



Community Based Fire Management (CBFiM) in East Kalimantan

– Concept and Strategies –

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for

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Abbreviation List and Glossary

Alang-alang	Grass species (<i>Imperata cylindrica</i>)
Bapedal	Environmental Impact Management Agency (national)
Bapedalda	Environmental Impact Management A. (provincial)
Bina desa	Village Development
Bioma	[Biosfer Manusia] The Social Biosphere Foundation
BKSDA	[Balai Konservasi Sumber Daya Alam]
Bupati	District Head
Camat	Sub-district head
CBFiM	Community-based Fire Management
CBFiM-DP	Community-based Fire Management – Development Programme
Dinas Lingkungan	Environmental Impact Agency
Dinas Kehutanan	Provincial and District Forestry Service
Dinas Kesehatan	Governmental Health Agency
Dinas Pendidikan	Education Department
Dinas Perkebunan	Estate Crops Agency
Dinas Pertanian	Agricultural Service Agency
Dinas PMD	[Dinas Pemberdayaan Masyarakat Desa] Community development agency
ENSO	El Niño Southern Oscillation
EU	European Union
Gotong-royong	Community Self-help
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
HUMAS	[Hubungan Masyarakat] Public Relations Section of the Government
HT	Hand Talk (radios)
IFFM	Integrated Forest Fire Management Project
JICA	Japan International Co-operation Agency
(Ex-) Kanwil Kehutanan	National Forestry Department
KEM	Kalimantan Equatorial Mining
Kepala desa	Village head
KfW	Kreditanstalt für Wiederaufbau
KPC	Kalimantan Prima Coal
LFC	Local Fire Centre(s)
MoU	Minutes of Understanding
NGO	Non-governmental Organization(s)
ORARI	[Organisasi Radio Amatir Republik Indonesia] Indonesian amateur (SSB) radio organization
PFC	Provincial Fire Centre(s)
Radio Komunitas	community radios
RAPI	[Radio Antar Penduduk Indonesia] private (SSB) radio organization
Si Pongi	Indonesian mascot for forest fire prevention and control
SK	[Surat Keputusan] (government) decree
SOP	Standard Operating Procedures
SSB	Single Side Band (Citizen Band CB)
Studi banding	Study Tour
ToT	Training of Trainers
TVRI	(Televisi Republik Indonesia) State TV channel
UPTD-PKHL	[Unit Pelaksanaan Tingkat Daerah Pengendalian Kebakaran Hutan dan Lahan] Technical Agency for Forest and Land Fire Control
VHF	Very High Frequency
WWF	World Wide Fund For Nature

Executive Summary

Almost every three to four years, the El Niño phenomenon occurs causing droughts and providing prime conditions for extended wildfires in East Kalimantan. The most severe events in recent history occurred in 1997/98, when wildfires burnt 5.2 million hectares of forests and other land causing huge damages to man and nature. Most ignitions resulted from forest conversion activities for industrial plantations and from escaped small-scale agricultural fires. Fire management capacities were limited and couldn't cope with the extreme situation.

The Integrated Forest Fire Management Project (IFFM) in Samarinda/ East Kalimantan has been supporting the forestry service *Dinas Kehutanan* and other involved agencies in developing a fire management system for the province. Part of the system is the co-operation with local communities. IFFM has been designing a development programme to establish community based fire management (CBFiM) in East Kalimantan. The programme covers all relevant aspects of fire management in the framework of community development and is aimed at a community-driven participation towards the protection of land from wildfires.

The programme discussed here consists of the following modules:

- Village selection
- Need assessment
- Village prevention campaigns and extension work
- The building-up of village fire crews
- Fire management training
- The provision of hand tools
- Institutional strengthening of village fire management
- The drafting of village fire regulations
- Yearly planning for fire management
- The establishment of a network.

The most important aspect in the course of developing CBFiM is the setting up of village fire crews and subsequently the providing training and simple hand tools. Once established, village fire crews have to define their visions and objectives and elaborate standard operating procedures, job descriptions, products and services, and financial and marketing aspects. The module of drafting village regulations on fire is designed to determine all fire relevant aspects important to a community – and therefore also regulates the framework for the use of fire in a village. In addition, village regulations potentially strengthen the position of village fire crews within their communities. This is critical for giving fire management some importance in villages and subsequently increasing the participation and motivation of fire crew members.

Fire information aspects such as readiness levels (alert levels), seasonal calendars, weather forecasts (early warning aspect) together with the determination of response areas are important to define strategies and resources needed for CBFiM.

Networking with other village fire crews, the government, and also with forest concessions and plantation companies is necessary in order to share resources and increase capacities in fire prevention, preparedness, response, and rehabilitation efforts. Therefore, communication strategies need to be set up. In rural areas, the use of modern communication technologies might still be limited. However, tools such as HT radios are very efficient and can be found in many villages. Other ways of communication in rural areas include the use of messengers, the setting up of cascades, and for prevention purposes, possibly also normal mail.

At provincial level, *UPTD – PKHL* should be in the lead to further develop CBFiM and should encourage Dinas Pertanian, Dinas Perkebunan, concession and plantation companies, NGO, and the Mulawarman University to join forces and develop capacities. A working group for CBFiM should be established. At district level, the agencies responsible for implementing CBFiM should be Dinas Kehutanan in co-operation with Dinas Pertanian, Dinas Perkebunan (in some districts part of Dinas Pertanian), Dinas Lingkungan (Bapedalda), Dinas PMD (not in all districts), local NGO and other governmental and non-governmental agencies. Dinas Pertanian at district level has field staff trained in extension work. They need to include tasks such as the carrying out fire prevention campaigns and the distribution of fire information and, therefore, need to be trained in CBFiM.

The development of CBFiM requires intensive support from Dinas Kehutanan. To date, however, there are often no Dinas Kehutanan personnel at province and district level assigned to routinely and regularly co-operate with local communities in East Kalimantan. This, however, would be a key critical for the success of CBFiM-DP. Thus, Dinas Kehutanan at provincial and district level should create CBFiM officer positions. These officers will then facilitate and carry out the implementation of CBFiM-DP in its necessary extend, flexibility, and intensity. The qualifications of CBFiM officers should include good communication, facilitation and moderation skills. They should be trained in applying participatory methods in workshops and other events and also in the design and implementation of training (visualization methods, and didactics).

1. Background

Since the early 1980's and then every 3-5 years, ENSO¹ driven severe vegetation fires have been recorded in the Indonesian Province of East Kalimantan. The worst ever recorded wildfire event occurred here in 1997/98 when approx. 5.2 million hectares of land were burned, affecting a quarter of the entire Province and causing huge economic and ecological damage (HOFFMANN et al., 1999). The fires potentially threatened the health of thousands of people in the province, partly interrupted sea and airborne transportation, and caused huge economic and ecological damages. Many reports have been written giving detailed information about the impacts of vegetation fires in East Kalimantan and other Indonesian provinces².

Fires in East Kalimantan are virtually all human-induced. Only in very limited areas, burning coal seams, mostly ignited by previous fires, have some significance in causing wildfires. A large number of all ignitions result from forest conversion activities for industrial plantations and from escaped small-scale agricultural fires. Fire is the least expensive tool to reduce vegetation cover, and for most of the smallholders the only one available. Many of the local people are upland farmers and use fire as a tool for land clearing. On the other hand, many of them also have experienced damages and losses due to wildfires³.

The Integrated Forest Fire Management Project (IFFM) is developing fire management capacities in the province of East Kalimantan. The participation of local communities is considered fundamental to fire management concepts. Past experiences have shown that fire management can only be implemented successfully in a vast province like East Kalimantan with limited access and infrastructure, if local communities participate. Consequently, IFFM has been designing and introducing a community based fire management approach in East Kalimantan that covers all important aspects aimed at a community-driven participation in fire management.

2. The Community Based Fire Management (CBFiM) Approach in East Kalimantan

2.1 What are the Objectives of CBFiM?

The involvement of rural communities in fire management in East Kalimantan has two major goals: It has to evoke benefits for the involved community, while at the same time it has to contribute to the prevention of uncontrolled vegetation fires with all their negative impacts for man and nature. MOORE (2003) describes CBFiM as "*an approach to the management of fire in the landscape that adequately includes communities in decision making about the role, application and control of fire, so that:*

¹ El Niño Southern Oscillation; explanations can be found in GOLDAMMER, SEIBERT, and SCHINDELE (1996) and BARBER and SCHWEITHELM (2000) with further references.

² Examples for East Kalimantan: GOLDAMMER et al. (1996); HAASE (2002), HINRICHS (2000); MAYER (1989); SCHINDELE et al. (1989); for all of Indonesia: BARBER and SCHWEITHELM (2000); BAPPENAS (1999); STATE MINISTRY FOR ENVIRONMENT OF THE REPUBLIC OF INDONESIA and UNDP (1998).

³ Assumptions are derived from interviews with villagers in fire-affected areas (unpublished). Also: MAYER (1989).

- ☐ *They have sufficient tenure (formal and informal) to ensure their rights are not subservient to broader (e.g., national, provincial and district) production and environmental protection aims and objective.*
- ☐ *They consider that involvement in land and fire management decision making and activities will improve their livelihood, health and security.”*

Any programme or approach in fire management at community level developed without considering these aspects does not apply to the CBFiM idea and concept. It also needs to be stressed that CBFiM must be integrated into community development processes from an early point and then driven by the community.

Some additional assumptions crucial to the success of CBFiM can be drawn from several years of experience in co-operating with local communities in East Kalimantan:

- CBFiM is supported by the government (e.g. through budgets);
- CBFiM is supporting / facilitating communities’ co-operation with other stakeholders (other villages, government agencies, local fire centres, concessions, etc.).
- CBFiM should be process-oriented. Therefore, modules should provide guidance and should be translated into local conditions and priorities in co-operation with involved communities.

In East Kalimantan, CBFiM is a crucial part of an overall fire management system that potentially includes all involved stakeholders. It is also an integrated approach designed to enhance the participation of local communities in fire management in East Kalimantan (MARBYANTO, 2003d). Basically, CBFiM should be part of every land use system where local communities are involved and fire is a tool or a threat.

2.2 Why CBFiM?

There are five major “fire-related” reasons for developing a CBFiM concept in East Kalimantan:

- ☐ **The fire cause factor:** Most vegetation fires are human-caused in the province. Local communities use fire as a tool in land management (slash-and-burn) and therefore, are a potential source for uncontrolled vegetation fires in East Kalimantan.
- ☐ **The fire damage factor:** In many cases in recent years, extended wildfires did not only damage millions of hectares of forests, they also destroyed fields, gardens, and even houses belonging to local people. Therefore, fire management efforts should support rural communities towards the better protection of their land from wildfires.
- ☐ **The resource factor:** Government efforts for fire prevention and suppression are limited due to a lack of sufficient human resources, funds, and infrastructure. Furthermore, many areas are too remote for the establishment of government driven fire prevention and suppression efforts. Consequently, as past experience – with only few exemptions – shows, such efforts without the participation of rural communities will not be very successful, even though forest concessions and plantations cover most of the province area and companies are obliged to build up fire management capacities.

- The time factor:** As indicated by *burned scar* and *hot spot maps*⁴, produced by IFFM and the Provincial Fire Centre⁵, most fires started in areas characterized by the occurrence of human activity, near access paths, roads, rivers, and human settlements. Thus, it can be assumed that members of rural communities might often be the first to detect, reach and fight wildfires in a certain area long before other fire fighting resources will be available.
- The experience factor:** Traditional Dayak communities have been managing fire for many decades and generations in the province. Such local experience and knowledge should be important input for developing an adequate and appropriate fire management system in East Kalimantan.

2.3 The CBFiM Cycle

CBFiM follows a “fire management cycle” describing measures in prevention, preparedness, response, and rehabilitation (see figure 1). Fire information and the necessary management tools, which includes aspects such as job descriptions, standard operating procedures, and budgets, support decision-making related to each aspect of the CBFiM cycle.

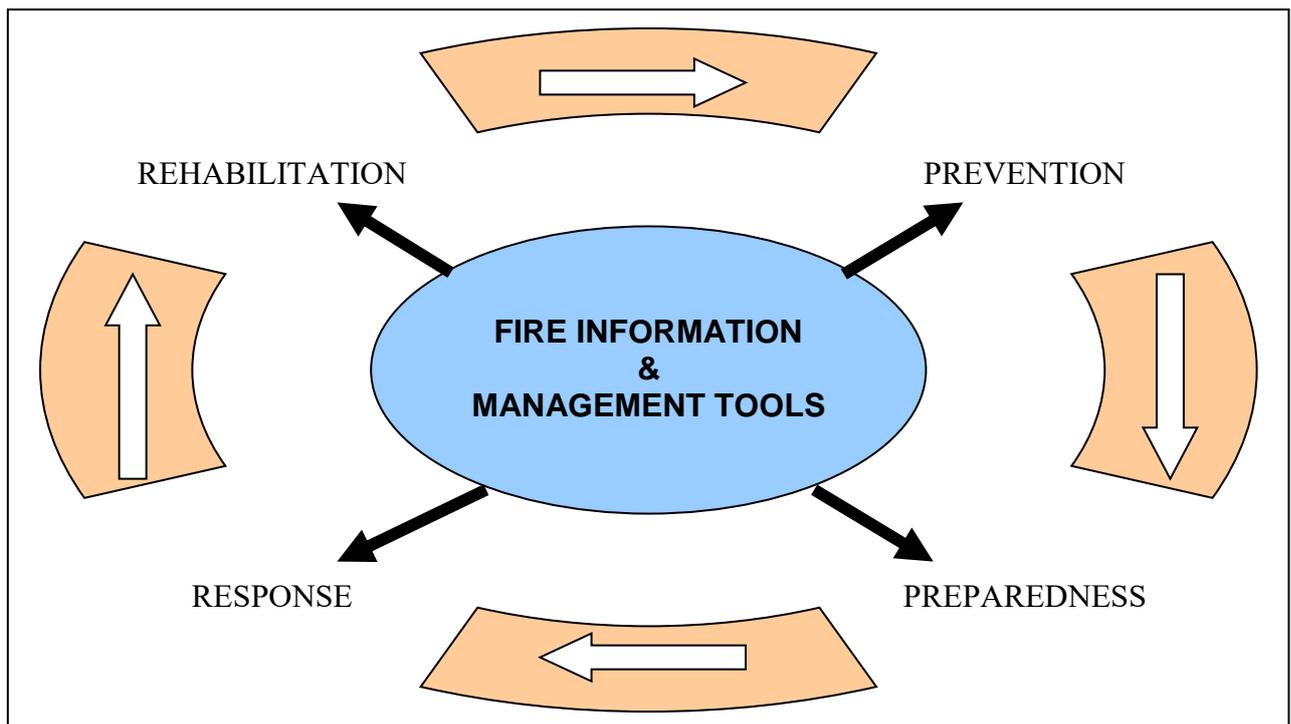


Fig. 1: The CBFiM cycle

CBFiM takes place at the village level. The cycle determines management approaches before, during, and after a fire. The term *Prevention* includes all activities and efforts taken in order to prevent a fire from happening at all. Such efforts can be of educational nature (e.g. awareness campaigns, training, school events, etc.), engineering measures (e.g. physically reducing fire

⁴ See SIEGERT et.al. (2001) and SIEGERT & HOFFMANN (2000);

⁵ The Provincial Fire Centre UPTD – PKHL: Unit Pelaksanaan Tingkat Daerah Pengendalian Kebakaran Hutan dan Lahan (Provincial [Local] Technical Implementation Agency for Forest and Land Fire Control).

hazards), and/or activities e.g. related to the drafting of village fire-use regulations and law enforcement. In order to determine the right timing and right location for fire prevention efforts an early warning system and fire-risk mapping should serve as the basic reference (see chapter 3). Such information can also help to determine when and how small-scale “slash-and-burn” land clearing should be carried out in order to prevent uncontrolled wildfires. The term *Preparedness* stands for efforts to maintain and/or up-grade all necessary resources in order to be prepared for fighting fires once they occur. For example, fire fighting equipment has to be maintained to be ready for use in the case of fire. If prevention measures fail and an uncontrolled fire occurs, the appropriate response has to be organized and carried out. The term *Response* describes all efforts taken to directly or indirectly fight uncontrolled or unwanted fires, respectively. *Rehabilitation* means all measures taken to rehabilitate (replant, re-cultivate) areas affected or damaged by fire. It is essential that measures to prevent future fires are directly integrated into rehabilitation plans. Such measures can be the establishment of green belts and/or fuel breaks. This eventually completes the CBFiM cycle.

The following table gives a general overview of the aspects described above. Corresponding activities, management tools and underpinning information probably vary from village to village depending on local conditions.

Table 1: Aspects of CBFiM cycle and corresponding tasks

CBFiM cycle	Tasks / Activities	Management Tools	Underpinning Information
Prevention	<ul style="list-style-type: none"> • (Designing, producing, and) distributing prevention material • educational / awareness campaigns • school programmes • patrolling • removing / reducing fire hazards • fuel breaks, green belts • controlled burning • developing and implementing village regulations on fire management 	<ul style="list-style-type: none"> • Human resource development (training, staffing, etc.) • SOP and job descriptions • budgeting • administration • networking with other villages/communities, the government and the private sector • monitoring and evaluation of CBFiM efforts 	<ul style="list-style-type: none"> • seasonal calendars in combination with readiness levels, weather forecast, <i>El Niño</i> predictions (early warning) • participatory fire risk mapping of village areas • dissemination of fire information / communication • knowledge about fire behaviour • traditional fire management e.g. in shifting cultivation.
Preparedness	<ul style="list-style-type: none"> • Fire fighting equipment (purchase, maintenance); • maintenance of water reservoirs; • simulations; 	<ul style="list-style-type: none"> • human resource development • SOP and job descriptions • budgeting • administration • networking with other villages/communities, the government and the private sector • monitoring and evaluation of CBFiM efforts 	<ul style="list-style-type: none"> • seasonal calendars in combination with readiness levels (early warning) • participatory fire risk mapping of village areas • human resource data and hand tool records (including traditional hand tools) • dissemination of fire information / communication tools • fire behaviour

CBFiM cycle	Tasks / Activities	Management Tools	Underpinning Information
Response	<ul style="list-style-type: none"> • fire suppression (initial attack, ICS, other suppression tactics); • mob up; • communication; 	<ul style="list-style-type: none"> • human resource development • SOP and job descriptions • budgeting • administration • networking with other villages/communities, the government and the private sector • monitoring and evaluation of CBFiM efforts 	<ul style="list-style-type: none"> • readiness levels (early warning) • hot spot information • fire behaviour • available resources • local knowledge in fire fighting / traditional fire management • dissemination of fire information / communication
Rehabilitation	<ul style="list-style-type: none"> • site selection, rehabilitation planning; • the preparation of seedlings; • planting; • technical management of rehabilitated areas; 	<ul style="list-style-type: none"> • human resource development • SOP and job descriptions • budgeting • administration • networking with other villages/communities, the government and the private sector • monitoring and evaluation of CBFiM efforts 	<ul style="list-style-type: none"> • seasonal calendars • available resources • quality of seedling material and soils • local knowledge about plants and planting.

2.4 The Selection of Priority Villages

The responsibilities for developing CBFiM should be in the hands of district government agencies, NGO, and private land management companies, potentially supported by the Provincial Fire Centre (PFC or UPTD-PKHL) in Samarinda. Due to limited human resources and budgets, government agencies might have to restrict the number of villages selected for a CBFiM programme, depending on their location in relation to areas of very high and high fire risk. Generally, the step of selecting villages is a strategic tool for tasks such as yearly planning and budget allocations. It is also the first step of a specific programme to develop CBFiM, described in the following chapters.

Fire risk maps that distinguish five different risk classes, based on previous fire events, vegetation classifications and land-use information, are available in different scales for province and district levels. They should serve as the primary reference for village selection. The provincial fire centre UPTD – PKHL is the agency providing fire risk maps principally for all parties involved. With the help of such maps, Dinas Kehutanan staff at district level, responsible for CBFiM, should pre-select villages according to the following aspects:

- Agency determines maximum number of villages per year selected for CBFiM according to available human resources and budgets;
- Village selection by the use of a district fire risk map, starting in very high fire risk areas and subsequently including villages in the next lower risk level, and so fort. Also include experience / knowledge of forestry staff about “fire problem areas” or “fire problem villages”. Consider clustering of villages in order to make logistics easy for subsequent implementation.

- Villages applying for support in developing fire management capacities (training etc.) should be included into the priority list.

After the pre-selection of villages at the office desk, the relevant sub-district and village heads have to be consulted to obtain information about the following aspects:

- Fire history and fire causes;
- Potential fire risks;
- Past community efforts in fire control;
- Potential interest to participate in a CBFiM-DP programme.

The officer responsible for CBFiM should carry out this task by the use of a questioner. By combining the results of the pre-selection and of village consultations, a final decision can be made. Further details including a *scoring help tool* are described in MARBYANTO (2003d).

2.5 Towards CBFiM: Necessary Steps to Establish Fire Management in Villages

This chapter describes the steps needed to establish CBFiM in selected villages in high and very high fire risk areas. While CBFiM is considered to be driven and managed mainly by rural communities themselves, much input and support is needed from government agencies, NGO, and other institutions to develop CBFiM and basically make it work.

In the past, many programmes and activities aimed at improving livelihood of rural communities were only successful as long as the support from “outside” was maintained. After they had ended, the continuation of development efforts by the communities themselves and the maintenance of established structures were at high risk to collapse. Therefore, such programmes often had only limited effects on communities in terms of sustainable development and welfare. Even more so, if their time period was relatively short.

A reason for limited success of many community development programmes was that local communities were regarded as targets rather than as co-operation partners. Therefore, such programmes did not necessarily match with the needs and interest of local communities. In addition, especially government agencies tend to “think” in terms of “activities carried out” rather than considering positive and negative effects of their activities on rural communities. Consequently, potential negative effects were a low participation of such communities and generally a limited “sense of self-interest”. Thus, community development programmes have to be improved continuously and adjusted in accordance with the interests of the local communities they are targeted at⁶.

In the past, similar constraints and shortcomings occurred when activities such as fire management training and campaigns were carried out in rural areas without any subsequent follow-up or further co-operation with local communities. In such cases, it seemed to be doubtful that villagers would take the initiative to prevent or suppress wildfires more successfully than before. Most probably, there was no change at all and the expensive and lavish training events or

⁶ Assumptions above are based on own experience and observations e.g. in transmigration and Dayak communities in East Kalimantan (e.g. Samboja area and Sungai Belayan area). See also OTSUKA (1991) and COLFER & DUDLEY (1993).

fire prevention campaigns created more confusion than motivation. Such events were producing expectations which could not be fulfilled. Therefore, in some cases it might have even been contra-productive in the end because villagers were disappointed about the missing follow-up. Luckily, this scenario seemed to happen only in very few cases in which the IFFM project together with the Forestry Department (Dinas Kehutanan, previously also Kanwil Kehutanan) simply didn't have the capacity for further inputs and consultations. More often, however, a necessary follow-up took place and fire managers were keen to continuously improve the programme they were providing towards increasing the participation of local communities in fire management.

Many discussions and consultations with villagers have taken place over the years and step by step, a Programme has evolved that tries to integrate fire management into the greater picture of community development *per se*. In connection with this, one aspect seems to be crucial when developing CBFiM: the approach must contribute to sustainable development and the welfare of rural communities. Then, the interest and participation of these communities might be strong enough to establish and also maintain village fire management efforts. For these reasons, a development programme towards CBFiM, a **CBFiM-DP**, has been designed for East Kalimantan.

2.5.1 Introduction to CBFiM-DP

The most important aspect of CBFiM – DP is the development of village fire crews. IN this respect, it has to be carefully elaborated how village fire crews can be integrated into the organizational and social structure of their communities. The question is whether a new organization should be established or fire management should be integrated into an existing organization such as a village farmer group or part of a mutual village co-operation (*gotong-royong*). In (participatory) need assessment workshops, such aspects have to be clarified.

The next steps are activities such as basic fire management training for village fire crews and the provision of fire fighting tools. Furthermore, visions and objectives, standard operating procedures, job descriptions, necessary fire information, ways of communication with other stakeholders, monitoring, and other necessary management tools have to be elaborated by village fire crews, carried out in one or more meetings and/or workshops facilitated by CBFiM officers. This step is followed by the drafting of village regulations on fire. Besides regulating all fire relevant aspects important to a community – and therefore also regulating the framework for the use of fire in a village – this step potentially strengthens the position of village fire crews in rural communities. Furthermore, experience shows that this module can be strategic towards the acknowledgement and support of village fire management by local and district authorities. The following module is the facilitation of yearly planning workshops together with the elaboration of strategies to access necessary budgets. Regular village consultations for monitoring and evaluation purposes complete the CBFiM DP. Since conditions might vary from one location or village to the other, a flexible approach is essential. The right “composition” of inputs should always be determined in accordance with needs and expectations of the partner community.

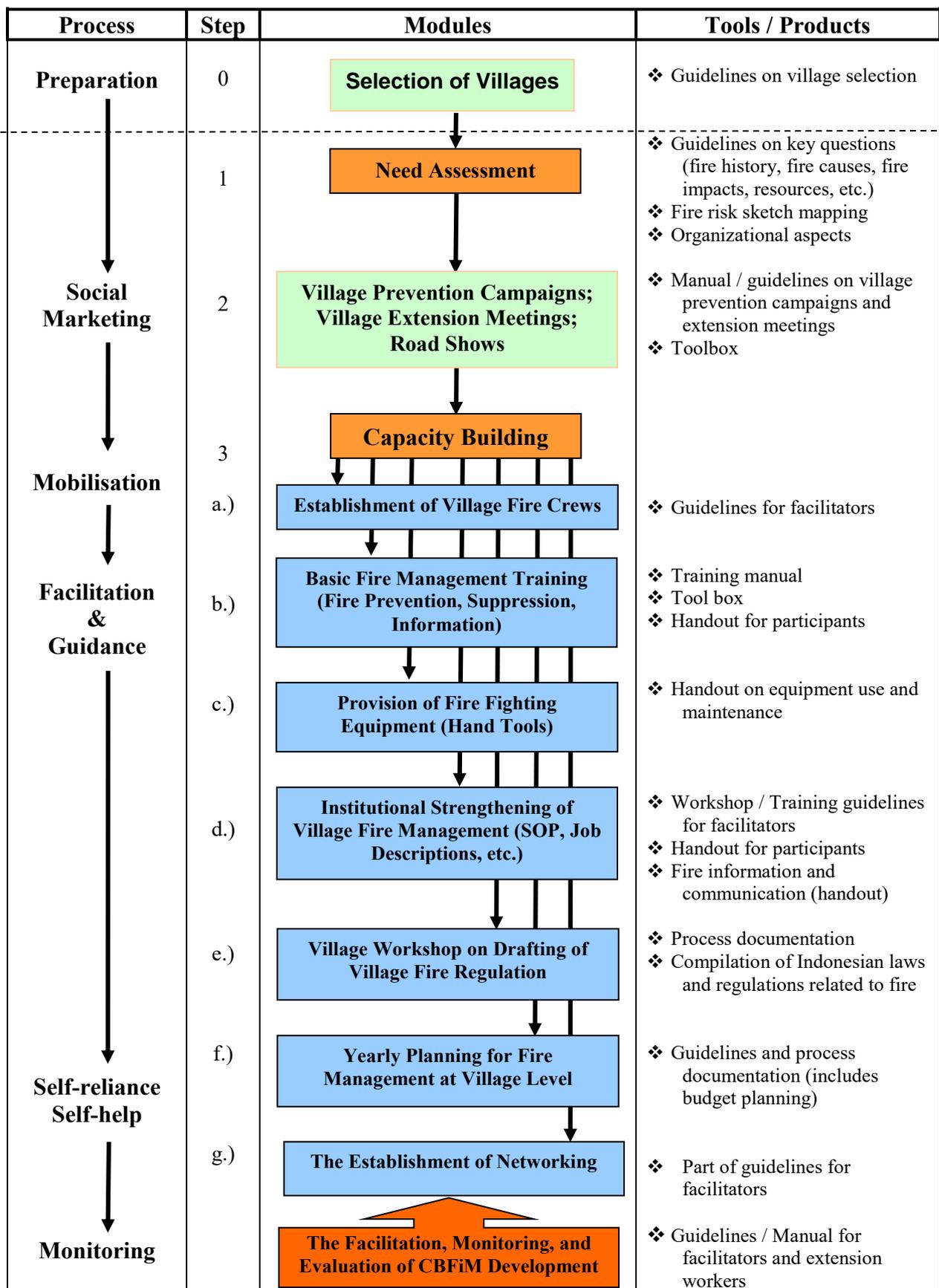


Fig. 2: Necessary Steps to establish fire management (CBFiM) at village level⁷

⁷ The sequence of steps eventually depends on local conditions and can slightly differ from village to village.

2.5.2 Need Assessment at Village Level

After the selection of priority villages, the CBFiM officer together with forestry and/or agricultural extension workers and the village leaders organize community workshops to discuss the following aspects:

- Fire history of the village, fire use, wildfire causes, wildfire impacts, past fire management efforts by the use of a participatory sketch mapping tool;
- Training and other needs in fire management;
- The possible development of a fire management organization (village fire crew).

In addition, the CBFiM officer should assess possible conflicts and constraints within the community that potentially lead to wildfires. Socio-economic village data should be obtained from the village administration.

Guidelines for CBFiM officers and extension workers on the outline and the facilitation of this participatory workshop need to be elaborated in order to gain accurate and practicable results. After the workshop, the CBFiM officer draws up a report describing the CBFiM-DP strategy for the selected villages. This document consists of a general description of the selected villages, the general planning of all CBFiM-DP activities, the necessary resources, and the assessment of possible chances, risks and constraints. A minimum period of two years should be anticipated to cover all necessary activities and modules of the programme. The document should be basic input into general and yearly planning at the LFC⁸ or Dinas Kehutanan at district level, respectively, and UPTD-PKHL at provincial level.

Table 2: IFFM products for need assessment tool

Product	Responsible for Product Design	Potential Product User	Urgency*
Booklet with workshop guidelines for facilitators, which include participatory sketch mapping and questioner with key questions	UPTD-PKHL (possibly also BIOMA and CARE), supported by IFFM	NGO, UPTD for training of district CBFiM officers; District CBFiM officers for implementation;	2
Report for planning purposes	UPTD-PKHL and District Dinas Kehutanan (LFC)	UPTD, District Dinas Kehutanan, NGO	2

* 1 = urgent; 2 = necessary; 3 = can be elaborated/designed later;

2.5.3 Social Marketing through Prevention Campaigns and Extension Work

Awareness raising and an increased participation of rural communities in wildfire prevention is the main goal of campaigns and extension work carried out in selected priority villages. Based on experience drawn from many prevention campaigns carried out in the province, the following aspects should be included into village campaigns in one or the other way:

⁸ Local Fire Centres under the responsibilities of Dinas Kehutanan. Construction financed by the German Development Bank KfW

- Functions and importance of forests;
- Possible wildfire risks;
- Negative impacts of wildfires;
- Introduction to laws and regulations related to fire;
- Controlled burning in shifting cultivation;
- Possibilities for the participation of rural communities in fire management.

The active participation of communities in village campaigns should be considered very important. Therefore, the local culture should be understood by facilitators and the programme should allow as much contribution and inputs as possible from participants. Discussions should be favoured and frontal teaching avoided. Good visualization and easy-to-understand contents are crucial if presentations are given by facilitators. Role plays and presentations by participants add to a lively and attractive event and provide good conditions to articulate local concerns not only in regards to fire. A way to make village campaigns more interesting is to include entertainment events such as movie shows, theatre shows, etc. Generally, village campaigns should raise the interest and motivation of rural communities to participate in the development of CBFiM in their respective villages. They should be carried out during alert level situations (readiness levels) at normal to up to level III. For further descriptions of readiness levels, see chapter 3.1.1 and CHRISTY (2003).

The responsibility for conducting fire prevention campaigns in villages should be with CBFiM officers at LFC or Dinas Kehutanan at district level, respectively. They need to co-operate and co-ordinate efforts with other governmental and non-governmental agencies with extension work capacities. They also closely co-operate with the provincial fire centre UPTD-PKHL, which should be responsible mainly for the development of concepts, campaign material, and the training of facilitators. Furthermore, village fire crews, once established, need to be actively involved in campaigns in their own and possibly also in neighbouring villages.

Village campaigns might require a rather large budget. Therefore, campaigns should only be carried out at very strategic locations together with several villages / communities participating in one event.

Further ways of fire prevention campaigns:

- School campaigns; they can be an additional part of village campaigns and should make use of prevention material and methods all around the Indonesian fire prevention mascot “Si Pongi”, which has been developed by IFFM and UPTD-PKHL together with teacher associations and environmental education groups. Useful material can also be obtained from other NGO (environmental education centres, BIOMA, WWF, etc.), the EU and JICA projects and many more.
- Road side campaigns; these campaigns might be useful in high fire risk areas during alert level situations at II to I. By-passing traffic can be stopped with the help of the police and fire prevention material distributed to passengers.
- Sports events; this is a good way to address the fire prevention message in different ways to a rather large audience. Fire prevention can be a part of the sports Programme. In communities which have established village fire crews, competitions between such crews showing their skills can be carried out.
- “Si Pongi” shows; IFFM and UPTD-PKHL have conducted or supported many small shows or events in the past, where Si Pongi was part of and prevention material was disseminated. One large show was carried out in 2001 in co-operation with *Kak Seto*,

who attracted more than 2000 children and their parents to see an amazing two-hour Programme with lots of highlights and fun with Si Pongi.

- Drawing competitions; children can be easily attracted to such events, where environmental issues such as forest fires are the subject, and Si Pongi is part of them. IFFM and UPTD-PKHL have supported many such events in schools, shopping centres, etc.
- Exhibitions: such events are always good opportunities to expose fire prevention material and information to a large number of people from urban and rural areas.

During readiness level (alert level) situations at II up to I, TV, radio, and newspaper campaigns should be included into awareness raising programmes.

Table 3: Necessary IFFM products for social marketing

Product	Responsible for Product Design	Potential Product User	Urgency*
Guidelines on village prevention campaigns and other extension activities	UPTD-PKHL supported by IFFM	Main user should be a district CBFiM officer and extension workers of Dinas Kehutanan (LFC) and Dinas Pertanian; generally all involved government agencies at province and district level, NGO, private enterprises, etc.	1
Prevention material such as leaflets about different prevention aspects (toolbox)	UPTD-PKHL supported by IFFM; district agencies (Dinas Kehutanan; Dinas Pertanian, etc.)	<ul style="list-style-type: none"> ○ District government agencies; ○ Extension workers; ○ NGO; ○ Village fire crews; ○ Private forest enterprises; agro-businesses, coal and gold mining; etc. 	Partly available 1

* 1 = urgent; 2 = necessary; 3 = can be elaborated/designed later;

2.5.4 Development of Village Fire Organizations (Institutional Aspect)

Village fire management has to be institutionalized at an early stage of the Programme. Responsibilities and tasks have to be assigned to community members who will, on a voluntary base, make up a village fire crew. It has to be carefully elaborated, how fire management can be integrated into the organizational village structure in order to gain full acknowledgement and support by the community. In villages with well organized and functioning farmer groups, the integration of fire management into their portfolio should be preferred.

The major task of village fire crews should be to prevent and suppress wildfires in the village area. Furthermore, they should promote safe burning practices in slash-and-burn agriculture in coordination and co-operation with village authorities.

Villagers need to have a basic idea about fire management and the future function and role of a village fire crew. This will be clarified in a training workshop together with village leaders and all interested members of a community. The following aspects should be discussed in the workshop (possible workshop outline):

Session I:

- a. General introduction of a (basic) village fire management concept (presentation by facilitator)
- b. Discussion and documentation of wildfire impacts on and damages to community
- c. Discussion and documentation of local needs in fire management

Session II:

- d. Advantages and possible constraints of a village fire management organization (facilitator)
- e. Elaboration of a village fire crew concept (function and role) based on local needs and capacities – basic structure of a village fire crew
- f. Recruitment (proposal)

Session III:

- g. Strategic planning (discussion of next steps)

This effort should further motivate participants to establish fire management in their villages. The workshop should be facilitated by CBFiM officers of Dinas Kehutanan at district level, possibly supported by UPTD – PKHL and NGO.

Table 4: IFFM products for institutional development

Product	Responsible for Product Design	Potential Product User	Urgency*
Booklet on guidelines for Facilitators	UPTD-PKHL together with IFFM, BIOMA, CARE	Main user should be a district CBFiM officer and possibly also extension workers of Dinas Kehutanan (LFC), UPTD-PKHL, and NGO,	1

* 1 = urgent; 2 = necessary; 3 = can be elaborated/ designed later;

2.5.5 Fire Management Training

Since the start of IFFM in 1994, more than 60 villages have received basic fire management training. In the first phase of the project, it was mainly conducted as training in fire suppression. Since then, training curricula and materials have continuously been improved with the help of regular evaluation and feedback of training events by participants.

A suitable training concept at village level takes the following conditions into consideration:

- All fire management aspects relevant to CBFiM should be included in the curriculum
- Training methods used encourage active participation (discussions, role-plays, group sessions, and other participatory methods)
- Training methods and material should be easy to understand by the participants
- The training should consider and incorporate local conditions and the knowledge and experience of participants
- Training should be proper balanced between class-room sessions and practical field training
- The number of participants should not exceed 30. They should come from at least 3-4 different villages.

Currently, basic fire management training is designed for 3 days (2 days class-room, 1 day field training) or 4 days (2 days class-room, 2 days field training) depending on available budgets.

Table 5: Curriculum for basic fire management training for villagers

1	Theory	Fire history in the village areas of participants
2		The fire triangle and fire behaviour
3		The fire management cycle
4		Fire Prevention
5		Alert / readiness levels and fire information
6		Fire suppression
7		Post-fire activities
8		Development of a village fire organization and standard operating procedures
9		Discussion of possible / necessary future steps
10		Training evaluation
11	Field exercise	Fire prevention techniques (e.g. the reduction of fire hazards at burning coal seam sites, etc.)
12		Fire suppression techniques and tactics.

Furthermore, a five-day “Training of Trainers” (ToT) approach has been designed for extension workers, forestry staff, crew bosses and possibly also community leaders, who have already passed the basic fire management training. Possible subjects of a “ToT” event can be as follows:

Table 6: Curriculum of “Training of Trainers” (ToT)

1	Theory	General repetition of basic fire management theory
2		Presentation and visualization skills
3		Facilitation skills; role and responsibilities of facilitators
4	Field exercise	Fire prevention and suppression exercises (refresher);
5		The facilitation of field exercises

Over the years, a lot of training material and training books for fire management have been designed by different organizations. However, suitable material for village participants is still very limited. The design of suitable training handouts and tool boxes for village training is quite urgent and has been one focus of IFFM in the last years.

Table 7: IFFM products for village fire management training

Products	Responsible for Product Design	Potential Product Users	Urgency*
Training handout	UPTD-PKHL supported by IFFM, CARE, BIOMA	Training participants	Available soon 1
Tool box for training	UPTD-PKHL supported by IFFM, CARE, BIOMA	Training facilitators; material partly distributed to participants (stickers, leaflets; etc.)	Partly available 1
“Training of Trainers” Manual	UPTD-PKHL supported by IFFM, CARE, BIOMA	Main users should be district CBFiM officers and extension workers of Dinas Kehutanan (LFC); UPTD-PKHL, NGO	Available soon 1

* 1 = urgent; 2 = necessary; 3 = can be elaborated/designed later;

2.5.6 Provision of Fire Fighting Equipment (Hand Tools)

Equipment traditionally used to fight fires consists of simple hand tools like the machete, self-made wooden rakes, and small hand-pumps out of bamboo. Such equipment might have been effective to fight grass fires or to safeguard small “slash-and-burn” fires, but they were not suitable to fight “hot” or large wildfires like those in 1997/98.

To elaborate a standard for fire fighting at community level, hand tools have been introduced and evaluated during fire management training. It has been stressed, that hand tools have to be suitable for local conditions. They have to be light and their dimensions have to fit the people who use them. Experience shows, that the backpack pump, the Pulaski tool (two-function hoe), and the McLeod tool (two-function rake) are the most favoured tools. Additionally, the fire swatter tool is useful to fight grass fires and is also well accepted. IFFM has assembled “tool boxes” to support a village fire crew with 15 to 20 members. More than 100 hand tool boxes were handed over to district forestry services for further distribution to rural communities under the following conditions:

- village is situated in or close to high fire risk area
- village has already established village fire crew
- at least some of the village crew members have already participated in basic fire management training
- village shows commitment to participate in fire management efforts (supports governments efforts in fire prevention or suppression; history of own fire prevention or suppression efforts, etc.)

In addition, suitable storage rooms have to be provided, which can also serve as village fire (management) posts.

In the future, one task assigned to local fire centre staff and forestry extension workers should be the support of village crews in maintaining and repairing their fire fighting hand tools. Village fire crews need to be handed out a simple booklet about hand tool use and maintenance.

Table 8: IFFM product related to hand tool provision

Product	Responsible for Product Design	Potential Product User	Urgency*
Handout on equipment use and maintenance	UPTD-PKHL supported by IFFM	Training participants; village fire crews	1

* 1 = urgent; 2 = necessary; 3 = can be elaborated/ designed later;

2.5.7 Institutional Strengthening of Village Fire Management

Experience shows that the establishment of village fire crews and the provision of training and hand tools to local communities are not sufficient to successfully manage future drought events with high fire danger situations. Village fire crews might have developed the necessary technical skills but often do not have experience in managing their organization. Therefore, adequate strategies and tools have to be introduced that help local communities to run and maintain a well-functioning village fire management organization. The goal is that village fire crews manage their organizations with full accountability and the necessary professionalism. For example, aspects such as the regulation of membership as well as job descriptions and standard procedures that determine tasks and contributions of each member need to be elaborated. Simple-kept procedures for the correspondence of the organization, the administration of finances and other administrative duties need to be introduced. Furthermore, village fire crews might require budgets to fulfil all agreed tasks and duties. Budgets may come from internal sources (e.g. fees for passive membership, etc.) and/or external (from village budget, government agencies, NGO, private enterprises, etc.). Paid services in fire prevention and suppression provided to other villages and/or to forest enterprises can be a strategic external budget source.

So far, members of village fire crews do have difficulties to maintain their interest and motivation in fire management. Often, the value of their efforts is not well understood. One possible solution for this could be that they attach an economic value to their fire management efforts in terms of providing products and services to others (their villages, other villages, the government, etc.). Subsequently, they might be in a better position e.g. to negotiate a share of the village budget and other budget sources for their fire management activities. In this respect, regular consultations with government authorities should be considered to inform about a crew's activities.

In addition, social marketing efforts such as the organizing of sport events among different village fire crews can be a good opportunity to increase their motivation and generally make village fire management more popular (see also chapters 2.5.3 and 2.5.10).

The clarification of “response areas” managed by village fire crews is a further important aspect to be considered. Here, “response area” determines the geographic extent to which fire suppression capacity of a village fire crew can access. It can include aspects of response such as detection, initial attack, main suppression, and post-suppression patrol (to prevent re-ignition) and can cover the village itself, fields and gardens, and possibly also other areas of interest for villagers (e.g. forests!). Village fire crews should record this in a combined fire risk and response area sketch map (see also chapter 3.1.4).

Table 9: Workshop outline for institutional strengthening

Part	Aspect	Contents
I	1. The organizational aspect	<ul style="list-style-type: none"> • Members and internal regulations • Job description, standard procedures • use of fire information and communication
	2. Administration	<ul style="list-style-type: none"> • General administration of a village fire crew • Administration of finances
	3. Capital / Financing / Self-Financing	<ul style="list-style-type: none"> • Financial sources (internal, external) • Budget allocations
	4. Products and Services	<ul style="list-style-type: none"> • Economic aspects writing of proposals, business motivation, etc. • Service aspect: work Programme etc.
	5. Sustainability	<ul style="list-style-type: none"> • Social benefits such as the support of the community • Formation of cadres / recruitment of crew members • Social marketing • Networking
II	1. The use of fire information	<ul style="list-style-type: none"> • The readiness level approach • The seasonal calendar • Other relevant fire information used at village level • The relevance for standard procedures • Reporting and documentation
	2. Communication	<ul style="list-style-type: none"> • Communication methods and techniques • Tools • Communication plans
	3. The response area approach	<ul style="list-style-type: none"> • Resources and preparations • Sketch mapping
III	Concrete planning of next steps in CBFiM	<ul style="list-style-type: none"> • Strategy plan

This module is quite extensive and requires intensive preparations and follow-up support. A village workshop together with the village fire crew, the village administration, and possibly other village key persons provides a platform for introducing aspects necessary to strengthen the organization. The workshop should last three to four days. It should be designed as a training event that provides guidance in the elaboration of aspects described above. Most probably, the process might require several follow-up meetings to complete the necessary planning, depending on experience and capabilities of village fire crews. The planning of budgets including the elaboration of strategies to obtain budgets will be carried out in a separate approach (see chapter 2.5.9).

Table 10: IFFM products required for the institutional strengthening of village fire management

Product	Responsible for Product Design	Potential Product User	Urgency*
Guidelines on the strengthening of a village fire organization (workshop or training guidelines)	UPTD-PKHL, CARE, BIOMA, etc., supported by IFFM	Main user should be the provincial and district CBFiM officers and extension workers of Dinas Kehutanan (PFC, LFC), trained extension workers of Dinas Pertanian, NGO, private concessions, etc,	1
Handout	IFFM together with UPTD-PKHL, CARE, BIOMA, etc.	Members of village fire crews	1
Handout (booklet)		Fire information and communication.	1

* 1 = urgent; 2 = necessary; 3 = can be elaborated/ designed later;

2.5.8 The Drafting of Village Fire Regulation

The enforcement of laws and regulations in fire management is rather weak in Indonesia. This might partly be caused by low integrity and work quality of the responsible Indonesian government apparatus together with a lack of knowledge and experience in government laws and regulations at the lower government levels (Marbyanto 2003).

However, many indigenous communities do have customary law related to the use of fire which was handed down from generation to generation. It generally prevented these communities from an un-controlled and disastrous use of fire. Only after the first exploitation companies entered the forest, the natural environment, rural communities lived in, has gradually been changed. At the same time, traditional regulations started to erode because of the break-up of social structures (mix-up of communities due to migration, social conflicts, etc.). The result of this was that many traditional regulations on the use of fire are not implemented anymore or do have only little impact. In addition, the government had not much knowledge about – and interest in – traditional regulations of rural communities (outside Java!) in the past and barely took them into account in legislation processes.

In 2001, IFFM started to develop a concept aimed at the revival and re-establishment of customary or indigenous “fire law”: The drafting and issuing of village fire regulations. This approach has been considered as a bottom-up approach in law enforcement and a good strategy to encourage rural communities to participate in fire management.

The elaboration of village regulations in fire management is based on the following official laws and regulations:

- Village regulations are considered as one source (among others) for legislation processes according to law nr. TAP MPR No. III, 2000 about the development and sources of legal processes / legislation;

- According to law UU Nr. 22, 1999 about local governments it is stated that villages as autonomous bodies have the legal power to issue regulations and [organize] community life;
- It can be derived from TAP MPR No. III, 2000 and UU Nr. 22, 1999 that village regulations as a source for legislation have strong and binding legal power.

IFFM has already successfully designed and carried out workshops on the development and documentation of village fire regulations in different villages together with BIOMA and CARE. In several sessions (small workshops), the following aspects were discussed, drafted, revised, and finally issued in a “village regulation on fire management”:

- The establishment, set-up, and tasks of a village fire crew
- Fire prevention efforts
- Land preparations
- Fire fighting equipment
- Fire control / suppression
- Participation by the community in fire management
- Budgeting
- Sanctions.

The document was officially signed by the head of the village and approved by the village representative board.

Table 11: IFFM products on the elaboration and drafting of village fire regulations

Product	Responsible for Product Design	Potential Product User	Urgency*
Process documentation of the steps of drafting village regulations (workshop documentation)	IFFM together with <i>CARE</i> and <i>BIOMA</i>	All relevant government agencies at national, provincial, and district level; the provincial and district CBFiM officers and extension workers of Dinas Kehutanan (province, districts), trained extension workers of Dinas Pertanian, NGO	Available
Compilation of Indonesian laws and regulations related to fire	IFFM	all relevant stakeholders related to fire management; village fire crews	Available

* 1 = urgent; 2 = necessary; 3 = can be elaborated/designed later;

This module proves to be a good tool for strengthening the position of fire crews and village fire management. It is critical for giving fire management some importance in villages and subsequently increasing the participation and motivation of fire crew members. Presented to government authorities at district and province level – even national level – such lobbying certainly increases the knowledge about the existence and the acceptance of village fire crews and potentially also fosters their support by the Indonesian government. Eventually, this approach is a crucial step towards the enforcement of regulations considering a generally weak “law enforcement mentality” by Indonesian authorities as described above.

2.5.9 Yearly Planning in Fire Management at Village Level

In order to properly carry out activities, village fire crews have to elaborate the necessary budget together with a yearly work plan. Aspects such as the amount of funds needed, potential sources to be accessed, and the allocation of funds for certain activities are important issues which need to be planned. Potential sources for funds can be the community itself or outside sources such as the government, private companies, NGO or other institutions. Furthermore, the village fire crew can also raise funds by carrying out activities that generate income for them. Such activities can be the support of fire prevention activities of a concession company or the patrolling in a concession area carried out as paid labour. It can also be certain paid work for another community member, and many more possibilities (see also chapter 2.5.7).

So far, not many village fire crews were able to obtain budgets for their fire management activities. In most cases, the yearly planning of fire management activities has not been carried out. CBFiM officers (see chapter 4.2) together with extension workers should facilitate this step in order to ensure, that village fire crews can carry out the activities they identify during the planning process. In a 3 days workshop, the following aspects need to be discussed:

- Work schedule and necessary budgets to be elaborated by the village fire crew, based on relevant fire information and “response area approach”
- Village fire crew elaborates strategy for announcing fire management planning to village, sub-district, and even district authorities
- Integration of fire management planning into general village development planning
- Further steps to ensure integration of budget proposal into usual budgeting procedure of the government.

Table 12: IFFM products for yearly fire management planning

Product	Responsible for Product Design	Potential Product User	Urgency*
Handout for village fire crews	IFFM together UPTD-PKHL	Village fire crews	2
Guidelines / workshop documentation for facilitators	IFFM and UPTD-PKHL, CARE, BIOMA	Government agencies at national, provincial, and district level; CBFiM officers and extension workers of Dinas Kehutanan (province, districts), trained extension workers of Dinas Pertanian, NGO, etc.	2

* 1 = urgent; 2 = necessary; 3 = can be elaborated/designed later

2.5.10. Establishing a Network

Communication between groups for sharing information, contacts and resources is often referred to as networking (HUNTER et.al., 1995). Networking with other village fire crews, the government, and also with forest concessions and plantation companies is necessary in order to share resources and increase capacities in fire prevention, preparedness, response, and rehabilitation efforts. Furthermore in the course of developing CBFiM, the exchange of experience and knowledge between different village fire crews might be important to increase

their motivation and interest in fire management. It is also very strategic for village fire crews to improve their skills through information from others and, *vice versa*, provides opportunities to communicate skills and experience to others.

Networking should first be initiated between different village fire crews, then between village fire crews and LFC and/or PFC, and between village fire crews and forest concessions and plantation companies.

Different methods are suitable to initiate networking. Study tours (*studi banding*) with demonstrations and presentations should be organized in the beginning. Sport events with competitions on fire management skills and regular meetings can follow. They are intensive and suitable ways of networking but they also need funding. It can not be expected that village fire crews will have the resources to start networking themselves. In the beginning, facilitators (e.g. CBFiM officers) have to initiate and organize networking events and funds. Donor organizations and NGO do have a crucial role in facilitating study tours and meetings of village fire crews. Once LFC have become operational, budgets should be available to regularly invite representatives from village fire crews for information exchange meetings and consultations. The initiation and organization of such meetings will be a further task of a CBFiM officer at the LFC, possibly supported by the PFC.

In the long run, it is hoped that networking particularly between different villages will spread the CBFiM idea in the Province and consequently, village fire groups might gain popularity, respect and the support they need to successfully manage future fires in the province.

Table 13: Networking

Network	Possible Ways of Networking	Remarks
Village fire crew – village fire crew	<ul style="list-style-type: none"> • Study tour • Regular meetings with demonstrations & presentations • Sport events • Joint simulations 	CARE <i>International</i> has already successfully carried out study tours to the Purwajaya village fire crews
Village fire crew – LFC / PFC	<ul style="list-style-type: none"> • Regular meetings • LFC supports sport events (competitions between village fire crews) • Initiates simulations 	Provided that LFC have become operational; Alternatively, forestry staff responsible for co-operating with local communities should take over in between
Village fire crew – concession company	<ul style="list-style-type: none"> • Regular meetings • Joint training events • Company supports sport events (competitions between village fire crews) • Initiates simulations 	Potentially very effective but also the most difficult cooperation to establish.

3. Fire Information and Communication

3.1 The Use of Fire Information at Village Level

An important base for fire management is the timely availability of relevant fire information in order to adequately prevent wildfires and, in case such efforts fail, to successfully fight fires. Relevant fire information potentially provided to village fire crews by LFC consist of readiness level calculations, done by UPTD-PKHL, fire weather forecasts (e.g. El Niño predictions) in combination with fire risk maps. Information prepared by village fire crews themselves might include the determination of response areas in sketch maps and seasonal calendars. Village fire crews should keep records of fire fighting equipment and draw up reports on fire management activities and simple fire reports provided to LFC, and from there to UPTD-PKHL.

3.1.1 Readiness Level Calculation

In 2003, the Governor of East Kalimantan issued a degree on the use of readiness levels which determined general procedures for fire management (Decision Nr. 522/K.130/2003). This is based on readiness level calculation carried out by UPTD-PKHL. Four levels (normal, level III to I) are used and calculated through a scoring method. Aspects such as the fire danger rating system, weather forecasts, the number of hotspots, smoke and haze conditions, and regular reports from districts about fire activity go into the calculation in accordance with scores attached to each criterion and degree of markedness⁹.

Readiness level information is a basic planning tool for the development of standard procedures for CBFiM. At each level, certain fire prevention and preparedness efforts have to be pinned down by village fire crews. In principle, efforts in fire management should be gradually intensified according to the increase of readiness levels. Latest at level II (two), village fire crews should carry out efforts (door-to-door campaigns, village meetings, distribution of prevention material etc.) aimed at convincing community members to stop land preparations by the use of fire. Vice versa, readiness levels can help to determine safe burning periods for slash-and-burn agriculture in order to prevent uncontrolled wildfires. Eventually at level I (one), a general fire ban must be executed with the help of village fire crews e.g. by carrying out campaigns together with village heads and other village key persons in the framework of village meetings and announcements in mosques and churches.

Within the course of CBFiM development, readiness levels in combination with SOP are addressed in Institutional Strengthening and Yearly Planning Workshops.

3.1.2 Seasonal Calendars

In addition to readiness levels, seasonal calendars should be taken into consideration as a second reference particularly for fire prevention planning. Seasonal calendars are based on villagers' experience and include basically all land management efforts from slashing, burning, cropping to harvesting. They indicate expected (normal) dry seasons. Often, seasonal calendars are not recorded in written form. The yearly course of agricultural activities is general knowledge based on experience and traditions shared among villagers. For village fire management, however, it is important that fire crews sketch seasonal calendars to be used as additional tools for planning

⁹ For detailed information on readiness level calculation see CHRISTY (2003).

purposes in combination with readiness levels. This information should then also be available for neighbouring village fire crews, LFC as well as concession holders. It can be used for the preparation of wildfire prevention measures such as patrolling and for the timing of campaigns. Village fire crews should be on stand-by during burn periods and might even be directly involved in slash burning by safe-guarding neighbouring lands.

3.1.3 Weather Forecasts

Information about upcoming dry seasons, El Niño events, and readiness levels has to be distributed by UPTD-PKHL to district Dinas Kehutanan offices (LFC). These offices should further communicate this to village fire crews via HUMAS or directly to sub-district heads via e.g. HT radios (see also chapter 3.2.3). In addition, fire information can be aired through radio and TV broadcastings, though coverage might be limited to the major cities in the province, only. In rural areas, private radio stations, so called *radio komunitas* cover relatively large areas and therefore, have an important role in distributing fire information.

Traditional knowledge about weather conditions and predictions is still available particularly in indigenous Dayak communities in East Kalimantan (ASPIANNUR et al., 1997). Environmental conditions, however, have been changing drastically in the last 30 years and therefore, many traditional systems might not necessarily cope anymore with these changes. Furthermore, predictions about extreme and long-lasting droughts normally do not exist and the El Niño phenomenon is hardly known in rural areas. It is therefore essential, that especially El Niño predictions are channelled to rural communities through the distribution of fire prevention messages and warnings. Village fire crews do have a crucial role and should definitely receive such information either directly from Dinas Kehutanan or through sub-district heads.

3.1.4 The Fire Risk and Response Area Approach

This tool combines fire prevention planning with the determination of areas for direct fire fighting. In the course of fire management planning, village fire crews need to elaborate adequate fire prevention measures based on their experience related to fire causes, frequency of past wildfire, and vegetation affected. For example, smouldering coal seams might imply a permanent fire risk for a village area. Fire prevention measures such as regular patrolling and control and the reduction of fuels directly around the site have to be considered.

Fire response areas define the area village fire crews are willing and able to cover for direct response to wildfires (see also 2.5.7).

Fire risk and response areas have to be put down in sketch maps, elaborated in planning workshops (institutional strengthening and/or yearly planning workshop). They are providing the following main information:

- The village itself and village land (fields, gardens, plantations, forests, wastelands, etc.), identifying crops and the name of land users (community members, concessions, other land users from outside)
- Roads, paths and rivers,
- Hand tool cache and other resources (also in neighbouring areas if available)
- Areas affected by previous fires (also beyond borders of response area)

- Potential fire hazard areas such as coal seam locations and alang-alang (fire risk zones based on the experience of villagers) inside and outside response area.

Fire risk and response area (sketch) maps should be kept simple. Together with readiness level information, they are the basic planning tools for the elaboration of village-specific SOP.

3.1.5 Hotspot Information

The use of hotspot information for fire detection and fire fighting purposes is of limited use for village fire crews. It can be assumed that villagers normally have already spotted fires long before hotspot information from UPTD-PKHL might reach them.

Table 14: IFFM products related to hand tool provision

Product	Responsible for Product Design	Potential Product User	Urgency*
Simple handout (leaflet) on readiness levels, seasonal calendars and general SOP for village fire crews	UPTD-PKHL; NGO; also Mulawarman Unisversity	Village fire crews; ToT participants	1
Leaflet on the design (methodology) and use of fire risk maps and response areas	UPTD-PKHL; NGO; Mulawarman University	Village fire crews; ToT participants	2

* 1 = urgent; 2 = necessary; 3 = can be elaborated/designed later;

3.2 The Distribution of Fire Information and Reporting in Rural Areas

In most districts, communication systems have been rapidly developing in recent years. Definitely, modern technologies are available more easy and also affordable by more people nowadays. Especially the use of mobile phone technology has been increasing in districts. However, such communication technology might still be limited to the cities and the nearer surroundings. They often do not cover rural areas yet.

In the following chapters, different communication methods and necessary links are described to support the implementation of adequate fire management and initiate networking among different stakeholders. Proposals are derived from field experience in villages in the districts of Kutai Barat and Kutai Kertanegara. Additional information came from research carried out by MODER (2003) in Kutai Barat.

3.2.1 Information Flow and Communication between Government Agencies

The UPTD-PKHL agency regularly sends readiness level calculation and other relevant fire information to Dinas Kehutanan at district level (by letter and fax). From there, fire information should be further disseminated to all involved district government agencies. Based on the governor decree Nr. 522/K.130/2003, the district government should elaborate standard operating procedures for the participation of all involved stakeholders in fire management and the dissemination of fire information. Such efforts need to be determined through regulations issued by the district head (“*SK Bupati*”). Based on workshop results from Kutai Barat¹⁰, the following scenarios for the distribution of fire information and co-operation mechanisms in extension and training among district government agencies have been elaborated. These mechanisms can serve as general guidelines also for other districts.

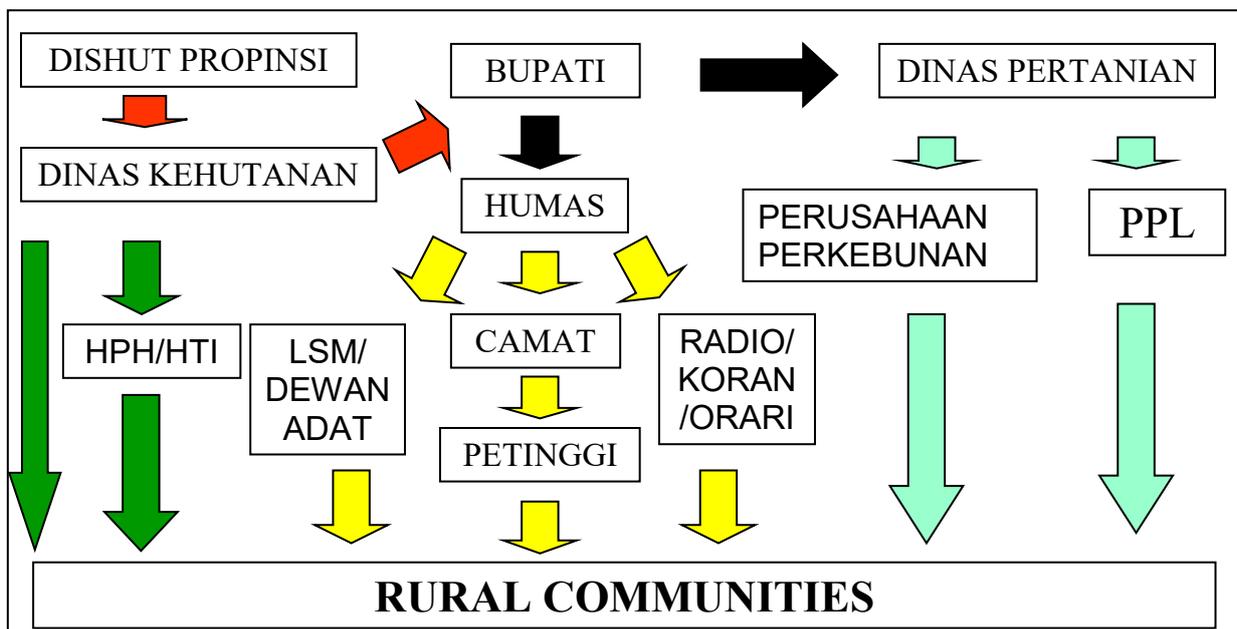


Fig.3a: Proposal for standard procedures for the distribution of fire information and co-operation mechanisms in accordance with readiness levels / early warning

All agencies and organizations shown in Fig. 3a and Fig. 3b should elaborate measures to contribute to fire prevention efforts in accordance with their portfolio, district standard operating procedures, and their capacities. Budgets need to be allocated accordingly. Furthermore, the district Dinas Kehutanan office in co-operation with UPTD-PKHL should provide the technical expertise and training to other involved stakeholders on all relevant aspects required in order to develop a co-operation as described above.

The district government should allocate a routine budget to their public relation section (HUMAS) for the dissemination of fire-relevant information to community radio stations and local newspapers.

¹⁰ Workshop on the distribution of fire information and possible co-operation and coordination mechanisms in training and extension work among government agencies in Kutai Barat, carried out on June 26 in Melak. Participants came from five government agencies, private companies, and NGO.

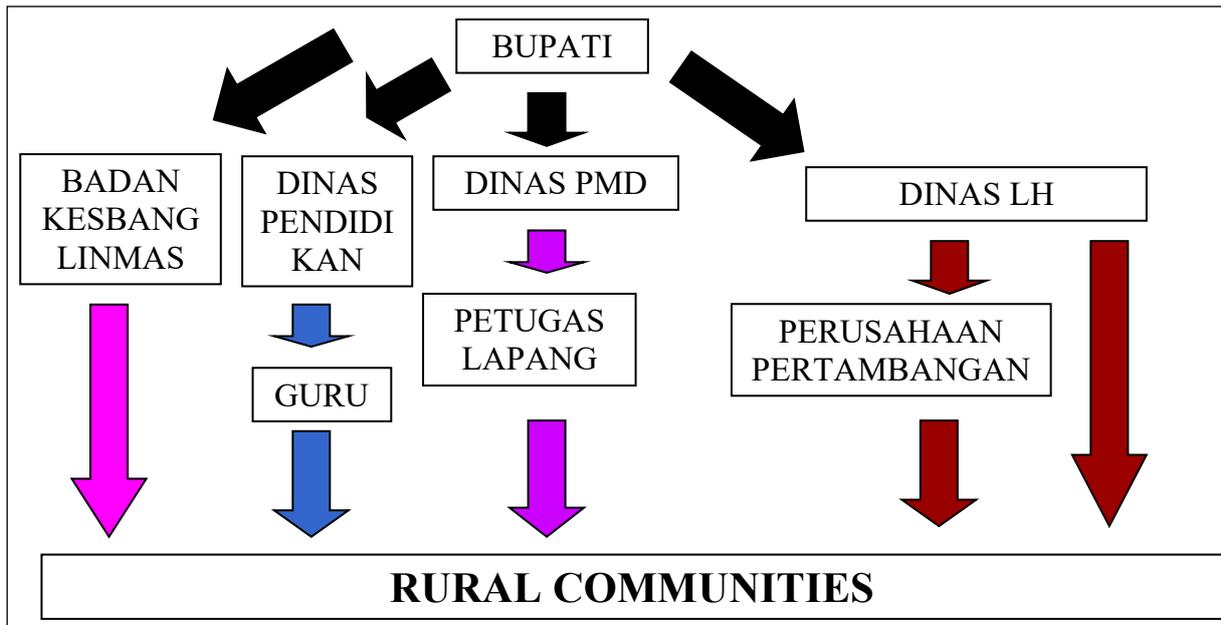


Fig 3b: Proposal for standard procedures for the distribution of fire information and co-operation mechanisms in accordance with readiness levels / early warning

3.2.2 Reporting

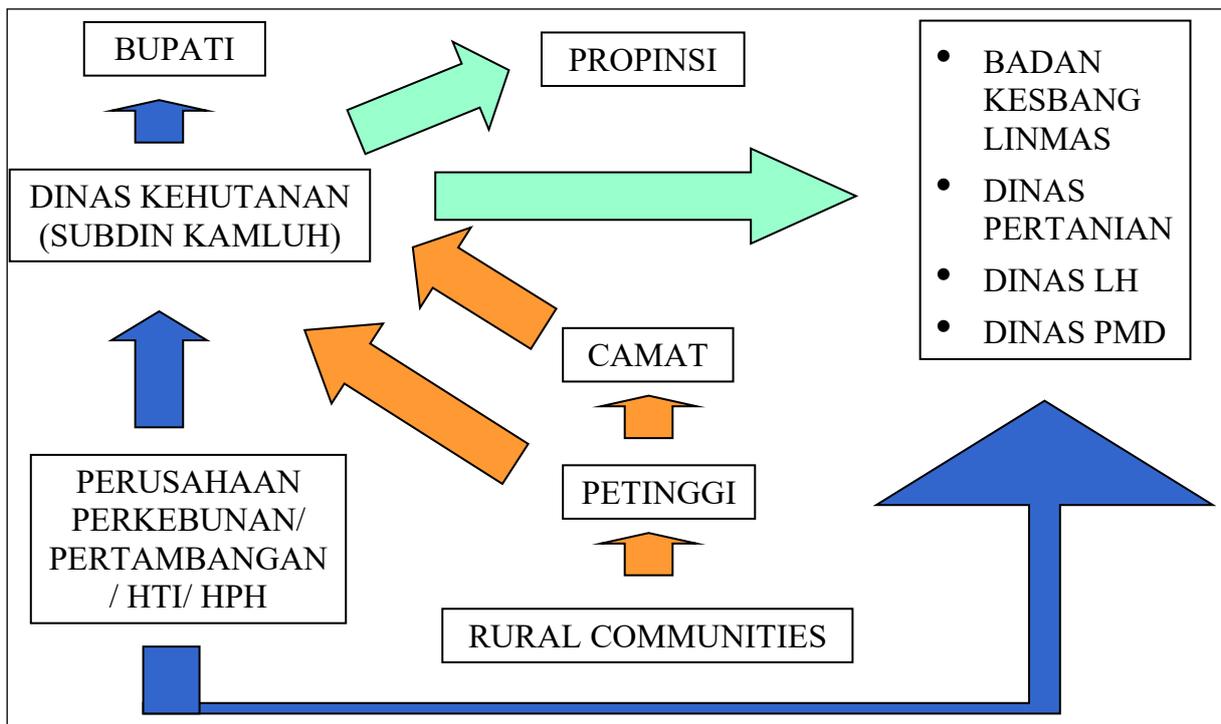


Fig 4: Fire reporting system

In order to set up a data base on wildfire events occurring in the districts, a reporting system must be developed and used by all stakeholders. A fire report must consider the following aspects:

- Fire location

- Area burnt
- Short description of the location (land use type, ownership, vegetation, etc.)
- Estimated damage
- Efforts to put out the fire.

The lead agency to manage the data base should be Dinas Kehutanan. It should report to the district administration desk responsible for statistics and also to UPTD-PKHL. All involved stakeholders should use the same (simple) report forms designed by UPTD-PKHL in co-operation with district Dinas Kehutanan offices. They need to be distributed together with leaflets on reporting procedures to other involved government agencies, managers of private enterprises (forest, mining, etc.), NGO, sub-district offices, and also to village fire crews.

3.2.3 Communication in rural areas

Village fire crews have a critical role in regularly disseminating fire information within their villagers. This can be initiated through close co-operation with the village head (official and customs head). The fire crew boss regularly briefs village heads and other village key persons about preparations for up-coming droughts, forecasts and readiness levels. A signboard at the village head office should give information about the actual readiness level. Furthermore, an opportunity to improve communication within villages can be to invite the village administration to all relevant workshops and other events planned by village fire crews.

During alert level situations, fire prevention material has to be distributed through village campaign gatherings or direct door-to-door activities. A good way of reaching a considerable number of community members can be during prayer times in the mosque or during church services, respectively. It is common that these opportunities have been used for the dissemination of information and are suitable for fire prevention efforts¹¹.

In case of fires, the traditional bronze gong might be a suitable tool to spread such information quickly within villages. In interviews, MODER (2003) found out, that Dayak communities which commonly used gongs in the past still know about the meaning of beating the gong in certain ways. For example, if a gong is beaten fast, something (often bad) happened and this has to be urgently reported to the community (disease, an unexpected incident, fires, etc.). According to villagers interviewed, the beating of a gong can be easily re-vitalized for fire detection purposes, even though gongs are barely used in villages these days. MODER (2003) states that during the severe drought in 1997/98, gongs were used for reporting fires to the community in 4 of 18 villages interviewed.

If fires can not be brought under control by one fire crew alone, help might be needed from other village fire crews. Assumed, that such co-operation was established before, the village fire crew would then send a messenger out to the next village. This procedure should be part of SOP agreed upon between village fire crews involved. Another possibility was to contact the neighbour village via HT radio. Few people do have such radios, but in most villages at least one set might be available. They are normally used just for fun by talking to other users in the district (and even beyond the district) about all kinds of issues - in one case observed, a HT radio was even be used to broadcast music. Therefore, the use of HT radios for asking neighbouring villagers for help in case of uncontrolled fires would make sense. In addition, HT radios can also be used for distributing fire information and fire prevention messages among villages. Own

¹¹ This assumption is based on own experience when sometimes for example, the authors were spontaneously invited to the mosque to speak about the wildfire issue.

experience shows that HT radio operators would be keen to share this with their listeners once they receive adequate fire information and prevention material from village fire crews, government agencies, concession companies, or development organizations. For example, CARE INTERNATIONAL has been developing a network by introducing HT radios to 28 villages in the framework of their disaster management programme that includes fire management. This enables field staff to closely cooperate with villagers and *vice versa*, gives villagers access to necessary information in order to prepare for future drought situations.

Generally, however, many HT radios found in rural areas might be out of order because of the lack of funds for their maintenance. Nevertheless, HT radios can be a powerful tool to spread fire information and co-ordinate efforts in fire management particularly in remote areas. Wherever it is possible, government agencies involved should therefore support the operation of HT radios for fire management. In this respect, a crucial role should be assigned to donor agencies and NGO.

Sub-district head offices do have an important role in communicating fire information, because they are in a strategic position in rural areas and have access to most of the villages under their responsibility. They can even co-ordinate fire management efforts of village fire crews during dry seasons and help to distribute fire prevention material in close co-operation with Dinas Kehutanan (LFC). Additionally, direct communication by village fire crews with Dinas Kehutanan can be set up through forestry extension workers and also in co-operation with agricultural extension workers of Dinas Pertanian.

In areas with no possibilities of direct communication either between village fire crews and sub-district head offices or village fire crews and government agencies in general, communication cascades should be established. The setting up of cascades should be facilitated by the CBFiM officers and procedures should be entered into SOP of village fire crews. If a dry season approaches, sub-village head offices activate and supervise them in accordance with readiness level information. Cascades should be trained in yearly simulations initiated again by sub-village heads in co-operation with Dinas Kehutanan (LFC).

In concession and plantation areas, companies normally apply professional and well-functioning HT and satellite phone communication systems. During dry seasons, village fire crews in the vicinity of such areas should be provided with HT radios by the companies to connect them with forest protection staff or professional fire brigades. Communication can be set up through open-access frequencies provided to the village fire crews. Subsequently, information about fire activity and coordinated suppression efforts can be organized much easier. Responsibilities in fire prevention such as patrolling can partly be handed over to village fire crews through the provision of contracts during dry seasons (paid labour). Furthermore, also joint village campaigns can be organized and coordinated by the use of HT radio communication. Such arrangements might be perceived as additional incentives and therefore, might increase the motivation of village fire crews to contribute to the protection of forests and plantations. The success of cooperation as described here might be at risk in case of conflicts between companies and villagers. It might even create tensions between different groups within villages and therefore, must be carefully discussed among village fire crews as well as company staff.

The dissemination of fire information and prevention messages through community radios (radio komunitas) and HT radio networks such as ORARI and RAPI should be considered by involved government agencies as a very strategic way to reach thousands of people in rural areas. Community radios are commonly in private hands, operated by hobby radio producers. They mainly broadcast music but also provide all sorts of information and news to their listeners. For fire management purposes, Dinas Kehutanan at district level should therefore make contracts

with community radios and routinely send readiness levels, fire weather forecasts, El Nino predictions, fire reports and other relevant information to them. Furthermore, UPTD-PKHL should record compact discs with fire-relevant information and contributions to fire prevention and send them to Dinas Kehutanan at district level for further distribution to community radios.

In Kutai Barat, local governments partly use community radios to disseminate general information about up-coming meetings or statements about important government issues. MODER (2003) found out, that there are at least seven community radios operating in the district of Kutai Barat. They potentially cover most of the fire risk areas in this district.

In remote areas, access to TV and radio broadcasting might still be limited. In Kutai Barat for example, only 17 percent of households interviewed in 18 villages in high fire risk areas own functioning TV sets (MODER 2003). Only eight percent do have satellite receivers providing them access to TV broadcasts. In addition, local TV programmes can hardly be received in rural areas since these programmes only cover a limited area around major cities in East Kalimantan. The use of newspapers might have similar disadvantages.

Generally, mass media do not necessarily reach villages in fire risk areas. Therefore, it might strategic to use mass media for awareness building in urban areas rather than for the dissemination of fire information in rural areas. However, since these technologies rapidly develop, the conditions might already be different in a few years from now.

Table 15: The distribution of fire information and communication procedures between different stakeholders

Necessary Links	Tool / Procedure	Description	Remarks/ Comments
UPTD-PKHL and other agencies at province level	<ul style="list-style-type: none"> • regular meetings • phone, letter, fax • email • reports 	<ul style="list-style-type: none"> • UPTD-PKHL initiates regular CBFiM meetings with district Dinas Kehutanan offices, the provincial Dinas Pertanian, Dinas Perkebunan, NGO such as BIOMA, CARE, the Mulawarman University, concession association, etc. • readiness levels, early warning information, fire weather per email, fax, and letter • use network to disseminate fire prevention material 	<p>UPTD-PKHL should urgently initiate the setting up of a working group together with other stakeholders.</p> <p>Furthermore, they should encourage involved agencies to develop SOP and allocate budgets</p>
UPTD-PKHL and district Dinas Kehutanan (LFC) and <i>vice versa</i>	<ul style="list-style-type: none"> • phone, fax, letter • email • regular coordination meetings 	<ul style="list-style-type: none"> • fire information routinely sent to the district Dinas Kehutanan offices by UPTD-PKHL • Dinas Kehutanan in the districts regularly sends reports to UPTD-PKHL about fire activities in the districts 	<p>UPTD-PKHL provides standard fire information reports. For readiness level calculation they regularly collect information about fire activity and haze conditions from the districts.</p>

Necessary Links	Tool / Procedure	Description	Remarks/ Comments
Among district agencies involved	<ul style="list-style-type: none"> • phone, fax, letter • (Email) • regular coordination meetings 	<ul style="list-style-type: none"> • fire information from Dinas Kehutanan to other involved agencies and organizations • regular meetings required • Bupati issues decree (SK) to determine agreed structures and procedures • each agency develops SOP in accordance with their portfolio and provides budgets 	<p>Dinas Kehutanan has to push such co-operation since fire is not only an issue of forestry. The local government (Bupati) should support this by providing the legal framework.</p>
From government to villages	<ul style="list-style-type: none"> • HT radios (HUMAS and sub-district heads) • extension workers • community radios • ORARI, RAPI • radio, TV • newspapers • the use of existing networks (health sector) 	<ul style="list-style-type: none"> • fire information from Dinas Kehutanan at district level provided via HUMAS or directly to sub-district head offices and from there, further disseminated to village fire crews • fire information and prevention messages and material presented to local communities by extension workers from forestry and agriculture • in rural areas, Dinas Kehutanan disseminates information and fire prevention messages through community radios and HT radio networks such as ORARI and RAPI • fire information attached to weather forecasts in TV and radio news • newspapers regularly publish readiness levels and other relevant fire information, funded by the government • networks set up e.g. by Dinas Kesehatan cover most areas in the province and are most suitable to facilitate the dissemination of information and prevention material (brochures, leaflets, stickers, etc.) to areas difficult to access by forestry or agriculture staff 	<p>Forestry and agricultural extension workers must be trained in the use of fire information and provided with material by Dinas Kehutanan in co-operation with UPTD-PKHL.</p> <p>Community radios as well as the ORARI and RAPI networks are strategic institutions to facilitate fire information. Local governments must consider payments for such services.</p> <p>Fire information distributed by TV, radio, and newspapers might not necessarily reach villages in fire risk areas. It might be a strategic method for awareness building in urban areas rather than to be used for the distribution of fire information in rural areas.</p> <p>The use of other networks (health) can only be an additional way of disseminating fire-relevant information and can not replace direct co-operation with villagers in rural areas.</p>
From village fire crew to village fire crew	<ul style="list-style-type: none"> • messenger • HT radios • letter • (phone) 		<p>Village markets provide opportunities to spread fire information and prevention material HT radios in many cases out of order</p>

Necessary Links	Tool / Procedure	Description	Remarks/ Comments
From village fire crews to Dinas Kehutanan (district) and <i>vice versa</i>	<ul style="list-style-type: none"> • messenger • HT radios • letter • (phone) 	<ul style="list-style-type: none"> • communication directly through extension workers and / or letters • via sub-district offices by the use of HT radios, messengers, or letter 	<p>In case of fire, the fastest possible way of communication should be used.</p> <p>Fire reports should be sent to Dinas Kehutanan in written form, possibly via the sub-district office.</p>
From village fire crews to Dinas Pertanian or other involved government agencies and <i>vice versa</i>	<ul style="list-style-type: none"> • direct communication • messenger • HT radios 	<ul style="list-style-type: none"> • communication directly through extension workers and / or letters • via sub-district offices by the use of HT radios, messengers, or letter 	<p>Very useful for fire prevention purposes.</p>
From village fire crews to sub-district heads and <i>vice versa</i>	<ul style="list-style-type: none"> • letter from village head • messenger • HT radios • through village head 	<ul style="list-style-type: none"> • villages send fire reports to the sub-village head from there, regular reports to be forwarded to Dinas Kehutanan 	
From village fire crew to concession / plantation company and <i>vice versa</i>	<ul style="list-style-type: none"> • messengers • HT radio • letter • regular meetings 	<ul style="list-style-type: none"> • messengers to be sent to the company office to ask for help in the case of fire • village fire crews should co-operate with companies in conducting fire prevention efforts such as patrolling and also in fire fighting; therefore, regular communication can be established via HT radios 	<p>Fire prevention efforts by village fire crews should be regarded as service provided to a company and should therefore be paid for (paid labour) for the help in fire suppression by village fire crews, mutual agreements should be made without paying money.</p>
Within villages	<ul style="list-style-type: none"> • regular informal briefings • village meetings • door-to-door activities information • announcements in mosques and churches • gong 	<ul style="list-style-type: none"> • fire crew boss regularly briefs village heads (official village head and customs head) • door-to-door for urgent messages (wildfire incident) • village meetings / gatherings used the distribution of prevention messages (campaigns) • fire prevention messages and information about readiness levels etc. distributed in mosques and churches • gong used in case of fire incidents 	<p>Village fire crews need the support and acknowledgement of the other community members and the village administration. Social marketing efforts and the permanent provision of fire information by village fire crews would very much contribute to this. Village fire crews do have a crucial role in disseminating fire information in their villages. This has to be considered in SOP and procedures need to be established.</p>

4. Tasks and Responsibilities in CBFiM-DP

4.1 The Role of Governmental and Non-governmental Organizations

The wildfire issue is not only an issue of the forestry sector. Fires do start in forest as well as in agricultural areas, each including wasteland or devastated areas (e.g. such as *alang-alang* grasslands). Consequently, forestry and agriculture should be the leading sectors in developing and implementing CBFiM. Co-operation and coordination between these two sectors would not only be useful but necessary even though it has been poor in the past. In this respect, however, there are examples with first promising steps towards a better co-ordinated approach in fire management¹².

At provincial level, *UPTD – PKHL* should build up capacities to further develop CBFiM including tasks such as training, monitoring and review of the CBFiM concept with all its components. Since CBFiM has been a relatively new approach in fire management in tropical countries, it would be a good opportunity for the agency to gain local, national and international recognition and support by further promoting CBFiM. *UPTD – PKHL* should co-ordinate efforts in CBFiM with Dinas Pertanian, local NGO (particularly the BIOMA foundation and CARE International Indonesia), and the *Mulawarman* University in Samarinda. Regular meetings together with these agencies and organizations should be carried out. *UPTD – PKHL* should have at least one officer, referred to as the CBFiM officer, directly responsible for all related tasks in CBFiM, otherwise, the success of the approach will be questionable.

Presently, UPTD-PKHL is still very much oriented towards “action in the field” despite limited budgets and personnel. Activities such as the implementation of lavish extension campaigns in districts and the distribution of prevention material to villagers consume time and money and do not have much impact on a long-term base. The key for a successful development of CBFiM will be the ability of the agency to provide the support to districts which they need (and want) to implement CBFiM-DP.

The following roles and responsibilities of UPTD-PKHL have been identified:

- Further develop and improve CBFiM modules and components, based on regular feedback from all possible players involved and on own monitoring activities. Therefore, the UPTD-PKHL should allocate additional budgets for discussion and “lessons learnt” meetings. It should try to establish a working group in CBFiM which meets regularly (at least once every two months) and aims at a co-ordinated improvement of the concept based on the exchange of experience of involved stakeholders. The working group should at least consist of UPTD_PKHL, Dinas Pertanian, representatives from the districts (Dinas Kehutanan), BIOMA, CARE, *Mulawarman* University;
- Elaborate and carry out monitoring mechanisms e.g. through regular consultations with involved district forestry staff, field visits, etc.;
- Provide incentives to districts (see also chapter 3.4) suitable to support the development of CBFiM;
- Encourage to and support the *Mulawarman* University in establishing research and conducting studies related to CBFiM;

¹² In the Kutai Barat district, coordination meetings just started recently among several different government agencies and also non-governmental organizations.

- Provide training in CBFiM-DP (“Train the Trainers”) to district forestry staff (if possible include also agricultural staff and NGO) that covers all CBFiM modules and steps;
- Encourage private companies to adopt the CBFiM-DP program;
- Strengthen international relations (with donors) through regular consultations, presentations, leaflets, newsletter, and others.

At district level, the agencies responsible for implementing CBFiM should be Dinas Kehutanan and BKSDA, the agricultural service Dinas Pertanian, and additionally the estate crop service Dinas Perkebunan (in some districts part of Dinas Pertanian). Dinas Pertanian at district level has field staff particularly trained in extension work or providing counselling and support to rural communities, respectively. They need to be trained in CBFiM and are potential partners to take over tasks such as the distribution of fire information and the implementation of campaigns.

In National Parks or other protected forest areas the responsible agency is the national BKSDA. They should develop CBFiM together with communities living in the vicinity of these areas and also co-operate with the agencies mentioned above.

Table 16: Development of CBFiM: Potential strengths, weaknesses, and responsibilities of agencies and organizations involved in CBFiM

Level	Agency	Potential Strengths	Weaknesses Observed	Potential Responsibilities in CBFiM
National	Ministry of Forestry	Political influence	Far away from the field situation; interest too much aimed at the establishment of <i>BKSDA</i> fire crews only	Encourage for co-operation with other sectors (particularly with agriculture); learn from the provinces and districts and take up concepts in discussions at national and international level; facilitate exchange of experience and knowledge between provinces / districts
	Ministry of Agriculture and Estate Crops	Political influence	Far away from the field situation; not much interest in forest and land fire issues	Support co-operation with other sectors (particularly with forestry) in fire management
	Bapedal	Law enforcement capabilities and responsibilities	Too much involved in technical fire management	Take up village fire regulations to be considered in national discussion on fire laws and regulations;
Province	<i>UPTD – PKHL</i>	Among government agencies the only one with experience and expertise in fire management at local community level; Extension work; Technical training	So far, the agency has been too technical and has tried to maintain operational tasks in the field, which is not useful for an agency at provincial level. So far, no staff member has been particularly appointed for CBFiM	Should be the lead agency in CBFiM development at provincial level; should try to join forces with NGO involved in CBFiM and push forward by establishing a CBFiM working group

Level	Agency	Potential Strengths	Weaknesses Observed	Potential Responsibilities in CBFiM
	Dinas Pertanian	Is the most experienced government agency related to extension work and community development	So far not involved in fire management; limited budgets	Should absolutely be consulted in relation to CBFiM development; Should participate in regular CBFiM working group meetings
	Dinas Perkebunan	“Controls” all estate crop areas; do have strong interest to establish fire management and keep fire out of plantations	Activities at community level limited	Encourage co-operation of estate crop companies with local communities
	Bapedalda	Some experience in extension work and law enforcement related to fire	During the last years, the agency has not been much involved in fire management; limited budgets	Support process of legal drafting
	BIOMA	Many practical experience and expertise related to traditional fire management by communities	Not known	Legal drafting, fire management training based on traditional knowledge; Development of village organizations / community development
	CARE	Develops a village network of 24 villages in one Kutai district; The programme focuses on disaster management; Large number of field staff; Expertise in CBFiM	Not known	Legal drafting, Fire management training, development of village organizations, Networking
District	Dinas Kehutanan	Trained in fire management; in some districts, forestry extension staff available	Too technical; limited experience in community development issues; relationship between forestry and local communities characterized by conflicts in some areas; often limited budgets	Have most important role in CBFiM development; driving force in establishing network in fire management (LFC, other government agencies, NGO, local communities, private sector)
	Dinas Pertanian	Often closest co-operation with local communities among government agencies; highest number of extension workers	Not yet trained in fire management; limited funds, therefore motivation and interest might be limited	Extension workers should contribute to fire prevention efforts and the distribution of fire information in the framework of their village work
	Dinas Perkebunan (not all districts)	Not known	Not known	Support and facilitate co-operation of estate crop companies with local communities
	Dinas Lingkungan / Bapedalda	Has partly been involved in fire prevention campaigns and training	Often limited number of staff and no extension workers; limited budgets	Contribute to the distribution of fire information and prevention work; co-operate with village fire crews in legal drafting and law enforcement

Level	Agency	Potential Strengths	Weaknesses Observed	Potential Responsibilities in CBFiM
	Dinas Pendidikan	Education mission includes environmental issues; covers all rural areas; probably the most extensive network besides the health sector	Not much incentives to contribute to fire prevention; so far, contribution depends on the interest of individuals only; limited budgets	Carry out school events in fire prevention and/or integrate wildfire issue into school lessons; distribute prevention material in schools
	Local NGO	Direct access to and support for communities; intensive consultations	Often not trained in fire management; fire management not yet a major issue	Joint facilitation of CBFiM-DP together with Dinas Kehutanan and/or Dinas Pertanian
	Forestry concessions	Normally do have community development sections (“Bina desa” programme); many concessions experienced in fire management;	Co-operation in fire management between concessions and local communities very limited, partly due to conflicts or lack of interest; in some areas, forest concession management hampered due to overlapping land / forest use rights	Co-ordinate fire management efforts with villages inside of and adjacent to the concession area. Fire prevention campaigns, joint training events, co-operation in patrolling, etc.
	Estate crops companies	Not known	Potential (land use) conflicts might hamper co-operation with local communities	Co-ordinate fire management efforts with villages inside of and adjacent to the concession area. Fire prevention campaigns, joint training events, co-operation in patrolling, etc.
	Gold and coal mining	Do have strong community development sections and programmes; strong financial resources	Potential conflicts might hamper co-operation with local communities	Integrate CBFiM-DP in community development work.

4.2 The Need to Create CBFiM Officer Positions

The development of CBFiM needs intensive support and input from government and non-government agencies. Only then it can become a strategic approach towards the reduction of wildfires in the province. The PFC (UPTD-PKHL) and even more the LFC of district forestry services have a significant role in that. But to date, there are often no Dinas Kehutanan personnel at province and district level assigned to routinely and regularly co-operate with local communities in East Kalimantan¹³. This, however, would be a key critical for the success of CBFiM-DP. In addition, it is also essential that CBFiM-DP is considered part of a general community development process in order to achieve substantial results in managing fires in rural areas. Such challenges can only be managed with especially assigned CBFiM staff. For these reasons, Dinas Kehutanan at provincial and district level should create CBFiM officer positions

¹³ For example in Kutai Barat, previously assigned forestry extension workers have been put into other positions. Co-operation with rural communities beyond the provision of training and equipment has been much depending on the motivation and interest of individuals only.

who will then facilitate and carry out the implementation of a CBFiM-DP in its necessary extend, flexibility, and intensity.

4.2.1 The CBFiM Officer at Provincial Level

The UPTD-PKHL as a unit of Dinas Kehutanan is designed to support fire management activities in the districts in East Kalimantan by providing “hot spot” locations, fire danger rating indexes, fire risk maps, material for prevention campaigns, support for training, and fire suppression methods to all involved agencies and institutions. Besides these tasks, UPTD-PKHL has been a major driving force in the development of CBFiM. Its current and future role will be to provide guidance and expertise in CBFiM to the districts. Thus, a CBFiM officer at UPTD-PKHL should have the following tasks:

- Develop suitable marketing strategies to promote CBFiM-DP to the district authorities
- Design concepts and materials to support district CBFiM officers in implementing CBFiM-DP. Design prevention material such as leaflets on readiness levels and government regulations (e.g. the governor’s regulation No. 522/K.130/2003 on determining readiness levels)) suitable for village use and provide them to LFC and other stakeholders
- Hold regular CBFiM co-ordination meetings with involved stakeholders (mainly Dinas Pertanian, NGO, the *Mulawarman* University, and district forestry service personnel / CBFiM officers)
- Continuously improve the UPTD-PKHL approach in CBFiM-DP in accordance with needs derived from co-operation with reference communities, NGO, and district forestry and agricultural personnel
- Design and carry out the monitoring and evaluation of CBFiM efforts in the province; Keep records about village fire crews (number, members, efforts, training, etc.)
- Write regular reports to district forestry services (or LFC) about provincial developments to inform about provincial efforts in CBFiM-DP.

The CBFiM officer position should be at section head or at least a sub-section head level. A CBFiM officer might require the support of 1-2 staff members.

4.2.2 CBFiM Officers at District Level

LFC are hoped to become the core of a fire management organization at district level and are designed to establish and provide cooperative assistance, guidance and services in CBFiM-DP. Services to local communities have to go beyond the provision of training, fire fighting equipment, and fire prevention material. As described before, LFC have to develop community development capacities in order to establish co-operation with rural communities in fire risk areas. Therefore, the organizational chart of LFC should consider CBFiM sections, which are responsible for organizing and implementing CBFiM-DP modules in selected villages. Fire prevention should be an integrated task of these CBFiM sections.

There are certain preconditions before LFC can take over this role in CBFiM-DP:

- LFC have to be operational (legal status, role, and functions of LFC clarified, staff members assigned with clear job descriptions and tasks, operational budgets allocated); CBFiM officers have to be assigned explicitly responsible for CBFiM

- Sufficient budgets for CBFiM are available allocated towards long-term support for communities in high fire risk areas
- LFC need to co-operate with other agencies / organizations involved in community development work in order to share responsibilities and costs.

To date, LFC have been handled differently from district to district. Very few forestry personnel have been directly assigned to LFC. In most districts, LFC are only used as warehouses (or cache) and fire management tasks such as fire suppression and the maintenance of equipment has been assigned as additional tasks to forestry officers. However, in at least three districts, such organizations gradually evolve from previous forest protection sections¹⁴. This is mainly a result of intensive networking and “marketing” of fire management concepts in the districts, carried out by IFFM together with UPTD-PKHL.

Nevertheless, the development of LFC as fire management organizations under district forestry services Dinas Kehutanan proves difficult. Therefore, a minimum goal should be that forest protection sections of district Dinas Kehutanan develop capacities in CBFiM-DP. Once again, however, this can not be accomplished without assigning staff particularly responsible for CBFiM-DP.

CBFiM officers at district level should have the following tasks:

- Implement CBFiM-DP modules; adjust and modify modules in accordance with local needs
- Closely co-operate and co-ordinate efforts with forestry extension workers as well as with extension workers of the agricultural agency Dinas Pertanian, other government agencies involved, NGO, community development sections of private enterprises, etc.
- Carry out regular village visits and consultations with village fire crews and village leaders at least once every 2-3 months during normal conditions and once a week during high alert conditions. Also maintain regular communication links with sub-district heads (*camat*)
- Facilitate CBFiM-DP modules, including the moderation of CBFiM-DP workshops
- Support village fire crews in acquiring budgets; Encourage village fire crews to develop income strategies.
- Assist village fire crews in identifying and acquiring the appropriate fire-fighting equipment; monitor and support the maintenance and repair of hand tools provided by the government (mainly through KfW funding)
- Encourage and support the exchange of experience between village fire crews by organizing events such as discussion meetings or sports events with crews competing with each other in different disciplines, e.g. by demonstrating their fire fighting skills, etc.; Organize at least one such event every year
- Manage all incoming and outgoing fire information from and to local communities (early warning, readiness levels, hotspots, fire reports from villages, etc.); also co-operate with HUMAS, the public relations section of the government, and with private radio stations to provide them with fire-relevant information for further distribution.
- Plans, co-ordinate, and implement fire prevention campaigns and activities, preferably in a joint approach with other agencies.
- Monitor and evaluate efforts in CBFiM; provide regular monitoring and evaluation reports to district Dinas Kehutanan and to UPTD-PKHL.

¹⁴ The districts of Kutai Barat, Balikpapan, and Kutai Timor

The CBFiM officer position should be at section head or at least a sub-section head level. A CBFiM officer might require the support of 1-2 staff members.

4.2.3 Qualifications of CBFiM Officers

Generally, the qualifications of CBFiM officers should include good communication, facilitation and moderation skills. They should be trained in applying participatory methods in workshops and other events and also in the design and implementation of training (training concept, visualization methods, didactics, etc.). They should have passed basic fire management training and the following “Training of Trainers” level. Eventually, training in environmental education and outreach (methods and materials) would be advantageous, especially at district level.

4.3 Who Should Finance CBFiM-DP?

Generally, most efforts in the development of CBFiM should be born by district and province governments with Dinas Kehutanan in a central role. At provincial level, UPTD-PKHL has gained much recognition with the help of IFFM. It certainly has a key role in promoting CBFiM and needs to apply for sufficient budgets in accordance with its general mission. The agency has also a strategic role to address the fire management issue to national and international donor agencies in order to gain support and funding. Generally, donor support through financing CBFiM-DP efforts is essential and has to be strived for.

Table 17: Budget sources

Budget Source	Agency	Comments
National budgets	BKSDA	UPTD-PKHL and district forestry services might have limited access
Provincial budgets	UPTD – PKHL Dinas Pertanian Dinas Perkebunan Bapedalda	Provincial budgets should include incentives to promote CBFiM to districts governments
District budgets	Dinas Kehutanan, Dinas Pertanian, Dinas Perkebunan Dinas Lingkungan (Bapedalda) and others	The clarification of responsibilities between the Province and Districts will certainly improve the budget situation for fire management including CBFiM in the districts
Forest concession and plantation companies, agricultural plantations, mining etc.	e.g. <i>Sumalindo, Rio Tinto, KEM, KPC</i> , etc.	The private sector needs to contribute by providing support and funds for community training, hand tools, village workshops, fire prevention material and prevention campaigns, paid labour such as patrolling, operational budgets for village fire crews, etc.
Donor support	NGO, UPTD – PKHL, Province and District agencies	Without future support of donor agencies, fire management in general and CBFiM-DP in particular will be difficult.

The forestry sector in the districts should initiate a co-operation with other land management agencies as described before¹⁵. Joint meetings and workshops will be necessary to agree on the responsibilities of each involved agency. The organizing of such meetings need to be supported –

¹⁵ This approach has been initiated in Kutai Barat, where the local government is very much in favour of a co-operation among all involved agencies in the district to share responsibilities in fire management.

even pushed – by the provincial UPTD-PKHL. The agency should also apply strategies to convince local governments (*Bupati* office) to chair these efforts. In the framework of such a co-ordinated approach, each involved government agency will then identify its contribution and should apply for the necessary budgets.

Besides Dinas Kehutanan, NGO such as BIOMA and CARE have gained excellent skills and experience in facilitating CBFiM-DP modules. They should strongly contribute to the development of CBFiM and have strategic access to budgets, provided by donor agencies.

4.4 Additional Incentives to Support and Promote the Development of CBFiM

In order to increase motivation and interest of local communities to participate in CBFiM-DP, additional incentives might be required. Incentives also potentially enhance rural communities’ contributions to an overall fire management system driven by the government (e.g. by preventing and/or fighting forest fires).

Village fire crews need official recognition as well as administrative, financial, organizational, educational and legal support by the district and provincial governments. Besides this, the popularity of fire management has to be increased in rural areas. Pride and honor to are attributes which need to be attached to the voluntary efforts village fire crews are making in Indonesia. This can be through awards granted to villages for successful performances in wildfire prevention and/or fire suppression during high fire danger episodes. Such awards can range from simple decorations, the provision of seedlings, funds for certain village activities, to special development measures like the improvement of village infrastructure and many more. The commitment and creativity of the government is required here to make potential incentives work and eventually fire management more popular.

Further incentives might be income generating programmes such as the provision of tree seedlings to local communities to rehabilitate fire-affected areas on community land. Through agro-forestry measures and later the marketing of timber from these rehabilitation areas, communities can realize income – presumed that the government fosters the marketing process as well. As an additional effect, communities might be strongly interested to protect these rehabilitation areas from fire. Especially for Dinas Kehutanan, the provision of such incentives might be a good opportunity to improve the previously often troubled relationship with local communities.

Table 18: Some additional incentives in the framework of CBFiM-DP

Aspect / Approach	Description	Benefits to the Community
Sports events – Competitions between village fire crews	Dinas Kehutanan organizes and finances village sport events among different village fire crews (e.g. from several neighbouring villages) with different competitions and events to show their fire management skills.	Such events can be good opportunities to increase the motivation of village fire crews and generally make village fire management more popular. Regularly promoted, they can become popular gatherings in rural areas and attract hundreds of people

Aspect / Approach	Description	Benefits to the Community
The provision of seedlings, for the rehabilitation of fire-affected areas	This has been carried out in several villages by the Ex-Kanwil Kehutanan department to provide an additional incentive related to fire prevention in the respected area. Also the BIOMA foundation and CARE International Indonesia provided seedlings basically a emergency measure after the drought and the fires in 1997/98. Tree seedlings provided in the framework of the rehabilitation of burnt forest areas or general fire-prone areas can be good long-term incentives for local communities. The local forest office must plan, monitor, evaluate, and finance such rehabilitation measures in high fire risk areas together with local communities. A rehabilitation programme has to be designed and training conducted on the management of rehabilitation areas.	Such an incentive can be a good income-generating measure on a long-term base. Trees planted can be harvested by the community after a certain period of time and sold to the neighbour forest concession company, providing cash to the community. Contracts or MoU between local communities and companies or the local forest service, respectively, with a guaranteed takeover of timber need to be established. A further benefit would be that such a measure potentially reduces areas prone to fire in a certain area and potentially motivates villagers to protect such areas.
Awards / rewarding of efforts	Every year, district governments should award successful performances in wildfire prevention and/or fire suppression during high fire danger episodes. These awards should be granted particularly to villages with fire crews in accordance with a number of criteria (e.g. village fire crew established, contribution to fire prevention measures; successfully protected forest areas from fire, and others). Awards can range from simple decorations, the provision of seedlings, funds for certain village activities, to special development measures like the improvement of village infrastructure and many more. In 1998, the national government awarded the Karya Baru village in East Kalimantan for successful fire prevention work during the 1997/98 El Niño drought. The village fire crew successfully prevented fires from entering the village area and even helped other villages in suppressing fires. As a result, parts of the nearby forest could be protected from fire.	The presentation of awards potentially stimulates pride and honour of village fire crew members and therefore can be an effective way to foster the development of fire management in rural areas. Besides this, it should provide direct incentives such as e.g. infrastructural development measures in villages. Subsequently, the whole village will experience the benefits of efforts made by their village fire crews.
Emergency measures during and after fire disaster	Mitigating negative impacts of fires in rural areas by providing food (and / or other commodities) to villages most affected by is a very much needed first step in disaster situations. Further measures related to fire-caused smoke and haze are the provision of masks (respirators), medication for asthmatics and general health support. Providing food security and health support can be a strategic entry point for developing CBFiM.	Emergency measures are aimed at the mitigation of negative impacts of wildfires and other disasters and therefore potentially create immediate benefits to affected communities.
Material support such as additional equipment, uniforms, etc. to village fire crews	Hand tools originally provided to villages by Dinas and Ex-Kanwil Kehutanan (with KfW funds) was only a starter set. If a village fire crew has been set up, more equipment might be required. Additional equipment can consist of back-pack pump, Pulaski, McLeod tool , etc. Furthermore, simple uniforms (long trouser sand t-shirts with in-printed crew and village name can be provided to village fire crews	Such measures certainly increase the motivation of village fire crews. Especially crew uniforms potentially contribute to a stronger identification of members with their crew and their voluntary work for their village. The provision of additional hand tools has to be carefully elaborated since equipment has to be suitable and fit the village fire crew supposed to receive it.

4.5 Time Frame of CBFiM-DP and Future Vision

The development of CBFiM in fire risk areas should be started in clusters with not more than four to maximum six villages. For the implementation of all CBFiM-DP modules, a period of about 2-3 years should be envisaged in each cluster, depending on the number of personnel and budgets available. A shorter implementation period might be unrealistic and might even hamper the success of CBFiM-DP.

Besides implementing CBFiM-DP modules, intensive and regular village consultations have to be carried out by CBFiM officers. Such efforts will further intensify the participation of village fire crews and might even reduce the overall time required for the programme. However, more important than the overall time needed for the implementation is the quality of work. Facilitators should always remember the goal that village fire crews eventually need to carry out CBFiM in an independent and self-reliable way. Once self-interest has been established, there's a good chance that they successfully manage fires in their village areas. Consequently, the number of devastating wildfires as well as the area affected by them should be drastically reduced.

Nevertheless, after the completion of CBFiM-DP, some future support for village fire crews is still required. Support should include the monitoring and evaluation of CBFiM efforts in co-operation with village fire crews and "on-request" – facilitation of workshops which they organize in the framework of their CBFiM routine.

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