

Community-based disaster management: a response to increased risks to disaster with emphasis on forest fires

Johan Kieft¹ and Aspian Nur²

Abstract

East Kalimantan has become increasingly vulnerable to forest fires in the last two decades. Most of the burning is caused by human activities aggravated by the El Niño Southern Oscillation (ENSO). The forest fires have seriously affected the livelihoods of people relying on the forests and many households are now less secure after the 1997/98 forest fires.

In response, CARE has developed a humanitarian approach to community forest fire management based on disaster management concepts. Disaster management incorporates community development with disaster/emergency responses. CARE's programme consists of six clusters of activities, i.e. participatory action and learning, training in disaster management, building local emergency response capacity, improving land-use mapping, organizing stakeholder planning workshops and establishing stakeholder forums on disaster management at the sub-district level.

Initial assessments highlighted the communities' fatalistic attitudes about their situation. CARE's attempts to engage the communities in designing and implementing activities have proven to be a successful start of the project. Training in disaster management was effective in developing initial links between communities and other stakeholders, as well as establishing a common vision about disaster management.

Disaster management has great potential in dealing with increased vulnerability to forest fires. One of its strong points is the flexibility of the programme that allows communities to adapt activities to suit their socio-cultural traditions and needs, and to integrate them into village development plans. It is equally important to expose stakeholders to existing international standards of entitlements to emergency assistance.

1. Introduction

Over the last two decades, East Kalimantan has become increasingly vulnerable to forest fires. Although forest fires are common occurrences in Kalimantan since pre-historic times (Brookfield *et al.*, 1995), the impact of recent fires is much worse and widespread than those recorded at the beginning of the colonial period. The 1997/98 forest fires were among the most destructive. They damaged 9.8 million ha of forests, of which 5.2 million ha were located in East Kalimantan.

According to Goldammer (1997) and the World Bank (2001), almost all the burning was related to human activities aggravated by the El Niño Southern Oscillation (ENSO). The World Bank estimated that only 1 percent of forest fires was due to natural causes while large-scale land clearance was responsible for 34 percent, shifting and permanent agriculture for 17 percent, arson for 14 percent and transmigration for 1 percent of the occurrences. The fires in 1997 caused a total loss of US\$9.3 billion for Indonesia, including US\$7.9 billion of socio-economic costs and US\$1.4 billion for carbon emissions and environmental damages.

CARE's assessments (2001a and 2001b) show that most of the affected communities are still trying to recover from the disasters. Many farmers are reporting repeated crop failures since 1997. The forest fires and drought were obvious reasons for the losses in 1997, but since 1998, plagues and floods, among others, are the main cause of the failures. More than 81 percent of the farmers lost at least some perennial crops, one of their most important assets, and the degree of damage can be seen in Table 1.

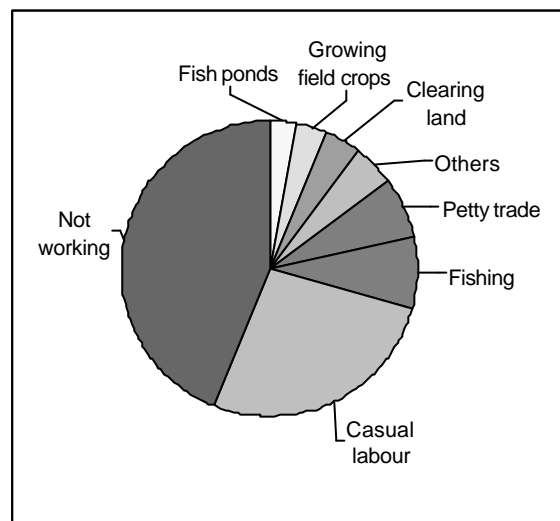
¹ Regional Programme Manager, Agriculture and Natural Resources (ANR), CARE-East Kalimantan, Indonesia.

² Project Manager, CA RE East Kalimantan, Indonesia.

Table 1: Damage to perennial crops caused by disasters since 1997 in target villages (CARE, 2001a and 2001b)

Degree of damage	Pepper (%)	Coconuts (%)	Rubber (%)	Fruits (%)
0%	29	49	15	45
1-50%		7	38	11
51-100%	71	44	47	44

The widespread destruction of the ecosystems in East Kalimantan has forced farmers to look for alternative livelihoods. Since 1997, more than 35 percent of the farming community are involved in illegal logging, petty trade, and occasional work, while others rely on coconut farming. Figure 1 shows the alternative income generating activities in Marang Kayu sub-district, one of the seriously affected areas. Logging is not included in this case mainly because there is no forest left in the area.

**Figure 1: Common livelihood strategies adopted by farmers in Marang Kayu**

The impacts of the 1983 and 1997/98 fires on forestry and natural resources have been documented in several reports (Von Gemmingen, 2001; Yeager, 1999). On the other hand, the impact on the livelihoods of forest-dependent communities has received less attention and is still not adequately assessed. Nevertheless, especially from the 1997/98 forest fires, indicators for food security, such as nutritional status for children, have given rise to grave concern for the affected communities. In 1998, CARE found 13.1 percent of children less than 5 years old to be moderately malnourished, and 3.1 percent were severely under-nourished, while in 2001 the figures were 12.6 and 5.3 percent, respectively (United Nations threshold standard for emergency interventions is 10 percent) (CARE, 1998). These data highlight the social impacts of the forest fires, making local communities more vulnerable to subsequent disasters in the long term.

2. A need for a humanitarian approach to disaster management

So far, the international community and Indonesian government have tried to deal with the forest fires by concentrating mainly on natural resource management issues. Indeed, this is a logical approach given the costs involved. However, the high incidences of malnutrition also points out that other issues are at stake and an alternative strategy is needed to address the immediate needs of vulnerable communities.

In response to this urgency, CARE is developing a household livelihood security (HLS)-based approach to disaster management in East Kalimantan. The project aims to facilitate the establishment of integrated and functional structures for disaster preparedness and the adoption of local-level disaster mitigation measures, including the adoption of environmentally sustainable land-use management techniques. A prerequisite for the success of the project is to actively involve all stakeholders and raise their awareness. Therefore, CARE networks with local communities, the private sector (e.g. concessionaires, mining and other resource extraction companies, plantation companies), governments (especially at village and sub-district levels) and local non-governmental organizations (NGOs). It also assists communities to improve or establish effective linkages with these organizations and companies.

3. A theoretical framework for disaster management

Many humanitarian agencies have a dichotomous approach to emergency recovery and development efforts. They have emergency staff who respond specifically to disasters and development staff who step in once the crisis is under control. However, in the 1980s, experiences of major relief and development agencies have convinced them that emergency and development programmes are intertwined.

A second factor that plays a role in changing perceptions of effective assistance is the increasing emphasis on livelihood security for households affected by disasters. Calamities are the main threat to this security and reducing the communities' vulnerability to such hardships is a crucial response.

Based on these insights and through intensive discussions, disaster management has evolved to merge rescue and development plans, and several sophisticated approaches have been formulated. Within the context of disaster management, development is defined as a process that reduces vulnerabilities and increases capacities. For further clarity, vulnerabilities are generally defined as long-term factors that affect the ability of a community to respond to events or make it susceptible to calamities. They contribute to a disaster's severity, impede effective responses, are present before disaster strikes and remain long after the event is over. In this respect, vulnerabilities differ from needs, which arise from the crisis and are often short term in nature (e.g. the need for relief food supplies immediately after a forest fire). Vulnerabilities to forest fires, however, are more enduring and have intensified in recent years because of increased conflicts, a lack of law enforcement, and poor natural resource management.

Nonetheless, their vulnerabilities, most communities still have capacities to rebuild their lives. From a disaster management's point of view, capacities are strengths on which future development can be built.

During disasters, the community's vulnerabilities are more pronounced than their capacities. Recognising the vulnerabilities and capacities of the affected population is essential for designing and implementing an effective disaster response. To identify these capacities and vulnerabilities, a Capacity and Vulnerability Analysis (CVA) matrix (Table 2) can be used to examine three aspects of information:

- ◆ Physical factors: what productive resources, skills and hazards (e.g. land, environment, health, skills and labour, infrastructure, food, housing, capital and technologies) are available?
- ◆ Social organization: what are the relationships among and organization of the communities (e.g. formal political structures and informal systems such as decision making, establishing leadership or organizing various socio-economic activities)? When prejudice or conflict is present in a community, social and organizational vulnerabilities are inevitable.
- ◆ Attitudes: how does the community view its ability to adapt to changes? Strengths and weaknesses can make a significant difference in the communities' ability to rebuild and improve their material base and social institutions. A community is psychologically more vulnerable when its people feel victimised, fatalistic and dependent.

Table 2: Capacity and vulnerability analysis matrix

	Vulnerabilities	Capacities
Physical factors	Geographical calamities (floods, earthquake) Economic misfortunes (drought) Poverty (insufficient resources) Lack of infrastructure Poor health	Skills to be productive Access to productive resources (land, forest, sea, capital, etc.) Technologies (agro-forestry/sustainable land management) Adequate infrastructure Good health
Social organization	Division according to religion, ethnicity, language, class or caste Prejudice Conflict Ineffective community organization	Social coping mechanism: family, group, community and/or area wide organizations
Attitudes	Superstition Fatalism (feeling that nobody supports them). Dependence on external support	Fighting spirit Religion* Sense of purpose

*Religion can have a positive impact on attitudes, but can also divide the community and create conflict.

In general there are two different disaster management models:

- ◆ The cyclic model in which emergency, recovery, development (preparedness, mitigation) and early warning are executed progressively, with each phase having its own particular approach(es).
- ◆ Expand and contract model in which all aspects of disaster management are addressed simultaneously, albeit with varying degrees of emphasis. For example, during the onset of a disaster, emphasis would be on emergency management and early warning but recovery and mitigation are taken into account as well.

CARE has adopted the “expand and contract” model for its disaster management programmes.

4. Disaster management for forest fires: the CARE DISPRE (DISaster PREparedness) approach

CARE has implemented the project in East Kalimantan for one year and has received positive feedback from local communities and other stakeholders. Although the project targets fire-prone forest communities, it does not focus on forest fires *per se*. Instead, it seeks to reduce vulnerabilities of communities to disasters in general, as the recurrence of other disasters (e.g. rat infestation, floods) poses a higher risk to these communities in comparison to forest fires.

CARE’s approach is based on the following principles:

- ◆ Involving local stakeholders:
Involvement of a full range of local stakeholders is essential to reduce vulnerability. The private sector is still the main land users in the most affected areas. The private companies are an important factor in forest fires as well as major providers of relief assistance to affected communities. Improved planning in both development and relief is only possible if these stakeholders are involved.

- ◆ Integrating disaster management and development:
The project facilitates the integration of disaster mitigation and preparedness into the community's development processes, in line with the Indonesian government's village development plans.
- ◆ Strengthening the community's capacity:
The project aims to re-establish and strengthen existing social and organizational capacities within the communities. Increasing the confidence of people to overcome their vulnerability is a major focus.
- ◆ Utilising an integrated media approach:
An integrated media approach comprises communication avenues such as participatory communication approaches (PCA), participatory workshops, community leaders' training, posters, and radio talk shows.

The CARE disaster management approach consists of the following activities (Figure 2):

- ◆ Participatory learning and action (PLA) is the core strategy to facilitate the integration of disaster management into village development plans and to infuse in the villagers a sense of ownership of the process. Participants set their own targets and indicators for each activity they implement. The initial PLA-derived findings then serve as a baseline that allows communities to monitor their progress. PLA has proven to be effective in re-establishing social structures that have been under pressure as a result of the disasters. PLA activities linked to natural resource management, such as constructing firebreaks, planting trees and converting wasteland into arable land, reinforce existing social structures and increase community self-confidence.

The communities are able to adjust the PLA programmes to suit their own socio-cultural environment. This is important in East Kalimantan given that the project involves seven villages with four different ethnic groups (Dayak, Bugis, Javanese and Kutai). Each group has its own traditional way of farming. Most of the Bugis rely on coconut trees, the Dayak and Kutai are mainly rice swamp farmers with some perennial crops, and the Javanese are transmigrants growing rubber trees in a former nucleus estate scheme. Hence, the needs of each ethnic group can differ significantly.
- ◆ Training in disaster management aims to develop common knowledge among the different stakeholders. The training methodology attempts to link disaster management concepts with the participants' local experiences and focuses on increasing understanding of the different aspects of disaster management, such as:
 - Different models of disaster management.
 - Terminology used in disaster management. Most participants are unfamiliar with the terminology, such as vulnerability, capacity, hazard and risk.
 - Different phases of disaster management including preparedness, mitigation, early warning, emergency management and recovery.
 - Conflict resolution as a tool in disaster mitigation.
 - Emergency management in line with the SPHERE international humanitarian standards (SPHERE, 1998). These standards are currently acknowledged as basic rights for those in need of assistance. During training, the standards are explained and participants explore how they can be integrated into community-level initiatives.
 - CVA as a tool to integrate disaster management into village development plans. Participants develop their own disaster management strategy based on CVA.
- ◆ Development of local capacity in emergency response involves training in fire repression, establishment of granaries to mitigate food shortages during emergencies (a very successful effort in Dayak villages) and indigenous rainwater storage techniques to avoid flood-related contamination in flood-prone areas.

- ◆ Vision mapping of the villages is used to facilitate village-level integration of disaster management into village development planning. It is also used to develop links between communities and other stakeholders, and as a planning tool for communities to effectively develop land-use plans to reduce the risk of forest fires for the next five years.
- ◆ After the vision mapping has been finalised, workshops are organized to prepare disaster management plans that include:
 - Development of local mechanisms to integrate disaster management into existing village and sub-district development plans.
 - Assessment of locally available capacity and ways to strengthen it.
 - Incorporation of SPHERE (1998) standards into local emergency response mechanisms.
 - Establishment of functional fora that bring together major stakeholders.
- ◆ Stakeholder fora at the sub-district level focus on broader issues other than forest fires as experience has shown that the destruction caused by forest fires significantly increases other hazards such as flooding and rat infestation of crops.

5. Initial experiences

During the first year, the project has focussed on strengthening the existing social structures in the villages. It has re-established farmer groups through PLA programmes. Some resultant activities were not directly linked to disaster management but allowed the communities to begin building up the necessary capacity to underpin effective disaster management.

5.1. PLA

Many of the participating communities were fatalistic at the start of the project. They had basically abandoned their agricultural activities and were relying on alternative incomes and illegal logging. The project initiated the PLA process to motivate them to take a more positive approach in overcoming their misfortunes. Activities currently assisted by the project include:

- ◆ Banana relay-planting with rubber cultivation:

From their experiences in fighting forest fires, the farmers found that planting banana trees as firebreaks in rubber plantations was effective in stopping the fires and provided them with extra income. Based on their recommendations, the project assists the communities to develop this technology.
- ◆ Formulating contracts for leasing land:

Contracts for lease of land facilitate better land-use planning between the more established settlers and recent (spontaneous) migrants. In the Dayak villages, land has traditionally been viewed as a common good with certain limited user rights after the land was first cleared. However, recent socio-economic changes have significantly decreased land availability. The more established Dayak groups claimed ownership to all the land they cultivated in the past. As a result, new Dayak migrants have access only to smaller plots. Land is left fallow and jealousy has led to increasing incidents of arson. The project introduced the concept of leasing land that allows the original claimants to retain their rights but also enables new arrivals to grow perennials such as rubber and fruit trees. The trees belong to the claimants but the harvests are shared by both parties.
- ◆ Cultivating productive firebreaks:

Another attempt is to establish permanent firebreaks around the villages, rubber plantations and homegardens with crops producing minimum biomass, such as onions. This can help to protect recently established perennials from fire outbreaks, especially from the alang-alang (*Imperata cylindrica*) areas.

- ◆ Organizing forest fire brigades:
In some communities, villagers are interested in organizing fire brigades based on existing social organizations (e.g. farmer associations). The project facilitates training and assists communities to extend the brigades' responsibilities to include early warning efforts.
- ◆ Establishing paddy fields on burned peat swamps:
The area was previously under coconut cultivation following traditional Buginese land clearance and water management systems. Drought and subsequent peat fires have destroyed the coconut plantations. Growing paddy will help to prevent further burning and re-establish livelihoods of affected villagers.

5.2. Disaster management training

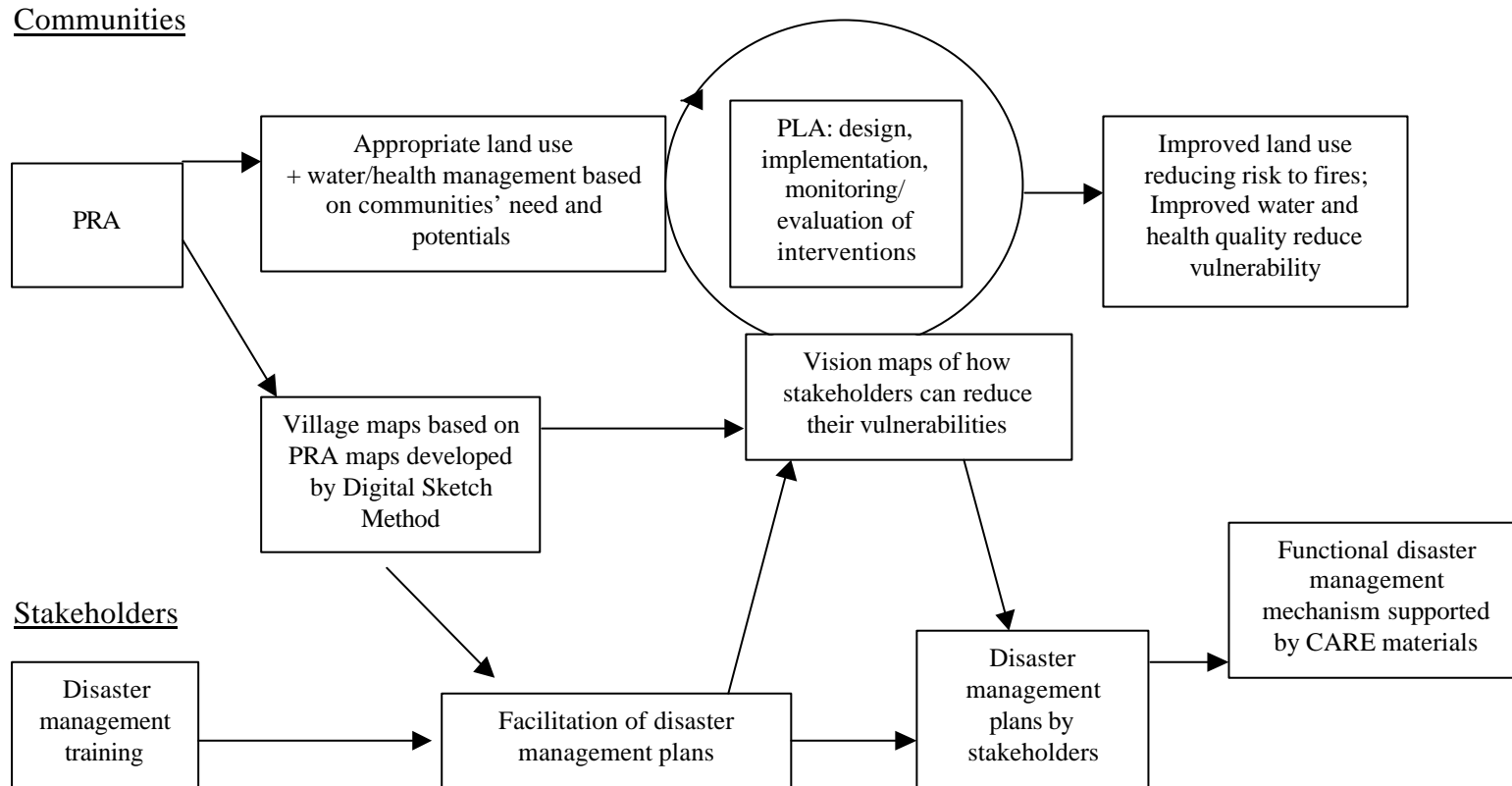
The disaster management training curriculum is based on experiences from other countries as Indonesia focuses mainly on internally displaced people and complex disasters, and not on disaster management. The curriculum aims to provide tools to participants to help them analyse and learn from their experiences. This has proved to be a successful strategy. Activities initiated by the training include:

- ◆ Assisting communities to deal with other stakeholders:
One example is a mining company that wants to dig a flood control channel but lacks the capacity to plan with the affected communities. Another is an oil palm plantation that intends to reduce fire vulnerability by supporting neighbouring communities to improve their land-use practices. CARE assists these communities in collaborating and co-operating with such companies to avoid negative impacts and reduce risks.
- ◆ Supporting local NGOs interested in developing disaster management programmes:
All interested and active local NGOs are invited to the training sessions and CARE helps them to develop programmes with communities in disaster management.
- ◆ Promoting conflict resolution:
Conflict occurs at different levels, both horizontally and vertically. Examples are conflicts over resources within a community, among communities and between communities and other stakeholders. During stakeholder sessions, participants are asked to explore different options for collaboration (e.g. partnerships, co-operatives) that should address the root causes of the forest fires as well as enhance local capacity to sustainably manage their resources.

6. Preliminary conclusions

Many lessons can be learned and preliminary conclusions drawn from the project even though it has been operating for just over a year, for example:

- ◆ In East Kalimantan more attention needs to be paid to the impact of disasters on HLS.
- ◆ The private sector, especially major companies that compete with the local communities for natural resources, exerts considerable impact – positive and negative – on the livelihoods of these communities in East Kalimantan. CARE tries to involve the private sector in community disaster management activities whenever feasible, and to assist the communities in advocating their interests to these companies. Training exposes the companies' community development staff to disaster management concepts and facilitates communication in a neutral setting. Such training sessions enable the incorporation of local communities' needs into the company plans and the integration of disaster management, including conflict management, into their development activities.



The process is strengthened by a media campaign that focuses on different aspects of the approach.

Figure 2: CARE's disaster management programme

- ◆ The fatalistic attitudes of communities in disaster-prone areas are often not taken into account, yet they are a major vulnerability. To be successful in disaster management, building up the confidence of the communities cannot be overlooked.
- ◆ Disaster management initiatives need to be integrated into community development activities to be effective. In fact, disaster management should be a thread running through community development planning in disaster-prone areas.
- ◆ Socio-cultural differences create divergent perceptions of land tenure and agricultural practices. This needs to be considered in disaster management. Activities have to enable the various ethnic groups to strengthen their capacities and reduce their vulnerabilities within their unique cultural frameworks.
- ◆ Training on humanitarian standards, such as the SPHERE standards, has been found to increase community members' understanding of their entitlements for emergency assistance. This helps the communities to better understand their rights and request for assistance especially when they no longer are able to cope on their own.

References

- Brookfield, H., Potter, L. & Byron, Y. (1995). *In place of the forests: environmental and socio-economic transformation in Borneo and the Eastern Malay Peninsula*. United Nations University Press, New York/Tokyo/Paris.
- CARE. (1998). *Kutai nutrition report*. Unpublished.
- CARE. (2001a). *Laporan baseline survey*. Unpublished.
- CARE. (2001b). *Unpublished baseline data*.
- SPHERE. (1998). *The Sphere Project: humanitarian charter and minimum standards in disaster response*. Website: <http://www.sphereproject.org>
- Von Gemmingen, G. (2001). *Justifikasi rehabilitasi hutan dan lahan: deforestasi di Kalimantan Timur akibat kebakaran, over eksploitasi, konversi dan illegal logging p17-32*. In KK-RHL, *Prosiding Semiloka: Rehabilitasi hutan dan lahan: Peluang dan tantangan dalam pembangunan daerah keberlanjutan Samarinda: KK-RHL/BRLKT Mahakam dan Berau/SFMP-GTZ*.
- World Bank. (2001). *Indonesia: environment and natural resource management in a time of transition*. World Bank, Washington, D.C.
- Yeager, C.P. (1999). *Fire impacts on vegetational diversity and abundance in Kalimantan, Indonesia during 1997/1998*. WWF-Indonesia report, Jakarta.

Acknowledgements

The authors want to thank Bud Crandal (Country Director CARE International in Indonesia), Lise Schofield (Senior Programme Co-ordinator) and Hadi Sutjipto (Emergency Team Leader) for their support and comments on earlier drafts of this paper.