongi" education program, mainly for children but also for adults, with entertainment, show and other advertisement activities.

*Operations towards greater protection of forests from fire is one important aspect towards sustainability in forest management. This should also be considered in the framework of certification awards in forest management.*

## **Law enforcement**

To prevent fires, law and regulations need to be enforced consequently and effectively. Indonesia has a bunch of laws and regulations concerning forest fires which should be sufficient to deal with the problem. But the reality shows that there are major constraints to enforce law in the field because of several reasons:

- the political will to enforce law is weak and is often seen only as an opportunity for the government official side to make money.
- the infrastructure as one basic commodity for law enforcement is not sufficient
- the forestry department does not provide sufficient personnel (forest guards) to cover such a large area as is East Kalimantan

## **3. THE IFFM/gtz FIRE INFORMATION SYSTEM AS A BASE FOR FIRE PREVENTION**

A Fire Information System (FIS) is the most crucial basis for forest fire management in general. It includes the monitoring of all factors which are necessary to prevent, suppress and evaluate fires. One very important outcome is a fire danger rating system (early warning aspect) as a base for standard operating procedures in fire management with emphasis on fire prevention. In general, the following questions have to be answered for fire prevention planning:

**What** has to be done to prevent fires (standard operating procedures)?  
**Where** should fire prevention activities be carried out?  
**When** is the right time to carry out different fire prevention activities?

**The "what-aspect":**

IFFM has designed fire prevention plans (including the technical aspects/pre-suppression activities) with standard operating procedures for one protected forest area and for one concession company in East Kalimantan. These prevention plans serve as the planning base for other protected forest and concession areas in East Kalimantan and are available for the different stakeholders.

**The "where-aspect":**

One outcome of the Fire Information System (FIS) will be a map with information about fire hazard areas in the province. This information is necessary for strategic fire prevention planning. If fire danger rises in the province, clear plans have to be available where action has to be taken to prevent the occurrence of fire.

**The "when-aspect":**

IFFM/gtz has developed the East Kalimantan Fire Danger Rating System based on the Keetch Byram Drought Index (KBDI). This system proved to be a suitable instrument for the prediction of fire occurrence according to the development of the index. The data items required by the model are:

- daily rainfall total (mm)
- daily maximum temperature (degrees Celsius)
- average annual rainfall

These data are input into a simple spreadsheet, which calculates a daily drought index and fire danger rating. The theoretical upper limit of the KBDI is 2000. The 0-2000-point range is divided into three fire danger rating classes:

- 0000 to 999 fire danger low (green)
- 1000 to 1499 fire danger moderate (yellow)
- 1500 to 2000 fire danger high (red).

During the rainy seasons, weather data can be input weekly, but as the dry seasons approach, these data should be input daily. SOPs for fire prevention and suppression will depend on the current and expected fire danger rating, as well as long term predictions for El Niño occurrence and severity.

Because East Kalimantan's most serious fire seasons follow El Niño patterns, the planning chief must track predictions and measurements of Pacific Ocean currents and sea surface temperatures. Predictions for El Niños occur months before their effects are felt in East Kalimantan, so should provide adequate early warning.

Basically, information about weather development and fire danger can be divided into a hierarchy concerning the time horizon given for fire management preparations.

- El Niño: long term information, normally available at least

- Regional weather data: 3 months in advance (internet, meteorological services)
- Keetch Byram Index: 1-4 days in advance depending on weather regimes.
- Keetch Byram Index: at least 3-4 days in advance of reaching a higher level in combination with regional weather data

#### **4. FIRE PREVENTION EDUCATION AND TRAINING**

##### **4.1 Step-by step program on village level**

IFFM/gtz designed a step-by-step module for establishing fire management on local community level in the different project areas in East Kalimantan. This module consists of:

**Step 1:** orientation process/identification of an area (fire hazards, socio-economic data of local communities, first contacts with key persons of the local government and communities); socio-economic studies to identify and assess the motivation, potential and constraints (problems) of local communities in the project areas aimed for the adaptation of the project approach to local conditions when building up fire management capacities.

**Step 2:** fire prevention campaigns in up to five villages considered as strategic for fire prevention; these events should finally include participants of up to 20 villages; during such a campaign villagers are encouraged to form voluntary village fire crews ; campaigns aimed for providing information about:

- fire weather;
- fire danger rating system (early warning aspect);
- fire causes and impacts;
- forest functions
- fire management organisation;
- laws and regulations
- fire suppression and tools (introduction)
- recruiting voluntary village fire crew
- entertainment program (if facilities available).

**Step 3:** training of volunteer village fire crews of at least five key villages;

**Step 4:** select one person of each trained village crew for a "training of trainers" program.

#### **5. PREVENTION STRATEGY**

The following main issues for fire prevention were identified;

- a.) Fire Information System (FIS)
- b.) prevention campaigns and training
- c.) awareness building for the general public
- d.) environmental education
- e.) incentives and career system

- f.) engineering
- g.) law enforcement

### **Co-operation between HPH and local communities**

IFFM/gtz designed a step-by-step program to establish fire management on the community level in East Kalimantan. This program consists of:

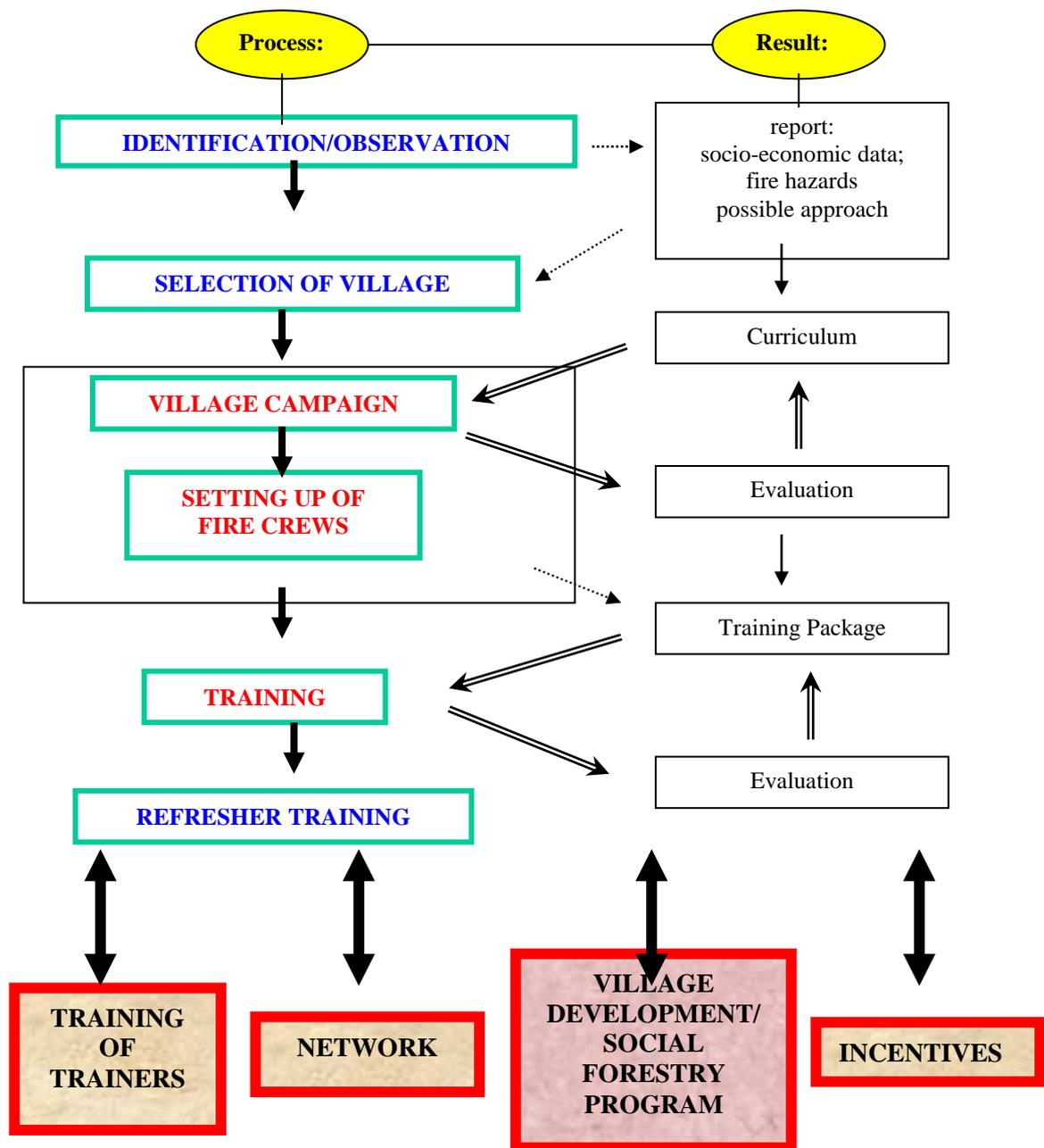
**Step 1:** Orientation process/identification of villages (fire hazards, socio-economic data of local communities, first contacts with key persons of the local government and communities). Socio-economic studies (RRA) carried out to identify and assess the motivation, potential and constraints (problems) of local communities in the project areas in respect to fire management.

**Step 2:** Fire prevention campaigns carried out in up to five villages/locations considered to be strategic for fire prevention. These events should finally include participants of up to 20 sub-villages/ hamlets; during such a campaign villagers are encouraged to form voluntary village fire crews.

**Step 3:** Fire prevention and suppression training for volunteer village fire crews. Provision of tool package for trained village crews. Crews are encouraged to provide for proper storage and maintenance of hand tools (small warehouse, responsibilities).

**Step 4:** Refresher training has to be carried out for such volunteer crews each year. During such events, up to two persons per district shall be selected for a "training of trainers" program. These village trainers shall later extend village fire prevention programs in close cooperation with the forestry extension service and HPH/HPHTI crews.

**Step 5:** Establishing a network between village fire crews, forestry extension services (jagawanas), and concession crews. The local government shall coordinate network activities.



**Figure 1:** Module for CBFFM in East Kalimantan

**Training of Trainers:**

It is envisaged, that of each project area at least two villagers are trained to organise and carry out fire prevention campaigns and basic fire management training for neighbouring villages. They are supposed to become key persons to maintain fire management activities on village level.

**Network:**

One goal of IFFM is to built up a network between the forestry department, concession companies and local villagers. Trained fire crews communicate and co-operate with each other and carry out tasks according to standard operating

procedures for fire management. Village fire crews shall take over fire prevention tasks (village campaigns), patrolling, elimination of fire hazards, and fire suppression in their village area, in co-ordination and cooperation with other crews.

### **Village Development/Social Forestry Program:**

Additionally to the provision of equipment and training organised for villages in the framework of the KfW contribution, a more intensive program is envisaged in 4 focus areas/villages. This program requires field workers in a two years scope to elaborate the following aspects:

- elaborate a communication and discussion forum on a participatory base;
- identify communities' needs towards improvement of the local economy in relation to strengthening local management capacities;
- evaluate the efficiency of village organisations and their potential as facilitators for fire management;
- identify needs and potentials concerning community based forest fire management;
- identify training needs and facilitate such activities with potential training providers;
- consider gender issues as an integrated part of the focus area approach;
- consider communities' regulations (adat) and integrate them into proposals/concepts;
- establish a forum for discussions between the community, the local government, and neighbor concession companies and facilitate such meetings;
- identify education needs and programs suitable to raise the awareness of the community concerning environmental issues in general and forest fire prevention in particular
- make documentation of traditional fire use in the selected villages
- develop controlled burning methods adapted to local conditions and prepare training material and concepts on this for village fire prevention training

This program will be implemented in close cooperation with local NGOs and the local government in a 2 years' program. Fieldworkers will be contracted for each location who will closely cooperate with the IFFM experts. Regular co-ordination meetings and presentations will be organised by the local IFFM expert.

### **Incentives**

The following incentives should be part of a CBFFM system besides training and the provision of equipment:

- villagers should be included in the overall fire management organisation and should have regular access to information;
- career opportunities in fire management within the forestry department but also paid job opportunities (volunteer fire prevention crews, village trainers, etc.). This goes hand in hand with a functional fire management organisation structure.
- on village level: awards for outstanding fire prevention performance given to a village in a certain area (district level, organised by the Provincial Environmental Impact Management Agency together with the district forestry service and NGOs).

- fire management issues more explicit included in the indicator catalogue for forest management certification.
- "Si Pongi" education program, mainly for children but also for adults, with entertainment, show and other advertisement activities.

The CBFFM itself will be an incentive if it supports the local capacity building process in connection with the local economy. Therefore, it has to be integrated into village structures to become part of the village development process. In this context, CBFFM has to deal with participatory mapping processes, land use management, gender, conflict solution processes, strengthening capacities of village organisations, and others.