

# COMMUNITY-BASED FIRE MANAGEMENT

## A review



# COMMUNITY-BASED FIRE MANAGEMENT

FAO  
FORESTRY  
PAPER

166

## A review



The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations (FAO) concerning the legal or development status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by FAO in preference to others of a similar nature that are not mentioned.

The views expressed in this information product are those of the author(s) and do not necessarily reflect the views of FAO.

ISBN 978-92-5-107094-9

All rights reserved. FAO encourages the reproduction and dissemination of material in this information product. Non-commercial uses will be authorized free of charge, upon request. Reproduction for resale or other commercial purposes, including educational purposes, may incur fees. Applications for permission to reproduce or disseminate FAO copyright materials, and all queries concerning rights and licences, should be addressed by e-mail to [copyright@fao.org](mailto:copyright@fao.org) or to the Chief, Publishing Policy and Support Branch, Office of Knowledge Exchange, Research and Extension, FAO, Viale delle Terme di Caracalla, 00153 Rome, Italy.

© FAO 2011

**Cover photo:**

*Community-based fire management in Zimbabwe, P. Vuorinen, 2009*

# Foreword

For more than 60 years, FAO has made dedicated efforts to strengthen the capacities of member countries in forest fire management. Over the years, many fire management projects have been implemented in member countries. Building on the experiences of FAO and others, two complementary approaches to fire management have been developed.

The first is an integrated approach. Integrated fire management combines science and fire management with socio-economic elements, at multiple levels. Environmental, cultural, social, economic and political interactions are considered. An integrated approach also looks at all types of vegetation fires, as fires do not stop at the border between one land-use or vegetation type and another. Integrated fire management requires a balance of many different fire-related activities; rather than being limited to actions involving fire suppression and provision of equipment, it extends to such activities as prevention, awareness-raising, preparedness and restoration. The integrated approach is reflected in the Fire Management Voluntary Guidelines published by FAO in 2006. Ideally, this approach would lead to integrated landscape fire management or integrated natural resource fire management.

The second approach is a participatory approach known as community-based fire management. Globally, people cause most fires. Involving the population in all aspects of relevant policy development and fire management practices is, therefore, a logical approach. Rural communities, especially in developing countries, are often closest to and most affected by vegetation fires. Often they cannot call on distant national agencies to prevent or to fight fires. As a consequence, they have to deal with these fires themselves. Most fire management projects of FAO focus on this approach. Like integrated fire management, community-based fire management also promotes activities that extend beyond suppression and provision of equipment to emphasize prevention and preparedness in a landscape perspective.

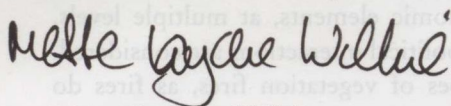
Community-based fire management can take different forms. The present publication highlights the state of the art in community-based fire management and provides updated information that complements the approach published previously in the Fire Management Voluntary Guidelines.

The document redefines the concept, reviews some implementation and training case studies, reflects on related policy and legal frameworks and considers the climate change concept. It draws attention to limitations in: policy and law, capacity, training opportunities, incentives, concept promotion and funding. It concludes with current challenges for community-based fire management, such as:

## Annexes – CBFIM case studies

- how to make the approach an integral component in natural resource and landscape management, and in rural development;
- the development of partnerships with communities, the private sector, NGOs, governments and their agencies to provide knowledge and resources necessary for effective implementation; and
- the need to direct existing information about this approach to resource managers and end users.

As a next step in community-based fire management, and based on this publication, the Forestry Department hopes to produce a tool for practitioners in this field. To this end we encourage you to provide us with feedback on this publication.



**Mette Loyche-Wilkie**

Principal Officer

Forest Assessment, Management and Conservation Division

FAO Forestry Department

# Acknowledgements

The first version of this document was produced by Darren Johnson, who began the document under the guidance of FAO Forestry Officer, Petteri Vuorinen, who was later replaced by Pieter van Lierop.

Authors of the CBFiM case studies are: Robin Beatty (Namibia), Darren Johnson and Rachel Brummel (United States of America), Ronald Myers (Mexico) and Gina Braun and Grant Allan (Australia). The case study on a community carbon project (Mozambique) was provided by Darren Johnson, Casey Ryan and Lucy Goodman.

A peer review, which included Sophie Grouwels (FAO), Mike Jurvelius (independent consultant), Fred Kafeero (FAO), Peter Moore (independent consultant) and Cesar Sabogal (FAO), resulted in useful recommendations for the final revision and editing, both of which were carried out by Peter Moore.

Location maps were designed by Kori Blankenship.

We also want to thank Roberto Cenciarelli for the layout and Graciela Andrade for the administrative support.

NIFC	National Interagency Fire Center (United States of America)
NTFP	non-timber forest product
PRA	participatory rapid appraisal
REDD	reducing emissions from deforestation and forest degradation
TNC	The Nature Conservancy
VER	verified emission reductions
WUI	wildland urban interface

# Acronyms summary

<b>CBFiM</b>	community-based fire management
<b>CBFM</b>	community-based forest management
<b>CBNRM</b>	community-based natural resource management
<b>CLC</b>	Central Land Council (Australia)
<b>CONAFOR</b>	National Forestry Commission (Mexico)
<b>CONANP</b>	National Protected Areas Commission (Mexico)
<b>CWPP</b>	Community Wildfire Protection Plan
<b>FMCN</b>	Mexican Conservation Fund
<b>GFMC</b>	Global Fire Monitoring Center
<b>GHG</b>	greenhouse gas
<b>IFM</b>	integrated fire management
<b>IPA</b>	Indigenous Protected Area (Australia)
<b>NGO</b>	non-governmental organization
<b>NIFC</b>	National Interagency Fire Center (United States of America)
<b>NTFP</b>	non-timber forest product
<b>PRA</b>	participatory rapid appraisal
<b>REDD</b>	reducing emissions from deforestation and forest degradation
<b>TNC</b>	The Nature Conservancy
<b>VER</b>	verified emission reductions
<b>WUI</b>	wildland urban interface

## Executive summary

Fire is a natural disturbance event that has also been used by humans for millennia as a tool to manipulate their environment. Fire still plays an essential role in many societies today; however, fire is not always used appropriately and can often be damaging. The danger is exacerbated by issues such as changes in land use, increasing population in rural areas, inadequate or inappropriate policy, and climate change. Traditional fire management practices and contemporary approaches used in developed countries – and increasingly being adopted in developing countries – often do not adequately address the complex issues of fire management. Through its integrated approach, community-based fire management (CBFiM) has the potential to address many of these challenges effectively.

Numerous natural resource management projects are being implemented globally that directly involve or collaborate with communities. The majority of these projects include a forest-management component with a focus on procurement, conservation, rural livelihoods and, more recently, carbon sequestration and storage. There are examples, particularly in the tropics, where communities involved in natural resource management projects have traditionally used fire as a tool for a variety of livelihood activities such as clearing land, hunting and agriculture, and they continue to do so. Many community-based natural resource management (CBNRM) projects, in which fire has been identified as a threat, do not recognize the essential role that communities play in effective fire management. In many instances, these projects fail to include communities in the fire management process, resulting in less effective management of fire and increased risk of damaging fire events that threaten the long-term success of the project. An integrated approach to fire management that includes communities in decision-making and implementation, CBFiM is a positive, perhaps essential, element of project implementation where fire has been identified as a threat.

To implement CBFiM successfully, a number of pre-existing conditions need to be present. Good governance and relevant policy and legislation that support integrated fire management approaches are the minimum requirements for the sustainable implementation of CBFiM. To implement CBFiM, existing governance and policy in that location should be examined from an integrated fire management perspective to determine strengths and shortfalls and to formulate potential modifications that will enable a feasible and long-term CBFiM strategy to be developed and implemented.

CBFiM training workshops designed to increase the expertise of practitioners should be conducted at the national and sub-national levels and should be followed up with an adequate level of technical support.

It is often necessary to collect field data rapidly and efficiently to support CBFiM project design and implementation. There are a number of ways of doing this. A notable methodology used by natural resource professionals is known as

participatory rapid appraisal (PRA). A number of PRA tools have been adapted and adopted by CBFiM practitioners to identify the strengths and weaknesses of existing CBFiM programmes and, in some cases, to assess the feasibility of initial CBFiM implementation. A methodology based on the Fire Management Voluntary Guidelines (FAO, 2006) may be used to design or review fire management circumstances, action plans or policies, using a participatory approach that includes all stakeholders and that is a good fit for CBFiM.

With an increasing amount of attention being focused on anthropogenic fire and its linkages to climate change, CBFiM should be considered as a viable approach to both effective fire management and climate change mitigation. Specifically, CBFiM can be more frequently employed to reduce carbon emissions and the threat of fire to carbon sequestration through active community involvement in fire management. Carbon sequestration projects, including approaches based on reduced emissions from deforestation and forest degradation (REDD), need to recognize the importance of community involvement in fire management to ensure the long-term success of the project.

The effective implementation of CBFiM is not without its challenges. Some of these challenges include: lack of institutional support in terms of appropriate policy, limited capacity, minimal training opportunities, lack of incentives for locals to engage and lack of resources, including funding and technical support. It is important that each of these challenges be examined within its individual context and that solutions be developed to meet each unique situation. Tools and resources need to be developed that are culturally appropriate, that are easily accessible to CBFiM practitioners and other end users and that support the effective long-term implementation of CBFiM. CBFiM is not a "one size fits all" approach, but rather must be tailored to meet specific needs and circumstances to be an effective and sustainable approach to fire management.

# Contents

Foreword	v
Acknowledgements	vii
Acronyms	ix
Executive summary	xi
<b>Introduction</b>	<b>1</b>
Fire management – concepts, context and system	1
<b>Community-based fire management (CBFiM)</b>	<b>3</b>
What is it?	4
Community	6
Integrated fire management	7
<b>CBFiM in practice</b>	<b>9</b>
<b>FAO training workshops</b>	<b>13</b>
Learning objectives	13
South Africa (2004)	15
Belize (2005)	15
Indonesia (2007)	16
China (2009)	17
Analysis	17
<b>Governance, policy and legislation</b>	<b>19</b>
<b>Rapid assessment tools</b>	<b>25</b>
Participatory rapid appraisal	25
Ranking, scoring and matrices	25
Analysis tables	26
<b>CBFiM and climate change</b>	<b>29</b>
<b>CBFiM – in sum</b>	<b>31</b>
Limiting factors	31
Partners and collaboration	32
Tools and resources	33
<b>References</b>	<b>35</b>

**Annexes – CBFiM case studies****39**

Annex 1 - CBFiM in Namibia: the Caprivi Integrated Fire Management programme	41
Annex 2 - CBFiM in the United States of America: the High Knob community wildfire protection plan	49
Annex 3 - CBFiM in Mexico: La Sepultura Biosphere Reserve in Chiapas	57
Annex 4 - CBFiM in the Tanami Desert region of central Australia	67
Annex 5 - The Sofala Community Carbon Project – Gorongosa National Park	79

ISBN 978-92-5-107094-9

© FAO 2011

# Introduction

Agriculture practices such as slash and burn and/or shifting agriculture by local communities have long been implicated as one of the main cause of wildfires. However to be considered is that communities are also part of the solution as they often use fire positively to manage the landscape. The issue of fire was especially high-profile in 1997 and 1998 when damaging fires occurred on every continent and attracted global attention, generating a series of reports, donor interventions and regional strategies. Community engagement in fire management (in many cases continuing the already-existing management of fires by local people) was also an attempt to balance the interventions in response to large, damaging or high-profile fires, which were overwhelmingly focused on suppression (fire fighting).

## FIRE MANAGEMENT – CONCEPTS, CONTEXT AND SYSTEM

The core and elements of fire management have been evolving and been clarified through adaptive approaches in recent decades. This process has been undertaken simultaneously in a number of nations and regions by a number of agencies and institutions at various levels, sometimes working in collaboration. The key ideas are set out here for reference and are dealt with in the guidelines prepared under the aegis of FAO (FAO Voluntary Fire Management Guidelines).

Dealing with fires, including the history of fire “management”, has often been focused on putting out fires or increasing the capacity to put out fires; yet consensus is that this approach is less effective than it could be. Often an oversimplified version of a complex situation is conveyed to decision-makers and the public:

- Forest fires are caused by extreme weather (not necessarily true).
- All forest fires are harmful (not true).
- All fires need to be prevented and extinguished (not true).
- Forest fires are periodic events best dealt with when they occur (definitely not true).

These overly simplistic explanations of forest fires tend to encourage decision-makers to conclude that fire fighting is the main solution to harmful forest fires, so they tend to react to short-term, recurring crises rather than focusing resources on long-term, sustainable solutions that integrate fire management. To date, inadequate attention has been paid to addressing underlying causes and to preventing a damaging pattern of recurrent fire and degradation in burnt areas.

Integrated approaches to fire management place greater emphasis on addressing underlying causes and seek long-term, sustainable solutions that incorporate the same five essential elements (the five Rs) that have been adopted globally in

dealing with disasters and their management:

**RESEARCH** – analysis of the fire issue and identification of options for positive change;

**RISK REDUCTION** – prevention, focusing resources on the underlying causes of fires;

**READINESS** – preparing to fight fires;

**RESPONSE** – ensuring appropriate responses to unwanted damaging fires; and

**RECOVERY** – community welfare, repairing infrastructure and restoration of fire-damaged landscapes.

Resources need to be redirected to support research that improves the understanding of the causes of fire, identifies existing management practices that encourage harmful fires and promotes management systems that take advantage of well-established fire use. Key stakeholders, especially local communities, need to be involved in fire management planning.

At present, analysis is often done only when a fire begins; it is then mainly influenced by political pressures created by dramatic fire images and by the immediate responses needed to protect people and assets or to respond to criticism. A better response would be to start analysis in fire-prone areas before a fire begins and consider rebalancing management, if required. Although understood in theory, this response is not often carried out for various reasons:

- In most cases there is no overall fire management framework available.
- The view that all fire is negative and fearsome leads, in turn, to the view that fires are a suppression challenge rather than a symptom of underlying management problems.
- The most dramatic part of fire management is response, or fire suppression. Fires are an obvious “enemy”, and clear consensus about addressing burning fires is more socially and politically expedient than addressing the complicated questions involved in long-term fire prevention and management. Sources of ignition and fuels are local; thus, the systems and frameworks of fire management are often best established at the provincial level, while monitoring and analysis are usually best dealt with at the national level. Yet discussion and debate often take place without reference to the appropriate scale of intervention.

To ensure that suppression occurs effectively at the local level, that is, that unwanted and undesirable fires are kept small, everything else in the fire management equation must occur at higher levels, including effective coordination and cooperation of all fire management agencies. To enable effective fire management, the key principles must be established at a landscape level to keep unwanted and untimely fire at the local level. The local level is where actions will be taken, but those actions must be considered at the landscape level to ensure consistency, effectiveness and clarity for fire managers, land managers, government agencies and civil society.

Local people and communities, therefore, play a pivotal role. This is particularly the case where the administration, agencies and other systems (communication and transportation, for example) are not able to fill the requirements for coordination of systems and frameworks necessary for routine, rigorous and effective fire management.

# Community-based fire management (CBFiM)

The term *community-based fire management* (CBFiM) was coined by Sameer Karki at the Regional Community Forestry Training Centre (RECOFTC) in Bangkok in 2000. The lower case “i” is used in the acronym to distinguish it from community-based forest management (CBFM), which has been implemented as a form of CBNRM for some time. Since recognition began almost a decade ago, there have been a series of reports, analyses, case studies, training efforts and some peer-reviewed papers. Collectively, this body of written work serves as a reference for CBFiM practitioners and policy-makers alike. CBFiM began to be documented and recorded in the late 1990s. This review brings together the insights and understanding generated throughout the past decade to create a solid summary and a platform that will enable CBFiM to progress to realize its potential role in sustainable landscapes in a changing world.

In many countries around the world communities continue to use fire in a safe and effective manner to improve livelihoods and protect resources. These communities are quite familiar with fire and its uses for traditional livelihood activities such as clearing vegetation for agriculture, improving pastures for grazing, hunting and managing non-timber forest products (NTFPs). Where communities may not rely directly on local natural resources to sustain a living or use fire to manage those resources, it remains in their best interests to have a stake in how fire is being managed across the landscape with which they are associated.

Analysis of CBFiM and its effectiveness as a fire management approach began in the early 1990s in Africa and Southeast Asia, where recent decades have seen a significant increase in large-scale fires (IFFN, 2003). Information and lessons learned from those analyses have confirmed CBFiM as a potential component of efforts to manage sustainable landscapes. Examples of CBFiM can be found globally in developing, transitioning and industrialized nations. The success of these efforts varies depending upon a number of factors, including the existence of: supporting policy and legislation, land tenure, and institutional and community capacity. What remains consistent, however, is that fire, people and the ecosystems that they inhabit are inextricably linked. There always has been fire and, as a natural disturbance event, there always will be fire. For these reasons it is essential that contemporary fire management approaches, if they are to be effective, consider not only the technical aspects of fire management, but also the communities and the environments in which they live.

CBFiM has multiple manifestations in most nations across mixed cultural, social, economic and ecological circumstances. This diversity has led to a range

of explanations and definitions for the term to describe local people actively engaged in fire and its management. Based on structured fieldwork by subject matter experts (Ganz, Fisher and Moore, 2003), a working definition was put together. This definition was considered a refinement of CBFiM concepts pulled together for a substantive review document in 2004 (Moore, 2004). Generally, it is an approach to fire management in which local communities are actively engaged in the development, and in some instances the implementation, of fire management strategies designed to prevent, control or utilize fires in ways that will improve their livelihood, health and security.

### WHAT IS IT?<sup>1</sup>

CBFiM can be considered as a subset of CBNRM, which is not a new idea or approach to natural resource management. CBNRM is receiving increasing attention as the role of communities in the management of their resources is recognized as being an essential element in effective and sustainable resource management. The concept of CBNRM is linked to a variety of terms, including participatory, community, community-based and collaborative natural resource management (Treue and Nathan, 2007). In practice, CBNRM is mostly about ways in which the state or government can share rights and responsibilities regarding natural resources with local communities. A continuum for CBFiM has been identified, suggesting that in general terms it can be considered as having three nodes:

- Local-scale fire management in which traditional or indigenous knowledge plays the major role in informing and undertaking fire management, which is also planned, conducted and controlled by local people. Livelihoods and maintaining the landscape are key to this node of CBFiM. A community may have complete ownership and legally recognized tenure rights, including management of land and natural resources, completely community-based. The practices of Australian aborigines are an example of this node of CBFiM.
- Community involvement in fire management that involves a range of local actors, including agencies and non-governmental organizations (NGOs), that work on fire management. Livelihood dependence, some traditional practice and community institutions may be characteristics. Elements needing support may include: analysis of the fire problem, technical capacity, regulatory framework or logistical assistance.
- Volunteers from the community, perhaps with agency involvement, conduct fire management on behalf of the community across private and public lands. The development of Community Wildfire Protection Plans (CWPPs) in the United States of America and the Volunteer Bushfire Brigades in Australia are examples of this node of local management. There may be very little direct involvement of local people in the rural landscape, and livelihood dependence on lands or forests is low. Hence, community involvement may be limited to a role in which the community is informed of management decisions and designated roles and responsibilities by the government, with very limited

1 This section includes material drawn from Moore (2004).

consultation. This node is, therefore, not really considered community-based.

Any situation in which CBFiM is practiced can be characterized on the basis of one of these nodes or a combination of them.

A common theme among the array of CBFiM definitions is that the community is actively involved in some aspect of fire management: either the development of fire management strategies or their subsequent implementation. This involvement includes activities associated with the management of fire-prone land, such as suppression, prevention and the use of fire. These fire management activities are typically associated with livelihood activities and occur with or without the assistance of groups or organizations outside of the community. However, the importance of entities external to communities in helping to achieve effective and sustainable CBFiM approaches has often been cited (Jackson and Moore, 1998).

A Strategic Paper written in 2003 similarly suggests that the emphasis on "community-based" relates not only to community involvement, but also to community capacity that has been recognized and supported by external agencies (governments, NGOs, projects and others) (IFFN, 2003).

Zhang *et al.* (2003) defined CBFiM as an approach in which villagers have shown a profound understanding of fire prevention and control and have participated voluntarily in fire management. A slightly more ambiguous definition of CBFiM included the conscious use of fire by communities to meet specific objectives (Suyanto, Applegate and Tacconi, 2002). In 2003, the Global Fire Monitoring Center (GFMC) updated the 1986 version of the online FAO Wildland Fire Management Terminology (FAO, 1986) and included the following definition of CBFiM:

*[CBFiM] is a fire 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.*

The term has been used to describe such a wide variety of different ways in which communities are involved in fire management, in parallel with the discussion of CBNRM, that it is difficult to make any systematic comparisons or generalizations. A definition should be precise enough to enable useful generalizations to be made about somewhat similar things, while being flexible enough to accommodate a variety of approaches; that is, it should be a definition based on essential features.

The definition proposed by Ganz, Fisher and Moore (2003) is:

*CBFiM is a type of land and forest management in which a locally resident community (with or without the collaboration of other stakeholders) has substantial involvement in deciding the objectives and practices involved in preventing, controlling or utilising fires.*