

Forest and fire suppression in East Kalimantan, Indonesia

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Abstract

The 1982/83 fire in East Kalimantan destroyed about 3.5 million ha of forest. Forest fires occur almost every year, however each event is specific in intensity and extent. The 1997/98 fire was declared a national disaster, since it affected more than 5 million ha of forest in East Kalimantan alone. Intensive logging activities also increased the susceptibility of the forest.

Indigenous knowledge can help protect tropical forest. To minimise the negative impact of fire and to develop fire prevention techniques, it is important to make use of indigenous knowledge and combine it with scientific knowledge of fire behaviour and fire management technologies.

1. Introduction

Intensive logging activities in East Kalimantan have turned its forests into a fire hazard, and forest fires are occurring more frequently. From 1982/83 to 1997/98, fires have decreased not only East Kalimantan's forest cover but also the quality of the forest. This affects the environmental functions of the forest and casts great impacts on the economy, culture and health of society.

Forest protection has become very important to the future of forest resources. In particular, the decentralisation of power and responsibility has made it possible for local people to exhaust natural resources more easily. Such exploitation interrupts the process of secondary succession and prevents the tropical forests of Kalimantan to reach its climax condition.

People living at the forest margins rely on traditional local knowledge and skills to protect the forest against fire. Their success depends on the community's attachment to the forest. The question remains whether traditional knowledge and skills alone are sufficient to manage the forest today.

2. Forest protection

2.1. Forest protection from fire

In 1982/83, fires destroyed about 3.5 million ha of tropical forests in East Kalimantan. Eighty percent were logged-over areas (Lennertz and Panzer, 1983). After the forest fires in 1982/83, 1991/92 and 1993/94, an El Niño event that lasted 12 months exacerbated major fires in 1997/98, burning approximately 5 million ha or 25 percent of the forests in the province. Almost 2.3 million ha of Hak Penguasaan Hutan (HPH – forest concession) areas (56 HPH and ex-HPH), 0.4 million ha in forest reserves, 0.9 million ha in Hutan Tanaman Industri (HTI – industrial timber plantation) areas (30 HTI) and 0.7 million ha in other plantation areas burned. Of the 27 ex-HPH concessionaires, only 7 were not burned. Two ex-HPH areas – P.T. Alas Kusuma (5,863 ha) and ex-HPH P.T. Astrini (11,669 ha) – were completely destroyed.

The smoke and haze from the forest fires affected the health of people nationally and regionally, and lead to serious criticism of Indonesia by neighbouring countries. This caused tension and disturbed international relationships. The fires also destroyed the habitats of wild animals, and forced some species (e.g. the orangutans (*Pongo pygmaeus*)), to move into the plantation areas (Ngatimna, 2001). Many mangrove forests, as the original habitat of endemic fauna such as bekantan (*Nasalis larvatus*), were also damaged. Moreover, underground coal seams pose an additional threat should they catch fire.

Efforts to protect plantation forests have been undertaken, although they were not very successful judging from the recurring fires. Table 1 shows examples of efforts to prevent and control forest fires in the HPH or HTI areas.

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Table 1. Types of activity and purpose for protection against forest fire

Activity	Purpose/target	Comment
Forest security procurement (personnel and training)	Increase the quality and quantity of the forest security	Not optimal yet, although personnel has increased in number and were trained
Material procurement and establishment of firefighting team (security post, watch tower, patrol car, and communication devices)	Support prevention	Not all HPH have firefighting team
Field prevention (firebreak, buffer strip, pools, warning signs)	Prevent the spread of fire	Forest paths are usually used as firebreaks
Clearing and cleaning of cultivation areas	Reduce inflammable materials	Hardly done
Counselling to the community	Community's awareness	Insufficient
Undertaking village establishment programme	Increase community welfare	No real effects
Establishing forest patrol	Security	More theoretical than reality
Making maps of fire hazard areas	Prevention and socialisation	Not all HPH have comparable maps

In East Kalimantan, 1.5 million ha of plantations are expected to be developed to produce 15 million m³ per year. The success of the reforestation efforts relies heavily on fire-free conditions. Additional efforts are needed to prevent fires from starting and to minimise the size of those that do occur.

2.2. Protection against illegal logging and forest conversion

The degree of fire damage depends to a considerable extent on forest conditions. Logged-over areas are more susceptible to fire than primary forests, and newly logged areas even more so. Illegal logging and forest conversion are major problems that lead to forest degradation. To protect the forest from fire, it is necessary to stop such destructive actions.

Nonetheless, illegal logging and forest conversion occur extensively all over Indonesia. The perpetrators are rarely arrested, and bribery and collusion are common. Local communities appear to be well aware of illegal logging, and in fact some are buyers of illegal timber. The government and private companies have tried to curb the extent of timber theft by taking some measures (Table 2).

3. Reinforcement of local knowledge in forest management

Fighting forest fires is not an easy task because it means mastering not only fire prevention and control techniques, but also overcoming problems of poor infrastructure and access, large concession areas, and limited and untrained human resources.

The overlap between forestland and community land for agricultural production means that assigning responsibility for forest protection, especially against fire, is a sensitive and difficult issue. A careful inventory of the biophysical features of the forest would be useful to identify open areas and determine the carrying capacity of the areas for human activities. This exercise could also reveal potential sites for delivery of stolen timber.

Traditional local knowledge of forest management appears to be ineffective because governmental and private company interests generally take priority over community needs. Furthermore, such knowledge and skills alone are not sufficient to protect the forest under extreme drought conditions (Sarjono, 1990; Devung, 1999; Widjono, 1989; Abberger, 1996; and Gunawan, 1998). To keep a synergistic co-operation between the forest manager and the community, the government could urge companies to incorporate better-tailored community development programmes into their forest management plans.

Table 2. Types of activity and purpose for protection against illegal logging and forest clearing

Types of Activity	Purpose/target	Comment
Confiscation of illegally felled trees	Law enforcement	Not effective
Confiscation of chainsaws	Law enforcement	Not effective and tends to create conflicts
Safeguarding forest protection team operation	Law enforcement	Efficient enough
Inventory and monitoring of the activities of illegal cultivators	Data collection	Hardly done
Providing information (about the advantages of forest, law, socialisation of border regulation)	Socialisation	Impact yet to be felt
PMDH* village establishment and community forest	Welfare improvement	Needs to be continued and monitored
Generating employment	Community involvement	Limited job opportunities
Stationing forest security patrols	Security	Operational difficulties
Co-ordination with relevant security and enforcement departments and institutions	Co-ordination	Sometimes disappointing
Use of signboards prohibiting illegal logging and cultivation	Prevention	No impact yet

* PMDH = Pembangunan Masyarakat Desa Hutan (Village Community Development Programme)

Another important factor that threatens the forests is the low incomes of rural communities in East Kalimantan. Poor farmers are found in all provinces. Almost 90 percent of them, both indigenous and migrant, settle in forested areas and depend on the surrounding natural resources for their daily needs. This has contributed to forest degradation. Moreover, the forest will continue to be exploited when illegal brokers continue to buy timber and other forest products. Unless this great disparity between the poor and powerful is resolved, forest degradation will continue.

Efforts to control shifting cultivation include transmigration policies, dryland cultivation (Pertanian Usaha Lahan Kering – PULK), permanent cultivator cadres (Kader Tani Menetap – Kanitab), resettlement of isolated tribes and HPH for forest village establishment. However, these efforts have not achieved the desired results – shifting cultivation and forest conversion persist. In addition, communities have settled in ex-HPH or conservation areas, such as the Kutai National Park.

4. Community forestry as a strategy for forest and land protection

The forests in East Kalimantan consist mainly of secondary logged-over and fire-affected areas. Without community participation in forest management and fire prevention, deforestation and forest degradation will continue with negative impacts on forest dwellings and forest margin communities.

Therefore, those involved in forest protection should be knowledgeable of the area to be protected, despite constraints such as poor accessibility and inconsistent monitoring of fire risks especially during droughts. The following factors need to be considered in planning forest protection.

4.1. Dividing the forest area into smaller units for more effective forest protection

Protecting the extensive forests of East Kalimantan is a classic problem for Indonesian forestry. Dividing the forests into more manageable units is in line with the Decree of Director General of Forest Cultivation No. 220/1997. According to this decree, a system can be established with an Administrator who controls 40,000-50,000 ha, Administrator Assistants who oversee 4,000-5,000 ha each, and Heads of Forest Resort who are responsible for 1,000-2,500 ha. Smaller areas enable the participation of local people in protecting that area from fire. Since a major problem that led to communal conflicts is poorly demarcated boundaries, clear and well-defined administration of smaller units will significantly improve fire prevention.

4.2. Sharing forest products in consultation with local communities

Forest management tends to exclude the local population from, and deprive them of, forest resources. By applying a profit sharing system, the community's reliance on the forest can be gradually reduced. This can be integrated with other activities such as establishing forest village communities, increasing the role of the community in protecting the territory and developing community awareness. In this way, the community will feel more attached to the forest and be willing participants of fire prevention activities.

4.3. Implementing integration programmes for newcomers to the community

Another common problem is the conflicts between indigenous communities and migrants. Transmigrants usually have few skills or knowledge of their new environment, and may use fire inappropriately. Unless well-planned integration arrangements are implemented, long-time residents will not accept newcomers. The conflicts are in fact the results of a misguided rural development programme.

4.4. Enforcing the law at all levels of society

Weak law enforcement is a sensitive issue that has to be overcome slowly. If not implemented appropriately, the community will resent the forestry department and will not co-operate in any of its programmes. Incentive systems may more appropriately be substituted for sanctions that are sometimes illegally practised today. The intentional destruction of forest resources by communities is a good indicator of their dissatisfaction and animosity.

4.5. Establishing policy and raising awareness of the community's role in conserving tropical forest

There are still forest inhabitants whose daily lives depend on traditional knowledge, and their skills should not be ignored. The transfer of local knowledge from one generation to the next is uncertain. Therefore, local traditional knowledge should be integrated with contemporary techniques for forest management in East Kalimantan. Research and analyses on how this knowledge can be applied in conserving tropical forest is needed.

4.6. Securing sufficient funds for forest protection

Putting out small fires is easier than extinguishing big ones, and preventing forest fires in the first place is preferable to suppression. However, funding for these activities is limited. Therefore, sufficient financial resources should be sourced and set aside to deal with forest fires before they become unmanageable.

4.7. Rehabilitating burned forest areas through natural succession process

Large-scale reforestation programmes are usually attempted to rehabilitate burned forest areas. Their success, however, depends on how well the plants grow. The situation is even more precarious if salvage cutting is carried out, as is commonly practiced. Allowing the burned forests to regenerate on their own and letting natural succession follow its course is an alternative that should be considered.

5. Conclusions

Indigenous knowledge has a long history of forest management. Community-based fire management therefore should incorporate indigenous knowledge. Combining local knowledge and skills with modern firefighting technologies is an optimum solution for forest fire prevention and suppression.

Institutional strengthening at the local level is essential. Qualified and trained people are needed to integrate contemporary knowledge and traditional skills. Local communities should be involved in maintaining and managing forest resources. They should also be given the opportunity to participate in forest protection. Without their involvement and knowledge, it will be difficult to ensure the success of fire management.

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