



**COMMUNITY BASED FIRE MANAGEMENT  
(CBFiM)**

## **11. Community Based Fire Management (CBFiM)**

### **11.1 Background**

Community Based Fire Management or (CBFiM) was first introduced into the fire terminology in the late 1990s and CBFiM practices were first analyzed in South East Asia (Moore 1998) where persistent fires arising from a complex set of circumstances, primarily from land conversion. The analysis stressed that the underlying causes to fire needed to be investigated, before any other actions towards the use of fire could be assessed.

Fire management also include activities such as: early warning, detection, mobilization and suppression of unwanted fires; in addition also restoration and rehabilitation of burned areas.

However, also policy/legal/regulatory frameworks had to be adapted to the new understanding of the role of fire in ecosystems worldwide. It was also recognized, that controlled or prescribed use of fire in local communities, allowed them to play an important role in wildland fire management.

### **11.2 CBFiM – What is it?**

#### **11.2.1 Definition**

Community-Based Fire Management (CBFiM) (FAO, 2006) is a management approach based on the strategy to include local communities in the proper application of land-use fires (managed beneficial fires for controlling weeds, reducing the impact of pests and diseases, generating income from non-timber forest products, creating forage and hunting, etc.), wildfire prevention, and in preparedness and suppression of wildfires. CBFiM approaches can play a significant role in fire management, especially in most parts of the world where human-based ignitions are the primary source of wildfires that affect livelihood, health and security of people. They include planning and supervision of activities, joint action for prescribed fire and fire monitoring and response, applying sanctions, and providing support to individuals to enhance their fire management tasks. Fire management should be safe, effective, environmentally, and socially acceptable, therefore communities can only assist in large-scale fire suppression, but should not be expected to shoulder the entire burden.

#### **11.2.2 Gender and fire**

An intrinsic aspect in community based fire management is gender, and in developing nations in particular, the roles of women, men and children. These roles can be quite specific, detailed and different. One example that illustrates this well comes from North-eastern Namibia. Data collected in North-Eastern Namibia in 1996, was similar to the data from the neighbouring countries of Angola, Zambia, Zimbabwe and Botswana: fire scar mapping of the area by satellite revealed; that between 50-85% of the forests, woodlands, savanna and grasslands was found to have burned each year.

In meetings with traditional leaders, technical staff discussed possible fire management strategies and steps that should be taken to reverse the trend of increasing, uncontrolled fires, aimed at restoring the situation to one in which the use of fire in the region was practiced in an environmentally sustainable manner.

When collecting data to serve as a basis for a study underpinning the above discussions, it was found that when men were interviewed, the main reason given for burning was because of "traditions", inherited from father to son. When women were asked the same questions, they stated that most wildfires had escaped from scheduled agricultural burning, a task that was exclusively carried out by women. Although the clearing of new land for shifting cultivation was carried out by men, it was found that spot-burning to kill and remove stumps and trees from clearings was mainly done by women, who also carried out all agricultural burning following the harvesting of crops. It is evident that in order to prepare a viable strategy for sustainable fire management in which local people are involved, gender aggregated baseline data is needed.

Gender aggregated data from pilot regions showed that 80% of the number of all fires was lit by women and 20% by men; but for primarily different reasons. It was concluded that in this case fire programmes should to a large extent target women not men, as had been previously done by the donor community. This targeting of men arose from the focus of all efforts on detection and suppression, activities dominated by men; instead of on prevention which was a women's domain.

The people, women fire users, know very well that fire outbreaks threaten the very resources they need for survival, in addition also their housing, children and elderly people.

In a survey in Mozambique 17 % of women said that their crop had burned during the last year and 16% that their house had burned down; all in all 39% of women confirmed that their house had burned down one time or the other. Out of men 48% and out of women 36% confirmed that they had experienced losses due to wildfires encroaching into their land.

In poor countries the use of fire is mainly about the lack of economic choice and alternatives. There is no choice but to keep using fire in agricultural activities despite having no resources to handle a large fire outbreak resulting from burning in livelihood activities. Since women are involved in most rural burning activities in many countries, therefore they should also receive high priority when planning fire training. Particularly so, because in most cases women are excluded from primary decision-making processes on management of land resources – a situation that needs to be addressed in the context of CBFiM as well as other frameworks.

### **11.2.3 Forms of CBFiM**

There are communities involved in fire management in a range of ways:

- In Finland where most members of the Voluntary Fire Brigades in local communities have most of their assets invested in "forest farming" and are private forest owners and will therefore protect their forests; and
- Australia through Volunteer Fire Brigades that arise from the community and are mainly for protection of community assets and perhaps in many cases less engaged in forest and land management for subsistence or dependence on it in other ways.

These groups are volunteers, from the community and in a sense 'for' the community but they are focused on fire fighting in two respects - preparedness and response with a little bit of prevention if they participate in prescribe burning or other measures. They are not really "community based" in the sense that CBFiM has been considered to date in developing nations.

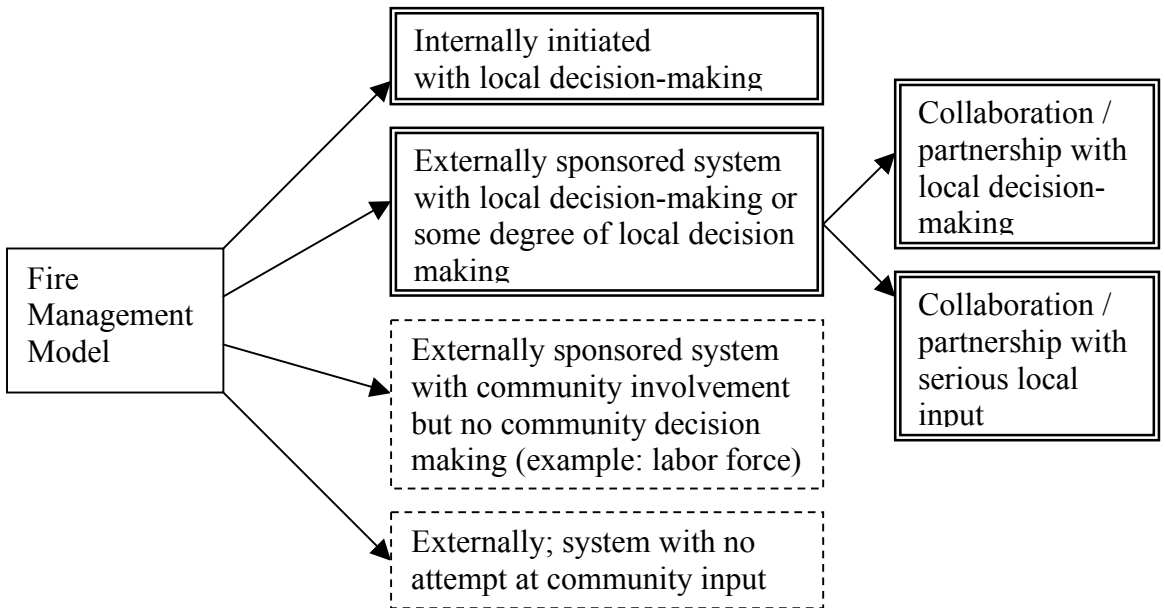
”Some (Moore, 2004) modes of management that do not allow for community input but do allow for community involvement (*Figure 1 - dashed lines*) are not considered CBFiM as per the definition previously given.

Although there is some emphasis on whether the system is initiated internally or externally, it should be noted that the initiation is not as important as the amount of credibility given to local decision making (*Figure 1 - double lines*)”.

Any attempt to improve and support CBFiM must start with an understanding of the causes and functions of various types of fires, and with their implications to various stakeholders within and outside a community. Similarly whether various stakeholders see a fire as beneficial or damaging is important before deciding what management is appropriate or possible.

The technical and organisational capacities of communities should also be considered.

Figure 1: Modes of Community Input in Decision Making in Fire Management (Moore, 2004)



#### 11.2.4 Policy/legal/regulatory frameworks and CBFiM

In most developing nations, fire is not well dealt with in legislation. The tenure covered is usually restricted to public lands and the responsibility for fires is not clearly stated.

Fire legislation is often also split up into many small paragraphs within a number of separate Ministries. Generally legislation is treating fires as negative and destructive. The use of fire for livelihoods purposes is seldom accepted, with exceptions in a few countries. The lighting of open fires is in many cases an offence punishable under the laws. Malaysian legislation is an exception where deliberate fire is allowed under permit for local and small-scale activities that are specified in the law. Commercial scale fire use is however banned in Malaysia.

Specific Legislation most often criminalises local farmers using fire as illustrated by the "old" Forest Act, Article 40. from Mozambique:

*"Anyone who, voluntarily, sets fire and thus partially or totally destroys crops, forests, woods or a grove of trees, shall be condemned to an imprisonment sentence of up to one year and to the corresponding fine".*

Millions of local families are daily practicing shifting cultivation around the world; how then apply socially inappropriate laws to the essential livelihood practices in local communities? The only solution is to involve these communities in; fire awareness, mitigation and education activities (CBFiM). Thereby their traditional knowledge and inherent skills are applied to the avoidance of unwanted damaging fires, and leads to expanded use of beneficial fires.

Increasing awareness of the damaging effects of fires (in monetary terms) e.g. on local people's food security and livelihoods, can have a strong effect on motivating communities. Local communities may not have recognized the negative fire impacts on their livelihood, as demonstrated in Brazil, India and Tanzania. People often perceive wild fire only as a seasonal nuisance related to local traditions.

With the meager resources usually allocated to fire management, Governments often cannot supervise culturally accepted use of daily fires; and the tightening of legislation, will not have any impact on wildfire occurrence as long as people will have to practice shifting cultivation because of lack of other livelihood opportunities.

In Namibia a similar situation was approached by developing National Guidelines on Fire Management; wherein directives were laid out on the responsibilities of various stakeholders in CBFiM, including principles for community participation in forest protection.

#### 11.2.5 Land tenure

A further consideration is the clarity of tenure under laws and regulation. In CBFiM efforts, the formal or informal rights of access, and use of lands was globally identified as a key aspect of communities taking an active role in fire management. The allocation of rights, access and operational efforts to clarify tenure are in many case not well formed in many nations. This is not necessarily restricted to developing nations as an issue.

There are many important components involved in fire management at the policy and field level, but a recurring theme is the fundamental question of who should control the use of fire and manage it appropriately? The rural landscape in developing nations remains home to hundreds of millions of people, both indigenous inhabitants as well as voluntary and forced migrants. Rural communities inevitably compete with internal and external factors for access to natural resources and the right to use fire as a management tool. Increased competition for land, water and forest resources may be an important factor driving the need for more clearly defined roles and responsibilities in fire management.

### **3.3 Fire and burning**

Fire is a disturbance that has played, and will continue to play, a major role in both fire sensitive and fire adapted ecosystems throughout the world. In almost all of these ecosystems, humans have altered the natural fire regimes by changing the frequency and intensity of fires. Local communities are often blamed for fires which are considered harmful, the benefits of burning to the ecology nobody seem to recognise. Evidently because local people usually have most at stake in the event of a harmful fire, they should clearly be involved in mitigating unwanted fires.

In many cases, the re-introduction of fire is as important as preventing damaging, unwanted fires. It is also important to recognize that human values and cultural norms are as important as ecological values.

#### **11. 3.1 Agricultural Burning**

Agricultural burning globally, seem to be accepted as a necessary daily practice in most countries. However, when these often uncontrolled fires, despite being planned, run out of control, then agencies argue about whose responsibility the management of these fires are. However, seldom if ever, do the Agriculture Departments claim responsibility for causing these fires.

Out of all global fires 95% stem from various human activities, it is estimated that 80% of fires globally burning in forested areas, stem from escaped agricultural fires. When an agricultural fire spreads in to a forest, then the fire management responsibility is automatically transferred to forestry staff or lately also to staff of Fire and Rescue Departments e.g. as recently in Tanzania.

Agricultural fires are used for a wide range of purposes including:

- Management and maintenance of rangelands agricultural lands;
- Land conversion from forest land to agricultural land;
- Beekeeping, Hunting, Wildlife Management; and
- Native/Indigenous people's fires and cultural fires.

Escaped agricultural fires represented 91% of all wildland fires in Italy (Corpo Forestale) and 95% of fires in Portugal in 2002.

The proportion of forest fires arising from escaped agricultural fires indicate that strengthening or encouraging of community based fire management is likely to be a significant means of improving the impacts of unwanted and damaging fires. The impact of this approach might be enormous; therefore community fire use must be recognised as potentially the largest source of information, expertise and experience available.

Fires cannot be completely excluded from the daily lives of people and the landscapes they inhabit. Studies illustrate the ways communities use smaller wanted fire to cultivate crops and non-timber forest products, hunt, create forage and manage pests and disease need to be distinguished from uncontrolled fires. In Australasian, European and North American context of recent years, alarmingly many of these fires are caused by arson i.e. they are deliberately lit.

#### **11.4 The Current State of CBFiM**

To varying degrees, governments have begun to adopt collaborative or community-based forest management strategies. The emphasis on "community-based" is not only the community involvement, but also where community capacity has been recognized and supported by external agencies (governments, non-government organizations, projects and others).

More common are instances where CBFiM has resulted from the formation of community institutions and mechanisms that support more efficient fire management entities.

In some countries, the driving force behind CBFiM approaches is indigenous land and/or use rights, including the right to use fire as a management tool. The securing of these rights may ultimately help maintain the beneficial uses of managed fires.

It is also important to caution in respect of over-emphasizing the role and capacity of local communities to fight fires historically larger and of higher intensity than those of the regimes of the past. Several of the CBFiM approaches documented in various sources occur in remote locations, where the government's fire control/suppression approaches are severely hindered by access, response time and availability of funding.

#### **11.5 External Intervention**

Since external actors have generated most of the documentation and assessment on CBFiM, there is also an emphasis on the means and modes of approaches to intervention. To lead to *sustainable CBFiM*, the aim should be to build on existing knowledge. Communities must own the fire management activity and design their community participation approach fitting their locality. It was recommended that: Communities should call/arrange their own meetings and invite experts that they think will be of use for their location considering their available resources. This will only happen if fire management is integrated with their production/livelihood systems.

Recently the awareness has been increasing on the role of food security and health security (HIV) of local populations from forests. Hundreds of millions of people are gathering their food (medicines) from forests; therefore more external support should be provided for increasing skills of local people in using fire beneficially.

##### **11.5.1 CBFiM Processes and Activities/Products by External Actors**

Based on experiences especially in Latin America, Sub-Saharan Africa and South East Asia, the following processes and activities are proposed for planning and implementing sound fire programmes, which give due consideration to both technical issues and stakeholder involvement.

A critical facet of the processes for supporting CBFiM is to carry out a baseline study at village level to record local community aspirations. Together with forestry and/or agricultural extension workers and the village leaders organize community workshops to discuss the fire history of the village, fire use, wildfire causes, wildfire impacts, past fire management efforts.

## **11.6 The lengthy process of changing human behaviour**

Out of all global fires 95% stem from various human activities; consequently therefore, unwanted fires globally should be reduced by proactive means of educating people.

However, many Governments, especially in developed nations, have over the last years, invested most of their resources in heavy fire fighting equipment, rather than in educating their people. The neglect to educate the growing population can in many cases be seen in the growing number of wild fires (uncontrolled fires).

Therefore, awareness rising was in the early 2000s, considered a key issue when aiming at success in fire prevention, mitigation and education programmes worldwide. Human values, perceptions, beliefs, behaviour and cultural norms, were considered as important as ecological values in fire management. Enabling local people to become involved in managing their fires is a lengthy fundamental process, which will require several years to become effective.

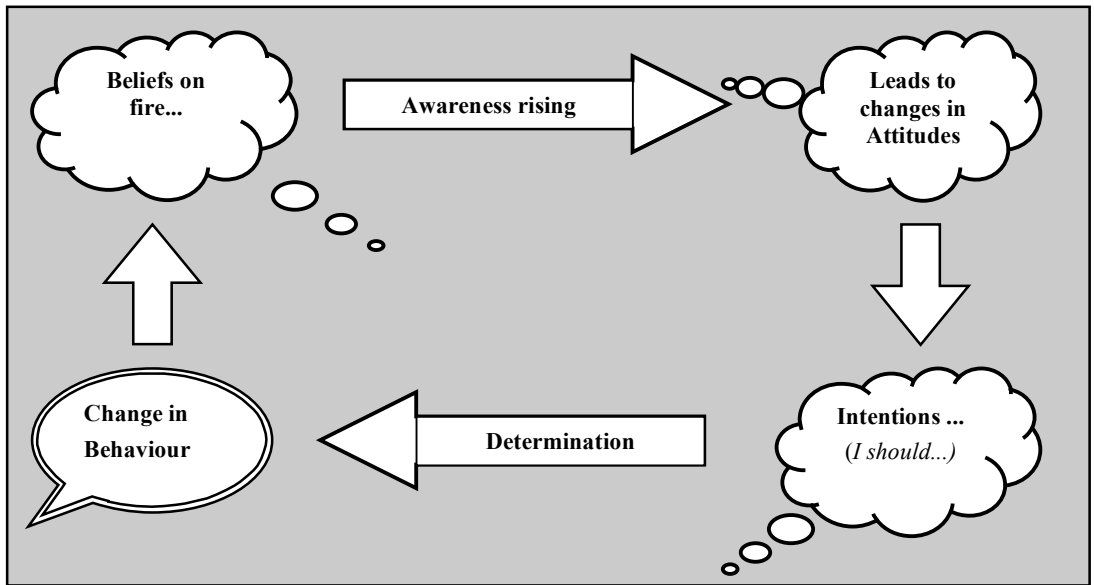
Awareness raising and increased participation of rural populations in wildfire prevention and fire management, is the main goal of organizing national, regional or local Fire Campaigns. Based on experience drawn from many prevention campaigns carried out around the world, the following aspects should be included into village campaigns in one or the other way:

- Functions and importance of landscapes;
- The ecological, economic, social and cultural benefits of fire;
- The role of fire in the landscape;
- The implications of removing fire from its ecological, traditional or economic function in the landscape;
- Possible wildfire risks;
- Negative impacts of wildfires;
- Introduction to laws and regulations related to fire;
- Prescribed burning in shifting cultivation and agriculture; and
- Possibilities for the participation of rural communities in fire management.

The active participation of communities in village campaigns is very important and facilitators should understand local culture. The programme should allow as much contribution and inputs as possible from the participants and good visualization and easy-to-understand contents are crucial in presentations given by facilitators.



## Fishbein 1967; ("Theory of reasoned action") applied to fire awareness rising



By analyzing Fishbein's "Theory of reasoned action" one can easily understand that if the aim is to introduce controlled use of fire by the local population, then one cannot approach the human population with contradicting messages such as; "fire is good" but you burn too much.

Even the "Theory of Planned Behaviour" (Ajzen 2002) still discusses the processes needed to change human behaviour. The success of fire awareness rising depends on how to make the task socially acceptable; community members clearly have to be able to see their own personal benefits, before they are going to change their behaviour.

To truly convince the local population, acquired Gender data and literacy levels, will further help to indicate as to what extent e.g. movie shows, theatre plays etc. should be used during the Campaign. The fire staff need to co-operate and co-ordinate efforts with all other government, non-government and outreach agencies. They also closely co-operate with the provincial fire officials, which should be responsible mainly for the development of concepts, campaign material, and the training of facilitators. Only these combined approaches will ascertain that; people move from the level of beliefs to new attitudes and further to *intentions*. The difficult final step is to move the human mind from mere intentions to changes in behaviour.

### 11.7 Development of Rural Community Fire Institutions

Community or village fire management has to be institutionalized at an early stage of any development effort. Responsibilities and tasks have to be assigned to community members who will, on a voluntary basis, make up a village fire crew or unit. Confirming the safe use of fire and effective fire management practice, including use of fire for ecological management is a key aspect of institutional development.

The village Fire Unit has to detect, prevent, and suppress unwanted fires in the village area. Importantly, they have to promote community preparedness, safe burning practices in agriculture in coordination and co-operation with village and district authorities and other communities of interest.

Importantly, a village fire unit has to manage fires at landscape level and not only in the home village.

Additional budget sources can be government agencies, NGOs, or private enterprises.

## **11.8 Training**

The sections above have dealt with the steps to take to achieve sustainable participatory approaches in fire management. These steps need to be complemented by training. The basic information (baseline study) on fire in communities, including gender segregated and literacy data, will provide the basis for planning of training activities of *which* target groups should be trained (notably women as identified for Southern Africa) in *what* and at *what level* should they be trained?

The training plan should answer the following questions:  
*(The 5W + 1H) (Why, What, Who, Where, When and How)*

Approaches in response to fires from both national as well as external actors, including donors, have generally (and still do) emphasised fire suppression. Implicit in this is the assumption that the fire "problem" results from a lack of awareness about fire damage and unwanted impacts and a shortage of skills and perhaps organisation.

By analyses of the 5W + 1H, the training may be directed to the right target group as well as contain the right curricula to meet the local needs.

### **11.8.1 Components of fire training**

Issues related to training in fire management are complex; there is a need to cover both fire inclusion and fire exclusion in curricula and training programmes. Frequently, there is a generalized need to train staff in Government agencies, NGOs, local populations and interest groups in various aspects of fire management. Staff responsible for fire management and local people alike, need to appreciate and understand the role and relationship between the basic components of fire (fuel, heat, oxygen), as well as the principles of fire behaviour. In addition, they need to master, at least in principle the skills of prescribed burning. Such knowledge will form the basis of a more common understanding of local fire ecology, requirements of fire for keeping the forest healthy, and for regenerating the forest.

The generalized view that local people will not understand complex biological and ecological issues has been proven wrong in many instances. More than 100.000 local people and government staff were educated or trained in forest fire management activities in Burkina Faso, Namibia and Mozambique between 1996 and 2006. Only very few of those who received education/training, were not able to relate the environmental information to their own community or home area.

Fire management training should provide a balanced mix of theory and field-practice, which incorporates local conditions and knowledge and experience of the participants. The curriculum includes fire prevention activities, environmental education, institutional issues, the role, functions, and responsibilities of fire crews, fire preparedness rising, the use and maintenance of simple equipment, and also fire fighting strategies, tactics and techniques.

Assumptions and gross over estimations are often made of peoples capabilities to fight fires by using tree branches, palm leaves etc. Barefooted people, without any protection against radiant heat, smoke inhalation and flames, are next to "useless" in combating fires, unless equipped with tools, clothing and water to contain the fire. Well made rake-hoes, fire swatters and backpack sprayers are required for community fire fighting (Jurvélius, 1980).

The temperature in a burning fire, with several metres of flame height, is ranging from 300 to 500 degrees Centigrade, depending on the fuel load and fire intensity. No human being will be able to go even near a 300-500 degree fire, without appropriated tools, boots and uniforms with helmet and face shield.

### **11.8.2 Training in controlled or prescribed burning**

The use of fire for subsistence and livelihoods is much more common than community institutions set up to only fight fires. CBFiM mainly exists where fire is used in some way that generates benefit for the local people. Active fire use generates skills, understanding and awareness and strengthens community institutions that deal with fire and related aspects.

Training in prescribed burning can have a range of benefits for the local people but importantly also for other actors and stakeholders that influence or are affected by managed fires. The training can ensure that skills and capacities are maintained and improved. Maintaining and understanding the use of fire at the local level is becoming an increasingly important; especially in places like Northern Australia, where skills are rapidly lost due to urbanization.

### **11.9 The way forward**

The active, intentional use of fire is an important factor in many, perhaps most, communities especially in developing nations. The initial focus for CBFiM should be on improving skills in the use of deliberate fires, increasing community preparedness, incorporating key aspects of gender, developing community institutions and implementing appropriate training.