

Community-based fire management: case studies from China, The Gambia, Honduras, India, the Lao People's Democratic Republic and Turkey



Food and Agriculture Organization of the United Nations
Project FireFight South East Asia



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**Community-based fire management:
case studies from China, The Gambia, Honduras, India, the Lao People's
Democratic Republic and Turkey**

**Gestion communautaire des feux:
étude de cas en Chine, en Gambie, au Honduras, en Inde, en République
Démocratique Populaire Lao et en Turquie**

**Manejo del fuego por las comunidades:
estudio de casos de China, Gambia, Honduras, India, la República Democrática
Popular Lao y Turquía**

Food and Agriculture Organization of the United Nations
Regional Office for Asia and the Pacific
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2003



FOREWORD

The frequency and intensity of forest fires have increased dramatically in many parts of the world in recent years, resulting in major impacts on forests and on rural and urban people and economies. Faced with increasing fire occurrences and decreasing fire suppression budgets, government agencies, local organizations and forest users must consider the full range of fire management options from around the world. By considering proactive approaches – in particular those that engage local communities in the planning and implementing of fire management activities – fire management organizations may avoid the pitfalls and mistakes of the past. This publication features case studies documenting a range of local fire management scenarios, each with a diverse set of land uses and desired outcomes. The community-based fire management (CBFiM) approaches from China, The Gambia, Honduras, India, the Lao People's Democratic Republic (Lao PDR), and Turkey presented in this publication illustrate a recent shift in direction; a movement away from centralized and state-driven forest fire management towards decentralized and mainly community-based management regimes. These approaches offer promise as more effective and more sustainable than conventional fire management and suppression approaches over the long term. However, they may operate effectively only where local populations are already adequately empowered to manage and use natural resources. It is imperative that practical steps are taken to capture the opportunities that CBFM has to offer and to identify viable frameworks for moving these initiatives forward. It is hoped that this publication will serve to advance these measures wherever appropriate.

PREFACE

Dans de nombreuses parties du monde la fréquence et l'intensité des feux de forêts ont considérablement augmentées ces dernières années en entraînant des conséquences majeures pour les forêts, les populations rurales et urbaines et sur les économies nationales. Face à la multiplication des feux de forêt et à la réduction des crédits affectés à la lutte contre ces incendies, les services gouvernementaux, les organisations locales et les usagers des forêts doivent étudier toute la gamme de solutions appliquées dans le monde. En étudiant des approches dynamiques – en particulier celles qui font participer les communautés locales à la planification et à l'exécution des activités de gestion des feux – les services chargés de la lutte contre les feux peuvent éviter de répéter les erreurs passées. Cette publication présente des études de cas qui décrivent divers types de gestion locale dont les formes d'utilisations des terres et les objectifs recherchés diffèrent. Les méthodes de gestion des feux à base communautaire documentées dans cette publication et qui sont appliquées en République Démocratique Populaire Lao (RDP Lao), en Gambie, au Honduras, en Inde, en Chine et en Turquie témoignent d'une réorientation récente qui consiste à abandonner l'action centralisée et dirigée par l'État pour des méthodes de gestion des feux de forêt décentralisées et à base communautaire. Ces méthodes semblent prometteuses, plus efficaces et plus viables à long terme, mais elles ne peuvent donner de résultats que si les populations locales disposent au préalable de suffisamment de droits pour gérer et utiliser les ressources naturelles. Il

apparaît indispensable de prendre des dispositions pratiques pour profiter des possibilités qu'offre la gestion communautaire des feux de forêt et dégager des cadres viables pour mettre en œuvre des initiatives dans ce sens. Cette publication a pour but d'encourager ce genre de dispositions lorsque les circonstances le permettent.

PREÁMBULO

En los últimos años la frecuencia e intensidad de los incendios forestales se han visto considerablemente incrementadas en muchas partes del mundo provocando un impacto mayor en los bosques y en las poblaciones rurales y urbanas y sus economías. Ante el incremento de la ocurrencia de incendios y la disminución de los presupuestos destinados a la supresión de los mismos, las agencias gubernamentales, las organizaciones locales y los usuarios del bosque deben tomar en consideración una gama de soluciones para el manejo del fuego que han sido experimentadas en distintas partes del mundo. Al considerar los enfoques que parten de una participación activa – en particular modo, aquellos en donde las comunidades locales participan y ejecutan actividades de manejo de incendios – las instituciones responsables por el combate a los incendios pueden evitar las dificultades y errores del pasado. Esta publicación presenta algunos estudios de casos que ilustran una serie de escenarios locales en donde se realiza el manejo del fuego, cada uno de los cuales se caracteriza por un conjunto distinto de formas de utilización de la tierra y de resultados deseados. Los enfoques de manejo comunitario del fuego (MCF) de la República Democrática Popular Lao, Gambia, Honduras, India, China y Turquía, que se presentan en esta publicación, ilustran un cambio de dirección reciente; un desplazamiento del manejo del fuego centralizado y estatal, en dirección de formas de manejo descentralizadas y de índole comunitaria. Estos enfoques prometen ser más eficaces y sostenibles que los enfoques convencionales de manejo del fuego y supresión de incendios a largo plazo. Sin embargo, éstos pueden operar de manera eficaz únicamente cuando se han atribuido derechos y medios a las comunidades locales, para que utilicen y manejen sus recursos naturales. Es de fundamental importancia que se emprendan medidas concretas a fin de captar las oportunidades que el manejo comunitario de los fuegos puede ofrecer, así como identificar marcos de trabajo factibles para impulsar estas iniciativas. Se espera que esta publicación sirva para mejorar estas medidas donde sea apropiado.

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PROLOGUE

Community-based fire management case studies from China, The Gambia, Honduras, India, Lao People's Democratic Republic and Turkey

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THE CONTEXT

Fire is a disturbance that has played, and will continue to play, a major role in forest 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. In many parts of the world, local communities are often blamed for what are considered harmful forest fires. This view often encourages fire and forest management institutions to perceive local communities as part of the problem, and certainly not part of the solution. As reflected in these case studies, the underlying reason for the local population's failure to control fires is not a lack of awareness or carelessness but rather a lack of incentives to protect forest resources. Why protect forests when they are owned by the state and utilized by outsiders?

Because local people usually have most at stake in the event of a harmful fire, they should clearly be involved in mitigating these unwanted events. Community-based forest fire management (CBFiM) is increasingly considered a component of participatory community development strategies and forest fire management. In addition, community-based forest management has recognized the integral contribution that CBFM has to offer participatory forest management. CBFM promoters have always maintained that there are potential and important linkages among CBFM, land-use planning, natural resource management and overall community development processes. CBFM cannot function independently from these other processes.

To varying degrees, governments around the world have begun to adopt collaborative or community-based forest management strategies. The term "community-based" in the context of fire covers a wide spectrum of situations: from potentially forced engagement in an activity (coercion), to free and willing participation in actions that have been developed by the actors themselves (empowerment). The emphasis is not only on community involvement, but also on a community capacity that has been recognized and supported by external agencies (governments, non-governmental organizations [NGOs], projects and others). Such recognition may include supporting an existing indigenous system through formalizing, modifying or otherwise elaborating on it, or instituting new systems. Many of these systems and approaches are

considered more effective in tempering uncontrolled burns, more beneficial to local ecosystems and more cost-efficient over the long term.

There is a large body of knowledge on, and examination of, the definition of communities and community-based approaches in other fields such as anthropology, community-based forest management and other social science disciplines. However, the technical and organizational capacity of communities in relation to managing fire, historically and culturally, is poorly understood and rarely studied. As a result, it is very difficult to transfer lessons from one community to another, in different provinces, nations and regions. This compilation of CBFiM approaches from Lao PDR, The Gambia, Honduras, India, China and Turkey is a valuable first step contributing to the body of knowledge on communities and their fire. Although this step has the potential to identify some general models of CBFiM for others to experiment with in their own countries, the cases' diversity, unique circumstances and varying contexts make it extremely difficult to extrapolate principles, common themes and aspects that would lend themselves to building a transferable model.

Some of the initiatives documented in this compilation, such as the Cooperazione e Sviluppo (CESVI) project in Sayabouri Province, Lao PDR, come from government or donor-initiated projects with a focus on fire prevention and preparedness. As forest fires are not seen as a major threat in most of the ecosystems documented, except for The Gambia, only a portion of these donor-driven and government projects are based solely on forest fire management. Appropriately, most projects consider fire management as one component of broader forest management initiatives. The projects view resource management more holistically and tend to be effective at addressing the root cause of unwanted fires.

More common are instances in which CBFiM has resulted from the formation of community institutions and mechanisms that support more efficient fire management entities (such as the two cases documented from Çal and Bergama in Turkey). Here, the lead institutional transformations occur at the local level, with government and non-governmental agencies accordingly reshaping their own functions away from direct management functions towards more technical and advisory roles. The nature of institutional change varies from place to place, as does the speed at which it occurs. Nonetheless, the movement towards CBFiM as a part of community forestry initiatives in countries such as The Gambia is startling.

The driving forces in this shift to CBFiM are further propelled by overall forest conservation objectives. While acknowledging the roles that governments have played in the past as forest conservators (mainly through the creation of reserves), there is also a growing recognition that government agencies have not ultimately proved the most effective agents for preserving forests. Even where government entities have successfully managed forests for conservation objectives, they have not always done so in the most participatory manner.

Of particular concern are the policing strategies that form the core of most government-sponsored fire management programmes. The institutions required to operate these policing regimes are no longer financially viable, and the principles of state protection they embody actually encourage conflict and thus, paradoxically, more expense. Rather than alleviating forest fire problems, these regimes often increase the scale and magnitude of forest fires. Furthermore, they largely ignore the human dimensions of fire, as well as the positive social and ecological benefits of smaller prescribed and managed fires.

In other 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 retention of traditional practices

through adequate empowerment of local populations to manage and use fire is one of the key components of CBFiM that is receiving more international attention. The securing of land and use rights may ultimately help maintain the beneficial uses of managed fires for such objectives as controlling weeds, reducing the impact of pests and disease and generating income from non-timber forest products (NTFPs). The case study presented from Orissa, India, documents the importance of traditional uses of fire for cultivating kendu and mahua flowers. The dearth of documentation on these and other practices threatens to erode the stores of cultural knowledge.

Some elements of CBFiM and other community-based strategies represent a revival and formalization of traditional natural resource management regimes. The authors seek, however, to caution against the overemphasis of this aspect. Although there is consistency in the overall framework (community or *kafoos*)¹ and key actors (leaders, Alkalos² or Muhtars)³ between the pre-colonial use of fire and modern fire regimes (based on fire suppression), present conditions require caution when reintroducing a traditional fire regime. With the current population growth and resulting migratory flows, some communities have become more heterogeneous than they were in the past, and in some cases are subjected to institutional arrangements and power struggles that are not favourable for community-based management activities.

A similar caution is urged in respect to overemphasizing the role and capacity of local communities to fight fires that are larger and of higher intensity than those of the pre-colonial (or pre-suppression) regimes. Given the fire regimes in many parts of the world, communities and their members can be an important, perhaps a pivotal, component but should not shoulder the entire burden for fighting fires.

Several of the CBFiM programmes documented in this compilation occur in remote locations where the government's fire control and suppression approaches are severely hindered by access and response time. In such remote locations, communities have a significant role to play in the prevention and suppression of harmful fires that have a detrimental impact on their lives. Yet again, while CBFiM recognizes the local community's capacity to help prevent catastrophic blazes, the government must not relinquish all responsibility, even in these remote locations. In the event of larger, more intense fires that require significant resources, the community should not bear the sole responsibility for extinguishing them.

Similarly, fire should not be completely excluded from the daily lives of people and the ecology of the landscapes that they inhabit. The case studies illustrate the ways that communities use fire to cultivate crops and NTFPs, to hunt, to create forage and to manage pests and disease (as in the case presented from Honduras). These smaller, intentional fires need to be distinguished from uncontrolled or unwanted fires.

These case studies illustrate examples where communities have a clear role in fire management – in some cases with full responsibility and in others with joint responsibility as co-owners and co-managers of the resource. Moreover, there are a few examples (such as the Community-Controlled State Forests [CCSFs] and community forestry approaches in The Gambia) in which local people legitimately use and manage forests in traditional ways through the establishment of use zones on the periphery of government-owned forests. In these areas, local users are beneficiaries of revenue-generating agreements or recipients of accelerated investments into areas that are directly adjacent to forests. These are all limited forms of community involvement.

¹ Village associations in the Gambia.

² Local village heads in the Gambia.

³ Local village heads in Turkey.

They do, however, at least acknowledge the importance of local communities in protecting and sustainably managing forest resources. More important, these examples provide a stepping stone for transferring the authority of fire management from being a solely government function towards becoming a more collaborative, ecologically coherent and sustainable model.

It is clear that there are many important components involved in fire management at the policy and field levels, many of which are not captured by the case studies documented in this report. A recurring theme is the fundamental question of who should control the use of fire and manage it appropriately. As the world's population has grown, the rural landscape has absorbed millions of people, both indigenous inhabitants and migrants (voluntary and forced). Burgeoning rural communities inevitably compete with internal and external factors for access to natural resources and the right to use fire as a management tool. Thus, increased competition for land, water and forest resources is often an important force driving the need for more clearly defined systems of fire management.

In summary, CBFiM is concerned with ensuring local people's access to, and management of, forest resources. The catalysts behind CBFiM approaches are indigenous land and/or use rights, including the right to use fire as a management tool. The retention of traditional practices is strongly dependent on an adequate level of empowerment of local populations to manage and use fire and forest resources. CBFiM recognizes the human dimensions of fire, as well as the positive social and ecological benefits of smaller prescribed and managed fires. The case studies in this report demonstrate how villagers manage fire for local daily subsistence needs. By placing tighter local controls on how fire is used and reaching clearer consensus on resource use and territorial rights agreements with their neighbours and government agencies, local people can minimize the destructive effects of fire and maximize its benefits.

THE SIX CASE STUDIES

The case studies present unique perspectives and experiences with CBFiM that have emerged simultaneously in different parts of the world. Reflecting the dynamic fire contexts within each country, each of the studies was carried out by a local partner organization. The six cases, their locations, respective emphases and affiliations included the following:

China

The research was conducted by the Center for Community Development Studies (CDS) with technical editing and support from the Regional Community Forestry Training Center for Asia and the Pacific (RECOFTC). CDS is a non-profit institution that aims to promote sustainable community development in China through effective empowerment processes based on community needs. Because its residents had a profound understanding of fire prevention and control, this case study investigated the village of Wenyime, a natural village in Dayao county, Chuxiong Yi Autonomous Prefecture. The village participated voluntarily in fire management with the financial and technical support of government agencies. This collaborative effort between government and local communities achieved significant results and was recently awarded a prize by the Yunnan Provincial Government.

This case demonstrates the importance of linking CBFiM to efforts to alleviate poverty and improve a region's overall living conditions. To remove the incentive to use fire as a land

clearing tool, a key recommendation from this study was the diversification of income sources for rural people.

The Gambia

The Forestry Department, in collaboration with The Gambian–German Forestry Project, investigated three of the five divisions of The Gambia to determine whether community forestry practices have increased the ability of local communities to manage fire more effectively. Fire in The Gambia, as in other countries documented in this series, is the primary local tool for clearing land. Although community forestry practices have not been able to reduce the frequency of forest fires nationwide, there have been some indications that local forest ownership (and/or a sense of ownership) has positively changed attitudes towards collaboration with government agencies. These areas have seen fewer damaging or unwanted fires, suggesting that increased participation and access to forest ownership may lead to more effective fire prevention. This was confirmed by a nationwide comparative survey of villages with and without involvement in community forestry.

The new concept of Community-Controlled State Forests (CCSFs) was introduced in this case study. CCSFs, in which communities are responsible for the management of state-owned lands adjacent to their community forests, demonstrate The Gambia's shift from centralized and state-driven forest fire management towards decentralized and mainly community-based management regimes.

Honduras

Research on CBFiM in Honduras was undertaken by the Forest Protection Department and the National School of Forest Science. As in most of these cases, 99 percent of the forest fires in Honduras are human-caused, mainly for land clearing for agriculture. In general, people view forests as an impediment to agricultural activities, and do not consider the additional income that they may yield. In other areas, fires are used as a means to retard succession, by keeping grasslands in an arrested state suitable for animal foraging. On communal forest lands, which are perceived to have economic value, local people often resort to clearing and burning. When a fire escapes control, the local community is asked to help put it out. Many of local people resent this type of activity because it takes them away from their agricultural activities. Without adequate compensation, there is a feeling that it is not in their best interest to help control fires.

The case study recommends the implementation of training and awareness-raising programmes in the communities. It also recommends the extension of legal independence and jurisdictional rights to the municipal governments so that they can define their own strategies for fire management.

India

Research on CBFiM in Orissa, India, was undertaken by Vasundara, an NGO with extensive involvement in Orissa's forests, and with technical support from the Regional Community Forestry Training Center for Asia and the Pacific (RECOFTC). Vasundara works to improve community–state collaboration and to orient policy towards community-based forest management systems. The local community in this part of India has a strong incentive to protect

forests and prevent or manage forest fires because a significant proportion of the rural population depends on forests for subsistence and income. By focusing the investigation on several diverse districts of Bolangir, Deogarh and Sambalpur in the state of Orissa, the case study offers a wide range of fire/resource management issues including inter-village conflicts, fuelwood collection and budgetary considerations.

This study offers one of the few documented cases in which fire is used by communities to facilitate the collection of NTFPs. It found links between the frequency of fires and the availability of natural resources, the extent of dependency on the resource and the traditional uses of fire for various income-generating activities.

Lao PDR

The research in Lao PDR was performed by a consultant to Project Firefight South East Asia, a global programme of the World Conservation Union (IUCN) and the World Wide Fund for Nature (WWF), working to identify stakeholders, their fire use and management practices and ways to improve fire management. The study provides several examples of CBFM strategies, primarily from government or donor-initiated projects that focus on fire prevention and preparedness. Many of the key elements necessary for establishing CBFM already exist in Lao PDR or are in the process of becoming established. Provincial government entities in Sayabouri are relinquishing fire management authority to the district level and maintain an ongoing interest in developing CBFM as a viable approach in this part of Lao PDR.

Contrasting with this government-sponsored, donor-driven example, another study in Salavan represents a more integrated community forestry approach. From this case, it is concluded that, in order to fulfil commitments and implement collaborative resource management effectively, additional financial and technical support is necessary in Lao PDR.

Turkey

The Ministry of Forestry performed a review of the mechanisms for active community participation in fire management. Variations in these mechanisms depended according to localized socio-economic and political situations (government-driven as against community-driven). Two cases of community involvement, from Çal and Bergama Forest District Directorates, were assessed and compared with fire statistics from five neighbouring villages. Both cases provide solid examples in which the active participation of local people increased the success of forest fire prevention and control measures. The rate of intentional forest fires in Çal and Bergama was 12.1 and 10.8 percent, respectively, while the national average over the last decade was 14 percent. Other statistical claims validate the effectiveness of this community involvement and the two sites are suggested as models to be applied elsewhere in Turkey for further testing on the efficacy of CBFM approaches.

THE WAY FORWARD

Several conclusions arise from a review of the cases presented here. First, a shift in focus by government and non-governmental agencies towards a supporting technical and advisory role was generally a positive trend in these case studies. Longstanding institutional frameworks for fire control and suppression are increasingly proving inadequate in today's conditions, even in

highly developed countries with large budgets. This widespread fire control model is subject to growing criticism from concerned government foresters and fire managers, academics and people living in and around the forests themselves.

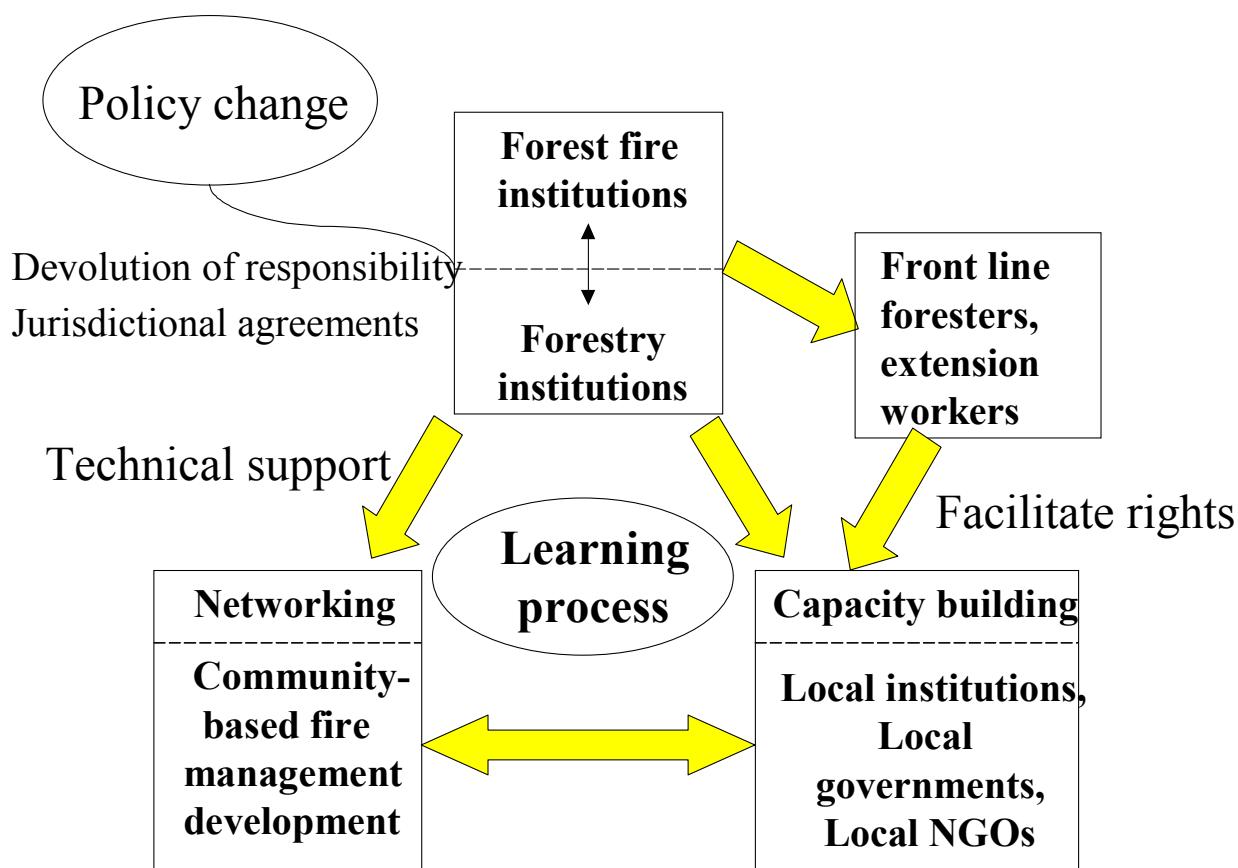
There are very few statistics on the extents or types of forest fires. Although most fires in the developing world are attributed to shifting cultivation, escaped fires for hunting, grazing, gaining access or clearing fields may cause more damage than shifting cultivation. Fire use in the processes of large-scale agriculture and commercial agribusiness activities cannot be identified separately in many cases. Fires used as an expression of social inequity or as a manifestation of inter-village conflict (as in the case study documented in Sundergarh, India) are also rarely distinguished from beneficial fire uses. There is not only a strong and critical need to collect the basic data required to identify and analyse the underlying causes of forest and land fires, but also a need to understand the impact of current institutional frameworks on such fires. Addressing the underlying causes of these fires (e.g. inequitable tenure arrangements and conflict management) can improve the efficacy of fire management. Better accounting is necessary to distinguish between wanted and unwanted or uncontrolled fires (such as the distinctions made in the Turkish and Gambian examples). In order to establish where and when fire is desired, a series of approaches and guidelines are needed that first take into account multiple stakeholders and their diverse interests.

As well as avoiding the potential financial drain of concentrating solely on suppression-focused fire management strategies, a movement towards CBFiM will also help governments to resolve the very conflicts in institutional rights and authority that have inhibited forest conservation and the sustainable utilization of natural resources. The fundamental elements of institutional change needed in fire management include:

- a shift in the locus of control from central government to the local level;
- a change in the institutional framework within which fire management is administered, from state institutions to local institutions (Figure 1);
- a recognition that forests cannot satisfactorily be retained, conserved or managed by governments without considering the potential impacts – positive or negative – of fire on local institutions;
- a change in the conceptual framework (Figure 1) within which fire management is conceived and developed, away from the dominance of state or commercial concerns towards one that acknowledges and supports the capacity of local institutions to plan and manage desired fire collaboratively, while preventing and reducing the destructive effects of unwanted fires;
- a change in the mode of day-to-day forest fire management, away from conflict-inducing regimes of police against user, towards one in which the local user is both self-regulating and partly responsible for protection activities (as in the cases presented from Dayao Country, Yunnan Province, China);
- a shift in forestry and fire management academic/training institutions, away from training foresters and resource managers as technical experts towards training facilitators to broker collaborative management arrangements between villages (as in the case presented from Salavan, Lao PDR), local institutions and government agencies (as in the case presented from The Gambia);

- a range of supporting activities will increasingly be required to invoke institutional change, including: policy reform; enabling legislation; institutional development and capacity building at the most local level; CBFiM authority and implementation; and investment in documentation and public awareness campaigns for communicating the efficacy of these approaches.

FIGURE 1: Country-level analysis with relationships among key actors and how changes in these relationships can lead to positive outcomes for CBFiM⁴



There are ample opportunities to learn from within community forestry and other associated disciplines. The six cases presented here offer a few examples from various regions of the world. There are likely to be numerous other examples in which local communities manage fires for a range of reasons. There was significant diversity in these community-based approaches. In order for CBFiM to progress, it must embrace this diversity and draw out similarities from the different community contexts in which it is found.

In an overall context of decentralization, there is a clear need for countries to determine the best approach to CBFiM through experimentation with local examples. Legal frameworks cannot satisfactorily be amended without the guidance of policy. Moreover, policies themselves will be

⁴ Adapted from Hobley and Shields, 2000. DFID-supported Western Ghats Forestry Project in India.

most productively reconstructed on the basis of example and the clarity of experience, not hypothesis. As with community forestry, CBFM lacks well-documented cases for driving policy reconstruction. With the aim of addressing this lack, this compilation of case studies provides some practical steps in the shift towards CBFM.

ACRONYMS

CESVI	Cooperazione e Sviluppo (Cooperation and Development)
CDS	Center for Community Development Studies
CCSFs	Community-Controlled State Forests
NWFP	Non-wood forest products
RECOFT	Regional Community Forestry Training Center for Asia and the Pacific
IUCN	World Conservation Union
WWF	World Wide Fund for Nature

PROLOGUE

Etudes de cas sur la gestion à base communautaire des incendies de forêt en Chine, en Gambie, au Honduras, en Inde, en République Démocratique Populaire Lao et en Turquie

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CONTEXTE

L'incendie est un phénomène perturbateur qui a joué et continuera de jouer un rôle très important dans les écosystèmes forestiers du monde entier. Dans presque tous ces écosystèmes, l'homme a changé le régime naturel des incendies en modifiant leur fréquence et leur intensité. Dans de nombreuses régions, les communautés locales sont souvent accusées de provoquer des incendies de forêt considérés comme néfastes. Ainsi, les institutions chargées de la gestion des forêts et des incendies sont souvent amenées à considérer les communautés locales comme un élément du problème et non de la solution. Comme le montrent les études, l'incapacité des populations locales à maîtriser les incendies a pour cause profonde non pas l'ignorance ou la négligence mais l'absence d'incitations à protéger les ressources forestières: en effet, pour quelle raison ces populations devraient-elles protéger des forêts qui appartiennent à l'État et sont utilisées par des gens de l'extérieur?

Les populations locales sont en général les premières touchées en cas d'incendie néfaste et devraient donc de toute évidence participer à la lutte contre ces phénomènes indésirables. La gestion à base communautaire des incendies de forêt est de plus en plus considérée comme un élément des stratégies participatives de développement communautaire et de la gestion des incendies de forêt. En outre, on reconnaît que la gestion communautaire des incendies a une contribution à apporter à la gestion participative des forêts et en fait partie intégrante. Les partisans de la gestion communautaire des incendies ont toujours soutenu qu'il existe d'importants liens potentiels entre la gestion communautaire des incendies, la planification de l'utilisation des terres, la gestion des ressources naturelles, et les processus globaux de développement communautaire. La gestion communautaire des incendies de forêt ne peut être mise en œuvre qu'en liaison avec tous ces autres processus.

De façon plus ou moins poussée, les gouvernements du monde entier ont commencé à adopter des stratégies de gestion des forêts à base communautaire ou en collaboration avec les communautés. L'expression "à base communautaire" englobe une vaste gamme de situations dans le cas des incendies: ces situations vont de la participation quasi forcée à une activité

(coercition) à la participation libre et volontaire à des actions conçues par les acteurs eux-mêmes (émancipation). On met l'accent non seulement sur l'intervention des communautés mais aussi sur leurs capacités qui doivent être reconnues et soutenues par des organismes extérieurs (gouvernement, organisations non gouvernementales, projets, etc.). On peut, par exemple, soutenir un système indigène existant en lui donnant un caractère officiel, en le modifiant ou en le perfectionnant; on peut aussi créer de nouveaux systèmes. Bon nombre de systèmes et de méthodes existants sont considérés comme plus efficaces pour limiter les feux non maîtrisés, plus bénéfiques pour les écosystèmes locaux et plus rentables à longue échéance.

Les communautés et les approches à base communautaire ont été largement étudiées par d'autres disciplines sociologiques comme l'anthropologie, la gestion des forêts à base communautaire. Toutefois, les capacités techniques et d'organisation des communautés en matière de gestion des incendies sont mal connues et ont rarement été étudiées d'un point de vue historique et culturel. Il est donc très difficile de transférer les enseignements dégagés d'une communauté à une autre située dans une province, une région ou un pays différent. Cette série d'études sur les méthodes de gestion à base communautaire des incendies de forêt au Laos, en Gambie, au Honduras, en Inde, en Chine et en Turquie constitue une première contribution utile pour connaître les communautés et leur mode de gestion des incendies. Elle devrait permettre d'identifier certains modèles d'intérêt général qui pourraient être mis à l'essai dans d'autres pays mais la diversité des cas, les conditions particulières et les contextes variables ne permettent guère d'établir par extrapolation des principes, des thèmes et des aspects communs qui se prêtent à l'élaboration d'un modèle propre à être reproduit.

Certaines initiatives présentées ici comme le projet de "Cooperazione e Sviluppo" (CESVI) de la province de Sayabouri, (RDP Lao) émanent de projets lancés par le gouvernement ou des donateurs qui sont axés sur la prévention des incendies et la préparation à la lutte. Comme les incendies de forêt ne sont pas considérés comme une menace majeure dans la plupart des écosystèmes étudiés, sauf dans le cas de la Gambie, certains seulement de ces projets sont axés exclusivement sur la gestion des incendies de forêt. La plupart des projets font à juste titre de la gestion des incendies un des volets d'actions de gestion forestière plus larges. Ils ont une optique globale de la gestion des ressources et visent à attaquer efficacement la cause profonde des incendies non désirés.

Dans la majorité des cas, la gestion à base communautaire des incendies s'est mise en place à la suite de la création d'institutions et de mécanismes communautaires qui favorisaient l'organisation de services plus efficaces de gestion des incendies (voir les deux exemples de Çal et de Bergama en Turquie). Les changements institutionnels initiaux se font alors au niveau local et les organismes gouvernementaux et non gouvernementaux se réorientent leur action pour passer de la gestion directe à un rôle plus technique et consultatif. La nature des changements institutionnels varie selon les endroits, comme d'ailleurs le rythme auquel ils se produisent. Néanmoins, l'adoption de la gestion à base communautaire des incendies de forêt dans le cadre d'initiatives de foresterie communautaire constitue un phénomène frappant dans des pays comme la Gambie.

Ce passage à la gestion à base communautaire des incendies de forêt est en outre favorisé par les objectifs généraux de conservation des forêts. Si l'on reconnaît que les gouvernements ont joué dans le passé un grand rôle dans la conservation des forêts (principalement en créant des réserves), on admet aussi de plus en plus qu'en fin de compte les organismes gouvernementaux ne se sont pas révélés les agents de sauvegarde des forêts les plus efficaces. Même les organismes gouvernementaux qui ont bien géré les forêts à des fins de conservation, ne l'ont pas toujours fait sur des bases vraiment participatives.

Il faut porter une attention particulière aux stratégies de maintien de l'ordre qui constituent la base de la plupart des programmes de gestion des incendies parrainés par les gouvernements. Les institutions nécessaires pour appliquer ces régimes de maintien de l'ordre ne sont plus financièrement viables et les principes de protection de l'État dont elles s'inspirent ont paradoxalement pour résultat de favoriser les conflits et donc l'accroissement des dépenses. Au lieu de réduire les problèmes posés par les incendies de forêt, ces régimes ont souvent pour effet d'accroître l'ampleur de ces incendies. En outre, ils négligent généralement les dimensions humaines des incendies ainsi que les avantages sociaux et écologiques positifs que peuvent apporter de petits incendies organisés et bien gérés.

Dans d'autres pays, la gestion à base communautaire des incendies de forêt tire son origine des droits indigènes sur la terre ou sur son utilisation, notamment le droit d'utiliser le feu comme instrument de gestion. Le maintien des pratiques traditionnelles grâce à l'attribution aux populations locales de pouvoirs appropriés de gérer et d'utiliser le feu est l'un des éléments clés de la gestion à base communautaire des incendies de forêt qui suscite de plus en plus d'intérêt au niveau international. L'obtention de droits sur la terre et son utilisation peut en dernier ressort contribuer à maintenir l'utilisation bénéfique de feux dirigés à des fins comme la lutte contre les mauvaises herbes, les ravageurs et les maladies et la création de revenus à partir de produits forestiers non ligneux. L'étude concernant l'État d'Orissa (Inde), expose bien l'importance des emplois traditionnels du feu pour la production de kendu et de fleurs de mahua. L'absence de documentation sur ces pratiques et d'autres du même genre risque de compromettre la sauvegarde des savoirs traditionnels.

Certains éléments de la gestion à base communautaire des incendies de forêt et d'autres stratégies à base communautaire correspondent à une relance et une officialisation des modes traditionnels de gestion des ressources naturelles. Les auteurs notent cependant qu'il ne faudrait pas donner trop d'importance à cet aspect. Même si le cadre global (communauté ou *kafoos*)¹ et les principaux agents (dirigeants, Alkalos² ou Muhtars)³ de l'emploi du feu pendant la période précoloniale restent en place dans les modes modernes de gestion des incendies (fondés sur la suppression), il faut faire preuve de prudence pour réintroduire un mode traditionnel de gestion des incendies dans les conditions actuelles. À la suite de l'accroissement démographique et des migrations qui s'ensuivent, certaines communautés sont devenues plus hétérogènes et sont parfois dotées de cadres institutionnels ou sujettes à des luttes de pouvoir qui ne favorisent pas les activités de gestion à base communautaire.

Il faut également éviter de surestimer le rôle et les capacités des communautés locales de lutter contre des incendies qui sont aujourd'hui plus importants et plus intenses que pendant la période précoloniale (antérieure à la stratégie de suppression des incendies). Compte tenu des régimes des incendies dans de nombreuses régions du monde, les communautés locales et leurs membres peuvent jouer un rôle important, voire essentiel, dans la lutte contre les incendies mais ne sauraient en assumer entièrement la charge.

Plusieurs programmes de gestion à base communautaire des incendies de forêt présentés ici sont appliqués dans des régions reculées où l'action de lutte contre les incendies des pouvoirs publics est gravement entravée par les problèmes d'accès et les délais d'intervention. Dans ces régions

¹ Associations villageoises de Gambie.

² Chefs de village de Gambie.

³ Chefs de village de Turquie.

reculées, les communautés doivent jouer un rôle important dans la prévention et la suppression des feux nuisibles qui ont un effet néfaste sur leur vie. Cependant, si la capacité des communautés locales de contribuer à éviter des grands incendies catastrophiques est reconnue, le gouvernement ne doit pas abandonner toutes les responsabilités, même dans les régions reculées. Si des incendies plus vastes et plus intenses qui exigent la mobilisation de ressources importantes ont lieu, la communauté concernée ne peut prendre seule la responsabilité de les éteindre.

De même, les feux ne sauraient être entièrement exclus de la vie quotidienne des populations et de l'écologie des zones qu'elles habitent. Les études montrent comment les communautés emploient le feu pour la culture, la collecte de produits forestiers non ligneux, la chasse, la production de fourrage et la lutte contre les ravageurs et les maladies (voir le cas du Honduras). Il faut bien faire la distinction entre ces petits incendies intentionnels et les grands incendies non maîtrisés ou non désirés.

Les études donnent des exemples du rôle précis que les communautés peuvent jouer dans la gestion des incendies – en ayant l'entièvre responsabilité dans certains cas et en partageant cette responsabilité en qualité de copropriétaire et de co-gestionnaire de la ressource dans d'autres. En outre, il existe quelques exemples (par exemple les forêts domaniales contrôlées par les communautés et les méthodes de foresterie communautaire en Gambie) de populations locales qui utilisent et gèrent légitimement les forêts selon des modalités traditionnelles en créant des zones d'utilisation à la périphérie des forêts domaniales. Dans ces zones, les usagers locaux sont les bénéficiaires d'accords de fourniture de revenus ou d'investissements accélérés dans des zones limitrophes des forêts. Il s'agit là de formes limitées d'intervention des communautés. En outre, ces régimes reconnaissent au minimum l'importance des communautés locales pour la protection et la gestion durable des ressources forestières. L'important, c'est que ces exemples ouvrent la voie au passage du pouvoir de gérer les incendies attribué exclusivement au gouvernement à un modèle de collaboration plus cohérent du point de vue écologique et plus durable.

De toute évidence, de nombreux éléments importants interviennent dans la gestion des incendies au niveau de la politique générale et au niveau du terrain et bon nombre d'entre eux n'apparaissent pas dans les études de cas présentées ici. La question fondamentale de savoir qui doit être maître de l'emploi du feu et le gérer convenablement est abordée à plusieurs reprises. À mesure que la population mondiale augmente, le milieu rural doit accueillir des millions d'êtres humains, indigènes ou migrants (volontaires ou forcés). Les communautés rurales en plein essor font inévitablement concurrence avec les facteurs internes et externes pour avoir accès aux ressources naturelles et au droit d'utiliser le feu comme outil de gestion. Ainsi, la concurrence croissante pour utiliser la terre, l'eau et les ressources forestières contribue souvent fortement à susciter la nécessité d'établir des systèmes mieux définis de gestion des incendies.

En bref, la gestion à base communautaire des incendies de forêt vise à assurer l'accès des populations locales aux ressources forestières et la gestion de ces ressources. Ces méthodes de gestion reposent souvent sur les droits indigènes sur la terre ou sur l'utilisation de la terre, notamment le droit à utiliser le feu comme outil de gestion. Le maintien des pratiques traditionnelles est fortement conditionné par l'attribution aux populations locales d'un pouvoir suffisant de gérer et d'utiliser les incendies et les ressources forestières. La gestion à base communautaire prend en compte la dimension humaine de l'incendie ainsi que l'utilité sociale et écologique des petits incendies délibérés et dirigés. Les études présentées dans ce rapport montrent comment les villageois gèrent le feu pour répondre à leurs besoins de subsistance journaliers. En imposant des contrôles locaux plus rigoureux sur l'utilisation du feu et en réalisant un consensus plus clair sur les accords relatifs à l'utilisation des ressources et aux droits

territoriaux avec leurs voisins et les organismes gouvernementaux, les populations locales peuvent limiter au minimum les effets destructeurs du feu et accroître au maximum son utilité.

LES SIX MONOGRAPHIES

Ces études présentent des conceptions et des expériences originales en matière de gestion à base communautaire des incendies de forêt qui sont apparues simultanément dans diverses régions du monde. Compte tenu de la dynamique des incendies dans chaque pays, chaque étude a été confiée à une organisation partenaire locale. Les six cas suivants sont présentés avec indication de l'endroit concerné, des orientations et des liaisons.

Chine

La recherche a été menée par le Centre d'étude du développement communautaire avec l'appui technique pour la rédaction et le soutien du Centre régional de formation à la foresterie communautaire pour l'Asie et le Pacifique (RECOFTC). Le Centre CDS est un organisme à but non lucratif qui cherche à promouvoir le développement communautaire durable en Chine au moyen de processus d'émancipation réelle fondés sur les besoins des communautés. L'enquête a porté sur Wenyime, village naturel du canton de Dayao, préfecture autonome de Chuxiong Yi parce que ses habitants connaissaient bien la prévention des incendies et la lutte. Le village a participé volontairement à la gestion des incendies avec l'appui financier et technique d'organismes gouvernementaux. Cette collaboration entre les pouvoirs publics et les communautés locales a donné de bons résultats et a récemment obtenu un prix du gouvernement de la province de Yunnan.

Cet exemple démontre combien il est important de lier la gestion à base communautaire des incendies de forêt à l'action visant à atténuer la pauvreté et à améliorer les conditions de vie générales dans une région. Il est recommandé de diversifier les sources de revenus des ruraux afin qu'ils n'aient plus de raison de recourir au feu pour défricher des terres.

Gambie

Le Département des forêts a, en collaboration avec le projet forestier Gambie-Allemagne, mené une enquête dans trois des cinq divisions que compte le pays pour déterminer si les pratiques de foresterie communautaire ont renforcé la capacité de gérer les incendies des communautés locales. En Gambie comme dans les autres pays étudiés dans cette série, le feu est le principal instrument local de défrichement des terres. Même si les pratiques de foresterie communautaire n'ont pas permis de réduire la fréquence des incendies de forêt au niveau national, il semble d'après certains signes que le fait que les populations locales sont propriétaires des forêts (ou aient le sentiment de l'être) a favorisé la collaboration avec les organismes gouvernementaux. Les zones en question ont enregistré un plus petit nombre d'incendies destructeurs ou non désirés de sorte qu'on peut penser que l'accroissement de la participation et l'accès à la propriété des forêts pourraient se traduire par une prévention plus efficace des incendies. Cette idée a été confirmée par une étude comparative à l'échelon national des villages pratiquant la foresterie communautaire ou non.

La notion nouvelle de forêts domaniales contrôlées par les communautés est présentée dans cette étude. Cette formule, selon laquelle les communautés sont responsables de la gestion des terres domaniales limitrophes de leurs forêts communautaires, montre que la Gambie passe d'une gestion des incendies de forêt centralisée et dirigée par l'État à des méthodes de gestion plus décentralisées à base communautaire.

Honduras

Au Honduras les recherches sur la gestion à base communautaire des incendies de forêt ont été effectuées par le Département de la protection des forêts et l'École nationale des sciences forestières. Dans ce pays, comme dans la plupart des autres, 99 pour cent des incendies de forêts sont causés par l'homme, principalement à des fins de défrichement de terres à mettre en culture. En règle générale, les populations considèrent les forêts comme un obstacle aux activités agricoles sans prendre en compte les revenus supplémentaires qu'elles peuvent fournir. Dans d'autres zones, le feu est utilisé pour retarder la régénération de la végétation en maintenant les herbes dans un état stable adapté à l'alimentation animale. Sur les terres boisées communales qui sont considérées comme ayant une valeur économique, les populations locales ont souvent recours à l'abattage et au brûlis. Lorsqu'un incendie échappe à leur contrôle, les communautés locales sont invitées à aider à l'éteindre. Bon nombre d'habitants acceptent mal ce genre de corvée qui les empêche d'exécuter les travaux agricoles. En l'absence de rémunération convenable, ils estiment qu'ils n'ont pas vraiment intérêt à participer à la lutte contre les incendies.

Les auteurs de l'étude recommandent de mettre en œuvre des programmes de formation et de sensibilisation au sein des communautés. Ils recommandent également d'élargir l'indépendance juridique et les droits de juridiction aux autorités municipales afin qu'elles puissent définir elles-mêmes leurs stratégies de gestion des incendies.

Inde

Les recherches concernant la gestion à base communautaire des incendies de forêt dans l'État d'Orissa (Inde) ont été effectuées par Vasundara, ONG qui s'intéresse activement aux forêts de cet État, avec l'appui technique du Centre régional de formation à la foresterie communautaire pour l'Asie et le Pacifique (RECOFTC). Vasundara s'efforce d'améliorer la collaboration entre les communautés et les pouvoirs publics et d'orienter la politique vers des systèmes de gestion forestière à base communautaire. Les communautés locales de cette région de l'Inde sont tout à fait disposées à protéger les forêts et à prévenir ou gérer les incendies de forêt parce qu'une part importante des ruraux tirent leurs produits de base et leurs revenus des forêts. L'étude qui portait sur plusieurs districts de Bolangir, Deogarh et Sambalpur de l'État d'Orissa différents entre eux, traite ainsi d'une large gamme de questions intéressant la gestion des incendies/ressources forestières, notamment les conflits entre villages, le ramassage du bois de feu et les problèmes financiers.

Cette étude présente un des rares cas bien établis d'utilisation du feu par les communautés pour faciliter la collecte de produits forestiers non ligneux. Elle fait ressortir les liaisons entre la fréquence des incendies et les disponibilités de ressources naturelles, le degré de dépendance vis-à-vis de ces ressources et l'utilisation traditionnelle du feu pour diverses activités lucratives.

République Démocratique Populaire Lao

Les recherches au Laos ont été exécutées par un consultant du projet de lutte contre l'incendie en Asie du Sud-Est, programme global de l'Alliance mondiale pour la nature (UICN) et du Fonds mondial pour la nature (WWF) qui a pour objectif d'identifier les parties prenantes, leurs pratiques d'utilisation et de gestion des incendies et les moyens d'améliorer la gestion des incendies. L'étude donne plusieurs exemples de stratégies de gestion à base communautaire des incendies qui proviennent principalement de projets lancés par les pouvoirs publics ou des donateurs qui sont axés sur la prévention des incendies et la préparation à la lutte. Bon nombre des éléments indispensables pour mettre en place ce type de gestion existent déjà ou seront prochainement mis en place au Laos. À Sayabouri les pouvoirs publics provinciaux transfèrent le pouvoir de gestion des incendies aux autorités de district et s'intéressent en permanence à la mise en place de la gestion à base communautaire considérée comme une solution viable dans cette zone du pays.

Une autre étude concernant Salavan présente une approche de foresterie communautaire plus intégrée par opposition aux projets lancés par les pouvoirs publics et les donateurs. L'étude conclut que, pour tenir les engagements et bien mettre en œuvre la gestion coopérative des ressources, un appui financier et technique supplémentaire est nécessaire au Laos.

Turquie

Le Ministère des forêts a passé en revue les mécanismes de participation active des communautés à la gestion des incendies. Ces mécanismes varient en fonction de la situation socio-économique et politique locale (action lancée par le gouvernement ou par la communauté). Deux cas de participation des communautés dans les directions des districts forestiers de Çal et Bergama ont été évalués et comparés avec les statistiques d'incendie de cinq villages voisins. Ce sont deux excellents exemples de participation active des populations locales propre à améliorer l'effet des mesures de prévention et de lutte contre les incendies de forêt. Le taux d'incendies de forêt volontaires s'établissait à 12,1 et 10,8 pour cent respectivement à Çal et à Bergama, contre une moyenne nationale de 14 pour cent sur les dix dernières années. D'autres statistiques confirment l'efficacité de cette participation des communautés et les deux sites pourraient servir de modèle à imiter dans d'autres régions de Turquie pour vérifier l'efficacité de la gestion à base communautaire des incendies de forêt.

L'AVENIR

L'examen des cas présentés ici permet de formuler diverses conclusions. En premier lieu, la plupart des études font ressortir une tendance positive des gouvernements et des organismes non gouvernementaux à s'orienter vers un rôle d'appui technique et de conseil. Les cadres institutionnels de lutte contre l'incendie établis depuis longtemps se révèlent de plus en plus mal adaptés à la situation actuelle, même dans les pays très développés disposant de budgets considérables. Ce modèle de lutte contre les incendies largement adopté suscite de plus en plus de critiques de la part des forestiers et des spécialistes des incendies des services publics, des universitaires et des habitants des forêts et de leurs environs.

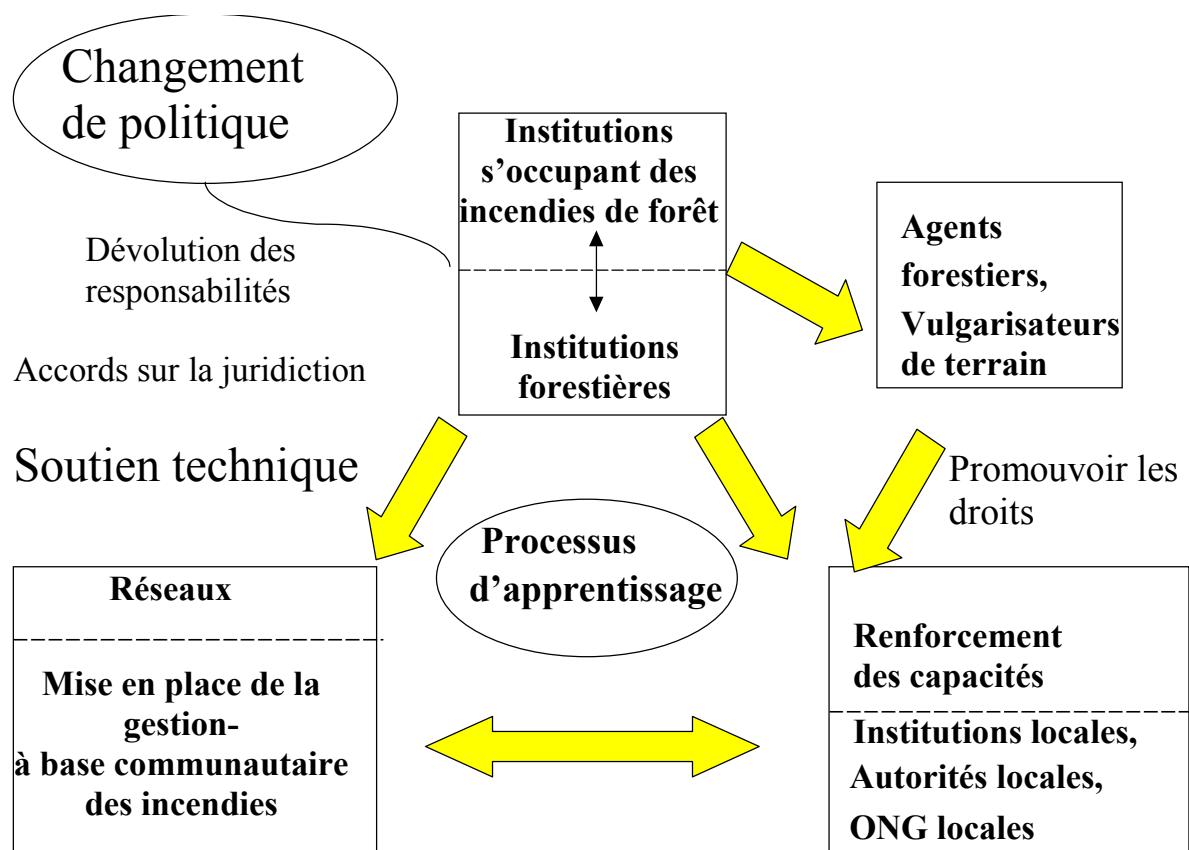
Il existe très peu de statistiques sur l'ampleur ou les types des incendies de forêt. La plupart des incendies survenant dans les pays en développement sont attribués à la culture itinérante, mais

les feux allumés à des fins de chasse, de pâturage, d'ouverture d'accès ou de défrichement qui échappent à leurs auteurs, provoquent peut-être plus de dégâts que la culture itinérante elle-même. Il n'est souvent pas possible d'identifier séparément les incendies provoqués par les processus de grande agriculture et d'agriculture commerciale. Les feux qui sont la manifestation d'iniquités sociales ou de conflits entre villages (comme à Sundergarh en Inde) sont aussi rarement distingués des incendies à effet bénéfique. Il est absolument nécessaire de rassembler les données de base requises pour identifier et analyser les causes profondes des incendies de forêt et de champs, mais aussi de comprendre l'influence des cadres institutionnels existants sur ces épisodes. La gestion des incendies peut gagner en efficacité si l'on s'attaque aux causes profondes de ces incendies (par exemple régimes fonciers et gestion des conflits inévitables). Il est nécessaire d'améliorer la collecte des données pour distinguer les incendies désirés et non désirés ou non contrôlés (comme cela est fait en Turquie et en Gambie). Pour établir où et quand un incendie est désiré, il est nécessaire d'établir une série d'approches et d'orientations qui prennent d'abord en compte les multiples parties intéressées et leurs intérêts différents.

Tout en évitant les charges financières que pourrait entraîner l'application exclusive de stratégies de gestion des incendies de forêt axées sur la suppression, le passage à la gestion à base communautaire pourrait aussi aider les gouvernements à résoudre précisément les conflits de droits et de pouvoirs entre institutions qui ont entravé la conservation des forêts et l'utilisation durable des ressources naturelles. Les changements essentiels à apporter aux institutions sont les suivants:

- un transfert des pouvoirs du gouvernement national au niveau local;
- une modification du cadre institutionnel dans lequel la gestion des incendies est administrée avec passage des institutions d'État aux institutions locales (figure 1);
- reconnaître que les forêts ne peuvent être maintenues, sauvegardées ou gérées de façon satisfaisante par les gouvernements sans tenir compte des impacts potentiels – positifs ou négatifs – des incendies sur les institutions locales;
- modification du cadre théorique (figure 1) dans lequel la gestion des incendies est conçue et mise en place avec passage de la prédominance de l'État ou des intérêts commerciaux à une conception qui reconnaît et appuie la capacité des institutions locales à planifier et gérer les incendies désirés en collaboration tout en prévenant et réduisant les effets destructeurs des incendies non désirés;
- une modification du régime de gestion quotidienne des incendies de forêt avec passage de régimes de maintien de l'ordre au détriment des usagers qui suscitent des conflits, à un régime selon lequel les usagers locaux réglementent leurs propres activités et sont en partie responsables de la protection (cas du canton de Dayao, province de Yunnan, Chine);
- une réorientation des institutions d'enseignement/de formation à la foresterie et à la gestion des incendies qui, au lieu de former des techniciens forestiers et gestionnaires de ressources, formeraient des médiateurs qui assureraient la promotion des accords de collaboration entre les villages (cas de Salavan, RDP Lao), les institutions locales et les organismes gouvernementaux (cas de la Gambie);
- la modification des institutions devra de plus en plus s'appuyer sur des activités complémentaires: réforme des politiques; législation; renforcement des institutions et des capacités au niveau local de base, pouvoirs en matière de gestion à base communautaire des incendies de forêt et mise en application; enfin, financement d'études et de campagnes de sensibilisation du public pour faire bien comprendre l'efficacité de ces méthodes.

FIGURE 1: Analyse au niveau national: rapports entre les acteurs principaux et résultats positifs que les modifications de ces rapports peuvent avoir pour la gestion sur des bases communautaires des incendies de forêt⁴



Il y a de nombreuses leçons à tirer de la foresterie communautaire elle-même et des disciplines connexes. Les six cas présentés ici offrent quelques exemples choisis dans diverses régions du monde. Il existe sans doute de nombreux autres exemples de gestion des incendies par les communautés locales pour diverses raisons. Les méthodes de gestion à base communautaire sont très variables. Afin de progresser, la gestion à base communautaire des incendies de forêt doit tenir dûment compte de cette variété et dégager les éléments analogues présents dans les contextes différents des communautés.

Dans un contexte général de décentralisation, il est évidemment nécessaire que les pays déterminent la meilleure approche à ce type de gestion en faisant des expériences au niveau local. Il n'est pas possible de modifier les cadres juridiques de façon satisfaisante en l'absence d'une politique d'orientation générale. En outre, il est préférable que les politiques soient elles-mêmes réaménagées sur la base d'exemples et d'expériences claires et non d'hypothèses. Comme dans le cas de la foresterie communautaire, il n'existe pas de documentation solide propre à servir de base au réaménagement des politiques en matière de gestion communautaire des incendies de forêt. Pour combler cette lacune, le présent recueil d'études de cas constitue une contribution pratique à l'adoption de ce type de gestion des incendies de forêt.

⁴ D'après Hobley et Shields, 2000. Projet forestier dans les Ghats occidentaux (Inde) soutenu par le DFID.

LISTE D'ACRONYMES

CESVI	Cooperazione e Sviluppo (Cooperation et développement)
CDS	Center for Community Development Studies (Centre pour les études du développement communautaire)
RECOFT	Regional Community Forestry Training Center for Asia and the Pacific (Centre régional de formation à la foresterie communautaire pour l'Asie et le Pacifique)
IUCN	Alliance mondiale pour la nature
WWF	Fond mondial pour la nature

PRÒLOGO

Estudios de caso sobre el manejo comunitario de incendios en China, Gambia, Honduras, India, la República Democrática Popular Lao y Turquía

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EL CONTEXTO

Los incendios constituyen un problema que ha desempeñado y seguirá desempeñando un papel importante en los ecosistemas forestales en todo el mundo. En casi todos estos ecosistemas, los seres humanos han alterado el orden natural de los incendios, cambiando la frecuencia e intensidad de los mismos. En muchas partes del mundo, se suele atribuir a las comunidades locales la responsabilidad de provocar incendios forestales perjudiciales. Esta consideración a menudo impulsa a las instituciones de manejo forestal y de manejo de incendios, a percibir a las comunidades locales como parte del problema, y no ciertamente, como parte de la solución. Según refleja el presente estudio de casos, la causa subyacente del fallido control de incendios por parte de la población no obedece a la falta de conciencia o atención, sino a la falta de incentivos para proteger los recursos forestales. ¿Por qué proteger los bosques, cuando estos pertenecen al estado o son utilizados por personas o entidades externas?

Dado que las poblaciones locales suelen correr un considerable riesgo en caso de incendios perjudiciales, son las poblaciones mismas quienes deberían poder participar a la hora de mitigar estos incidentes indeseables. El manejo comunitario de incendios es considerado cada vez más, como un componente de las estrategias de desarrollo participativas y de manejo de incendios forestales. Además, el manejo forestal comunitario reconoce la índole integral de la contribución que el manejo comunitario de incendios presta al manejo forestal participativo. Los promotores del manejo comunitario de incendios siempre han sostenido que existen nexos importantes y potenciales entre el manejo forestal comunitario, la planificación del uso de la tierra, el manejo de los recursos naturales y los procesos de desarrollo comunitario en general. El manejo comunitario de incendios no puede funcionar de manera independiente respecto a estos demás procesos.

Los gobiernos en todo el mundo, y con las debidas diferencias, han comenzaron a adoptar estrategias de manejo forestal colaborativas o comunitarias. El término “comunitario” en el contexto de los incendios abarca una amplia gama de situaciones: que van desde la probable participación forzada (coerción), a la libre y voluntaria participación en actividades que los actores mismos llevan a cabo (atribución de poderes y medios). El hincapié en este caso no sólo

reside en la participación de la comunidad, sino también en la capacidad que posee una comunidad que ya fue reconocida y apoyada por las instituciones externas (gobiernos, organizaciones no gubernamentales, proyectos y demás). Tal reconocimiento puede comprender el apoyo al sistema indígena existente, o puede realizarse mediante la formalización, modificación o reelaboración del mismo, o a través del establecimiento de sistemas nuevos. Se considera que muchos de estos sistemas y enfoques son más eficaces para mitigar las quemas incontroladas, siendo más beneficiosos para los ecosistemas locales y más eficaces desde el punto de vista económico a largo plazo.

Existe un vasto conjunto de conocimientos, así como un amplio examen de la definición que se hace de las comunidades y de los enfoques comunitarios en otros campos, como la antropología, el manejo forestal comunitario y otras disciplinas de las ciencias sociales. Sin embargo, la capacidad técnica y organizativa de las comunidades en relación con el manejo de los incendios, desde los puntos de vista histórico y cultural es poco conocida y es raramente estudiada. En consecuencia, es muy difícil transferir los conocimientos y el aprendizaje de lecciones de una comunidad, a otra, en distintas provincias, naciones y regiones. Esta recopilación de enfoques de manejo comunitario de incendios de la República Democrática Popular Lao, Gambia, Honduras, India, China y Turquía es un valioso paso inicial que enriquece el conjunto de conocimientos que existen sobre las comunidades y los incendios. Aunque este paso encierra el potencial de identificar algunos de los modelos generales que existen sobre el manejo comunitario de incendios, a fin de que los demás puedan ponerlos en práctica en sus respectivos países, la diversidad que caracteriza a los casos, circunstancias únicas y contextos variados vuelven ardua la extrapolación de principios, temas y aspectos comunes que se presten a la elaboración un modelo transferible.

Algunas de las iniciativas que se documentan en esta recopilación, tales como el proyecto de la entidad Cooperación y Desarrollo (CESVI), realizado en la Provincia de Sayabouri, República Democrática Popular de Lao, forman parte de proyectos gubernamentales o promovidos por donantes y están enfocados en la prevención y alerta de incendios. Dado que los incendios forestales no se consideran como una amenaza tan grande para la mayoría de los ecosistemas documentados, a excepción de Gambia, sólo una parte de estos proyectos gubernamentales, o promovidos por donantes, se basa exclusivamente en el manejo de incendios forestales. Mejor aún, la mayoría de los proyectos consideran el manejo de incendios como un componente de las iniciativas de manejo forestal más amplias. Dichos proyectos consideran el manejo de los recursos de manera holística y tienden a ser eficaces en cuanto al tratamiento de las causas de los incendios involuntarios.

Los ejemplos de manejo comunitario de incendios más comunes, son aquellos que derivan de la creación de instituciones comunitarias, así como de mecanismos de apoyo para un manejo de incendios más eficaz (tales como los dos casos que se documentan en las localidades de Çal y Bergama en Turquía). En estos casos, las principales transformaciones institucionales se verifican en el ámbito local, mientras que las agencias gubernamentales y no gubernamentales reorganizan sus propias funciones de conformidad, alejándose de una función de manejo directo para asumir papeles más técnicos y consultivos. La naturaleza de los cambios institucionales varía de lugar a lugar, así como la rapidez con la cual los cambios ocurren. Sin embargo, el desplazamiento en dirección del manejo comunitario de incendios, como parte de las iniciativas forestales comunitarias en países como Gambia ya se puso en marcha.

Las fuerzas promotoras de este desplazamiento en dirección del manejo comunitario de incendios cobraron mayor impulso gracias a los objetivos de conservación en su conjunto. Mientras que se reconoce el papel que los gobiernos desempeñaron en el pasado, en cuanto a la

conservación de los bosques, (principalmente a través de la creación de reservas naturales), también existe cada vez más conciencia de que las entidades gubernamentales no demostraron ser los agentes más eficaces para la conservación de los bosques. Aún en los lugares en donde las entidades gubernamentales han logrado manejar los bosques con el fin de conservarlos, éstas no siempre lo hicieron de manera participativa.

Las estrategias de vigilancia que forman el núcleo de la mayoría de los programas de manejo, patrocinados por los gobiernos, son objeto de particular preocupación. Las instituciones que deben administrar estos sistemas de vigilancia dejaron de ser factibles desde el punto de vista económico y los principios de protección estatal que estos encarnan, alimentan los conflictos y, paradójicamente, incrementan los gastos. En lugar de mitigar las dificultades que crean los incendios forestales, estos sistemas a menudo incrementan la magnitud y escala de los incendios mismos. Además, estos ignoran ampliamente el papel que desempeña la dimensión humana en los incendios, así como los beneficios sociales y ecológicos que conllevan los incendios prescritos y controlados.

En otros países, las fuerzas que impulsan los enfoques de manejo comunitario de incendios son los derechos indígenas de propiedad y uso de la tierra, entre ellos, el derecho a utilizar el fuego como instrumento de manejo forestal. La persistencia de las prácticas tradicionales, a través de la capacitación y habilitación adecuada de las poblaciones locales para que manejen y utilicen el fuego, constituye uno de los componentes fundamentales del manejo comunitario de incendios, que está captando cada vez más atención en el ámbito internacional. Garantizar los derechos a la propiedad y uso de la tierra puede contribuir a mantener el uso beneficioso de los incendios controlados con fines de desyerbe, reducción del impacto de las plagas y enfermedades, así como de generación de ingresos a partir de productos forestales no madereros (PFNM). El caso proveniente de Orissa, India, documenta la utilización tradicional de los incendios para favorecer la floricultura, cual la producción de flores de kendu y mahua. La falta de documentación de esta y de otras prácticas similares amenaza con desgastar el acervo cultural y cognitivo.

Algunos elementos del manejo comunitario de incendios y de otras estrategias de índole comunitaria constituyen un resurgimiento y formalización de sistemas indígenas de manejo de recursos naturales. Sin embargo, los autores se proponen alertar sobre los riesgos que conlleva un excesivo hincapié en este aspecto. Aunque existe coherencia en el marco general (comunidad o *kafoos*)¹, y los actores principales (dirigentes, Alkalos² o Muhtars)³; entre el uso de los incendios antes de la colonización y los sistemas actuales (basados en la supresión de incendios), las condiciones actuales requieren de precaución cuando se trata de volver a introducir los sistemas tradicionales de uso de incendios. Debido al actual crecimiento de la población y a los consiguientes flujos migratorios, algunas comunidades se han vuelto más heterogéneas de lo que eran y en algunos casos, se encuentran sujetas a arreglos institucionales y a luchas de poder que no favorecen a las actividades de manejo comunitario.

Se requiere de una precaución similar respecto a un excesivo hincapié en el papel y capacidad que poseen las comunidades locales para combatir los incendios más vastos y de mayor intensidad, respecto a aquellos de índole precolonial (o anteriores a la práctica de la supresión de incendios). Dado que existen sistemas que utilizan el fuego en distintas partes del mundo, las comunidades y sus miembros pueden ser un componente importante y clave, pero todo el peso de la lucha contra incendios no debería descansar en las comunidades.

¹ Asociaciones de aldea en Gambia.

² Dirigentes de aldea en Gambia.

³ Dirigentes de aldea en Turquía.

Varios programas de manejo comunitario de incendios, documentados en esta recopilación, se llevaron a cabo en lugares remotos en donde los enfoques gubernamentales de control y supresión de incendios se encuentran gravemente amenazados, debido al tiempo que se requiere para acudir y responder a la emergencia. En localidades remotas como esas, las comunidades tienen un papel importante que desempeñar para prevenir y apagar incendios perjudiciales que tienen un impacto negativo en sus vidas. Aún más, mientras el manejo comunitario de incendios reconoce la capacidad que la comunidad local tiene para ayudar a prevenir el surgimiento de incendios, el gobierno no debe delegar toda la responsabilidad, aún en estas localidades remotas. En el caso de incendios más vastos e intensos, es necesario contar con notables recursos y la comunidad no debe cargar sola con toda la responsabilidad de extinguir los incendios.

De manera similar, los incendios no deberían excluirse del todo, de la vida cotidiana de la población, ni de la ecología del ambiente que estos habitan. El estudio de casos ilustra las formas en que las comunidades utilizan el fuego para preparar la tierra y sembrar cultivos y productos forestales no madereros, para cazar u obtener forraje y para manejar las plagas y enfermedades (según puede observarse en el caso de Honduras). Estos pequeños incendios intencionales deben distinguirse respecto a los incendios involuntarios e incontrolados.

Este estudio de casos ilustra ejemplos en donde las comunidades tienen un evidente papel en el manejo de incendios – en algunos casos siendo plenamente responsables, y en otros compartiendo la responsabilidad con otros dueños o gestores conjuntos de los recursos. Además existen algunos ejemplos (tales como los bosques estatales manejados por las comunidades y los enfoques de forestería comunitaria de Gambia) en los cuales la población local utiliza y maneja los bosques con plena legitimidad, por medio de métodos tradicionales y a través del establecimiento de zonas de uso en la periferia de los bosques de propiedad estatal. En estas áreas los usuarios locales son beneficiarios de acuerdos sobre actividades generadoras de ingresos o reciben fuertes inversiones en áreas que se encuentran adyacentes a los bosques. Todas éstas son formas limitadas de participación comunitaria. Sin embargo, estas al menos reconocen la importancia que las comunidades locales tienen respecto a la protección y manejo sostenible de los recursos forestales. Aún más importante es que estos ejemplos proporcionan un peldaño para transferir la autoridad sobre el manejo de incendios, la cual deja de ser únicamente una función del gobierno, para transformarse en un modelo de mayor colaboración, coherente desde el punto de vista ecológico y más sostenible.

Es evidente que existen muchos componentes importantes del manejo de incendios que forman parte del ámbito de las políticas y del ámbito de terreno; muchos de esos aspectos no figuran en el estudio de casos documentado en este informe. Un componente recurrente consiste en el tema fundamental de quién debería controlar el uso de los incendios y manejarlos de manera apropiada. A medida que la población mundial creció, el ámbito rural ha absorbido millones de personas, tanto habitantes indígenas, como migrantes (voluntarios y forzados). Populosas comunidades rurales compiten inevitablemente con los factores externos e internos para tener acceso a los recursos naturales y al derecho de utilizar los incendios controlados como instrumento de manejo. En consecuencia, la creciente competencia por la tierra, el agua y los recursos forestales, a menudo, es una importante fuerza que guía la necesidad de contar con sistemas mejor definidos de manejo de incendios.

En resumen, el manejo comunitario de incendios se preocupa por garantizar que la población local tenga acceso a los recursos forestales y al manejo de los mismos. Los elementos catalizadores que respaldan los enfoques de manejo comunitario de incendios son los derechos

de propiedad y/o uso de la tierra, entre ellos el derecho a utilizar los incendios como instrumento de manejo. La preservación de las prácticas tradicionales depende en gran medida del grado de capacidad con que cuenten las poblaciones locales para manejar y utilizar los recursos forestales. El manejo comunitario de incendios reconoce el papel de la dimensión humana en los incendios, así como los beneficios sociales y ecológicos que tienen los pequeños incendios prescritos, utilizados como instrumentos de manejo. El estudio de casos que figura en este informe demuestra cómo los aldeanos manejan los incendios con fines de subsistencia cotidiana. Al ejercer un control local más estricto en cuanto al uso de los incendios y al lograr un consenso más evidente acerca del uso de los recursos y respecto a los acuerdos en materia de derechos sobre el territorio, en relación con sus vecinos y los organismos gubernamentales, la población local puede restringir los efectos destructivos de los incendios e incrementar al máximo sus beneficios.

EL ESTUDIO DE SEIS CASOS

El estudio de casos presenta perspectivas y experiencias únicas de manejo comunitario de incendios que surgieron de manera simultánea en distintas partes del mundo. Como reflejo de los contextos tan dinámicos que caracterizan al tema de los incendios en cada país, cada uno de los estudios fue realizado por un organización local. Los seis casos, sus localidades, el hincapié y las afiliaciones respectivas comprenden:

China

La investigación fue realizada por el Centro para los estudios de desarrollo comunitario, (CDS) y contó con la edición técnica y el apoyo del Centro Regional de Capacitación en Forestería Comunitaria para Asia y el Pacífico, (RECOFTC). CDS es una institución sin fines de lucro que promueve el desarrollo comunitario sostenible en China, mediante procesos de capacitación eficaces basados en las necesidades comunitarias. Dado que los habitantes tienen un profundo conocimiento acerca de la prevención y el control de incendios, este caso se propuso realizar la investigación en Wenyime, una aldea del condado de Dayao, de la Prefectura autónoma de Chuxiong Yi. La aldea participó voluntariamente en el manejo de incendios y contó con el apoyo financiero y técnico de las agencias gubernamentales. Este esfuerzo de cooperación entre el gobierno y las comunidades locales logró resultados considerables y fue galardonado recientemente con un premio por el gobierno provincial de Yunnan.

Este caso demuestra cuán importante es establecer un nexo entre el manejo comunitario de incendios, los esfuerzos de mitigación de la pobreza y el mejoramiento, en general, de las condiciones de vida en la región. A fin de desalentar la utilización de los incendios como instrumento de desboscamiento del terreno, el estudio arrojó una recomendación clave que consiste en diversificar las fuentes de ingresos de la población rural.

Gambia

El Departamento forestal, en colaboración con el proyecto forestal gambiano-alemán, investigó tres de las cinco divisiones del país para determinar si las prácticas de forestería comunitaria han incrementado la habilidad de las comunidades locales para manejar los incendios de manera más eficaz. Los incendios en Gambia, así como en otros países documentados en esta recopilación, constituyen el principal instrumento local para desboscar el terreno. Aunque las prácticas de forestería comunitaria no han sido capaces de reducir la frecuencia de los incendios forestales en

todo el país, existen evidencias de que la propiedad local de los bosques (y/o cierto grado de propiedad) hizo cambiar, de manera positiva, las actitudes de colaboración de las comunidades para con las agencias gubernamentales. Estas áreas se han visto menos afectadas por incendios involuntarios y perjudiciales, haciendo suponer que el incremento de la participación y el acceso a la propiedad de los recursos forestales pueden conducir a una prevención de incendios más eficaz. Esta tendencia se confirmó gracias a una encuesta nacional comparativa, realizada entre las aldeas involucradas en la forestería comunitaria y aquellas que no lo estaban.

El nuevo concepto de Bosques estatales manejados por la comunidad (CCSFs) fue introducido en este caso. Este concepto, según el cual las comunidades son responsables del manejo de las tierras de propiedad estatal adyacentes a sus bosques comunitarios, demuestra que Gambia se desplazó de un manejo centralizado promovido por el gobierno, hacia un sistema de manejo descentralizado y principalmente comunitario.

Honduras

La investigación sobre el manejo comunitario de incendios en Honduras fue realizada por el Departamento de protección forestal de la Administración Forestal del Estado y por la Escuela Nacional de Ciencias Forestales. Como sucede en la mayoría de los casos, el 99 por ciento de los incendios forestales en Honduras obedecen a causas antropogénicas, sobre todo debido a las actividades de desboscamiento para la agricultura. En general, la gente considera los bosques como un obstáculo para las actividades agrícolas, y no toman en consideración los ingresos suplementarios que éstos pueden rendir. En otras áreas, los incendios se utilizan como medios para retardar la regeneración, manteniendo los pastos en un estado apropiado para producir forraje para los animales. En las tierras boscosas comunales, consideradas como tierras con valor económico, la población local a menudo desbosca y quema. Cuando los incendios escapan fuera de control, se solicita a la comunidad local que ayude a apagarlo. Muchos se resienten por este tipo de actividad dado que los aleja de sus actividades agrícolas. Si no existe una compensación adecuada, la población considera que controlar los incendios no es de su interés.

El estudio de este caso recomienda que se lleven a cabo programas de capacitación y concientización en las comunidades. Asimismo, recomienda que se extiendan derechos de jurisdicción e independencia a los gobiernos municipales, de manera que estos puedan definir sus propias estrategias de manejo de incendios.

India

La investigación sobre manejo comunitario de incendios en Orissa, India, fue realizada por Vasundara, una organización no gubernamental que cuenta con una trabajo extenso en los bosques de Orissa, y con el apoyo técnico del Centro Regional de Capacitación en Forestería Comunitaria para Asia y el Pacífico (RECOFTC). Vasundara trabaja para mejorar la colaboración entre la comunidad y el estado y para orientar las políticas en dirección de sistemas de manejo comunitarios. La comunidad local en esta parte de la India cuenta con un fuerte incentivo para proteger los bosques y prevenir o manejar los incendios forestales, dado que una proporción considerable de la población depende de los bosques para su subsistencia e ingresos. Al enfocar la investigación en varios y distintos distritos de Bolangir, Deogarh y Sambalpur en el estado de Orissa, este caso ofrece una amplia gama de temas sobre el manejo de recursos/incendios que comprenden los conflictos entre aldeas, la recolección de leña y las consideraciones de índole presupuestaria.

Este caso ofrece uno de los pocos ejemplos documentados, en donde los incendios son utilizados por las comunidades para facilitar la recolección de productos forestales no madereros. El estudio identificó nexos entre la frecuencia de los incendios y la disponibilidad de los recursos naturales, el grado de dependencia que se tiene del recurso y los usos tradicionales de los incendios para varias actividades de generación de ingresos.

La República Democrática Popular Lao

La investigación en la República Democrática Popular Lao fue realizada por un consultor del Proyecto de combate contra incendios de Asia Sudoriental, un programa mundial de la Unión Mundial para la Naturaleza (UICN) y del Fondo Mundial para la Naturaleza (WWF), los cuales trabajan para identificar a los actores, el uso que éstos hacen de los incendios y sus prácticas de manejo, así como las maneras de mejorar el manejo de incendios. El estudio proporciona varios ejemplos de estrategias de manejo comunitario de incendios, principalmente de proyectos promovidos por gobiernos o por donantes que se centran en la prevención y medios para afrontar situaciones de emergencia debidas a incendios. Muchos de los elementos claves necesarios para establecer prácticas comunitarias de manejo de incendios existen ya en la República Democrática Popular Lao o se encuentran en vías de establecimiento. Las entidades del gobierno provincial están cediendo la autoridad del manejo de incendios al ámbito de distrito y mantienen un interés continuo en desarrollar el manejo comunitario de incendios como un enfoque factible para esta región de la República Democrática Popular Lao.

En contraste con este ejemplo patrocinado por el gobierno y promovido por los donantes, otro estudio realizado en Salavan ilustra un enfoque más integrado de forestería comunitaria. Al partir de este caso, se concluye que, a fin de cumplir con los compromisos y poner en marcha un manejo de recursos coparticipativo eficaz, es necesario que la República Democrática Popular Lao cuente con apoyo técnico y con financiación suplementaria.

Turquía

El Ministerio de Bosques llevó a cabo una revisión de los mecanismos que existen para lograr una participación comunitaria activa en el manejo de incendios. Las diferencias entre estos mecanismos dependían de las situaciones socioeconómicas y políticas locales (las promovidas por el gobierno respecto a las que impulsa la comunidad). Se tomaron dos casos de participación comunitaria en las juntas directivas de Çal y Bergama del distrito forestal, los cuales fueron evaluados y comparados respecto a las estadísticas de incendios provenientes de cinco aldeas vecinas. Ambos casos proporcionaron ejemplos sólidos en los cuales la participación de la población local incrementó el éxito de las medidas de control y la prevención de incendios forestales. La proporción de incendios forestales intencionales en Çal y Bergama fue de 12.1 y de 10.8 por ciento, respectivamente, mientras que el promedio nacional en el curso del último decenio fue del 14 por ciento. Otros datos estadísticos validan la eficacia de esta participación comunitaria y los dos sitios se sugieren en calidad de modelos a ser aplicados en los demás lugares de Turquía a fin de probar mejor la eficacia de los enfoques de manejo comunitario de incendios.

LA VIA FUTURA

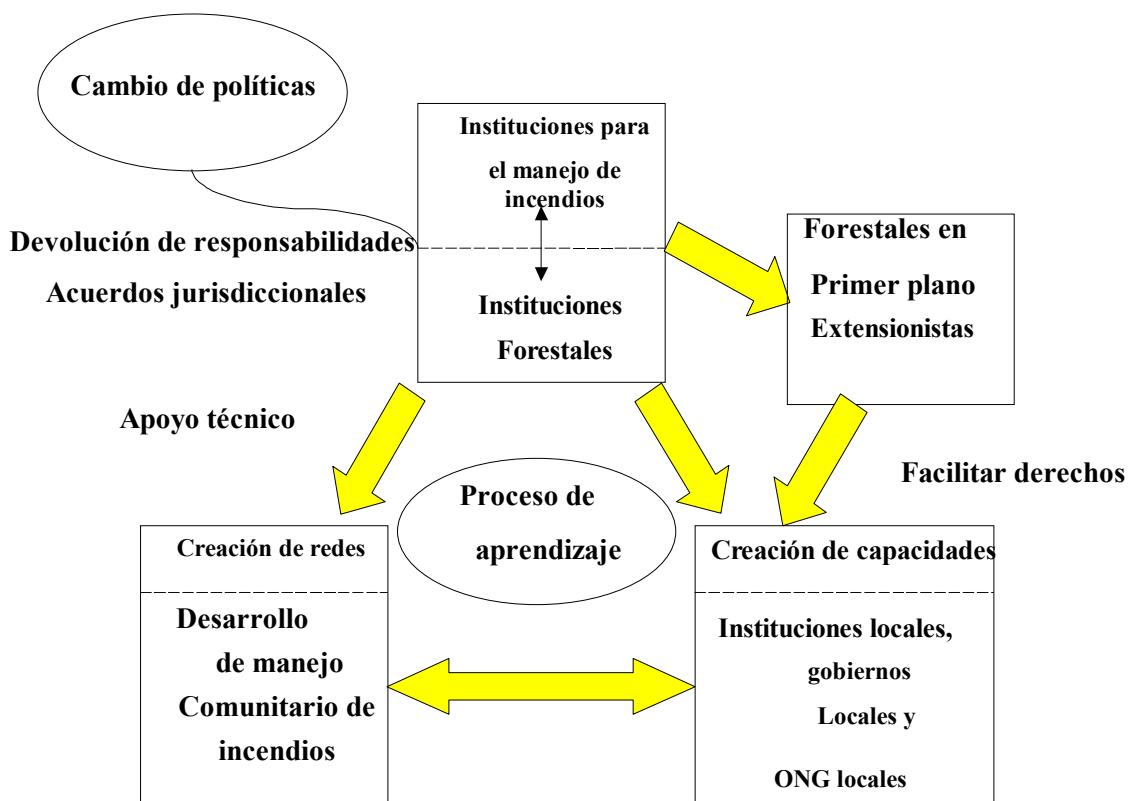
Varias conclusiones emergen a raíz de la revisión de los casos aquí presentados. Primero, el desplazamiento del enfoque de las agencias gubernamentales y no gubernamentales hacia un papel de índole técnica y consultiva, constituyó una tendencia positiva en este estudio de casos. Los viejos marcos de trabajo institucionales para el control y supresión de incendios demuestran ser cada vez más inapropiados para la situación actual, aún en los países desarrollados que cuentan con grandes presupuestos. Este modelo de control de incendios tan difuso se encuentra sujeto a una crítica creciente por parte de los forestales y gestores interesados del gobierno, amén de los académicos y la población que vive en los bosques y alrededor de ellos.

Existen muy pocas estadísticas acerca de la extensión y tipos que caracterizan a los incendios forestales. Aunque la mayoría de los incendios en los países en desarrollo se atribuyen a la agricultura itinerante, los fuegos incontrolados debidos a las prácticas de caza, pastoreo, acceso o desboscamiento pueden causar más daños que la agricultura itinerante. En muchos casos, el uso del fuego en los procesos de agricultura en gran escala y en las actividades de la agroindustria comercial no puede identificarse separadamente. También los incendios que surgen como una expresión de desigualdad social o como una manifestación de conflicto entre aldeas (como lo muestra el caso documentado en Sundergarh, India) se distinguen raramente de la utilización beneficiosa de los fuegos. No sólo existe una fuerte necesidad de recopilar los datos fundamentales necesarios para identificar y analizar cuáles son las causas subyacentes de los incendios forestales y terrestres, sino que además se necesita comprender cuál es el impacto que los marcos institucionales actuales tienen en esos incendios. Las causas subyacentes de estos incendios (por ej. La situación de la tenencia de la tierra y el manejo de conflictos) pueden mejorar la eficacia del manejo de incendios. Se requiere de una mejor contabilidad para distinguir entre las quemas prescritas y los incendios involuntarios e incontrolados (tal como las distinciones hechas en los casos de Turquía y Gambia). Con el fin de establecer cuándo y dónde se propician los incendios, se requiere además, de una serie de enfoques y directrices que primero tomen en cuenta a los diferentes actores y sus distintos intereses.

Asimismo, es necesario evitar la fuga potencial de finanzas cuando se concentra la atención únicamente en las estrategias de manejo de incendios basadas en la supresión de los mismos. Un desplazamiento en dirección del manejo comunitario de incendios también ayudará a los gobiernos a resolver los conflictos que surgen respecto a los derechos institucionales y a la autoridad, entidades que hayan podido inhibir la conservación de los bosques y el uso sostenible de los recursos naturales. Los elementos fundamentales necesarios para un cambio institucional comprenden:

- Un desplazamiento del control, alojado en el gobierno central, hacia el ámbito local;
- Un cambio en el marco de trabajo institucional dentro del cual el manejo de incendios pase de ser administrado por las instituciones estatales, a ser manejado por las instituciones locales (Figura 1);

FIGURA 1: Análisis del ámbito nacional y de las relaciones que existen entre los actores claves y cómo los cambios en estas relaciones pueden conducir a resultados positivos para el manejo comunitario de incendios⁴



- El reconocimiento de que los bosques no pueden ser mantenidos, conservados o manejados de manera satisfactoria por los gobiernos, sin tomar en consideración los impactos potenciales – positivos o negativos – que esos incendios tienen en las instituciones locales;
 - Un cambio en el marco conceptual (Figura 1) dentro del cual el manejo de incendios se conciba y desarrolle, lejos de predominio del estado o de los intereses comerciales, desplazándose hacia un marco que reconozca y apoye las capacidades de las instituciones locales para planificar y manejar los incendios;
 - Un cambio en la manera de llevar a cabo el manejo de incendios forestales cotidianamente, lejos de sistemas que induzcan al conflicto entre usuarios y guardianes, y orientado hacia una forma de manejo en la cual el usuario local ejerza el autocontrol y esté parcialmente a cargo de actividades de protección (como lo muestra el caso del condado de Dayao, en la provincia de Yunnan, en China);
 - Un desplazamiento de enfoque dentro del ámbito de las instituciones académicas e instituciones de capacitación en materia forestal y manejo de incendios, que se aleje de una formación de los forestales y gestores de recursos, formados en calidad única de expertos técnicos, en dirección de una formación que incluya un papel de facilitador que maneje y promueva acuerdos de colaboración entre aldeas (como muestra el caso de Salavan, República Democrática Popular Lao), instituciones locales y agencias gubernamentales (según muestra el caso de Gambia);

⁴ Adaptado a partir de Hobley y Shields, 2000. Proyecto Forestal en Western Ghats en India apoyado por DFID.

- Una gama de actividades de apoyo será cada vez más necesaria a fin de propiciar cambios institucionales, entre ellos: la reforma de las políticas; la existencia de legislación favorable; el desarrollo y creación de capacidades en el ámbito lo más local posible; la existencia de una autoridad encargada del manejo comunitario de incendios y de su ejecución, así como la inversión para elaborar documentación y campañas de concientización pública a fin de comunicar la eficacia de estos enfoques.

Existen grandes oportunidades para aprender de la forestería comunitaria y otras disciplinas afines. Los seis casos del estudio presentados aquí ofrecen algunos ejemplos provenientes de distintas regiones del mundo. Es probable que existan numerosos ejemplos más, en los cuales las comunidades locales manejen los incendios por otra serie de razones. Estos enfoques comunitarios mostraron tener una gran diversidad. A fin de que el manejo comunitario de incendios pueda progresar, éste debería abarcar esa diversidad e identificar las similitudes en los distintos contextos comunitarios que las albergan.

En un contexto general de descentralización, existe una evidente necesidad de que los distintos países determinen cuál es el mejor enfoque de manejo comunitario de incendios a través de la experimentación con los ejemplos que existen localmente. Los marcos legales no pueden ser enmendados de manera satisfactoria sin que exista la orientación de las políticas. Además, las políticas mismas podrán ser reformadas con más productividad a partir de los ejemplos y de la claridad que proporcionan las experiencias, y no a partir de hipótesis. Al igual que con la forestería comunitaria, el manejo comunitario de incendios carece de casos bien documentados que sirvan de propulsores para la reconstitución de las políticas. Con el fin de colmar esta tarea, esta recopilación de estudios de caso proporciona algunos pasos prácticos a realizar en dirección del manejo comunitario de incendios.

LISTA DE ACRÓNIMOS

CESVI	Cooperazione e Sviluppo (Cooperación y desarrollo)
CDS	Center for Community Development Studies (Centro para los estudios de desarrollo comunitario)
CCSF	Community-Controlled State Forests (Bosques estatales manejados por la comunidad)
PFNM	Productos forestales no madereros
RECOFT	Regional Community Forestry Training Center for Asia and the Pacific (Centro regional de capacitación en forestería comunitaria para Asia y el Pacífico)
UICN	Unión Mundial para la Naturaleza
WWF	Fondo Mundial para la Naturaleza

Community-based forest fire management in Wenyime village, Sanchahe township, Dayao county, Chuxiong Yi autonomous prefecture, Yunnan province, China

By Zhang Lichang, Wu Long, Zhao Yaqiao and Lu Caizhen; October 2001

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EXECUTIVE SUMMARY

China had an average of 15 619 forest fire events each year since the establishment of the People's Republic of China in 1949 until 1990. Yunnan is one of the country's key national forest areas. It is rich in forest resources, but also very prone to fire. Every year, more than 2 700 forest fire events occur, destroying 1.7 million ha of forest. Of the many natural disasters in Yunnan, fire has had the most pronounced influence on forest cover. Although forest fires are difficult to prevent altogether, proper management and control can reduce their occurrence and spread, or at least minimize the damage that they cause.

The Chinese Communist Party and Government in Dayao county have paid great attention to forest fire management, especially after the Daxinganling forest fire in 1987. A collaborative effort between government and communities in the county has led to significant achievements, culminating in Dayao county being awarded a prize for advanced forest fire management by Yunnan Provincial Government in 1992.

This case study investigates the village of Wenyime in Dayao county, Chuxiong Yi Autonomous Prefecture, where villagers have shown a profound understanding of fire prevention and control and have participated voluntarily in fire management. The effect of such community-based fire management (CBFiM) has been beneficial to both villagers and government.

Forest fire management has a close and direct relationship with forest tenure. The existing Responsibility Mountain policy has provided benefits and income to the people of Wenyime village, thereby encouraging their participation in CBFM in order to protect the forest resources from which such benefits are derived. To date, the effects have been positive, with no incidence of uncontrolled fire in the past 35 years. The most effective forest fire prevention regulations are not necessarily those of the government or outside agents. In Wenyime village, the community has discussed and formulated very effective regulations of its own. These experiences are worth publicizing within the county, the province and the whole country.

Gestion à base communautaire des incendies de forêt dans le village de Wenyime, municipalité de Sanchahe, canton de Dayao, Préfecture autonome de Chuxiong Yi, Province de Yunnan, Chine

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RÉSUMÉ

La Chine a enregistré en moyenne 15 619 incendies de forêt par an entre 1949, date de création de la République populaire, et 1990. Le Yunnan est une des zones forestières les plus importantes du pays: il est riche en ressources forestières mais très exposé aux incendies. Chaque année, plus de 2 700 incendies ont lieu et détruisent 1,7 million d'hectares de forêt. Parmi les nombreuses catastrophes naturelles qui frappent la province, c'est le feu qui a l'incidence la plus forte sur le couvert forestier. Bien qu'il soit difficile de prévenir totalement les incendies de forêt, une gestion et une lutte bien organisées permettent de réduire leur fréquence et leur ampleur, ou tout au moins de limiter au minimum les dégâts qu'ils causent.

Le Parti communiste et les pouvoirs publics du canton de Dayao ont porté un grand intérêt à la gestion des feux de forêt, notamment après l'incendie de Daxinganling en 1987. La collaboration entre les pouvoirs publics et les communautés du canton a donné des résultats si remarquables que le canton a reçu du gouvernement provincial un prix pour sa gestion avancée des incendies de forêt en 1992.

Cette étude porte sur le village de Wenyime du canton de Dayao, (préfecture autonome de Chuxiong Yi) où les villageois connaissent bien la prévention et la lutte contre les incendies et ont participé à titre volontaire à la gestion des incendies. La gestion à base communautaire des incendies a été bénéfique pour les villageois comme pour les pouvoirs publics.

Il existe un rapport étroit et direct entre la gestion des incendies et le régime foncier des forêts. La politique de responsabilité dans les zones de montagne actuellement appliquée a apporté divers avantages et fourni des revenus aux villageois de Wenyime, et les a ainsi encouragés à participer à la gestion communautaire des incendies de forêt afin de protéger les ressources forestières si précieuses pour eux. Jusqu'ici cette politique a eu des effets positifs et aucun incendie non maîtrisé n'a eu lieu depuis 35 ans. Ce ne sont pas nécessairement les règlements des pouvoirs publics ou d'agents extérieurs qui sont les plus efficaces pour prévenir les incendies de forêt. Au village de Wenyime, la communauté a étudié et établi elle-même une réglementation très efficace. Ces réalisations méritent d'être largement connues au niveau du canton, de la province et de tout le pays.

Manejo Comunitario de los incendios en la Aldea de Wenyime, de la alcaldía de Sanchahe, condado de Dayao, aorefecura autónoma de Chuxiong Yi, provincia de Yunnan, China

Por Zhang Lichang, Wu Long, Zhao Yaqiao y Lu Caizhen; Octubre 2001
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RESUMEN DE ORIENTACIÓN

China alcanzó un promedio de 15 619 incendios al año entre 1949, fecha de la fundación de la República Popular de China, y 1990. Yunnan es una de las áreas forestales más importantes del país. Esta provincia es extremadamente rica en recursos forestales, pero también es muy propensa a los incendios. Cada año ocurren más de 2 700 casos de incendio que destruyen cerca de 1.7 millones de ha de bosque. El fuego es uno de las numerosas causas de desastres naturales que ocurren en Yunnan, en efecto, los incendios han tenido un fuerte impacto en la cubierta forestal. Aunque los incendios forestales son difíciles de prevenir, el manejo y control apropiados pueden reducir la ocurrencia y propagación de los incendios, o al menos, reducir al mínimo los prejuicios que estos provocan.

El Partido Comunista Chino y el Gobierno del condado de Dayao han dado mucho relieve al tema del manejo de incendios forestales, especialmente después de que ocurrieran los incendios del bosque de Daxinganling, en 1987. Un esfuerzo de colaboración, realizado entre el gobierno y las comunidades del condado, tuvo grandes logros que fueron coronados en 1992 con el premio otorgado al gobierno de la provincia de Yunnan, por el manejo avanzado de los incendios forestales.

Para realizar este estudio de caso, se condujo una investigación en la aldea de Wenyime en el condado de Dayao, de la Prefectura Autónoma de Chuxiong Yi, en donde la población mostró un profundo conocimiento sobre la prevención y el control de incendios, habiendo participado de manera voluntaria en el manejo de incendios. El efecto producido por este manejo comunitario de los incendios forestales ha sido beneficioso tanto para la población, como para el gobierno.

El manejo de los incendios forestales tiene una íntima y directa relación con la tenencia del bosque. La política de Responsabilidad de las Montañas que existe actualmente en China, produjo beneficios e ingresos para la población de la aldea de Wenyime, fomentando así su participación en el manejo comunitario de incendios a fin de proteger los recursos forestales de los cuales provienen tales beneficios. Hasta la fecha, los efectos de esta participación han sido positivos y han evitado la incidencia de fuegos incontrolados durante los últimos 35 años. La reglamentación más eficaz de prevención de incendios forestales no es necesariamente de índole gubernamental o la producida por agentes externos. En la aldea de Wenyime, la comunidad ha debatido y elaborado una reglamentación propia muy eficaz. Vale la pena divulgar estas experiencias en el ámbito del condado, de la provincia y de todo el país.

BACKGROUND AND OBJECTIVES

Many environmental problems, such as global warming, greenhouse effects, soil erosion, desertification, water resource degradation, loss of biodiversity and excessive flooding, have been linked directly or indirectly to the decrease in forest cover. One cause of the rapid decrease in forest cover is the effects of various natural disasters. Among non-natural events, excessive logging can be blamed for much of the loss. Of the many natural disasters, fire has had a pronounced influence on forest cover. Although forest fires are difficult to prevent altogether, proper management and control can reduce their occurrence and spread, or at least minimize the damage that they may cause. Prevention and control of forest fire has always been an important part of disaster prevention and relief. Appropriate forest fire management has not only important repercussions for human well-being, but also a profound significance for forest resource protection, restoration effects and sustainable economic development.

This study investigates community involvement in fire management as a way to strengthen forest development, fire prevention and the management of forests and woodlands in Yunnan Province. The objectives of the study are to:

- provide background information on fire management in China;
- collect primary data and statistics from a village, analyse these and provide recommendations to improve forest policy;
- itemize traditional uses of fire in forests and surrounding areas, and document community relationships with forest fire;
- gain an understanding of indigenous methods, rules and regulations used for community-based fire management (CBFiM).
- study how the community has been involved in fire prevention, control, management and remedial measures of restoration after fire;
- assess the level of local people's awareness about fire management.

The strategies used to reach these objectives were: collection of primary data and statistics on forest fire management, and evaluation of local people's awareness about fire management. There was an emphasis on traditional sources of fire, methods of using fire and managing fire for productive and non-productive uses. These include the causes of forest fires, prevention methods and village rules and regulations. The study also provides background information on China's fire management policies and includes recommendations for the further development of such policies.

The criteria for site selection included: frequent fire occurrences; degraded landscape; fire management challenges; the government's interest in collaborating; community involvement; and significant achievements with CBFiM. With collaboration from the headquarters of Yunnan Provincial Forest Fire Management Office, the Wenyime natural village in Dayao county, Chuxiong Yi Autonomous Prefecture was selected as the site for studying CBFiM in Yunnan Province. The reasons for selecting Wenyime were as follows:

- Wenyime village is located in the river valley of Sanchahe township. The weather tends to be dry and hot in spring and winter, with prevalent windy conditions. It is one of the most fire-prone areas in Dayao county, with fires occurring often. Bordered by Bingchuan county and Xiangyun county of Dali Bai Autonomous Prefecture, Dayao county has signed a joint protection agreement with these neighbouring townships for forest conservation and fire management.

- In recent years, Wenyime villagers have participated in fire fighting in a nationally owned forest managed by the township. Villagers have a profound understanding of fire prevention and control and have also participated voluntarily in fire management. The effect of this CBFM has been beneficial for both villagers and government agencies.
- Wenyime village is multiethnic. People of Yi and Han nationalities have been living there in harmony for more than a century.
- Leaders at the county, township and village levels recommended this village and supported the work there.

CASE STUDY METHODOLOGY

A total of 18 days were spent in Wenyime village. In the first stage, the research team spent four days listening to the introductions of the township and village leaders and discussed forest resources, forest fire management organizations and forest fire disaster time lines. In the second stage, the members of the research team stayed in the village for 11 days to hold group discussions with the following groups of villagers:

- present and past leaders;
- women;
- elders;
- joint defence fire control volunteer team;
- key households reliant on forest resources;
- shepherds.

A workshop was held for household heads.

Semi-structured interviews, forest resources stakeholder analysis, questionnaires and ranking were used to obtain primary data and relevant information. Key informant interviews were also carried out; key informants included elementary school teachers, the former party secretary, elders, neighbouring villagers, and people who had been punished for starting fires. In the third stage, the research team spent three days completing the collection of secondary data, cross-checking primary data and giving feedback of the study results to the township and village leaders.

FOREST FIRE STATISTICS AND FOREST FIRE MANAGEMENT IN CHINA

From the establishment of the People's Republic of China in 1949 until 1990, China had an average of 15 619 forest fire events each year (1996 inspection tour, National People's Congress). The average forest area damaged by fires was 930 000 ha per year. The forest fire incidence rate was 11.1 occurrences per 100 000 ha of forest area. Every year, the forest fire damage rate was 0.706 percent (the area of fire-damaged forest divided by the country's total forest area). On average, 103 people were killed and 643 injured by fires each year.

Since the 1987 forest fire in Daxinganling, each level of government has strengthened its leadership on forest fire management and adopted more effective measures. In the past ten years, forest fires have decreased significantly. Between 1990 and 1995, the number of forest fire events decreased to 5 768 per year and the average forest fire incidence rate to 4.4 occurrences per 100 000 ha per year. Compared with values from 1990, the number of forest fires in 1995 had decreased by 63.1 percent, and the incidence rate by 58.5 percent. The area of forest

damaged by fire was reduced to 38 800 ha per year, amounting to a forest damage rate of 0.029 percent between 1990 and 1995. Compared with figures from 1990, the damaged forest area had decreased by 95.3 percent, to become lower than the world average of 0.1 percent of forest area burnt. The number of deaths resulting from forest fires also decreased from 1990 to 1995: 49 people died and 203 were injured in fires every year. The number of deaths and injuries had therefore decreased by 53.4 and 68.4 percent, respectively.

In 1996, about 4 948 fires took place in China, and forest fire alarms were sounded on 2 156 occasions. Fire occurrences included categories of ordinary forest fires (2 779), major forest fires (ten) and extraordinary forest fires (three). The damaged forest area was 148 985 ha. The forest fire incidence rate was 3.8 occurrences per 100 000 ha, and the damage rate was 1.13. In 1996, 105 people were injured and 75 killed. Compared with 1995, the number of fire occurrences decreased by 4.8 percent; the damaged forest area increased by 155.9 percent; the number of injuries decreased by 36.7 percent; and the number of deaths increased by 82.9 percent. Three extraordinary forest fires in Mongolian forests increased the damaged area significantly. Regarding the causes of forest fires in 1996, productive uses of fire such as prescribed burning or wasteland burning caused 2 355 fires, comprising 47.6 percent of the total ignitions; non-productive uses of fire, such as smoking or burning paper when visiting graves, caused 2 474 fires, accounting for 50 percent of known ignitions; arson caused 54 fires, making up 1.1 percent of known causes; lightning caused 16 fires; and fires from other countries caused five forest fires.¹

1987 was a turning point in China's forest fire management activities. Since 1987, China's forest fire management has made great progress through joint efforts on the part of government and civil society. The following steps were taken:

- *Establishment of forest fire management organization and system.* Forest fire management command and administrative bodies were set up at the provincial, prefecture and county levels. This created a forest fire management command system from top to bottom. Now there are 2 900 forest fire management command headquarters and 3 000 administrative bodies at and above the county level. Meanwhile, each forestry bureau (state forest farm) has also set up forest fire management command institutions. This has formed the basis of a provincial forest fire management network.
- *Reform of the legal system to carry out forest protection and fire management.* The State Council issued Forest Fire Management Regulations in 1988. Each provincial, prefecture and local government formulated its own enforcement with detailed rules and regulations legalizing forest fire management work.
- *Reinforcement and reiteration of administrative leaders' responsibility for administering the forest fire management system.* According to the Forest Fire Management Regulations, each provincial-, prefecture-, county- and township-level government is to establish a system in which administrative leaders are held responsible for fire management. This system identifies responsibilities and jurisdictions at each level.
- *Strengthening of public awareness of forest fire management issues.* By increasing education activities on forest fire management and emphasizing the Everybody Has a Responsibility for Forest Fire Management policy, fire management consciousness has been strengthened.
- *Strengthening of the forest fire management infrastructure.* Since 1987, the state has given 50 million yuan renminbi a year for improving forest fire management infrastructure. In recent years, this investment has reached 70 to 80 million yuan. The State Fiscal Ministry contributed 5 million yuan per year for construction of fire lines in the northeast and Inner

¹ Data on fire management from 1997 to 2001 are not available.

Mongolia. In 1997 these funds were increased to 10 million yuan. Another 16.5 million yuan was invested in aviation measures. Each province, prefecture and local fiscal unit has arranged matching funds (according to certain proportions) to strengthen the efficacy of this infrastructure investment. Forest fire management infrastructure has been upgraded by the building and maintenance of more than 7 000 watchtowers and 700 000 km of fire lines and by the acquisition of 16 000 fire engines, 89 000 radio base stations and 56 000 wind-blower fire extinguishers.

- *Establishment and training of forest fire teams.* There are some 9 300 professional or semi-professional fire fighting teams supported by 328 000 staff and 146 000 volunteer fire fighting teams. There are also 5.29 million volunteer firefighters. Heilongjiang, Jilin, Inner Mongolia and Yunnan provinces have four forest police teams and 18 aviation stations from which to carry out aerial surveillance in the northeast, Inner Mongolia and southwest forest areas.
- *Increased scientific research on forest fire management.* China has used and experimented with helicopter drop buckets, chemical applications and fixed wing aerial drops. To monitor fire, ground patrols, watchtowers and aeroplane patrols have been used, as well as satellite data for monitoring and discovering hot spots. Local weather broadcast departments have been strengthened by including fire weather broadcasts. A risk rating system is used to increase awareness, foresight and collective action.

Since 1987, leaders at all levels of government have paid greater attention to forest fire management issues. Consciousness has been strengthened, and forest fire management has made three fundamental shifts: forest fire management work has changed from depending solely on forestry departments to giving greater responsibility to multiple departments working collaboratively with civil society; work has changed from arousing the masses on fire management passively (after the fact) to more proactive measures of pre-fire management and fire control – professional teams now realize the goal of fire control at early stages, i.e. when fires are small and of low intensity and where the communities' collaboration allows for quick and effective control; and previously simple administrative management has evolved into integrated control in which combined administrative methods are used with economic and legal incentives.

Forest fire situation in Yunnan Province

Yunnan is one of China's key national forest areas. It is rich in forest resources but also very prone to fire. Every year, more than 2 700 forest fire events occur, in which 1.7 million ha of forest is consumed by fire. From 1951 to 1999, 130 000 occurrences of fire burnt 8 622 million ha of forests. Over the same period, 658 people died and 1 944 were injured by fire. The losses to the economy were estimated at 4 billion yuan. The latest statistics show that in 1999, 964 forest fire events occurred, burning 10 469 ha, killing 12 people and injuring 185.



Prevention and control of forest fire in Dayao County

The Chinese Communist Party and Government in Dayao county have paid great attention to forest fire management, especially after the Daxinganling forest fire in 1987. Under the attention and appropriate leadership of these institutions, with the collaborative effort of each level's government and the communities, forest fire management has made significant progress. In 1992, Dayao received the prize for the best advanced forest fire management unit in Yunnan Provincial Government for the following reasons:

- Command and administrative bodies were coordinated for forest fire management at the county, township and village levels. Fourteen townships have command stations for forest fire management, within which 150 village committees have command groups for forest fire management. Within Sanchahe township, there are ten command groups with 175 firefighters.
- Dayao county has made infrastructure improvements by building two watchtowers and 256 km of fire prevention lines and by purchasing four fire engines, 80 radios with eight base stations, 23 wind-driven fire extinguishers, eight fire water guns, 70 sets of fireproof clothing, 300 No. 2 fire fighting tools, and 500 fire extinguishing bombs.
- Forest protection and fire management are carried out according to law. One month before the dry season, the county uses various media to publicize the Forest Fire Management Regulation of the State and the Forest Fire Management Regulation of Yunnan Province. Each township and village formulates its own rules and regulations legalizing its own form of CBFiM.
- Based on the Forest Fire Management Regulation, government at the provincial, prefecture, county and township levels has established a system whereby administrative leaders are responsible for fire management. This system identifies responsibilities and jurisdictions at each level.
- Education and public awareness on forest fire management have been improved. By using newspapers, radio, cable TV, posters, billboards, leaflets and children's storybooks, the government has increased awareness by advertising the policy of Everybody Has a Responsibility for Forest Fire Management.

- Networking and joint protection bodies for forest fire management have been set up in accordance with the policy of Reliance on Preventive Measures, Collectively Unite and Help Each Other Protect Forest. Dayao county has established a collaborating network for fire management with 18 townships in six counties. A joint protection regulation for the prevention and control of forest fires was made with six neighbouring counties, and was formulated at the township and village levels.
- Three county-level forest fire control teams have been established: one team has 30 members and is organized by the county forestry bureau; one has 20 members and is organized by the natural forest protection centre; and the third has 30 members and is organized by the county public security bureau and armed force squadron. There are therefore a total of 80 county-level firefighters. Each township has a team of at least 30 members and each village committee has a team of at least 15. Each villager group has organized a volunteer fire control team with at least ten people. Institutions and personnel working in forested areas must sign a fire-safe responsibility document of forest fire management. Dayao county has 19 semi-professional armed forces fire control emergency teams with a total of 754 members. At the village level, there are 735 armed forces fire control emergency teams with 14 700 members. Sanchahe township has 12 teams with 208 members and has also set up 47 fire control joint defence teams with a total of 709 members – one team for each village of more than 30 households.

FIELD STUDY IN WENYIME VILLAGE

Wenyime is one of 14 villages participating in the village committee of Sanchahe township, Dayao county. Wenyime village is situated on the Datianling plateau, eight km from Sanchahe administrative village. Han and Yi nationalities have been living together here for more than a century. The village's 42 households have a total population of 186 people, 90 of them male and 96 female (fifth census, November 2000). The Han nationality makes up 60 percent of the total population. The cultivated land area covers 202 mu (1 ha = 15 mu), of which 25 mu are paddy fields and the remaining 177 mu irrigated fields. The average farming land area is 1.08 mu per capita. The yearly grain output is 51 600 kg. The average grain output is 276 kg per capita. The main crops are maize, rice, broad bean and some other coarse foodgrains. Tobacco is the main cash crop with a yearly planting area of 118 mu and a total output of 18 762 kg. There are 95 cattle, 39 mules and horses, 85 goats and 134 pigs. In 2000, the total income of the group was 284 700 yuan per year, of which, 51 600 yuan was from agriculture, 93 800 yuan from tobacco, 74 600 yuan from animal husbandry, 49 700 yuan from forestry, and 5 000 yuan from other sources. The average annual income is 1 530 yuan per capita. Most households live in tiled houses surrounded by walls on three sides. The village is reached by road, and electricity was connected in 1997. Some households have TV, video, and grain and fodder processing machines.

The main mountain is Hongjia, which forms a tower-shaped landscape with Datianling plateau at its peak. Soils are fertile and suitable for tree growing. The forest land area is 5 600 mu. Vegetation is subtropical green broadleaf trees and the Yunnan pine belt. The main tree species are Yunnan pine (*Pinus yunnanensis*), Chinese fir (*Keteleeria evelynina*) and sawtooth oak (*Quercus acutissima*). The forest cover rate is 40.7 percent and the average forest area per capita is 30.1 mu. The village has cash trees such as walnut, chestnut, peach, plum, pear, bamboo and apple. Walnut has an annual output of 3 091 kg and chestnut output is 362 kg which, together with wild mushrooms and fuelwood, generated an income of 49 700 yuan in 1999. Income from NTFP makes up 17.5 percent of the total income.

Landownership and use rights for forest resources are related to the development, prosperity and subsequent decline of forestry in China. Stable forest tenure is essential for effective protection of forest resources. Since the People's Republic of China was established, forest ownership had gone through six distinct policy changes.² The most recent experimental Responsibility Mountain policy was first implemented in 1985. Under this policy, 2 100 mu was allocated to the Wenyime village community, with ownership belonging to the collective and individual households owning the forests and trees. This has provided the incentive for households to manage forest and to control fire. The Responsibility Mountain certificate that was issued allocated 37.5 percent of the village collective mountain area. Each household has an average area of 50 mu of mountain forest, with a maximum of 109 mu and a minimum of 20 mu. Now that each household has its own mountain forest, they have invested in, benefited from and managed the forest by themselves. The confirmation of rights, responsibility and benefits of this Household Running Hills policy improved forest fire management initiatives, as well as forestry development for the collective and households. This type of community-based approach is further explored in this case study.

Forest fire and its impacts

Historically, Wenyime village has used slash-and-burn cultivation for agricultural production and other fires for improving pastoral lands. This practice is based on indigenous knowledge that “the soil would not be rich without fire burning the hills”, and “the grass would not grow, so the goats would not be strong, without fire burning the hills”. Such knowledge was handed down, so forest fires took place frequently. During discussions, elders stated that there had been more than ten occurrences of forest fire since the establishment of the People's Republic of China, the largest of which took place in March 1965. This fire was caused by a neighbouring village shepherd making a fire to warm himself. The fire continued for more than one month. The following facts emerged during investigation of this fire:

- It died out after four or five attempts to control it.
- All of the trees were destroyed in this crown fire.
- After the fire, no pasture was left for the animals and they had to be sold.
- After the fire, it was impossible to collect pine needles, grass or tree leaves. No manure fertilizer was collected so grain production decreased. The farmers had to rely on grain from government relief programmes.
- After the fire, flooding in May and June had detrimental effects on the watershed and agriculture, i.e. the water ditches and fields.
- Spring water was limited for several years; leaving little drinking-water.
- Walnut and chestnut trees did not bloom for many years.
- Wild mushroom harvesting ceased for some time owing to lack of production.
- No wildlife (barking deer, leopard, monkey and hare) was seen on the mountain.
- There was no wood for the construction of new houses for some 20 years.

These are only a few of the effects of the 1965 fire. The former village leader claimed that the fire had a positive impact because it encouraged the next generation to remember the potential

² The Land Reform, the Rural Cooperative, the Four Fixes and the Three Formulations of Forestry, the Two Hills and Responsibility Mountain.

effects of fire. The memory of this fire would be handed down from generation to generation, reminding people that “Forest fire can be merciless. Forest fire management is necessary to minimize its effects on the community”.

TRADITIONAL USES OF FIRE AND ITS RELATIONSHIP WITH FOREST FIRE

In order to evaluate the sources of ignition and the cultural uses of fire within the village, 37 surveys were taken from different stakeholder groups (elders, women, main forest households, shepherds, young people and village leader groups). The main topic of the survey was “do you know the productive and non-productive uses/sources of fire in Wenyime village”. Thirty-six of the surveys were returned. The following are the productive uses of fire in Wenyime village:

- post-harvest burning to prepare seedbeds;
- burning field banks and using the burnt soil as fertilizer;
- burning tree branches and leaves on shifting cultivation plots to increase the fertility of buckwheat and/or tobacco;
- burning melon delve by using leaves and grass;³
- burning withered grass on the meadow in winter to promote the sprouting of new grass;
- for reforestation efforts fire is used to reduce shrubs, reduce stocking by scattering trees and remove less desirable tree species.

The non-productive sources are:

- cooking when herding animals;
- smoking and throwing cigarette butts away;
- using fire for hunting (such as catching squirrels);
- burning wild bees to get their larvae as food;
- pine torches for lighting at night;
- burning incense, paper and firecrackers when visiting grave sites;
- children playing with fire;
- tobacco drying.

Villagers' habits and consciousness in managing fire

Except for one fire alarm caused by a child playing with fire in February 1982, there has been no significant fire since that of March 1965. The 1965 fire was the first forest fire in Sanchahe township and the last significant forest fire in Wenyime village, which had no forest fires in the 35 years from 1966 to 2000. During discussions with elders, women, forest households, shepherds and young people, the following components of CBFM in Wenyime village were identified:

- Responsibilities and jurisdictions have been set up, with each villager group responsible for different parts of the pasture, forest land, etc.
- The source of fire is strictly controlled.
- Forest fire management bodies, such as a leadership group of forest fire management and a voluntary joint defence team for fire control, have been set up.
- People in all households know the Everybody is Responsible for Forest Fire Management policy.

³ Melon delve grows mostly near the forest and has higher yields after low-intensity fire.

- Fire lines have been cut around areas of high concern.
- Pine needles and branches have been cleared to prevent and control forest fire.
- Children have been taught not to play with matches and cigarette lighters.
- The burning of paper, cooking and the setting off of firecrackers when visiting a relatives' graves have been stopped.
- Instead of pine torches, flashlights are used for lighting.
- People have stopped throwing away lit cigarette butts, cooking food while herding, burning wild bees and using fire to trap animals.
- They have stopped burning field banks, tobacco cultivation plots or melon delve.
- Villagers now obey village rules and regulations conscientiously.
- Herding times have been changed from once to twice a day, so that shepherds can eat lunch at home instead of cooking or heating lunch on the hills.
- Hay is stored for the winter feeding of livestock, instead of the traditional practice of burning pasture to promote grass growth.
- The period from 20 December to 30 May has been identified as the dry period for fire prevention, and a meeting is held a month earlier for planning control measures.
- Forest guards have been employed to enforce laws and regulations.
- The "four contracts" of responsibility are carried out: village leaders oversee the masses, teachers oversee students, shepherds oversee pastures, and forest guards oversee forest land.
- The "six responsibilities" are carried out: the group head is responsible for group members starting fire; the leader is responsible for the masses starting fire; the family head is responsible for children starting fire; the teacher is responsible for students starting fire; the guardian is responsible for disabled people starting fire; and the individual is responsible for him/herself.
- Forest fire is controlled as quickly as possible. When it breaks out, the volunteer joint defence fire team controls it at the early stage of its development.

Villagers' role in preventing and controlling forest fire

Based on this study, the farmers are the main body in forest fire prevention and control. The farmers in Wenyime village joint action depend on two factors: they have had clear forest tenure since 1982 and now obtain such forest products as timber for house construction, leaves for animal stables and fertilizer, fodder, fuelwood, fruits and a comfortable living environment, all of which influence their behaviour; and the government has formulated requirements and strict regulations. The punishment for causing a forest fire or not actively participating in its control is severe, and everyone is deterred by it. The role of the villagers in forest fire prevention and control are as follows:

- collecting falling leaves to use for animal stables, to provide fertilizer for crops and to clear the ground under trees so as to decrease the risk of forest fire;
- obeying the regulation that prohibits the starting of fire in the forest, especially between the months of November and May;
- teaching children not to play with fire;
- collecting the sources of fire (e.g. lighters, matches) and putting them out of children's reach;
- never using fire for heating or cooking food during grazing activities (e.g. not putting potatoes into the fire for lunch);

- sending at least one family member to join fire control activities as soon as forest fire breaks out;
- providing information to the forestry office on the causes and perpetrators of any forest fire that has occurred.

Villagers' indigenous methods and regulations for fire management

The main indigenous regulations are as follows:

- Village rules and regulations for forest fire management, such as the Three No's, the Four Contracts, the Five No Burnings and the Six Responsibilities are formulated: the Three No's are no smoking on mountains, no opening up wasteland by destroying forest and no burning fire to catch wild bees and animals; the Four Contracts are as mentioned in the section on the Six Responsibilities; the Five No Burnings are no burning without permission, no burning without opening fire lines, no burning without fire control tool, no burning under heavy winds and dry conditions, and no burning without supervision; and the Six Responsibilities are as already mentioned.
- Formulate a forest fire management period from 1 December to 31 May and a high-risk period from 1 March to 31 May.
- Establish forest management responsibilities that are separate from those for pasture management, and guardian responsibilities for each of the groups involved.
- Identify 1 000 mu of forest as a watershed protection area in which to carry out special protection and management.
- Establish the protection and management of the watershed area and 2 500 mu of collective forest as the main focus. One person is selected as a full-time coordinator to manage these and is paid 180 yuan per month for doing so.
- Implement public awareness campaigns and education in forest fire management. Request the township film team to visit the village regularly to show slides and films on fire management.
- Formulate village rules and regulations for forest fire management at meetings of household heads. These meetings are also the forum at which village cadres allocate CBFiM responsibilities to village members.
- Set up CBFiM organizations, institutions and teams. Village leadership groups for forest fire management consist of the village group cadre (as the head), the Party Secretary (as the deputy head), the former villager head, and the armed forces team (as the group members). A regular household head meeting is held once a month to monitor, evaluate and reallocate forest fire management work. At the same time, a village volunteer fire control team is established and a full-time forest guard is hired.

ROLE OF CBFiM IN COMMUNITY FOREST RESOURCE MANAGEMENT

Forest fire can potentially harm forest resources. After 35 years, the effects of having villagers cultivate, manage and protect the 5 600 mu of forest are clear. The following are some of the effects of CBFiM on forest resources protection:

- Mountains in Wenyime Village become greener every year.
- Forests have become mature timber because of good conservation and management.
- Pine and fir trees are straight and evenly spaced because of intermediate thinning and lack of fire.

- Many herbs and shrubs are present in the understorey. Watershed and soil resources are protected.
- Many rare wild animals, such as barking deer, monkey and pheasant, have returned since the fire disaster of 1965.
- The mushroom harvest is, once again, one of the main sources of income.
- The forest resembles a virgin forest. Water yields have increased and provide enough water for drinking and crop production. Flooding has been tempered and water flow is now regulated.
- Chestnut, walnut, peach, plum, pear and apple are, once again, cash crops for most households.
- Good living conditions and the ecological environment have been maintained so that future generations will benefit from resources.

CONCLUSION

In China, forest fire prevention and control is more of a top-down than a bottom-up process. Planning, regulations, cost and management all come from the government; the local community thus has a limited role in decision-making. Experiences from Wenyime village have the potential to provide recommendations for forest fire prevention policy that emphasize the local community's ability to manage fire. They also demonstrate how to encourage and build on the local community's interest in protecting forests. Forest fire management has a tight and direct relationship with forest tenure. The Responsibility Mountain policy has given benefits and income to the villagers so that they have the incentive to participate in fire management, and the effects of this have been positive. The most effective forest fire prevention regulations are not necessarily those of the government or outsiders. In Wenyime village, the community discussed and formulated regulations of its own, which are very effective. Awareness building about forest fire management is a long but important process. The attitude and behaviour of Wenyime villagers are the result of 35 years of capacity building, awareness raising and the benefits derived from CBFiM practices.

RECOMMENDATIONS

It is necessary to find CBFiM models that supplement the current top-down and government-dominated forest fire management approach. The Chinese saying that “A single spark can start a prairie fire” is quite true. It is necessary to perform more studies on CBFiM and to summarize some key elements that may foster the formulation of more CBFiM models that are appropriate to China. For example:

- Local communities should be the main managers of forest fire, especially in collectively owned forests. Several elements need to be considered if the model of CBFiM from Wenyime village is to be extended to other areas.
- Local communities should have the right to decide the use of forest resources so that they may increase the benefits that they derive from the forest. Full, stable and secure rights to resources are the key for CBFiM, as well as for sustainable forest management. The government should do more to ensure that local communities have clear and secure forest tenure, especially secure use rights to forest products.
- This requires open, equal regulation formulation processes and effective supervision from the community itself during the implementation of regulations. For this, the Everybody has a Responsibility for Forest Fire Management policy means clear and equal rights and access to

forest resources and benefits. The local community may derive counterpart benefits from forests and relevant activities, but every community member should have equal access.

- Government agencies should transfer certain roles to communities so that they may generate income from forest resources and create linkages between prevention of forest fire and livelihood security. In southwest China, CBFiM must be combined with efforts on poverty alleviation and livelihood improvement. Increasing farmers' income sources and level should be the fundamental base for CBFiM.
- The rules and regulations for forest fire management, as well as for other village affairs, should come mainly from the community itself. Wenyime village has not experienced any forest fires for 35 years. One of the key reasons for this is that the villagers established, revised and followed village rules and regulations. These experiences are worth publicizing in the county, the province and the whole country.

Management of forest fires through the Involvement of Local Communities: the Gambia

By Almami Dampha; January 2001

Kaniman Kamara and Clemens Beck, Forestry Department, PO Box 504, Banjul, The Gambia

EXECUTIVE SUMMARY

There are insufficient data on forest fires in The Gambia because of inadequate staffing at the field level and the unwillingness of the population to expose fire offenders for prosecution. It is clear, however, that most of the country's forest lands are burnt annually. The resulting losses are huge considering the incalculable amounts of timber and fuelwood destroyed and the low agricultural productivity resulting from soil degradation.

The use of fire is intrinsic in the socio-economic activities of the rural population. Because of the nature of the farming system (small-scale and temporal) and the absence of other appropriate means of land preparation, fire is usually resorted to as a way of preparing fields for crop cultivation. Consequently, a significant number of forest fires result from field clearing, because control over these fires was and is still generally lacking. Other traditional causes of forest fires are hunting, honey collection, herding, fuelwood collection and smoking.

State control over the ownership of forest resources caused the general public to have a laissez-faire attitude towards forest fires, especially in the past, when fire prevention and control were seen as the responsibility of the Forestry Department. Following political independence in 1965, government policies put a lot of emphasis on economic development, mainly through the expansion of agricultural crop production – particularly groundnuts – to generate much-needed foreign exchange. Forest lands were seen as fertile land reserves for agriculture, and the only cheap tool for converting forests to other land uses was fire. Thus forest fires were not seen as detrimental as long as they facilitated farm preparation. Forested land area was relatively large compared with the demand of the population. The situation gradually worsened as the need for more cultivable land increased.

The issue of forest fires has been a major concern for The Gambian Government since the late 1970s. Policy instruments have been put in place to deal with forest fires, and these are starting to bear fruit. Since its creation in 1977, the Forestry Department has been active in forest fire prevention and suppression, including the clearing of firebreaks along managed forest parks and the launching of radio programmes to increase public awareness. Controlled early burning is encouraged around forest parks and community forests.

After nearly two decades of conventional forest management, in 1990 the Department of Forestry piloted the community forestry concept, which has been modified over the years and is now applied countrywide. One of the goals of community forestry is to reinstate public interest in the sustainable use of forest resources by transferring forest ownership from the state to deserving communities. It was hoped that this gesture on the part of the state would engender public participation in the crusade against forest fires.

Seven years after the first transfer of forest ownership to local communities, there was no significant reduction in the frequency of forest fires nationwide. There are a few areas where

forest fires are becoming rare and it is encouraging that public awareness about forest fires has increased greatly. Indications are that people are willing to change their attitudes positively and that local forest ownership promotes this. This was confirmed by a nationwide comparative survey of villages with and without involvement in community forestry.

This study shows that there is profound indigenous knowledge about the causes, effects and prevention of fire and makes various recommendations on the local management of fires.

Gestion des incendies de forêt grâce à la participation des communautés locales: Gambie

Par Almami Dampha; Janvier 2001

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RÉSUMÉ

On ne dispose que de données insuffisantes sur les incendies de forêt en Gambie parce que le personnel de terrain n'est pas assez nombreux et que la population n'est pas disposée à dénoncer les coupables pour qu'ils soient poursuivis. Il est cependant évident que la plupart des terres boisées du pays sont incendiées chaque année. Cette pratique entraîne des pertes énormes car un volume incalculable de bois d'œuvre et de bois de feu est ainsi détruit et la productivité de l'agriculture est faible en raison de la dégradation des sols.

L'utilisation du feu fait partie intrinsèque des activités socio-économiques des populations rurales. Étant donné que celles-ci pratiquent l'agriculture temporaire à petite échelle et n'ont pas d'autre moyen approprié de préparer les terres, elles ont généralement recours au feu pour préparer les champs. En conséquence, le défrichement provoque un nombre non négligeable d'incendies de forêt car les cultivateurs ne maîtrisent pas toujours les feux qu'ils allument. La chasse, la récolte du miel, l'élevage, le ramassage de bois de feu et le tabagisme constituent d'autres causes habituelles d'incendies de forêt.

Le fait que l'État soit propriétaire des ressources forestières a amené le public à considérer les incendies de forêt avec indifférence, surtout dans le passé lorsque la prévention et la lutte contre les incendies étaient considérées comme relevant du département des forêts. Après l'accession à l'indépendance en 1965, le gouvernement a donné une grande importance au développement économique, principalement grâce à l'accroissement de la production agricole – en premier lieu celle d'arachide – afin d'obtenir les devises dont le pays avait le plus grand besoin. Les terres boisées ont été considérées comme des réserves de terres fertiles pour l'agriculture et le feu était le seul moyen peu coûteux de convertir ces terres à d'autres utilisations. Ainsi, les incendies de forêt n'ont pas été considérés comme néfastes tant qu'ils facilitaient la préparation des terres pour les cultures. La superficie boisée était grande par rapport à la demande de la population. La situation s'est progressivement dégradée à mesure que les besoins de nouvelles terres cultivables augmentaient.

Le gouvernement de la Gambie a commencé à se préoccuper vivement du problème des incendies de forêt pendant les dernières années 70 et il a mis en place pour le régler des

instruments qui commencent à donner des résultats. Depuis sa création en 1977, le Département des forêts s'occupe activement de la prévention des incendies de forêt et de leur suppression, notamment en créant des coupe-feu à la limite des parcs forestiers aménagés et en organisant des émissions de radio pour sensibiliser le public. Il encourage les recours aux feux précoces dirigés sur le pourtour des parcs forestiers et des forêts communautaires.

Au bout de près de vingt ans de gestion classique des forêts, le Département des forêts a lancé, en 1990, la notion de foresterie communautaire qui a ensuite évolué progressivement et est maintenant appliquée dans tout le pays. L'un des objectifs de la foresterie communautaire consiste à relancer l'intérêt du public pour l'utilisation durable des ressources forestières en transférant la propriété des forêts de l'État aux communautés qui le méritent. On espérait que ce geste de l'État inciterait le public à participer à la croisade contre les incendies de forêt.

Sept ans après le premier transfert de propriété des forêts aux communautés locales, aucune réduction sensible de la fréquence des incendies de forêt n'était enregistrée au niveau national. Il y a quelques zones où les incendies deviennent de plus en plus rares, et, fait encourageant, le public est beaucoup plus sensibilisé à ce problème. Il semble que les gens soient disposés à adopter une mentalité plus positive et que le transfert de la propriété des forêts aux populations locales encourage cette évolution. Cette idée est confirmée par une enquête comparative au niveau national sur les villages qui participent à la foresterie communautaire ou n'y participent pas.

Il ressort de l'étude que les populations indigènes ont une connaissance approfondie des causes et des effets des incendies et de leur prévention et diverses recommandations concernant la gestion locale des incendies sont formulées.

Manejo de incendios forestales a través de la participación de las comunidades locales: Gambia

Por Almami Dampha; Enero 2001

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RESUMEN DE ORIENTACIÓN

No existen suficientes datos acerca de los incendios forestales en Gambia, porque no se cuenta con personal adecuado en el terreno, y porque la población se niega a exponer a los infractores a la persecución. Sin embargo es evidente que la mayoría de las tierras forestales nacionales se incendia cada año. Las pérdidas son ingentes, si se toman en consideración las incalculables cantidades de madera y leña que se esfuman, amén de la baja productividad agrícola que se produce a raíz de la degradación de los suelos provocada por los incendios.

El uso del fuego forma parte intrínseca de las actividades socioeconómicas de la población rural. Debido a la naturaleza del sistema agrícola (temporal y en pequeña escala) y debido a la falta de medios de preparación de la tierra apropiados, el fuego suele ser el recurso adoptado para preparar la tierra destinada a la siembra de cultivos. Como consecuencia, se produce una cantidad considerable de incendios forestales, debido a las prácticas de desboscamiento del terreno, porque no existen prácticas de control de estos fuegos. Otras causas tradicionales de los

incendios obedecen a la práctica de la cacería, a la recolección de miel, al pastoreo, a la recolección de leña y a las prácticas de ahumado de alimentos.

El control de la propiedad de los recursos forestales de parte del Estado propició en la población una actitud permisiva en materia de incendios forestales, especialmente en el pasado, cuando la prevención y el control de incendios se consideraban como sujetos a la responsabilidad del Departamento Forestal. Después de la independencia nacional en 1965, la política gubernamental hizo mucho hincapié en el desarrollo económico, principalmente a través de la expansión de la producción agrícola de cultivos – sobre todo de maní – con el fin de generar las divisas, tan necesarias para el país. Las tierras forestales se consideraban como reservas de tierras fértilles a destinar a la agricultura y el único medio barato para convertir los bosques a otros usos de la tierra era el fuego. Por lo tanto, los incendios forestales no eran considerados perjudiciales, en la medida en que facilitaban la preparación de la tierra. El área de tierras forestales era relativamente grande, comparada con la demanda que existía de parte de la población. Pero la situación se agravó gradualmente, en la medida en que crecía la necesidad de tierras cultivables.

El tema de los incendios forestales ha sido una de las principales preocupaciones del Gobierno de Gambia desde finales del decenio de 1970. Se crearon instrumentos en materia de políticas a fin de afrontar los incendios forestales, los cuales están comenzando a dar frutos. Desde la creación del Departamento Forestal en 1977, esta institución ha participado activamente en las actividades de prevención y supresión de incendios forestales, entre ellas la preparación de barreras cortafuego a lo largo de los parques sujetos a manejo, así como la divulgación de programas de radio destinados a la concientización pública. Además, se fomenta el uso temprano del fuego controlado alrededor de los parques y de los bosques comunitarios.

Después de casi dos decenios de manejo forestal convencional, en 1990 el Departamento Forestal introdujo el concepto de forestería comunitaria, que ha sido modificado en el curso de los años y que actualmente se aplica en todo el ámbito nacional. Uno de los objetivos de la forestería comunitaria consiste en restaurar el interés público, en cuanto al uso sostenible de los recursos forestales, a través de la transferencia de la propiedad de los bosques estatales a las comunidades que así lo merecen. Se esperaba que este gesto de parte del estado generaría una participación pública en la cruzada contra los incendios forestales.

Siete años después de la primera transferencia de la propiedad estatal a las comunidades locales, no se ha verificado una reducción significativa en la frecuencia de los incendios forestales en el ámbito nacional. Pero existen algunas áreas en donde los incendios forestales son cada vez más raros y es alentador que la concientización del público acerca de los incendios forestales haya crecido de manera considerable. Existen indicios de que la población quiere cambiar sus actitudes en sentido positivo y de que la propiedad de los bosques promueve este cambio. Así lo confirmó una encuesta comparativa entre las aldeas que participaban de la tenencia y las que no lo hacían, realizada en el ámbito nacional.

Esta encuesta muestra que existen profundos conocimientos indígenas acerca de las causas, efectos y prevención de los incendios. Además, el estudio hace varias recomendaciones acerca del manejo de los incendios forestales.

INTRODUCTION

Fire in The Gambia, as in many countries, is the main tool used to expedite land clearing. Deforestation has been linked to the use of fire for land clearing for settlements, croplands, grazing, fuelwood cutting and charcoal burning. The last of these was banned in 1980, because it was considered a very serious cause of deforestation. The situation was aggravated by an increase in the population and the influx of migrant farmers from Senegal and Mali to engage in groundnut cultivation. As the population lit fires on a regular basis, forest canopy cover decreased and the areas of grassland and savannah grew larger.

Villagers depended on forest resources and the abundance of those resources was taken for granted. Villagers did not think that the negative impacts of burning seriously outweighed the advantages. In the context of the present fire regime, human activities are perceived as the cause of all fires.

Research objectives

This study examines whether or not community forestry has increased the awareness of local communities about forest fires and whether such awareness is leading to a change of attitudes towards the prevention of forest fires.

Scope and methodology of the study

The study area covers three of the five divisions of The Gambia: the Western Division, the Central River Division and the Upper River Division. The study covers 32 villages in rural parts of the country. A series of 113 interviews served to assess systematically the uses of fire in rural communities, as well as the awareness and attitudes of village populations towards fire. Interviews were held with 83 individuals, comprising 35 women and 48 men. Thirty interviews were conducted with groups of four to six people. The ages of the people interviewed range from 13 to 97 years, with a peak in the typical labour force age of between 30 and 50 years. The group interviews were assembled to include representatives from village institutions, such as forest committees, village development committees, kafoos (village associations) and Alkalos (local village heads), and to collate the answers obtained from the individual interviews with the voiced opinions of these stakeholders. In assembling the groups, attempts were made to include women, but in many cases only one woman was willing to take part. A large majority of those interviewed are farmers (59.5 percent) or farmers and herders (19 percent), i.e. farming is their main livelihood activity.

In addition to the community study, a countrywide written survey of forest station heads for forest fire management and a literature review of past and existing legislation and policy frameworks were undertaken. The results of the field surveys were presented and discussed with participants drawn from forestry field staff, NGOs and local administrative authorities (chiefs) in two workshops conducted in the Central River and Western Divisions. This discussion process served as a forum for gaining feedback from those directly concerned with fire prevention issues at the local level and to develop elements of the national fire prevention strategy in a participatory manner.

BACKGROUND ON THE GAMBIA

The Gambia, which covers an area of 11 295 km², is the smallest state on the African continent, and lies within the savannah belt of West Africa on the Atlantic coast. The Gambian climate is characterized by a short rainy season, followed by a long dry season (of eight months). With more than 104 inhabitants per square kilometre, The Gambia is one of the most densely populated African countries. It is also a predominantly rural country, with agricultural activities forming the backbone of the population's livelihood. While the population is itself multiethnic, consisting mainly of Mandinka, Fula and Wolof, almost 15 percent are immigrants from other African countries, including refugees from southern Senegal (Casamance) and Sierra Leone. The Gambia's forest cover (including mangroves) was estimated at 43 percent of the land area (503 900 ha) in 1983. These forests are impoverished as a result of overexploitation and annual forest fires. Closed woodlands constitute only about 4 percent of the total area and form important sources of timber and fuelwood. They are also important sources of the non-timber forest products (NTFPs) on which forest-dwelling communities often rely.

Forestry development in The Gambia

The Gambia has had significant success in the past few years in community forestry implementation. By January 2000, the number of community forests in the country had reached 267, with a total area of 22 945 ha (*Out of the Forest*, 2000: 9) and there are encouraging signs that the rural population is still highly motivated to join the community forestry programme. It is clear that community forestry is the most important strategy to reduce the incidence of forest fires. Within the community forestry concept, tenure over forest resources has been made clear, and could be passed to the local communities. As Abdoulaye Kane said in his publication on public policies affecting forest fires in the African region (FAO, 1999b), local populations are not likely to interfere with forest fires unless their lives or properties are threatened.

Community forestry has been ongoing in The Gambia for more than ten years. Since it was first piloted in the Foni Brefet district in 1990, it has gradually extended to all parts of the country. There are now no fewer than 270 villages countrywide participating in community forestry. These villages manage something close to 24 000 ha of forest land. The main reason for introducing the community forestry concept is to facilitate local communities' participation in the management and utilization of forest resources. In the process, ownership of forest areas is handed over to communities that are able to demonstrate their ability for sustainable forest management through their own responsible bodies (Forest Committees). When the communities have a stake in the forest resources, it is believed that they will do everything within their means to protect their forests from deforestation activities, particularly forest fires.

The community forestry approach was formally embraced with the development and adoption of the 1995 Forest Policy, which puts special emphasis on community involvement in forest resource management. A revised Forest Act and Regulations back the policy. At the time of writing, legislators had approved the Forest Act and it was hoped that the Regulations would soon be approved as well. The approach is now the priority of the Forestry Department and the aim is that nearly half of the country's forest cover will be under community management by the time that the current forest policy comes to an end in 2005.

Community participation in the management and utilization of the nation's forests has gained additional momentum from the new concept of Community-Controlled State Forests (CCSFs). This concept foresees local communities taking care of forest areas adjacent to their community

forests and sharing the benefits obtained equally with the government. The concept has not yet been fully mastered by the majority of Forestry Department staff and collaborating agencies, and further orientation sessions are required, at least for senior staff members. Initial attempts to sell the idea to local communities received a lukewarm reception, which was not strange considering that the villagers are always cautious when entering into agreements with the state. At the time of writing, they do not see the advantage of supporting CCSF because, previous to its introduction, they did not have to share anything with the state from areas outside forest parks and community forests.

NATIONAL POLICIES RELATING TO FOREST FIRES

Very few issues are as contentious as forest fires. The different stakeholders, foresters, farmers and pastoralists all perceive forest fires differently, and sometimes in very divergent ways. As the frequency of forest fires kept increasing and the Forestry Department was unable to cope with the problem, villagers were asked to form fire committees to increase awareness of and coordinate forest fire issues at the village level. By the second half of the 1980s, fire committees were established in most villages, but a lack of resources meant that they could not perform their expected role and the majority of them ceased functioning.

Forest Policy, 1995–2005

The most pragmatic and holistic approach to tackling the menace of ever-increasing environmental degradation came into effect with the adoption of the 1995–2005 Forest Policy. This was developed in line with the environmental and socio-economic policy objectives of the government. Before this, there was no clear-cut national forest policy for The Gambia and all forestry development proposals were mentioned briefly in the five-year centralized development plans. The Forest Policy puts special emphasis on community and private forestry and recognizes multiple-use forestry. The policy has also been designed to contribute to poverty alleviation by calling for the active involvement of local communities and the private sector in the management and development of forest resources. In short, the policy aims at making stakeholders perceive themselves as indispensable actors in the protection and rational utilization of forest resources. The policy takes account of the fact that sustainable forest management will always remain an illusion unless everybody becomes a stakeholder. This is precisely why the policy makes provisions for private and community forestry management.

The Gambia Forest Management Concept (GFMC)

This concept has been developed by The Gambian–German Forestry Project in collaboration with the Forestry Department. It collates information and experiences gathered since 1980. GFMC describes approaches to reach the targets specified in the Forest Policy document. It promotes the nucleus concept, which aims at integrating community forestry into the management of forest parks. It also underlines the importance of collaboration among the Department of Forestry, line departments and NGOs in the nationwide promotion of the community forest concept.

The GFMC gives high priority to the participation of local communities in the protection and management of forest resources. The nucleus concept enshrined in the GFMC strongly recommends the recruitment of local communities living around forest parks for firebreak preparation and other forest management activities. The overall aim is that, as well as augmenting the income returns from forests for the communities, local people acquire forest

management skills and experience. Through the involvement of communities in economic activities in and around the forest, the value of the forest is enhanced in the eyes of the communities and they become more concerned for its protection and judicious utilization.

The Forestry Legislation and Regulations, 1998

According to the New Forest Act (Section 21, subsection 2), it is mandatory that neighbouring communities are informed prior to the setting of any prescribed burning by the nearest forest station. One of the reasons for this is to avoid fire escaping into croplands and thus burning field crops. Communities are also required to offer help during the controlled burning activities. It is a criminal act under the Forest Regulations for anybody to refuse to help in fire fighting without genuine reasons.

The Regulations (Part IV Section 23) permit the burning of farmland or pasture outside of forest areas only where:

- (a) the areas to be burnt are delimited and protected by strips of land cleared of bush and grass;
- (b) the burning is supervised by farmers or other concerned people to ensure that the fire is kept within the designated limits.

Section 24 of this Part makes it mandatory for the general public to assist in fighting fires. According to the Forestry Regulations (Part IV Section 19), heads of districts, towns, villages and communities are responsible for protecting the lands within their jurisdictions from the ravage of forest and bush fires. If they are found guilty of negligence of duty with such fires, they may be held liable to the penalty prescribed for contravention. If the fire originates between two villages and the culprit cannot be traced, the heads of the concerned villages are held responsible.

The forest committees are also charged under Part IV Section 17 with responsibility for protecting from fires their community forests, the CCSFs and any other piece of public forest within the area. They are required to create sufficient mechanisms to ensure the safety of their forests from fire.

The laws sanctioning the mandatory participation of the public in forest fire suppression are seen as punitive, and are strongly contested by the local communities and authorities. The village heads, in particular, argue that the law holds them responsible for fires over which they have no control. They further protest that their enemies, in or outside the community, can start fires with the aim of causing them trouble.

As with any other act, promulgation is far easier than application. The district chiefs are often reluctant to act against their subjects for fear of losing support.

Fines and prison terms have been prescribed for various forest offences, including forest fires. Forest fire offences draw the severest fines and prison terms according to the Forest Act (Schedule V – Fine Classes).

Exclusive nature of the Forest Policy

The Forest Policy does not incorporate the wishes and aspirations of local communities, which have developed strong resentment against the forest sector. The policy fails to recognize the right

of local communities to have a say in the way that forest resources are managed. Forest exploitation licenses have been issued without the involvement of local communities, resulting in serious overexploitation.

The mandate of the Forestry Department also runs contrary to traditional ownership rights. According to the statutory law, all naturally grown trees belong to the state, irrespective of their location. This is strongly resented by the local people, who have lost their sense of owning the forest and have resorted to undermining the efforts of the forestry services by constantly burning forests and carrying out other forms of illegal exploitation. Arsonists are rarely reported to the authorities for prosecution.

Lack of security of tenure

Populations living around forest parks have little sense of ownership or stewardship of the state reserve. In the Kiang West and Upper Badibou, according to case studies (Schoonmaker Freudenberg, 1994): “the Forest Parks are perceived to be owned and managed by the state and thus not worthy of care by the local populations. Villagers are certainly aware of the excessive exploitation of the parks and frequent forest fires (and they partake of it in many cases), but they do not try to stop abusive practices because they believe that this responsibility lies with the state.”

Access to benefits from the forest is another important consideration that encourages communities to participate willingly in forest resource management. The cost of community participation in forest protection activities must be balanced by the expected returns.

Lack of government commitment

Until 1985, all government programmes on forestry were sketchily mentioned only in the five-year development plans, and focused mainly on plantation management. There was no coherent policy on the way forward for the sustainable management of forest resources. In addition to lack of will, there was also the constraint of inadequate human resources in the department. Staff were thinly spread, leading to unsupervised operations on the part of commercial fuelwood cutters and other licensed forest users. Government policies were ill-defined and thus attracted only half-hearted measures and support. The forestry services seriously lacked the trained staff and financial endowment necessary to formulate and implement holistic forest policies and regulations.

Lack of will to enforce laws

Most destruction of the forest is not caused by lack of laws but by staff unwillingness [to enforce them], exacerbated by socio-cultural conditions. The motivation of forestry staff to enforce forest fire regulations has suffered as a result of low emoluments and openness to corruption. Chiefs and village heads are not very enthusiastic about prosecuting their subjects for offences related to forest fires. More often than not, fire cases linger in the courts for long periods and, when punishments are meted out, they are often mild compared with the damage caused.

There are many reasons for this reluctance to apply the laws. District chiefs fear losing the cooperation and support of their subjects by prosecuting them for fire offences. The general preference in The Gambia, especially in rural areas, is to settle issues outside the courts. So when individuals are accused of starting forest fires, their relatives and associates plead on their behalf, either to drop the case or to punish the accused very leniently.

The absence of a socio-economic framework

If people are to be concerned about forest fires and their impacts, they must feel the effects of the problems. As long as forest resources are abundant, local communities have very little cause to worry about the annual burning of the forest. Agricultural policies have invariably encouraged the conversion of forest lands to crop fields. The cultivation of groundnuts to acquire the much-needed foreign exchange was encouraged, to the detriment of the environment. The forest has been viewed mainly as a reserve for agricultural expansion. The root cause of this is the lack of coordinated and harmonized sectoral policies.

USES AND CAUSES OF FIRE

It is a matter of utmost importance that the causes of forest fires are known, not only for historical records, but also for the more practical purposes of planning forest fire prevention and management activities. The exact causes of the majority of fires are difficult to establish. In a traditional set-up, nobody is willing to risk his or her reputation by reporting neighbours for a punishable offence such as starting forest fires. As a result, the causes of most forest fires are unknown. The different causes of uncontrolled fires are discussed in detail in the following paragraphs.

Farm clearance: Of the 113 villagers interviewed in the study, 59 percent named farming as their main livelihood activity and another 19 percent depend on farming and herding. Consequently, burning for the purpose of field clearing is the most important reason for using fire in the fields. When asked to describe their method of burning in fields, almost two-thirds (64 percent) mentioned the preventive establishment of firebreaks around the field, and virtually all of them (96 percent) spoke of raking the area and establishing heaps from the residue.

Burning is carried out in the morning and evening. More than three-quarters (76.3 percent) of respondents said that they burnt "when the sun is very low". The reason given was often that at this time, "the wind is stagnant" and "the heat of the sun is reduced", making the fire less fierce and less prone to escape. Almost 60 percent of respondents said that they burnt in May and June, "just before the rains", and another 22.2 percent named April, May and June as the peak season. This means that more than 81 percent of those interviewed carry out burning in these three months at the end of the dry season. It is also in these months that, in the experience of the interviewees, most uncontrolled fires erupt.

Livestock grazing: There is a large livestock population in the country. Cattle herders often burn the bush towards the end of the long dry season to encourage the growth of new succulent grass for their animals. However, few of those interviewed supported this practice. Only four villagers mentioned the encouragement of grass growth as an incentive to burn, and none of these people was a herder. Control of wild animals as a motive for setting fire in the forest was mentioned just five times, but not by the herders.

Hunting: Hunting is a traditional activity in The Gambia, often undertaken by semi-professionals. Especially in the past, it has been a major cause of forest fires. Nowadays, the number of fires attributable to hunting is less because the majority of the country's fauna has already disappeared. Nonetheless, hunting is still the second most important reason for using fire in the forest, being mentioned by almost one-quarter (23 percent) of respondents. Its relevance as

a cause of fire is supported by the fact that more than half (56 percent) of the interviewees mentioned hunting when asked the causes of uncontrolled fires.

Wild honey collection: As it emerged from the interviews, honey collection seems to be a primary motive to set fires in the forest. It was mentioned by 40 percent of all respondents. People collecting wild honey can cause fires accidentally by using crude methods with lit torches to drive the bees away.

Smoking: In the interviews, villagers described smoking as a major cause of fires. Five villages in the sample had been seriously affected by seven fires caused by smokers. Smoking was mentioned as a possible cause of uncontrolled fires by 81 percent of the respondents.

Crop protection and pest control: Fire is used to keep animals, namely bush pigs and monkeys, away from field crops in the rainy season, especially during the night. More than one-third (35 percent) of interviewees mentioned animal control as a motive to use fire in the fields (see Figure 10). Fields are also burnt during the dry season to destroy smaller pests such as locusts and grasshoppers, which farmers believe lay their eggs in the surrounding forests.

Table 1: Use of fire in the field according to categories

Category	CF villages active	CF villages inactive	Non-CF villages	Total / average %
	1	2	3	
Clearing of weeds	21 61.8	26 68.4	19 46.3	66 58.4
Clearing of harvest leftovers	23 67.6	20 52.6	35 85.4	78 69
Clearing in general	4 11.8	6 15.8	7 17.1	17 15
Fertilization	3 8.8	2 5.3	7 17.1	12 10.6
Preparation of planting	3 8.8	4 1.05	3 7.3	10 8.8
Preventive burning	5 14.7	1 2.6	1 2.4	7 6.2
Processing of oysters	1 2.9	0 0	0 0	1 0.9
Cigarette smoking	7 20.6	7 18.4	4 9.8	18 15.9
Control of wild animals	10 29.4	17 44.7	13 31.7	40 35.4
Insect control	5 14.7	5 13.2	8 19.5	18 15.9
Cooking/roasting	5 14.7	7 18.4	6 14.6	18 15.9

Note: In each cell, the first figure indicates the absolute number of responses, the second the percentage related to the respective category.

Fuelwood and charcoal production: According to the Forest Regulations, only dead wood can be collected for commercial fuelwood production. Fuelwood producers are bending these rules by setting the forest on fire to kill more trees in order to perpetuate their businesses. According to the villagers interviewed, such illegal practices are unlikely to be mentioned openly.

Nevertheless, six interviewees indicated that they employed this practice, and it can be assumed that the actual number is considerably larger. When asked indirectly in relation to their own activities, the number of respondents who implicated dead wood generation as a cause of fire rose to one-quarter (24.8 percent) of all respondents. Unlike fuelwood production, the production of charcoal is illegal in The Gambia, although trade in it is allowed according to the New Forest Act of 1998 (Section 110 Part XI). In 1980, a Presidential Decree was issued prohibiting both the production and the trade of charcoal. The prohibition on charcoal production is obviously not fully observed: 12 interviewees (10.6 percent) mentioned it as a purpose of fire, and it can be assumed that the actual number of people involved in this activity is greater.

Forest management activities: There is evidence of uncontrolled fires developing from controlled early burning and firebreak preparation activities conducted by Forestry Department staff and villagers around forest parks or community forests. Three villages in the survey were affected by this kind of fire. Two of these villages are involved in community forestry and fires set for early burning in forest parks spread into their forests. The villagers alleged that forestry staff did not inform them, as they are obliged to do, before carrying out the controlled burning nearby. In the interviews, it was clear that not only were forest areas destroyed, but also the relationships between forestry staff and the communities were seriously damaged. Villagers concluded that forestry staff, while protecting the state's forest parks, did not care about the forests that were assigned to the communities. Villagers developed the impression that: "The Forestry Department is prosecuting villagers for setting out fires while they are not prosecuting themselves if they are offenders."

This can seriously impede the ability of forestry staff to sensitize community members about fire issues and to cooperate in the fight against forest fires.

Sparks from faulty vehicles: It is not uncommon that badly maintained combustion engines throw sparks from their exhausts when being operated. As with cigarette butts, this can cause the grass cover along roads to catch fire.

Other causes of forest fires: There is a strong belief that a local tree species (*fang jaano*) causes fire in the dry season by the explosive disposal mechanism of its seeds. At the workshop, a lot of foresters confessed that they had never seen this tree, and it was mentioned only twice in the interviews as a possible cause of fire.

Other causes include:

- cooking and roasting of food in the open: this is a common practice when spending long hours undertaking field or forest activities;
- oyster processing: in the mangrove areas near the River Gambia;
- palm wine tapping: as in honey collection, fire is used in palm wine tapping to drive the bees away;
- Senegalese customs officers sanction the burning of the forest in order to expose smugglers across the border.

LEGISLATIVE APPROACHES ON COMMUNITY INVOLVEMENT

The most important legislative measures to control forest fire in The Gambia are the Forest Act and the draft Forest Regulations of 1998. These pieces of legislation facilitate the participation of local communities in forest management through community forestry. Other participatory forms of forest management involve CCSF, which is currently being promoted.

Prior to the inception of the community forestry concept, the state took ownership of the forest away from the local communities, resulting in a lack of concern for the forest. People left fires unattended on lands that they saw as belonging to the government, expecting Forestry Department staff to extinguish them. The community forestry concept was introduced to change this situation. Under the terms and conditions of the concept, local people have full access to benefits accruing from the forest. With the devolution of authority over the forest to the villagers, there are improved chances to contain the menace of forest fires. The prevention and control of forest fires are considered to be the most crucial elements of the community forestry approach. The communities are under very strong obligation to prevent fires in their community forests and the surrounding state forests. The ability of the community to keep forest fires under control is the main criterion used in evaluating them for the issuance of a Preliminary Community Forest Management Agreement (PCFMA) and a Community Forest Management Agreement (CFMA).

COMMUNITY-BASED FIRE MANAGEMENT

The environment (vegetation type and weather conditions during the dry season) makes fire prevention a difficult task. In years of good rainfall, the grass cover becomes very thick and tall, providing favourable grounds for serious surface fires. The situation is compounded by the dry, windy harmattan conditions prevalent from December to February each year. Communities have to be particularly alert in these three months of the dry season.

Fire fighting techniques

From the interviews carried out for this study, a pattern of fire fighting strategies can be summarized: “The holy drum is beaten, everybody assembles, women draw water, men go with rakes, establish firebreaks, they pour some water on the dry grass before the fire reaches it. Sometimes they use green branches, sometimes sand”.

While branches bearing green leaves are commonly used to beat out fire, farming tools such as rakes, axes and cutlasses are typically used by men to clear the area of flammable shrubs and grasses. Women are usually responsible for fetching water from the local well, if the fire is not too far from the village.

A more advanced method to combat particularly fierce forest fires is the coordinated creation of firebreaks and the use of counter-fire. While firebreak clearing is quite common and used in roughly half (52 percent) of cases, counter-firing is rather more demanding and needs some experience to be employed correctly. In fact, in one interview a counter-fire was mentioned as the cause of an uncontrolled fire that burnt several compounds. Counter-fire can be the only method to stop very fierce fires that are practically out of control, yet only 21 percent of the villagers mentioned it as a possible means of fire fighting.

Community-based mechanisms

Fire committees

To alert the community in case of an uncontrolled fire, a holy drum, a village bell or a crier calls the people to action. Roughly half of the villagers (52 percent) referred to fire committees. Typically, a village fire committee has two tasks: to watch the surrounding areas for fire and to call people for fire fighting if necessary. “[They] patrol the forest to detect fires and mobilize community labour to fight it out”.

By-laws

Probably the most important mechanism for fire management at the local level are by-laws. About 70 percent of respondents knew about by-laws in their village that are related to fire. These are set up at the community level and enforced through a village council or the Alkalo. They may not be formally codified, but are enacted through an agreement of the community.

The most frequently mentioned by-law was one that makes it compulsory for villagers to participate in fire fighting when alerted. This means that the call of the fire committee or the village crier is to be taken seriously and not just as a plea. People who fail to participate are usually reported to the local authorities (Alkalos or chiefs), who decide on their punishment. In all, 21 percent of people from 15 different villages mention this by-law. This means that it is known in almost half of the villages sampled. Another common by-law is the one that regulates the widespread practice of field burning, making strip clearing along the field compulsory when clearing fields with fire. This law was mentioned in ten interviews. The Alkalo usually enforces by-laws. To reinforce this authority, there is a regulation that calls on every villager to report fire culprits to the Alkalo or chief. This by-law was mentioned by 17.7 percent of those interviewed.

Apart from these most widespread by-laws, the interviews brought to light a range of regulations that have been developed to protect villages and forests from the ravage of fires. In six villages, the drawing-up of by-laws is related to a village’s involvement in community forestry.

Some of the regulations merit being mentioned as examples:

- “If there is a forest between two villages and there is fire in that forest, the village from which the fire starts takes up responsibility, but they all go and put out the fire first.”
- “Nobody shall go to the community forest with matches.”
- “When fire occurs while you are using the forest, you are automatically responsible.”
- “When you sell honey in the village and forest fire occurs on the same day, the villagers will put it out and look if the fire started through honey collection. If that is the case, they will fine you 50 D (about US\$4).”

The widespread implementation of by-laws appears to be a recent phenomenon. Just more than half of the 71 respondents who can recall their inception (51 percent) say that by-laws have been developed within the last five years.

Impact of community forestry on fire management

Of those interviewees who saw changes, 44 percent said that they now apply controlled burning techniques and take more care when using fire. It was encouraging that 31 percent of those

interviewed had never seen any use of fire in the forest. The number of people who responded in this way was higher in the two categories of community forest villages than in villages that do not manage their own forest. Through community forestry, a general consensus is being built that forest fires are more destructive than useful:

“[Until] ten years ago, there was nothing like management of the forest by the communities, it was managed only by government. But when they involved the communities, things began to change. When in those days it was government who protects, people now burn only the area they wish to farm and only at the beginning of the rains”.

The effects of this gradual change of attitude were already visible for the local population. When asked about changes in forest fire occurrence over the last six years, 33 out of 34 respondents in category 1 villages said that less area is now being burnt, and 59 percent said that fires are less frequent. The differentiation between fire frequency and affected area is not merely artificial. While the frequency of uncontrolled fires relates to fire use patterns and preventive measures, the area that is actually being burnt in a fire incident depends on the alertness and willingness of the local population regarding fire fighting: “Now when there is forest fire, there is a very small area that is burnt because the people go out quickly to fight against it”.

The reduction in the occurrence of forest fires is largely, but not solely, attributable to the impact of community forestry. In 1998, Mr Pascal Vardon, a graduate student from France, carried out a short survey of farmers’ attitudes to forest fires in the three districts of Western Division mentioned earlier. The results of the survey indicate that farmers are willing to invest more labour in field preparation by way of making a protective belt around their fields to avoid fires escaping to the surrounding forests. Some farmers said that they undertake these elaborate measures because of pressure from the Alkalos, who do not want to be prosecuted for unaccounted fires in their village territories under the 1998 Forest Act (Vardon, 1998: Annex 3).

It seems that consistent enforcement of the Fire Regulations in the Forest Act, together with the incentives created by community forestry, could bridge the gap between the high level of awareness and the gradual change of attitudes. Most people see the responsibility for causing uncontrolled fires as grave and were in favour of severe punishments for the culprits. In the survey, a solid 95 percent of those interviewed supported this. Usually they pleaded for heavy fines, even without considering the financial capacity of the culprit. Moreover, it was frequently advised that those incapable of paying should be imprisoned. Some respondents advised corporal punishment such as a heavy beating and went as far as proposing the death penalty.

CONCLUSION

Forest fires are one of the most intractable problems for the forestry services all over the Sahelian region, and ways to combat them remain as debatable as ever, even within the same country. A realistic fire prevention strategy for The Gambia should not aim to prohibit the use of fires in the farm management activities of the local population, but rather to regulate its application and, at the same time, make people sensitive to the dangers of fire. In fact, the use of fire to aid in farm clearance is not in itself unacceptable. What is worthy of disapproval is the indiscriminate burning of the forest in the name of farming. Because the law proscribes the uncontrolled use of fires in farm clearing, farmers who are short of help to clear their fields in the right manner sometimes covertly start forest fires, which eventually spread into their fields. Such farmers escape prosecution because they remain unidentified. Some farmers go to the extent of

setting fires in the vicinity of their neighbourhood to mislead any investigation tracing the guilty person (Vardon, 1998).

Consistent law enforcement can help to deter those inclined to careless practices in relation to fire use. Furthermore, people who willingly comply with regulations will continue to do so only if they see that culprits are being prosecuted. Otherwise, compliers will form the impression that their own commitment is in vain and that they would fare better if they also breached the law. If heeding rules is labour-intensive, as it is with field clearing, or puts complying individuals at a disadvantage, people will only observe laws if they see that others also follow them. Villagers call for resolute prosecution because, understandably, they do not want to see the positive results of their own efforts being spoiled by others.

Fires are quite often caused by humans and could be prevented if the people who set them could be persuaded to change their habits. Although awareness creation is essential, fires can only be eradicated if the general public actively participates. The local population can directly prevent or control forest fires. Villagers should be able to enjoy the benefits of managing the use of fire during land clearance. Community forestry makes this possible.

The urban population also has an important role to play in forest fire reduction, because it is in urban areas that policy-makers are found. These people contribute to the design of programmes, policies and laws and are themselves influenced by public opinion.

The use of political influence for the prevention and control of forest fires is indispensable in fire management. Politicians (both parliamentarians and chiefs) should be made aware of forestry's contribution to both informal and formal sectors of the economy. Lobbying politicians for support must go hand-in-hand with sensitizing the general public about the difference between controlled and uncontrolled fires, and about the threat that uncontrolled forest fires pose to national stability. With such a level of activity, the forest fire issue could be brought to the national agenda. Political support for the Forestry Department is extremely valuable. It would mean greater commitment from chiefs, leading to expedited hearings of fire cases in the courts and the delivery of appropriate judgments. Parliamentarians can help to focus national attention on forest fires by declaring a special date to commemorate this problem in The Gambia.

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El Manejo de los Incendios Forestales y la Participación de las Comunidades Locales

Por César Augusto Alvarado, Sara Elisa Rosales y Miguel Angel Salazar Aguilar ; Febrero 2001

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RESUMEN DE ORIENTACIÓN

A pesar de que los bosques de Honduras son una fuente importante de recursos económicos y de bienestar para la sociedad, en algunas comunidades estos han constituido un obstáculo para la expansión de distintas actividades, tales como las de índole agropecuaria. Es por ello que el 99 por ciento de los incendios forestales ocurre por causas antropogénicas y la mayoría de ellos tiene origen en terrenos de propiedad privada.

Sin embargo, existen comunidades conscientes de que es necesario proteger a los bosques, sobre todo porque éstas dependen de sus recursos, tanto desde el punto de vista cultural, como social y económico. Es por ello que la reducción de los incendios forestales es más notoria en aquellas zonas en donde las comunidades están ligadas al bosque mediante actividades productivas.

Para entender mejor la dinámica que favorece esta toma de conciencia, el presente estudio analiza cuál es la situación de los incendios forestales, a través de la legislación correspondiente y del papel que las municipalidades desempeñan respecto a las comunidades que ejercen actividades forestales. Asimismo, el estudio propone lineamientos estratégicos destinados a la protección y al uso racional y sostenible de los recursos forestales. Entre éstos figuran el fortalecimiento institucional, la coordinación de la cooperación internacional, la revisión de políticas y normas municipales, la educación forestal, las giras educativas, el control de permisos de roza y quema y la generación de incentivos para las comunidades.

Este análisis ha sido realizado, utilizando como referencia a las comunidades de Chagüite Grande, El Carrizal, Lavaderos y Laínez, las cuales se localizan en ecosistemas forestales que tienen un alto grado de riesgo de incendios forestales, y en donde el bosque constituye la mejor alternativa para el desarrollo socioeconómico local.

Aunque los incendios forestales siguen siendo una amenaza en las comunidades mencionadas, existe un alto grado de conciencia forestal que puede facilitar la protección de los bosques, por ejemplo a través de la introducción de actividades de cultivo de árboles de uso múltiple y crecimiento rápido que estimularía la protección del bosque.

El estudio llega a una serie de conclusiones y recomienda que la Administración Forestal del Estado (AFE/COHDEFOR) revise sus políticas a fin de revertir la actitud de una parte de los pobladores, mediante el fomento de acciones en favor de la protección del bosque. Otra de las recomendaciones hace hincapié en que es necesario llevar a cabo programas de desarrollo comunitario acordes al potencial natural de las áreas que fueron objeto de estudio, de manera que estos programas fomenten la

participación comunitaria en actividades de protección de sus recursos naturales, tales como la prevención y el combate de los incendios forestales.

Management of Forest Fires and the Participation of Local Communities

By César Augusto Alvarado, Sara Elisa Rosales et Miguel Angel Salazar Aguilar ; February 2001

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EXECUTIVE SUMMARY

Although forests are an important source of financial resources and well-being for society in Honduras, in some communities they have become a barrier to the expansion of certain activities, such as farming. As a result, 99 percent of forest fires are caused by human interventions, and most of them originate on private land.

However, some communities are aware of the need to protect the forests because they depend on them for their resources, from both a cultural and a social and economic perspective. It is for this reason that a decrease in forest fires is more noticeable in areas where communities have links with the forest through production activities.

In order to improve understanding of the dynamics that favour such awareness raising, this study analyses the status of forest fires in the light of relevant legislation and the municipalities' role *vis-à-vis* the communities that carry out forest activities. The study also suggests strategic guidelines aimed at protecting forest resources and making rational and sustainable use of them. Among these strategies are the strengthening of institutions, the coordination of international aid, a review of municipal policies and norms, forestry education, educational tours, the control of slash-and-burn permits and the creation of incentives for communities.

As a reference, the analysis uses the communities of Chagüite Grande, El Carrizal, Lavanderos and Laínez, which are located in forest ecosystems with a high risk of forest fires and in which the forest is the best alternative for local socio-economic development.

Although forest fires continue to pose a threat to these communities, there is a high level of forest awareness, and this may make protection of the forests easier – for example, by introducing such activities as the planting of rapid-growth, multiple-use trees, which would stimulate the protection of the forest.

The study draws a range of conclusions and recommends that the State Forestry Administration – Forestry Development Corporation of Honduras (*Administración Forestal del Estado – Corporación Hondureña de Desarrollo Forestal* [AFE/COHDEFOR]) review its policies with a view to changing the attitude of part of the population by encouraging actions that favour protection of the forest. Another recommendation highlights the need to implement community development programmes that are in line

with the natural potential of the areas under study, so that the programmes may encourage community participation in activities that are aimed at protecting their natural resources, such as the prevention and fighting of forest fires.

Gestion des incendies de forêt et participation des communautés locales

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RÉSUMÉ

Les forêts constituent une source importante de revenus et de bien-être pour la société au Honduras mais dans certaines communautés elles sont désormais un obstacle à l'expansion de certaines activités comme l'agriculture. En conséquence, 99 pour cent des incendies de forêt sont dus à l'intervention humaine et la plupart d'entre eux se déclenchent sur des terres privées.

Cependant, certaines communautés ont conscience de la nécessité de protéger les forêts parce qu'elles en tirent leurs ressources du point de vue culturel, social et économique; c'est pour cette raison que ces incendies diminuent de façon plus visible dans les zones où les communautés entretiennent des liens avec la forêt sous forme d'activités de production.

Afin de faire mieux comprendre la dynamique qui favorise cette prise de conscience, l'étude analyse la situation des incendies de forêt à la lumière de la législation en la matière et le rôle des municipalités vis-à-vis des communautés qui ont des activités dans les forêts. On y suggère également des orientations stratégiques visant à protéger les ressources forestières et à les utiliser d'une façon rationnelle et durable. Les stratégies sont les suivantes: renforcement des institutions, coordination de l'aide internationale, examen des politiques et des normes des municipalités, éducation forestière, voyages d'étude, contrôle des autorisations de cultures sur brûlis et mise en place de mesures incitatives destinées aux communautés.

L'analyse utilise comme référence les communautés de Chagüite Grande, El Carrizal, Lavanderos et Laínez, qui sont situées dans des écosystèmes forestiers extrêmement exposés aux incendies et pour lesquelles la foresterie constitue la meilleure solution pour assurer le développement socio-économique local.

Bien que les incendies de forêt représentent toujours une menace pour elles, ces communautés ont fortement conscience de l'importance de la forêt, ce qui pourrait faciliter sa protection; on pourrait par exemple introduire des activités qui encouragent la population à protéger la forêt, comme la plantation d'essences polyvalentes à croissance rapide.

L'étude formule diverses conclusions et recommande que l'Office public d'administration des forêts (*Administración Forestal del Estado – Corporación Hondureña de Desarrollo Forestal* [AFE/COHDEFOR]) réexamine sa politique en vue de changer la mentalité des populations en encourageant des actions propres à favoriser la protection des forêts. Il est également jugé nécessaire de

lancer des programmes de développement communautaire qui correspondent bien au potentiel naturel des zones étudiées de façon que ces programmes favorisent la participation des communautés à des activités visant à protéger leurs ressources naturelles, par exemple la prévention et la lutte contre les incendies de forêt.

INTRODUCCIÓN

En Honduras, los incendios forestales son una de las principales causas de degradación de los bosques. La mayor parte de los incendios son provocados por la población, quien por diversas razones, ha adoptado la “cultura del fuego”. Sin embargo, aunque existan comunidades que han sido protagonistas de la destrucción del bosque, también hay comunidades que los protegen.

Es por ello que el estudio se basa en experiencias comunitarias en donde se ha manifestado una tendencia hacia la reducción de la ocurrencia de incendios forestales, lo cual obedece a una sensibilización sobre la importancia de los recursos boscosos. Otro elemento que caracteriza al presente estudio es que ha sido colocado en el ámbito de los procesos de descentralización municipal y de reforma de la legislación de los sectores agrícola y forestal. Al final, se recogen conclusiones y recomendaciones generales derivadas del análisis efectuado.

OBJETIVOS

Los objetivos del estudio consisten en:

- Analizar la situación de los incendios forestales en base a la legislación correspondiente y en base al papel que las municipalidades desempeñan, en cuanto al desarrollo de las comunidades que ejercen actividades forestales;
- proponer lineamientos estratégicos tendientes a la protección y al uso racional y sostenible de los recursos forestales.

METODOLOGÍA

La metodología utilizada para realizar el estudio se basó en las siguientes etapas:

- a) definición conceptual del estudio;
- b) definición de la ruta metodológica y de los criterios de selección de las comunidades a investigar;
- c) revisión y análisis bibliográfico;
- d) recolección de la información;
- e) procesamiento y análisis de la información recolectada;
- f) elaboración del informe.

SITUACIÓN GENERAL DE LOS INCENDIOS FORESTALES

A pesar de que los bosques del país constituyen una fuente importante de recursos económicos y de bienestar para la sociedad, en algunos sectores de la población éste ha constituido un obstáculo para la expansión de algunas actividades productivas, tales como las agropecuarias. En consecuencia, en varios sectores sociales se ha ignorado el valor y el significado que el bosque tiene¹, generando así una indiferencia respecto a los incendios forestales en el país.

El 99 por ciento de los incendios forestales en Honduras ocurre por causas antropogénicas (la mayoría en terrenos de propiedad privada) y el uno por ciento obedece a causas naturales. La cantidad de incendios ocurridos y la superficie afectada por ellos en los últimos diez años, señala que la ocurrencia de incendios ha disminuido, no así la extensión del área afectada por ellos. Esta tendencia muestra que la

¹ SILVIAGRO S. De R. L. Análisis del subsector forestal de Honduras. COHDEFOR/Proyecto CAFOR-GTZ. Honduras. 1994

población está tomando conciencia y provoca menos incendios, pero una vez que estos se han originado, la gente no participa en el combate contra los mismos.

Actitud de las comunidades respecto a los incendios forestales

En el transcurso del tiempo, muchas comunidades forestales, especialmente aquellas que figuran en el presente estudio, han alcanzado altos niveles de conciencia forestal y responden con actitudes muy positivas en cuanto a la lucha contra los incendios. En algunos casos los evitan, mientras que en otros, proceden a combatirlos. No obstante, la mayor parte de las comunidades en el país, se sigue mostrando indiferente al respecto. Además, la actitud de los miembros de algunas comunidades hace que otras comunidades inicien el incendio, y en estos casos no proceden al combate del mismo. De acuerdo a estudios realizados en la Escuela Agrícola Panamericana, El Zamorano, se puede establecer un resumen comparativo de actitudes en dos tipos distintos de comunidades, según muestran indicios del año 1999:

Comunidades sin ocurrencia de incendios	Comunidades con ocurrencia de incendios
Existe una conciencia ambiental de índole tanto individual como general.	La conciencia ambiental existe solo en una minoría.
Existe unión al momento de trabajar.	La unión comunitaria no existe.
Se genera organización	Los intentos de organización fracasan.
La comunidad trabaja por sí misma.	La comunidad trabaja en función de los factores externos.
La comunicación es eficaz.	No existe un sistema de comunicación.
El papel que desempeña el alcalde auxiliar es respetado y su función es ejemplar.	El alcalde auxiliar tiene un desempeño apático.
No hay envidias ni resentimientos.	La envidia y el resentimiento son gestores de la situación.

Las actitudes mencionadas anteriormente, están relacionadas con las variables que caracterizan el acceso al bosque y con la falta de conciencia sobre el valor del mismo. El comportamiento de la población con respecto a los recursos naturales depende de las actividades que se realicen en el futuro, pero mientras no se lleven a cabo programas de educación, en donde se concilien los intereses de carácter social, económico y ecológico en todos los estratos de la sociedad nacional, será difícil detener la tasa de deforestación en el país.

Criterios de selección de las zonas de estudio

Para seleccionar a las comunidades objeto de este estudio, se tomaron en consideración los siguientes criterios:

- las comunidades que se encontraban en ecosistemas forestales con predominancia de especies del género *Pinus spp.*, debido a que éstas corresponden a las áreas en donde existe mayor incidencia de incendios forestales en el país;
- las comunidades que se enmarcaban dentro de las zonas con alto potencial de riesgo de incendios forestales;
- las comunidades que disponían de suficientes recursos forestales, los cuales deberían constituir su principal patrimonio;
- el comportamiento de la población, en el curso del tiempo, respecto a la utilidad y protección de los recursos boscosos;
- la presencia de instituciones y/o proyectos de cooperación en la comunidad;
- el grado y tipo de estructuras organizativas comunitarias que existían.

En base a estos criterios, se seleccionaron a las siguientes comunidades: a) Chagüite Grande, en el municipio Villa de San Antonio, departamento de Comayagua; b) El Carrizal, en el municipio de Lepaterique, departamento de Francisco Morazán; c) Lavanderos, en el municipio de Guinope, en el departamento de El Paraíso; y d) Laínez, en el municipio de Yuscarán, departamento de El Paraíso.

Caracterización de las comunidades

En las cuatro comunidades sujetas a estudio, la vegetación forestal predominante está compuesta por la especie *Pinus oocarpa*, clasificada en la zona de vida según la clasificación de Holdridge, como Bosque Húmedo Subtropical (bh-ST), en el cual existe un acceso permanente, contando además con la presencia y participación de instituciones estatales y organizaciones no gubernamentales.

Chagüite Grande

Esta comunidad pertenece al municipio de la Villa de San Antonio, departamento de Comayagua. La comunidad cuenta con 230 habitantes. Se ubica aproximadamente a 58 kilómetros de la ciudad capital Tegucigalpa y a 36 kilómetros de la cabecera de Comayagua. La superficie con que cuenta esta comunidad es de 1 535 hectáreas, de la cual el 58,14 por ciento es forestal. La actividad principal abarca varios aspectos de la producción forestal (madereo, resinación, aserrío manual, aserrío industrial, venta de leña, madera en rollo de pequeñas dimensiones).

En la comunidad existe una gama de instituciones del Estado, dentro de las cuales los mismos habitantes de la comunidad son actores principales, todos ellos según la función de voluntariado. El Cuadro 1 describe las diferentes instituciones del Estado, así como las organizaciones propias de la comunidad. La principal riqueza que posee la comunidad es el recurso forestal. Esta realidad es reconocida por la comunidad, lo cual se pone de manifiesto a través de la protección que reciben los bosques y la ausencia de incendios forestales.

Cuadro 1. Instituciones presentes en la región de Chagüite Grande

Instituciones del Estado	Organizaciones comunales
<ul style="list-style-type: none"> • Ministerio de Salud Pública • partera • guardián de salud • colaboradores de salud • Ministerio de Educación Pública • municipalidad • alcaldes auxiliares • AFE-COHDEFOR 	<ul style="list-style-type: none"> • Patronato pro-mejoramiento communal • Sociedad de padres de familia • Comité pro-feria de la Iglesia • Microempresa de aserrío manual • Industria Maderera Campesina (IMACACH) • Grupo SIFES

El Carrizal

La aldea El Carrizal está situada en el municipio de Lepaterique, en el departamento de Francisco Morazán. Ésta cuenta con 1 042 habitantes distribuidos en siete caseríos: Oropule, El Naranjo, El Hatillo, El Ovejo, El Guayabal, Cansopoteca y Cimartagua. El nivel de educación es muy bajo. Los ingresos obtenidos gracias al aprovechamiento del bosque representan el 30,7 por ciento del ingreso familiar. Una parte importante de este uso es la producción de leña para la venta. En cuanto al valor que la comunidad confiere al bosque, el campesinado en general considera que el bosque da vida, proporciona dinero y trabajo, leña y sombra. La percepción que la población tiene acerca de la situación del medio ambiente en la actualidad, oscila entre regular y buena, aunque una pequeña proporción de la población, que cuenta con mayor conocimiento de su relación con el bosque, la considera mala.

Lavanderos

Lavanderos es una aldea que pertenece al municipio de Guinope, departamento de El Paraíso, y cuenta con una población total de 511 personas. En esta aldea el bosque de pino, que se encuentra bajo la protección de COHDEFOR, es abundante. Los habitantes de la comunidad talan el bosque para extraer leña para el consumo local. Desde el punto de vista económico la principal actividad de la comunidad es la agricultura, aunque en los últimos seis o siete años, la extracción de resina constituyó una fuente de ingresos extra.

El impacto de los incendios ha disminuido en todos los municipios de esta región, según señala el Programa de Desarrollo Sostenible de la Región del Yeguare, debido a que las áreas quemadas no son extensas. La mayoría de los incendios forestales suelen ser causados intencionalmente debido a conflictos vecinales. Al analizar el nivel de participación de los grupos comunales, se observa que el mayor porcentaje de participación corresponde al comité de apoyo contra incendios forestales, el cual se encarga de coordinar actividades de control de incendios y concientiza a los vecinos de la comunidad.

En esta área se desarrolla un proyecto relacionado con los recursos naturales y su población, denominado Proyecto UNIR, el cual está a cargo de la Escuela Agrícola Panamericana, El Zamorano. A través de este proyecto se apoyan actividades de organización, capacitación, respaldo operativo mediante radio comunicadores, herramientas y apoyo en la prevención y combate de los incendios forestales. Asimismo, existen otras instituciones y proyectos que apoyan fuertemente las actividades de prevención y control de incendios, entre ellas figuran el Proyecto de apoyo a la forestería comunitaria (AFOCO), Vecinos mundiales y la AFE-COHDEFOR.

Laínez

Esta comunidad pertenece al municipio de Yuscarán, del departamento de El Paraíso, y se sitúa al norte de la cabecera departamental. Los suelos son irregulares, pobres e inapropiados para la agricultura y se encuentran cubiertos, en su mayoría, por bosques de pino. El proyecto de apoyo a la forestería comunal (AFOCO) ejecutado por COHDEFOR y financiado por la agencia de cooperación alemana GTZ inició en 1994 fundando el Comité Ecológico “Los Halcones”, cuya misión era contribuir a proteger y mejorar los recursos naturales en Laínez.

OBSERVACIONES

El análisis de las consultas efectuadas, revela dos situaciones muy interesantes. La primera de ellas es el caso en la zona del Zamorano, en donde después de tres años de trabajo para proteger el bosque, y no obstante exista un evidente y constante incremento de la ocurrencia de incendios forestales, las áreas afectadas son menos extensas, lo cual refleja que la población alcanzó algunos niveles de conciencia respecto a la importancia de combatir los incendios inmediatamente después que estos han ocurrido. Esta tendencia también podría deberse a que el personal técnico del Proyecto de El Zamorano ha mantenido una supervisión y apoyo constante en el área.

La segunda observación corresponde a la región de Lepaterique, en la cual hay zonas que, después de 6 años de trabajo de prevención, muestran una ocurrencia de incendios sumamente baja. Sin embargo, precisamente debido a la falta de incendios, se ha verificado una acumulación de combustible, razón por lo cual en la ocurrencia de un incendio, éste sería difícil de controlar.

En esta región se han preparado planes de manejo que no contemplan el empleo de campesinos para actividades de prevención en la protección contra los incendios forestales. Además de El Zamorano,

existen otras instituciones y proyectos que apoyaron fuertemente las actividades de prevención y control de incendios: AFOCO, Vecinos Mundiales y COHDEFOR. Las actividades realizadas por estos organismos fueron: organización de grupos, transporte, donación de herramientas, capacitación y apoyo en alimentos por trabajo. Por el contrario, el Departamento del Sistema Social Forestal de la AFE/COHDEFOR ha reducido sus actividades de asistencia y supervisión de los trabajos realizados por los grupos existentes.

Historia de los incendios en las comunidades seleccionadas

Debido a las características del uso de la tierra, todas estas comunidades tienen una vocación forestal y están ubicadas en el corredor central, de fácil acceso y cercanas a los centros urbanos más importantes del país. A pesar de que la ocurrencia de incendios en la superficie comunal es muy reducida, o nula, éstos suelen ocurrir en las áreas vecinas a ellas. Es por ello que hay que contemplar la posibilidad de ocurrencia de incendios, a fin de mantener una capacidad logística y operativa en cada comunidad. En el Cuadro 2 figura la cantidad de incendios ocurridos, así como la superficie afectada, por municipio, según muestran los registros del Departamento de protección de la AFE-COHDEFOR.

Cuadro 2. Incendios forestales registrados por año y municipio

Municipio/ Comunidad	1997		1998		1999		2000		Promedio	
	#	ha	#	Ha	#	Ha	#	Ha	#	Ha
Villa San Antonio (Comayagua)	24	247	9	237	8	126	12	976	11.8	305.5
Guinope (El Paraíso)	0	0	40	686	23	167	31	1127	17.8	354.3
Yuscarán (El Paraíso)	16	698	18	505	21	48	6	219	14.7	329.5
Lepaterique (Francisco Morazán)	0	0	0	0	0	0	0	0	0	0

(Entre paréntesis se indica el departamento en el cual está ubicado el municipio)

En el registro de cada municipio se observa una aparente tendencia al incremento de los incendios, pero en realidad sucede que los registros de los municipios han mejorado gracias a la asistencia de los proyectos que operan en las comunidades. Se espera que, con la aplicación de la ley que moderniza y desarrolla el sector agrícola, las expectativas de mercado de los productos derivados del bosque, adquieran mayor evidencia y transparencia. Es por ello que los planes de manejo, que hasta ahora se han enfocado principalmente en los recursos maderables, deben considerar y desarrollar un plan basado en productos diversificados. La resinación ha resultado ser estratégica como medida de protección, puesto que el tratamiento y explotación se realiza individuando a cada árbol.

Mecanismos para el control de los incendios forestales

Las corporaciones municipales han emitido una serie de disposiciones de conformidad con la Ley Forestal, a fin de reducir el uso del fuego como método de preparación de las tierras agrícolas. Estas disposiciones se deben, en parte, a la influencia de proyectos o de organismos no gubernamentales. Entre las medidas o mecanismos más comunes figuran las Ordenanzas, que son instrucciones directas

impartidas a los alcaldes auxiliares, nombrándolos en calidad de guardabosques, los cuales a su vez, reciben incentivos en alimentos por trabajo, gracias al apoyo de CODEHFOR.

Asimismo, en algunos municipios se han organizado comités de protección forestal y en otros se han formado juntas de vigilancia. En las comunidades estudiadas, en particular las de Chagüite Grande, El Carrizal y Laínez, se ha notado que el componente forestal es fundamental para el desarrollo local. El plan de manejo, que en estas comunidades se ejecuta, ha demostrado tener un enorme impacto en la conservación y sostenibilidad de los recursos boscosos y en la población.

Como alternativa al uso del fuego en áreas agrícolas, se han venido aplicado técnicas de incorporación de la materia orgánica al suelo, a través de medios mecánicos. De esta manera, la ocurrencia de incendios forestales por causa de quemas para fines agrícolas, ha disminuido paulatinamente. No así cuando el fuego es utilizado para renovar pastos o eliminar algunas plagas del ganado, razón por la cual esas actividades suelen ser las causas principales de los incendios forestales.

Participación de la comunidad en la prevención y control de los incendios forestales

Los efectos del huracán Mitch (1998), provocaron una reacción positiva en muchas autoridades, en lo que se refiere a los bosques. Es por ello que muchos programas de organismos e instituciones han puesto en relación el impacto de tal fenómeno y la fragilidad de los bosques, aumentando así la justificación de sus actividades de conservación. De esta forma, muchas comunidades rurales han incorporado las organizaciones existentes a grupos que trabajan para dar respuesta rápida a los incendios forestales. En algunos casos, los campesinos son obligados por alguna autoridad a incorporarse a las tareas de combate contra los incendios, en caso de que éstos ocurran. Por el contrario, en otras regiones los habitantes de las áreas urbanas se ofrecen como voluntarios, aunque, por falta de entrenamiento y por motivos de seguridad, no se les permite participar.

LINEAMIENTOS ESTRATÉGICOS

La aplicación de los lineamientos estratégicos para el manejo de fuegos forestales estará condicionada por diferentes factores, tales como el compromiso del Gobierno; la participación de las organizaciones municipales y los mecanismos que serán utilizados para su ejecución en el contexto de la nueva legislación forestal.

Asimismo, la participación de las comunidades locales, dependerá de la definición y aplicación de aspectos estratégicos centrales, como los siguientes:

Fortalecimiento institucional

La Ley de Modernización y Desarrollo del Sector Agrícola da mayores atribuciones a las municipalidades en cuanto a la gestión de los recursos forestales. En consecuencia, será necesario realizar estudios relacionados con el beneficio de índole comunal que deriva de las actividades reguladoras, de protección y conservación del bosque. Asimismo las unidades ambientalistas de cada municipalidad, así como el personal técnico asignado, deberán sistematizar sus procesos de monitoreo de acuerdo al marco de los Criterios e Indicadores para la Ordenación Forestal Sostenible, dado que el país es signatario de los compromisos derivados del Convenio Regional para el Manejo y Conservación de los Ecosistemas Naturales Forestales y el Desarrollo de plantaciones Forestales, a raíz de la Reunión cumbre de 1993. Estas unidades municipales deben reconocer el desarrollo histórico de la vocación y

uso de la tierra y de sus habitantes, aprovechando las oportunidades que ello ofrece para constituir un ejemplo demostrativo de la eficiencia en el desarrollo socioeconómico y ambiental.

Cooperación internacional

La cooperación internacional, tanto directa, como a través de organizaciones no gubernamentales (ONG) y organizaciones privadas de desarrollo (OPD), ha sido objeto de una polarización en todo el país. Varias instituciones estatales, identificadas como ejecutoras por la cooperación, han desarrollado actividades, muchas veces antagónicas, destinadas a desarrollar sectores distintos. Es por ello que la ley vigente y la nueva Ley Forestal, en proceso de ejecución, ofrecen una situación atractiva para unir esfuerzos a fin de planificar actividades que sean congruentes con la política global de ordenamiento sostenible de los recursos boscosos. Esto hace más meritorio el logro alcanzado por las comunidades estudiadas en los últimos años.

Políticas y normas municipales sobre los incendios forestales

La nueva Ley Forestal contempla un capítulo exclusivamente relacionado con los incentivos para la conservación del bosque, por medio del cual se espera lograr una amplia participación de los propietarios de terrenos forestales. Asimismo, la ley instaura la figura del Regente Forestal como forma de mecanismo técnico y administrativo que sirva de apoyo a la Administración Forestal del Estado.² La protección del bosque contra los incendios forestales no puede ser considerada fuera del contexto del manejo forestal, aunque este contemple otros problemas, tales como las plagas, el desboscamiento con propósito agrícolas y la tala clandestina. Es por ello que la aplicación de las leyes, a través de las Unidades municipales ambientales, apoyadas a su vez, por organizaciones no gubernamentales y organizaciones privadas de desarrollo, debe favorecer tanto la equidad socioeconómica, como la protección ambiental. Para lograrlo, los nuevos procedimientos administrativos deben considerar los siguientes aspectos:

Educación Forestal

El aspecto educativo debe contemplar un factor fundamental que consiste en revisar los contenidos curriculares de los programas de estudio en materia de educación forestal. A través de los esfuerzos conjuntos entre maestros de educación primaria y secundaria, es posible desarrollar pequeños proyectos, con el apoyo de organizaciones tales como los Clubes forestales juveniles que maneja COHDEFOR o los grupos de Jóvenes voluntarios de protección forestal. Estas actividades educativas pueden producir una mayor sensibilización de los padres de familia, a través de los cuales también pueden lograrse cambios de actitud con respecto al bosque.

Giras educativas

Las corporaciones municipales, apoyadas por organismos no gubernamentales, pueden promover *giras educativas*, las cuales permitirán a cada uno de los participantes conocer procedimientos preventivos aplicados en otras áreas con resultados exitosos. Además, este tipo de actividad permite efectuar el intercambio de experiencias entre las comunidades que realizan actividades de grupo.

² Ley Forestal de las Áreas Protegidas y de la Vida Silvestre. Versión de octubre de 2000.

Organización de Comités de Protección

La Ley forestal contempla la organización de comités municipales y locales de protección forestal, cuyos grupos pueden surgir como una necesidad de las comunidades mismas a fin de asegurar el presente y el futuro del bosque; o de contar con productos de uso doméstico como la leña, o para disponer de medios de protección de las microcuencas hidrográficas. A fin de que estos comités funcionen, se requiere el respaldo de las instituciones del sector público o privado. Además, es necesario que los miembros del comité sean objeto de una capacitación permanente por parte de las diferentes instituciones presentes en la zona (educación, salud, forestal, seguridad, etc.).

Control de permisos de roza y quema

La roza y quema son sistemas tradicionales de preparación de terrenos para fines agrícolas, o para la renovación de pastos. Esta actividad puede ser controlada mediante la participación efectiva del alcalde auxiliar o de los comités locales en la aplicación de procedimientos de coordinación entre las autoridades responsables y las comunidades mismas. Asimismo, esta coordinación puede contemplar el enfoque de microcuencas y tomar en consideración áreas para la regeneración natural. En este sentido, es importante que la corporación municipal, con la asistencia de COHDEFOR, pueda dar directrices, tanto en la realización de rozas, como en la aplicación de quemas controladas.

Generación de incentivos para las comunidades

El grado de educación forestal en las comunidades es sumamente limitado. Por ello es fundamental despertar la motivación de grupo, por ejemplo, haciendo que cada comunidad tenga indicadores para verificar sus logros. Es necesario promover incentivos de motivación, con la ayuda de los organismos no gubernamentales, que no despierten actitudes paternalistas en o respecto a las comunidades.

Ordenanzas municipales

Las comunidades suelen ser altamente disciplinadas y en raras oportunidades infringen la ley. Es por ello que la corporación municipal deberá emitir ordenanzas sobre aspectos como: el corte de árboles para uso doméstico, las rozas, las quemas agropecuarias, el control de la fauna y los cultivos de especies de rápido crecimiento.

Financiación

Las corporaciones municipales, con la asistencia de la AFE/COHDEFOR, pueden preparar pequeñas propuestas y presentarlas ante el sector privado (organismos no gubernamentales, propietarios de bosques, instituciones de asistencia) a fin de solicitar herramientas, organizar cuadrillas comunitarias voluntarias, solicitar patrocinios, capacitación, cursos para cuadrillas comunitarias, para alcaldes auxiliares, así como para el mapeo de áreas de influencia por comunidad. Con la asistencia de la AFE/COHDEFOR o de los organismos no gubernamentales es posible organizar a la comunidad para que pueda efectuar la detección y el control de incendios, estableciendo sistemas de alerta. Además, es conveniente continuar con mecanismos para la protección del bosque nacional a través de convenios con las municipalidades, tales como los diseñados por la AFE-COHDEFOR.

CONCLUSIONES

Al cabo del presente estudio se llegó a las siguientes conclusiones:

1. El bosque constituye la mejor alternativa para el desarrollo socioeconómico de las comunidades.
2. Los incendios forestales siguen siendo una amenaza para el futuro de los bosques y de las comunidades en general.
3. El elemento agua, dentro del contexto de uso múltiple, es el factor clave para la motivación de las comunidades en el manejo y protección del bosque.
4. Existen organizaciones no gubernamentales que trabajan en el desarrollo comunitario, las cuales, junto con las autoridades municipales pueden actuar contra los incendios forestales.
5. En las áreas que fueron objeto de estudio, existe un alto grado de conciencia forestal que puede facilitar la introducción de actividades para el cultivo de árboles de uso múltiple y crecimiento rápido, las cuales estimularían la protección del bosque.
6. Los incendios forestales ocurren en su mayoría en los bosques privados porque hay muchos propietarios que no asumen su responsabilidades en la protección de sus áreas forestales.
7. Aunque los incendios forestales han sido frecuentes en los años anteriores, las comunidades han carecido de un registro para recoger esa información. Sin embargo es evidente que existe una recuperación del bosque debido a la reducción de los incendios forestales.
8. Las causas de los incendios forestales son diversas, siendo quizás las políticas institucionales (AFE/COHDEFOR) las que más han influido en la actitud de la población con respecto a la protección del bosque.
9. La presencia de proyectos en las áreas de estudio, ha logrado cambios sustanciales a través de la capacitación para la prevención y control de incendios forestales, formando así una actitud positiva de la población con respecto a la protección del bosque.
10. La falta de asistencia de las municipalidades y de la AFE/COHDEFOR en el combate de incendios en las comunidades, está desestimulando la participación de sus habitantes en tales actividades.

RECOMENDACIONES

1. La AFE/COHDEFOR junto con las municipalidades y organizaciones no gubernamentales, deben identificar, en base a las potencialidades naturales de las comunidades, la ejecución de programas de desarrollo comunitario, incentivando la participación comunitaria en la prevención y combate de incendios forestales.
2. Todas las comunidades deben ser informadas a través de boletines y ordenanzas municipales sobre las medidas para contrarrestar las causas de los incendios forestales.
3. Las escuelas primarias, pueden formar clubes forestales juveniles para que sus maestros dispongan de información elemental acerca de las áreas protegidas o reservas que les permitan fomentar una actitud activa de los jóvenes respecto a la protección de los bosques.
4. Es importante que las unidades para el medio ambiente de cada municipalidad sean fortalecidas, para que mediante ellas, se pueda registrar toda la información (registro de incendios) que les permita tomar decisiones respecto al bosque.
5. Los planes de manejo y programas de protección deben incluir el componente de manejo de fuegos, que permita reducir el peligro de incendios en aquellas áreas de mayor importancia forestal.
6. La AFE/COHDEFOR debe revisar sus políticas a fin de que le permitan revertir la actitud actual de los pobladores y fomentar así una reacción en favor de la protección del bosque.
7. Las municipalidades deben crear un programa de incentivos para las comunidades que, de tener resultado, puede crear un mayor interés en la protección del bosque.
8. Es conveniente revisar los convenios internacionales, regionales y nacionales que fomentan la cooperación internacional y local en pro del ordenamiento forestal sostenible y buscar este tipo de cooperación, principalmente con el fin de fortalecer las municipalidades.

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LISTA DE ACRÓNIMOS

AFE-COHDEFOR	Administración Forestal del Estado-Corporación Hondureña de Desarrollo Forestal
AFOCO	Proyecto de apoyo a la forestería comunitaria
GTZ	Deutsche Gessellschaft für Technische Zusammenarbeit (Agencia de cooperación técnica alemana)
ONG	Organizaciones no gubernamentales
OPD	Organizaciones privadas

Management of forest fire through local communities: a study in the Bolangir, Deogarh and Sundergarh districts of Orissa, India

By Pritam Kumar Nanda and Pravat Chandro Sutar; October 2001

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EXECUTIVE SUMMARY

In the state of Orissa, India, the vast rural population is very dependent on forests. A substantial part of the livelihoods of these forest-dependent people is obtained from the trade of non-timber forest products (NTFPs). From a commercial viewpoint, the two most important NTFPs are mahua (*Madhuca indica*) flowers and kendu (*Diospyros melanoxylon*) leaves. The flowers of mahua are rich in carbohydrates and form the substrate for locally brewed liquor. The new, regenerated leaves of kendu are used in the *bidi* industry. It is well-known that fire is used in forest areas to initiate the coppicing of kendu plants and to facilitate the collection of mahua flowers.

Unfortunately – and incorrectly – these activities are among the reasons commonly given for forest fires, pointing to the forest-dependent people as the root causes of such fires. What escapes attention, however, is the poverty that these people live in.

This research on community-based fire management (CBFiM) was undertaken in the belief that forest-dependent communities would be sufficiently interested to protect forests and prevent or manage forest fires, owing to the importance of forests to their livelihoods. Cases were studied in the districts of Bolangir, Deogarh and Sambalpur in the state of Orissa. These districts have one of the highest forest covers in the state, and hence a significant proportion of their rural population is dependent on the forest for its subsistence, as well as for much-needed income. In order to generate a full picture of the dynamics involved, elaborate discussions were held with the forest dwellers, grassroots-level workers in a local non-governmental organization (NGO) working in the area and Forest Department officials at all the three sites. At village-level meetings, it was ensured that there was maximum representation of women and village elders.

During the course of the study, it was found that most forest protection initiatives emerged only after the dependent community had started to feel the scarcity of resources. The frequency of occurrence and the management of forest fires seem to be closely correlated to the level of dependency that a community living in close proximity to the forest has over the forest. It was seen that the people at two of the three sites studied were taking a proactive interest in the management of forests. Given that the state Forest Department lacks infrastructure and has poor budgetary allocations, it would be useful to encourage community-based initiatives as the most feasible mode to manage forest fires.

Gestion des incendies de forêt par les communautés locales: Étude effectuée dans les districts de Bolangir, Deogarh et Sundergarh de l'État d'Orissa, Inde

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RÉSUMÉS

Dans l'État d'Orissa (Inde), la population rurale, qui est fort nombreuse, tire une bonne part de sa subsistance des forêts, notamment du commerce de produits forestiers non ligneux. Du point de vue commercial, les deux produits de ce genre les plus importants sont les fleurs de mahua (*Madhuca indica*) et les feuilles de kendu (*Diospyros melanoxylon*). Les fleurs de mahua sont riches en hydrates de carbone et servent de base à la production locale de liqueur, tandis que les jeunes feuilles de kendu sont utilisées pour la fabrication de cigarettes *bidi*. Tout le monde sait que le feu est utilisé dans les zones boisées pour créer des taillis de kendu et faciliter le ramassage des fleurs de mahua.

Malheureusement, ces activités figurent – à tort – parmi les causes des incendies de forêt évoquées habituellement de sorte que les populations qui vivent de la forêt sont considérées comme étant à l'origine de ces incendies. Toutefois, ce qui est passé sous silence, c'est la pauvreté dans laquelle vivent ces populations.

Cette recherche sur la gestion communautaire des incendies de forêt a été entreprise parce que l'on pensait que les communautés tributaires des forêts seraient disposées à protéger ces dernières et à prévenir ou gérer les incendies en raison de l'importance des forêts pour leur survie. Des études de cas ont été effectuées dans les districts de Bolangir, Deogarh et Sambalpur (État d'Orissa). En effet, ces districts ont un des pourcentages de terres boisées les plus élevés de l'État, de sorte qu'une proportion non négligeable des populations rurales tire des forêts sa subsistance ainsi que des revenus dont elle a le plus grand besoin. Afin d'avoir une vue complète de la situation, des entretiens approfondis ont eu lieu avec les habitants des forêts, les agents de terrain d'une organisation non gouvernementale locale qui travaille dans la zone et des fonctionnaires du Département des forêts sur les trois sites. On a veillé à ce que les femmes et les anciens soient représentés le plus largement possible aux réunions au niveau des villages.

Au cours de l'étude, on a constaté que des mesures de protection des forêts ne sont généralement mises en place que lorsque la communauté intéressée commence à ressentir les effets de la pénurie de ressources. La fréquence des incendies de forêt et leur gestion semblent étroitement liées à la mesure dans laquelle une communauté habitant à proximité d'une forêt en tire sa subsistance. Il est apparu que les populations de deux des trois sites étudiés portaient un intérêt actif à la gestion des forêts. Étant donné que le Département des forêts de l'État manque d'infrastructures et ne dispose que de crédits budgétaires limités, il serait souhaitable d'encourager les initiatives à base communautaire car elles constituent le moyen le plus pratique de gérer les incendies de forêt.

Manejo de los incendios forestales a través de las comunidades locales: un estudio realizado en los distritos de Bolangir, Deogarh y Sundergarh de Orissa, India

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RESUMEN DE ORIENTACIÓN

En el estado de Orissa, India, la población rural es muy numerosa y depende, en gran medida, de los bosques. Una parte importante de los medios de subsistencia de esta población proviene del comercio de productos forestales no madereros (PFNM). Desde un punto de vista comercial, los dos productos forestales no madereros más importantes son las flores de mahua (*Madhuca indica*) y de kendu (*Diospyros melanoxylon*). Las flores de mahua son ricas en carbohidratos y forman parte de la preparación de una bebida alcohólica local. Las hojas de kendu regeneradas, forman parte de la industria del *bidi*. Es ampliamente reconocido que en estas áreas boscosas el fuego es utilizado para obtener rebrotes de cepa y generar más plantas de kendu, así como para facilitar la recolección de las flores de mahua.

Desafortunada – y erróneamente – estas actividades forman parte de las causas mencionadas a menudo como responsables de los incendios forestales, señalando así a la población que depende de los bosques, como la causa de dichos incendios. Sin embargo, se hace caso omiso de la pobreza en la cual vive dicha población.

Esta investigación sobre el manejo comunitario de incendios forestales fue realizada con la convicción de que las comunidades que dependen de los bosques, tendrían suficiente interés en protegerlos y prevenir, o manejar, los incendios forestales debido a la importancia que los bosques tienen para su subsistencia. Se estudiaron los casos de los distritos de Bolangir, Deogarh y Sambalpur en el estado de Orissa. Estos distritos tienen una de las cubiertas forestales más densas del estado, y por lo tanto una proporción considerable de su población rural depende de los bosques para su subsistencia, así como para la generación de los ingresos que tanto necesitan. Con el fin de proporcionar un panorama completo de las dinámicas que actúan en este marco, se llevaron a cabo debates exhaustivos con los habitantes de los bosques, los trabajadores de campo de una organización no gubernamental local que trabaja en el área, así como con los funcionarios del Departamento Forestal en los tres sitios. En las reuniones realizadas en el ámbito de la aldea, se aseguró que existiera el mayor grado de representatividad de las mujeres y ancianos.

En el curso del estudio, se hizo evidente que la mayoría de las actividades de protección de los bosques, surgían a medida que la comunidad dependiente comenzaba a percibir la disminución de los recursos. La frecuencia con que ocurren y se manejan los incendios forestales parece estar íntimamente ligada al grado de dependencia forestal que tiene una comunidad que vive cerca de los bosques. Además, se verificó que la población de dos de los tres sitios estudiados, estaba tomando un activo interés en el manejo de los bosques. Dado que el Departamento Forestal carece de infraestructura y tiene escasos recursos presupuestarios, sería útil fomentar las actividades comunitarias como el medio más factible para manejar los recursos forestales.

INTRODUCTION

Forest fires sometimes cause widespread destruction to the flora and fauna of forest ecosystems. The restoration time needed by some forested ecosystems ravaged by fire can be very long. Because of their livelihood interests, it is believed that forest-dependent communities would be sufficiently interested to protect the forest and, thus, to prevent the occurrence of forest fires. It was with such a motive that a study was initiated by Vasundara¹ and FAO to explore the rationale for using fire to enhance the production of kendu leaves in India; the collection of other NTFPs; the economics of such interventions; and their environmental impacts. A pattern emerged showing a distinct correlation among the community's dependency on the forest, the abundance or lack of forest resources and the level of interest that the community has in taking steps towards fire prevention and mitigation. The role of the state Forest Department (FD) and the facilitation of CBFM were also explored.



The accumulation of leaf litter over the years helped the fire to reach heights of 2-3 feet at place. Note the burn and charring in the hollow of the tree.

Photograph taken at Badatoila Reserve Forest, Deogarh.

Varying emphasis has been placed on identifying indigenous practices for using fire as a management tool. In this part of India, common uses of forest fires are to:

- initiate coppicing of kendu (*Diosporus melanoxylon*);
- facilitate the collection of mahua (*Madhuca indica*) flowers;
- encourage a good growth of grass for fodder;
- keep wild animals away from human habitation, for safety and for the hunting ritual.²

These uses point to forest-dependent people and their activities as the most likely cause of the

¹ Vasandra is an NGO involved in the forestry sector in Orissa. Its aims are to improve community-state collaboration and facilitate policy changes towards community-based forest management systems.

² This ritual is still carried out in the districts of Keonjhar and Mayurbhanj in the state of Orissa.

forest fires. However, the poverty that these people live in drives them to carry out such activities. The first three activities are carried out to derive some subsistence income. The frequency of occurrence and the management of forest fires seem to have a close correlation with the level of dependency that a community living close to the forest has on the forest.

The state allocates meagre resources to the management of forest fires, and these resources remain at the disposal of the FD. The lackadaisical attitude of its field staff, coupled with the desperation of forest-dependent communities seeking an immediate source of livelihood and easy methods for forest product collection, create a volatile environment in which fire often becomes an uncontrolled phenomenon. In many areas, a guard has to patrol an area of about 150 to 200 ha. Controlling forest fires over such large areas without the active cooperation of communities is a massive task.

It would be almost impossible for the FD to stop the occurrence of forest fires by policing the area. It has been alleged that the root cause of forest fires is the misuse of fire by forest-dependent people. They use fire for two main purposes: to initiate regeneration of kendu leaf shoots and to facilitate the collection of mahua flowers. The new kendu leaves promoted by fire are harvested for the *bidi*³ industry. Fire is also used to clear the ground of leaf litter to help facilitate the collection of mahua flowers, which have a ready market as the sole raw material for a locally brewed liquor. For the rural people, especially among the tribal population, both products form important parts of their diet, as well as being income-generating activities.

METHODOLOGY

For this study on community initiatives to manage forest fires, three sites in the districts of Bolangir, Deogarh and Sundergarh in the state of Orissa were selected (see map of Orissa showing these field sites) after consultations with the FD and NGOs working in these areas. The priority was to select areas showing high kendu leaf and mahua collection, and dependency of the poor people living in and around the forests on these NTFPs. Group and key informant interviews and meetings were held with forest protection communities at the village level and with the Divisional Forest Officers, Range Officers and other field-level staff of the state FD.

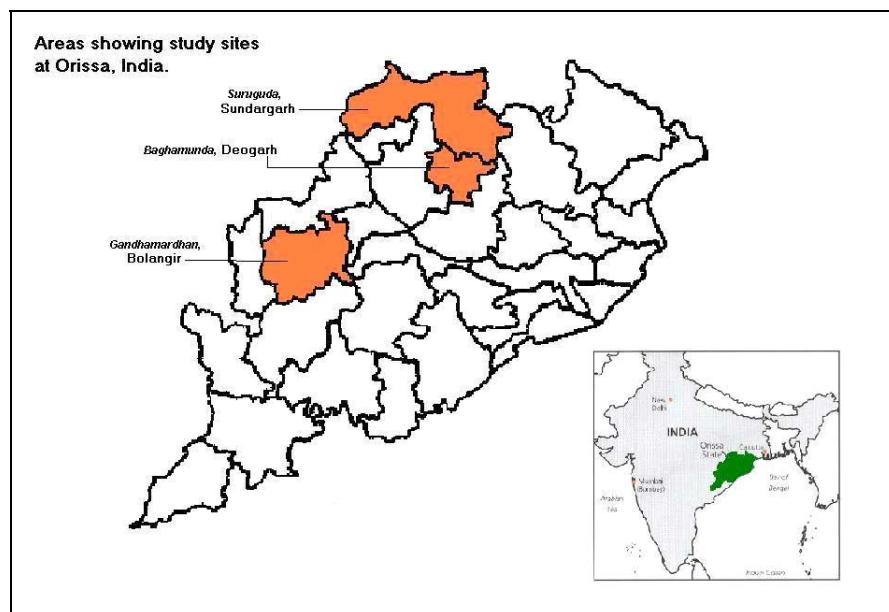
The prevalent policy framework

In reference to the reserve forests, the Orissa Forest Act⁴ (1972), under section 27(1) (b) and (c), states: "... kindles any fire in such forests or leaves any fire burning in such manner as to endanger such forest or forest land; or in a reserved forest kindles, keeps or carries any fire except at such reason as the Forest Officer may notify in this behalf, shall be punishable with imprisonment for a term which may extend to six months [and with fine] which may extend to 500 rupees (Rs)". The Indian Forest Act (1927) prescribes the same for such offences in reserve forests.

The same Act, under section 27(3) (a) states that any person in a reserve forest who: "... lops or burns any tree ... shall be punishable with imprisonment with a term which may extend to two years [and with fine] which may extend to Rs 5 000".

³ Hand-rolled cigarettes made of kendu leaves and tobacco.

⁴ The Act governing the state's forests.



The Orissa Forest (Amendment) Act 2000 is stricter than the earlier Act. The amendments that were bought in last year were:

1. For offences made under Section 27(1) the term of imprisonment was extended to up to one year and the amount that could be fined was raised to Rs 1 000.
2. For offences made under section 27(3) the term of imprisonment was extended to up to three years and the amount that could be fined was raised to Rs 10 000.

In spite of these provisions, the FD's failure to enforce them means that there are no tangible changes in the situation.

SITE 1 – BOLANGIR

The district of Bolangir is towards the western part of the state of Orissa. Approximately 23.5 percent of its area (1543.85 km^2) is under forest cover (Statistical Office, 1999). Within this district, a site was selected for studying community initiatives for forest fire management in the Gandhamardhan hills, which stretch for 96 km. The site of the study, Harishankar, is an important place of worship for the Hindus. Adjoining this site is the village of Nandupalla. Human interventions are marked, take place all year round and, at times, assume gargantuan proportions. Pilgrims undertake overnight journeys to get to the site, travelling from all over Orissa and the neighbouring state of Madhya Pradesh. They are part of a floating population and stay at the site for a day or two. Even though the site is inside a reserve forest area, the pilgrims start wood fires and cook meals. Although voluntary organizations try to ensure that fires are kept to a minimum and are properly looked after, there have been cases where fires have been abandoned without being put out.

The KL story

At the village meeting at Harishankar, locals readily agreed that KL was being collected from areas on the slopes of Gandhamardhan where bush cutting operations were taking place, even though bush cutting operations are not supposed to be undertaken there. They also agreed that regeneration of the new KL shoot was the result of a fire that had occurred. The difficulties in carrying out bush cutting operations on hilly slopes are known to all, so it is obvious that a section of society in this area resorts to using fire in order to initiate coppicing of the kendu plants. “All it requires is just a match,” said Mr Palasagar Bhoi, the President of GSAC

A group of 30 villages, based in the foothills of the Gandhamardhan hills, have come together to form the Gandhamardhan Suraksha⁵ Action Committee (GSAC). This committee does not owe its existence to any conscious forest management initiative, but to the amalgamation of efforts in protest against the leasing of the Gandhamardhan hills for mining⁶ activities. Forest fires are a fairly frequent phenomenon in the Harishankar area: “Patches of forest are under fire every year and this year it had spread right up to the boundary wall of the temple.” (Mr Prasana Pujari, Treasurer GSAC)

Forest protection measures have been undertaken since 1980, but GSAC was not formally registered⁷ until March 2001. Prior to 1980, forest protection measures existed but there were no formal or written rules. Voluntary actions had been the mainstay of all forest management efforts, including mitigation and awareness generation activities, and it was said that the annual occurrence of forest fires is as habitual a phenomenon as the change of seasons. These are human-caused fires, as was revealed during the meetings at Nandupala: the villagers do not remember fire ever occurring as a result of natural phenomena such as lightning. Even after GSAC enacted the forest protection rules, there was no sign of a decline in the frequency of fires. Almost all protection initiatives have been directed at thwarting the efforts of the mining companies. The people have never given much consideration to the long-term detrimental effects of forest fire, and thus continue to use it to meet their daily needs.

The fire in 2001 came during mid-February, coinciding with the bush cutting activities that are undertaken in the Gandhamardhan hills. The kendu leaf (KL) division of the state FD does not carry out bush cutting on these slopes, in spite of the abundance of kendu plants. The explanation for this varies from source to source: local people claim that it is because the money allocated to bush cutting is “misappropriated” by FD staff, while the FD claim that the money “is just not enough”. This is surprising because Bolangir is one of the highest KL producing districts in the state and the economically undeveloped area of the district is highly dependent on the KL trade. For landless people, KL contributes between 66 and 78 percent of their total annual income (Vasundhara, 1998), and since Bolangir district has suffered from drought, the rural population’s dependency on the resource has increased greatly. According to state government figures, crop

⁵ *Suraksha* means “protection” in Oriya, the local language of Orissa.

⁶ In 1980, BALCO, a Government of India enterprise, was given lease for Bauxite mining activities. This attempt to lease out the forest area in the Bolangir Forest Division was thwarted by a mass movement of the people living close to the range who are partially, or wholly, dependent on the forest for their livelihood needs.

⁷ Under the Societies Registration Act (1860) of the Government of India.

losses in 2001 were between 60 and 70 percent in and around the Gandhamardhan area. Because the forest provides a source of income to a portion of the population, the rate of migration from these areas to the cities has decreased.

Fires in the Gandhamardhan area are mostly of a smouldering or creeping nature. As surface fires occur annually, there is only limited accumulation of the leaf litter layer and the resulting substrata is too shallow to provoke high flames. The villagers have a nonchalant attitude toward fires, never finding them “menacing or threatening to their lives and property”. The nearest human habitation is at least 1 to 1.5 km away from the foothills, separated from them by agricultural fields.

The livelihood perspective

KL is the mainstay of the landless people, providing employment and cash during the torrid summer, which is the lean agricultural period. The other major NTFP contributing to rural people's livelihoods is mahua, whose flowers – especially the fleshy petals – are rich in carbohydrates and form an important part of the diet of tribal people. *Mahua* is also used for

brewing a local drink that has a ready market. Trade in KL and mahua makes the difference between a family starving and having two meals a day during the lean agricultural period.

In spite of yearly fires in the Gandhamardhan area, the forest-dependent people do not find any marked reduction in the availability of forest products. They were of the opinion that, although the population residing in the foothills does not depend completely on the forest, almost every community has some kind of dependency on the forest. There have been no disputes or conflicts among the members of the communities over unequal sharing of the resources. Mr Ganga Sethi, who has collected medicinal plants as his source of livelihood for 23 years, says that he still finds optimum quantities of medicinal plants in the area. The forest fires that occur every year do not seem to have had a marked effect on the availability of medicinal plants. Villagers were unanimous in replying that they did not find any remarkable change to the landscape in terms of loss of tree cover. Fire may therefore not be as devastating as is generally thought.

The mahua story

It is difficult to pick the mahua flowers that fall on the forest floor daily. The normal practice of forest-dependent communities is to ignite the litter under the canopy of a tree in a circular manner. When the mature flowers drop on the ash they can easily be collected. “This is probably the only method of collection through which people can collect a substantial amount of mahua flowers, but it is never the best managed one,” said Mr B.B. Patel, the Assistant Conservator of Forests in Deogarh Forest Division. People rarely take safety precautions in controlling the fire, which invariably spreads owing to the availability of leaf litter substrate

The role of the Forest Department

As is the case throughout Orissa, in Bolangir the FD plays a minimal role in the mitigation of forest fires. This is owing to the lack of infrastructure and budget resources: an average of Rs 1 500 to Rs 2 000 per annum is allocated to each forest range for meeting fire mitigation expenses.

Conclusion for Bolangir

The ample availability of forest resources is the main reason for the lack of conflict within the dependent groups that share those resources. With regard to initiatives for forest fire management, there is an apathetic attitude among community members who believe that, because fires occur every year, there is nothing that they can or should do about them. This was demonstrated by the fact that the fire of 2001 burnt for 72 hours and crept up to the boundary of the temple without the people of the villages or the members of GSAC taking any steps to mitigate it.

Although awareness raising activities regarding forest fires and general forest management principles are common, forest fires still occur every year. In a few isolated cases, youth organizations, encouraged by various NGOs, are starting to disseminate information and are trying to create awareness among the forest-dependent people of the area. Owing to the low level of dependency on the forest, with a large section of the population being agriculturists, interest in protecting the forest from fires will grow only if local people perceive a tangible loss of resources and a marked depletion of the forest cover over the years.

SITE 2 – DEOGARH

The district of Deogarh lies towards the north-central part of the state. Deogarh Forest Division (DFD) is a relatively recent state administrative demarcation; its total forest area is 3 484.01 km².

“Forest fires are a regular and annual phenomenon which cause damage to at least 40 to 60 percent of the cover whenever they occur,” (Mr B.B. Patel, Assistant Conservator of Forest, DFD)

The site of the study, Badatoila Reserve Forest, is surrounded by 11 villages, which are highly dependent on the forest. Together with rainfed agriculture, NTFPs augment the livelihoods of the people in the region and tide them over during the non-agricultural periods.

The site

Although 11 villages depend on this 200-ha reserve forest, it has been protected by the people of Baghamunda village. A women’s self-help group, Arnapurna Mahila Samiti, has taken the lead and plays a very active role in protecting the forest. Although the villagers themselves tried to ensure the well-being of the forest, formal protection was deemed necessary in 1988: “We felt the resource base was reducing. To obtain basic necessities like fuelwood, we had to wander about for long periods in this degraded forest, hence wasting a lot of time. This prompted us, and apart from initiating other economy-enhancing activities, forest protection measures were also taken up by our group. This was done with the complete cooperation and active support of our menfolk.” (Ms Sumitra Pradhan, President, Arnapurna Mahila Samiti)

Funds and fire

There is a relationship between the amount of funds flowing in every year and the size of the forest patch that is ignited. The larger the area under fire, the greater the support that is solicited from villagers, and the higher the allocation of funds for fire mitigation activities. This information leaks out to the people. The DFO was therefore of the opinion that it is a good sign not to have a large flow of funds into the division.

In all forest management activities, the committee has received the whole-hearted support of the other villagers of Baghamunda. The group has not made any clear-cut rules for the mitigation of forest fires, and has not even considered doing so. Over the past ten years, there has been no incidence of fire in the area that the group protected. Forest protection initiatives have ensured at least two tangible and very visible benefits: the yearly supply of fuelwood has been ensured; and the villagers earn enough from their yields of mahua to tide them over the non-agricultural season. They do not have to migrate to other areas and work as labourers at construction sites.

According to Division Forest Officer (DFO), Mr Omprakash Singh, the FD has created very few firebreaks because of inadequate budget allocations. With an annual allocation of about Rs 10 000 (about US\$210) for forest fire management across the entire division, the FD cannot be expected to establish any major initiative. The DFO added that a large portion of these meagre funds goes to the villagers as payment for their labour in fire mitigation activities.

The constant limitations on resources in the state FD have led to a lack of field personnel, which in turn results in poor policing and law enforcement. The best option for the FD is to solicit the community's active support, but conflict over the sharing of resources has divided the communities, both externally and internally: "For the first time in ten years of forest protection activities, the forest was on fire this year ... and within 12 hours over 50 to 60 percent of the area that we had been protecting had burnt." (Ms Tava Naik, Secretary of Arnapurna Mahila Samiti)

The villagers of Baghamunda allege that this was the act of members of a non-protecting village, in retaliation for not being allowed to collect timber and NTFPs from the area. On the day of the fire, all of Baghamunda was involved in two marriages that were being solemnized. By the time that people were aware of the fire, it had already spread over a large area. The adults of the village rushed to create a firebreak, using raw branches to douse the flames. The flames were almost 1 m high where there was leaf litter. The women of the village remarked that, owing to the fire, there would be a great dearth of fuelwood and a scarcity of mushrooms (an important part of their diet) during the monsoons. The villages in and around the Badatoila Reserve Forest depend completely on the forest for their annual supply of fuelwood.

Fuelwood – a basic necessity

Until 1998, each household extracted an average of 40 cart loads of fuelwood per annum. Since the FD held meetings at the village level, with the help of representatives from Orissa Jungle Mancha, the level of extraction now stands at an average of 12 cart loads.

This fire resulted from a conflict that had been brewing for more than two and a half years. When asked about the cause of the fire, members of the village stated that they had seen the benefits that the villagers of Baghamunda were deriving from their forest protection initiatives and wanted to demarcate a portion of the protected forest for their own use, but the villagers of Baghamunda would not agree to this. They argued: "Years ago when cooperation was sought from all the neighbouring villages, no one turned up. Now that the forest has started yielding resources, everybody wants a share of it". The Baghamunda forest protection committee's refusal of the neighbouring village's request prompted retaliation.

The livelihood aspect

Kendu leaf and mahua are the two species that contribute the most to villagers' livelihoods. Constant vigilance by the people of Baghamunda and voluntary adherence to the forest management rules of the self-help group (SHG) have ensured that there were no fires in the forest for ten years. Although the people of Baghamunda and neighbouring villages are involved in the collection of KL and mahua flowers they do not use fire to augment yields. While gathering mahua flowers, the collectors use fire sparingly to burn the leaf litter under the mahua tree. They take great care that the fire does not spread, by first clearing the surrounding area or by gathering the leaves into a single pile and burning them. An FD staff member was caught by the members of a neighbouring village while abating the use of fire to initiate regeneration for KL production. A Public Interest Litigation against the staff member is still pending in court. (This information was gathered during discussions in the village and with the DFO of Deogarh.)



A board put up by the Deogarh Forest Division at a tourist spot with the following verse: "There is no rain without forest; There is no life without rain; When our huts burn, we flee to the forest. When the forests burn, where do we flee to?"

Local people also use the forest to meet other needs. As revealed during the study at this site, mahua flower collection and the regeneration of KL are not the only human activities that expose the forest to the dangers of fire. One segment of the rural population uses wood ash from the *Asàn* (*Terminalia tomentosa*) tree to clean clothes, by boiling the ash together with the clothes. Most of these people are members of the washer community, and use very large quantities of ash. Members of the blacksmith and goldsmith communities are similarly dependent on wood charcoal for their professions. These three communities prepare the ash and charcoal within the forest and smuggle it out because it is illegal to cut trees in that forest area. Fires related to these activities tend to be left unattended and often spread.

The Orissa Forest Act (1972) forbids any kind of human activity inside the reserve forest, but a brick kiln was found at the study site in this area. During discussions with the forest protection group and villagers, they admitted that they needed the kiln to meet the local infrastructure needs of their village. At first, they were blamed for carrying out an illegal activity in a reserve forest area and for increasing the threat of forest fires in the surrounding area. However, closer investigation revealed that precautions were taken. Villagers had made sure that the area surrounding the kiln was clear of any substrata, and that throughout the firing process the area was kept under surveillance to ensure that the fire had no chance of spreading. In addition, the bricks were used to repair houses, so the villagers were making them to meet a local and basic need rather than for commercial purposes.

This example illustrates how community awareness can give rise to mechanisms in which fire is used in a carefully managed way. The Baghamunda village members have a heightened level of awareness and interest in managing the forest on which they depend. Both the FD officials and the villagers agreed that human interaction with nature is the root cause of forest fires. Both parties also agree that CBFM is the most logical and easily implemented system to prevent and mitigate forest fires.

SITE 3 – SUNDERGARH

The district of Sundergarh lies in the northwestern part of the state. It has 4 087 km² of forest cover, one of the highest levels among all the districts in the state of Orissa (Forest Survey of India, 2000). Being a predominantly tribal district, the level of forest dependency is high.

The site

The site selected in this district is in the Bindhapahad Reserve Forest area, which has been protected by a village-level forest protection committee called Suruguda Vana Samrakhyana Samiti⁸ (Suruguda VSS). Informal protection started here in 1984/1985. The shortage of fuelwood and timber to meet the needs of local villagers had prompted the establishment of a forest protection group. In 1994, the state FD entered into a joint forest management (JFM) arrangement with the forest protection committee. Currently, this group has 120 general body members from Suruguda village and Millupada. As in other districts of Orissa, trade of KL and mahua is a major source of livelihood for the landless majority in Sundergarh and the landless and those with marginal holdings in Suruguda village depend on these two NTFPs for subsistence earnings during the lean agricultural season. The population of the area is not solely dependent on forest products, because a large number of people own agricultural land.

⁸ This can be translated as “Suruguda Forest Protection Committee”.

Fires in the region

Inter-village conflicts are sometimes the root cause of forest fires. The last destructive fire occurred in 1999, when a group of people from another village started a fire that raged for days while nobody volunteered to extinguish it. This was in retaliation for the failure of executive body members of Suruguda VSS to fulfil promises made to volunteers during the previous year's annual cleaning operations.⁹ The volunteers alleged that they were not compensated for their

services, and said they were not willing to put in labour for any activity that was related to the forest because they were not deriving any tangible benefits.



A marker in the Sundergarh Forest Division with a message about forest fires:

“As it Goes...

The name is Fire,
do not rename me as Forest fire.
Keep me at a distance from the forest,
let the forest gets on Fire...”

In contrast, when a woman was caught lighting the litter under a mahua tree in the protected area, she was fined Rs 500 (about US\$12) – a hefty sum for a forest-dependent person. She was also ordered to make a public apology to the villagers. Such severe punishment has had constructive effects and forest fires were almost non-existent in 2001. Only a small patch of forest was affected by fire, which was quickly extinguished by a patrol group of the forest protection committee.

⁹ Under the JFM agreement, periodic cleaning of forest areas is undertaken and forest products are shared equally among the members of the protecting group.

Of all three sites studied, this one showed the lowest level of forest fires, primarily owing to early mitigation. At Suruguda, the cooperation of the village-level forest protection committee and its village members contributed to the successful implementation of a protection system.

CONCLUSIONS AND SUGGESTIONS

This study takes into account the opinions of the forest-dependent community (as both managers and end users) and of the state FD, which has to enforce many antiquated laws (some of which were formulated during the period of United Kingdom colonization of India). From a socio-economic perspective, the important dimensions that were considered were the links between the frequency of forest fires and:

- 1) the availability of resources;
- 2) the degree of forest-dependency of the people;
- 3) the use of fire for various livelihood-generating activities.

There are myriad causes of forest fires in the state of Orissa. The most common are those related to the livelihoods of the forest-dependent people. Local people and the FD agree that fire is used in numerous places and under varying circumstances, and that some fires get out of control. In areas where there is the potential for KL collection, but the KL wing of the FD does not initiate bush cutting activities, the people collect KL for their own livelihoods. Setting fire to the litter on the forest floor seems to be the most economical method (both financially and in terms of labour) to initiate the regeneration of new leaves.

FD officials agree that there are no alternative methods for the collection of mahua flowers. As the tiny brown petals fall on to the forest floor, it is difficult for collectors to find and gather them from under the dried leaves. The use of fire seems to be a dangerous practice but, in areas where people are aware and take precautions, it is very prevalent and there are no instances of uncontrolled forest fires. Forest-dependent people also need to address their infrastructure needs. The example of the brick kiln inside the Badatoila Reserve Forest in the Deogarh Forest Division demonstrates an awareness of fire management issues. This activity was illegal, but the precautions taken indicate that the community has the knowledge and capacity to keep fire in check. Alternatively, at the site at Gandhamardhan (in Bolangir district), where people are aware of the destructive nature of forest fires, most forest protection initiatives are related to mining activities. Fires occur there every year and are considered to be natural phenomena (even though they are started by humans).

In general, stiff retribution by the forest protection committee at the village level and in front of the village seems to be a good strategy. The formulation of rules and decisions about the nature and extent of punishment should be the responsibility of committee members in conjunction with the villagers. This process promotes compliance, or at least awareness of all the sanctions and how they are formulated. The risk of being prosecuted in public would surely act as a deterrent to future offenders.

The outbreak and frequency of forest fires are dependent on the interests and level of forest dependence of the rural community living close to the forest area. Forest protection measures are adopted only when communities experience scarcity of forest resources and realize the magnitude of the impending disaster. This explains why forest protection activities were taken up

passionately by the communities at Baghamunda¹⁰ and Suruguda.¹¹ At the site in Bolangir, only a few people are highly dependent on the forest because much of the population is agrarian in nature. Even though there are strong signals of resource depletion, the forest range can still provide ample material for the needs of the 30 villages located in the foothills. The GSAC people's organization cares for the forest by opposing mining activities, but it has not yet turned its attention to the regular occurrences of forest fire, and does no more than disseminate information regarding its destructive effects. The FD has also made efforts to raise awareness of the dangers of fire. At a couple of sites where people gather, the FD has put up information about the effects of forest fires.

Owing to the lack of infrastructure and poor budgetary allocations, the state FD cannot do much by itself to manage forest fires. In general, forest-dependent people take an active interest in forest management, and it has been shown that their community-based initiatives are the best way to manage forest fires. Past experience shows that valuable flora and fauna cannot be protected by a few forest officials, even if those officials are well equipped (with arms, ammunition, the required number of vehicles, etc.) and empowered to conduct searches and arrest offenders. People's participation in the protection of forest and wildlife may have the desired effect (Statistical Branch, 1999). With this in mind, strategies could be developed for:

- imparting basic knowledge on forest fires;
- creating awareness about the pros and cons of forest fires, for both immediate and long-term benefits;
- training in methods of forest fire control and management.

Special attention should be paid to the way forest protection committee meetings are initiated and held. At least one adult member from each household should be present at the meetings to participate in the discussion, but at present only management committee members attend meetings. The meetings should be held at the start of the torrid summer months, as it is during these months that forest fires are most frequent.

In India, it is alleged that forest-dependent communities are the root cause of forest fires and that they use fire in order to derive immediate gains. However, these are also the people who, over the generations, have developed indigenous and instinctive ways of managing forest fires. Their knowledge should form an important part of management principles. The entire activity should aim at building rapport with the FD in the state, so that villagers and FD personnel can work together. The active involvement of local people in CBFM would assist the perpetually resource-starved FD to manage fire collectively in a large area, when conventional suppression mechanisms are failing.

¹⁰ The site in Deogarh district.

¹¹ The site in Sundergarh district.

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Community-based fire management in Lao People's Democratic Republic: past, present and future

By Sharon London; October 2001

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EXECUTIVE SUMMARY

The El Niño drought year of 1997, combined with intense fires and haze from these fires in Indonesia and Malaysia, brought the issue of forest fire management to the forefront in Southeast Asia. Community-based fire management (CBFiM) is a new strategy that is attracting increasing interest in the Southeast Asian region because it ties the idea of participatory community involvement (community forestry) with forest fire management. No research has previously been conducted on CBFM in the Lao People's Democratic Republic (Lao PDR).

Lao PDR is a country rich in natural resources and culture, and it contains both biological and cultural diversity. The people are extremely dependent on forests, and much of the country's revenue comes from forest products. There are no confirmed data on the extent or type of forest fires in Lao PDR, although most fires are attributed to shifting cultivation. Escaped fires for hunting or clearing fields may actually cause more damage than shifting cultivation, but more research needs to be conducted before this can be confirmed. Numerous laws and policies already exist regarding forest fire management and community involvement in land management activities.

Present initiatives in Lao PDR related to forest fire management are primarily from government or donor-initiated projects and focus on fire prevention and preparedness. As forest fires are not seen as a major threat, few projects are based solely on forest fire management (except for the Cooperazione e Sviluppo [CESVI] project in Sayabouri Province, see p. 13), but rather are part of larger forest management initiatives. Forest fire management can be found in National Biodiversity Conservation Area (NBCA) management planning, in some development project initiatives where forest fires are considered a constraint, and in land-use planning, particularly at the village level. The IUCN non-timber forest product (NTFP) project in Salavan Province is an example where local people are actively involved with forest fire management on NBCA land that is also part of their village land.

Incorporating CBFM into forest management will require sincere commitment from all stakeholders, particularly the Lao Government, the donor community and the local people involved. Many of the key elements necessary for establishing CBFM already exist or are in the process of being established. Strategies should be encouraged that incorporate existing government law, support indigenous knowledge and clearly explain why forest fire management is necessary. More research is needed about the implications of Lao Government policy for CBFM, the indigenous usage of fire, fire ecology and the overall impact and extent of forest fires in Lao PDR. Capacity building at all levels and funding will also be necessary.

Gestion à base communautaire des incendies de forêt dans la République Démocratique Populaire Lao: passé, présent et avenir

Par Sharon London; Octobre 2001

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RÉSUMÉ

La sécheresse provoquée en 1997 par le phénomène El Niño, qui s'ajoutait aux violents incendies et aux fumées provenant de ces incendies en Indonésie et en Malaisie, a fait prendre une grande importance à la gestion des incendies de forêt en Asie du Sud-Est. La nouvelle stratégie de gestion à base communautaire des incendies retient de plus en plus l'intérêt dans cette région parce qu'elle lie l'idée de l'intervention participative des communautés (foresterie communautaire) à la gestion des feux de forêt. Cette stratégie n'avait jusqu'ici fait l'objet d'aucune recherche en République démocratique populaire lao.

Le Laos est un pays riche en ressources naturelles doté d'une grande diversité biologique et culturelle. La population tire une grande partie de sa subsistance des forêts et les produits forestiers fournissent une bonne part du revenu national. On ne dispose pas de données confirmées sur l'ampleur ni la nature des incendies de forêt dans le pays mais la plupart de ces incendies sont attribués à la culture itinérante. En fait, les feux non maîtrisés allumés à des fins de chasse ou de défrichement pourraient causer plus de dégâts que la culture itinérante elle-même mais il serait nécessaire de faire des recherches plus approfondies pour confirmer cette hypothèse. Il existe déjà de nombreuses lois et autres mesures concernant la gestion des incendies de forêt et la participation des communautés à l'aménagement des terres.

Les initiatives en cours qui intéressent la gestion des incendies de forêt émanent essentiellement de projets du gouvernement ou de donateurs et sont axées sur la prévention et la préparation à la lutte contre les incendies. Étant donné que les incendies de forêt ne sont pas considérés comme une menace grave, les projets sont rarement fondés exclusivement sur la gestion de ces incendies (à l'exception du projet de Cooperazione e Sviluppo [CESVI] dans la province de Sayabouri), mais s'inscrivent plutôt dans de grandes actions d'aménagement forestier. La gestion des incendies de forêt est prévue dans les plans d'aménagement des zones nationales de conservation de la biodiversité, dans certains projets de développement lorsque les incendies de forêt sont considérés comme un obstacle et dans la planification de l'utilisation des terres, surtout au niveau du village. Le projet de l'UICN concernant les produits forestiers non ligneux (PFLN) qui est en cours dans la province de Salavan offre un exemple de participation active des populations locales à la gestion des incendies de forêt dans une zone de conservation de la biodiversité qui fait également partie des terres des villages.

La gestion à base communautaire des incendies de forêt ne pourra être intégrée dans l'aménagement des forêts qu'avec l'engagement sans réserve de tous les intéressés, en particulier le Gouvernement lao, les donateurs et les populations locales concernées. Bon nombre des éléments indispensables pour organiser cette gestion existent déjà ou vont être mis en place. Il faudrait encourager l'application de stratégies qui prennent en compte les lois en vigueur, appuient les connaissances indigènes et précisent clairement pour quelles raisons la gestion des

feux de forêts est nécessaire. Il faudrait entreprendre des recherches plus approfondies sur les implications de la politique du Gouvernement lao pour la gestion communautaire des incendies de forêt, l'utilisation indigène du feu, l'écologie des incendies et l'incidence globale et l'ampleur des incendies de forêt dans le pays. Il sera également nécessaire de renforcer les capacités à tous les niveaux et de mobiliser des fonds.

Manejo Comunitario de Incendios en la República Democrática Popular Lao: Pasado, Presente y Futuro

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RESUMEN DE ORIENTACIÓN

El año de sequía provocado por El Niño en 1997, aunado a los fuertes incendios y niebla provocada por los mismos, en Indonesia y Malasia, puso sobre la mesa el tema del manejo de los incendios forestales en Asia Sudoriental. El Manejo comunitario de incendios (MCI) constituye una estrategia nueva que cobra cada vez más interés en dicha región, debido a que ésta enlaza el concepto de participación comunitaria (forestería comunitaria) con el manejo de los incendios forestales. Hasta ahora no se ha efectuado ninguna investigación sobre el manejo comunitario de incendios forestales en la República Democrática Popular Lao.

Este país cuenta con un rico acervo de recursos naturales y culturales que a su vez, albergan tanto la diversidad biológica, como la cultural. La población depende en gran medida de los bosques, y buena parte de los ingresos nacionales provienen de los productos forestales. No se cuenta con datos que confirmen qué tipo y qué extensión caracterizan a los incendios forestales que afectan al país, aunque la mayoría de los incendios suelen ser atribuidos la agricultura itinerante.

Los fuegos que escapan fuera de control, cuando se les utiliza en la cacería o el desboscamiento del terreno, pueden, en realidad, provocar mucho más daño que la agricultura itinerante. Sin embargo, es necesario llevar a cabo investigaciones antes de poder confirmarlo. Ya existen numerosas leyes y políticas relacionadas con el manejo de los incendios forestales y la participación de la comunidad en las actividades de manejo de la tierra.

Las iniciativas que actualmente se llevan a cabo en la República Democrática Popular Lao, en materia de manejo de incendios forestales, son fundamentalmente de naturaleza gubernamental o fueron propiciadas por proyectos patrocinados por donantes y se centran en la prevención y medios para afrontar situaciones de emergencia en caso de incendios. Dado que no se considera a los incendios forestales como un peligro de gran magnitud, pocos proyectos consisten sólo en el manejo de incendios forestales (a excepción del proyecto de la organización no gubernamental Cooperación y Desarrollo [CESVI] realizado en la provincia de Sayabouri), más bien, éstos suelen formar parte de iniciativas más vastas de manejo forestal. Es posible encontrar actividades de manejo de incendios forestales en los planes de manejo del Área Nacional de Conservación de la Biodiversidad (NBCA), así como en las iniciativas de algunos proyectos de desarrollo en donde los incendios forestales se consideran como un problema, y también en las actividades de

planificación del uso de la tierra, especialmente en el ámbito de la aldea. El proyecto de productos forestales no madereros (PFNM) de la UICN, con sede en la provincia de Salavan, es un ejemplo de cómo la población local ha participado activamente en el manejo de incendios forestales en el Área Nacional de Conservación de la Biodiversidad, la cual también forma parte de sus tierras comunales.

La incorporación del manejo comunitario de incendios en el manejo forestal requiere de un compromiso genuino de parte de todos los actores, especialmente del Gobierno de la República Democrática Popular Lao, de la comunidad de donantes y de la población local que participa en él. Muchos de los principales elementos necesarios para establecer el manejo comunitario de incendios ya existen, o se encuentran en vías de establecimiento. Habría que fomentar las estrategias que incorporen las leyes gubernamentales actuales, así como apoyar los conocimientos indígenas y explicar claramente por qué es necesario el manejo forestal de incendios. Se requiere de más investigación acerca de las implicaciones que las políticas del Gobierno de la República Democrática Popular tienen sobre el manejo forestal de incendios, sobre el uso que los indígenas hacen del fuego, sobre la ecología relacionada con el fuego y sobre el impacto general y la extensión de los incendios forestales que afectan al país. Asimismo, es necesario realizar actividades para crear capacidades en todos los ámbitos, así como propiciar la financiación.

INTRODUCTION

The El Niño drought year of 1997, combined with intense fires and haze from these fires in Indonesia and Malaysia, brought the issue of forest fire management to the forefront in Southeast Asia. Community-based fire management (CBFiM) is a new strategy that is attracting increasing interest in the Southeast Asian region, because it ties the idea of participatory community involvement (community forestry) with forest fire management.

A meeting at the Regional Community Forestry Training Center (RECOFTC) in Bangkok, in December 2000, to assess CBFiM in Southeast Asia found that information about CBFiM is available in most Association of Southeast Asian Nations (ASEAN) countries, but little is known about the situation in Lao PDR. Therefore, this study was commissioned to determine to what extent Lao PDR is dealing with forest fire management, and how local communities are involved in forest fire management.

To answer these questions, this paper looks at existing policies and projects in Lao PDR, offers experiences from two case studies, and makes recommendations for future CBFiM initiatives in Lao PDR.

Background on Lao PDR

The Lao People's Democratic Republic (Lao PDR) is the only landlocked country in Southeast Asia. It is situated between 13°54'N and 22°31'N and between 100°05'E and 107°42'E in the centre of the Indochina Peninsula. China and Myanmar border Lao PDR in the mountainous north, Viet Nam to the east, Thailand to the west and Cambodia to the south. The land area covers 236 800 km², of which more than 80 percent is mountainous terrain with steep valleys (Rundel, 1999). The Mekong River flows for 1 700 km along the length of Lao PDR and the human population is mostly settled in the broad fertile valleys along the river and its tributaries. Lao PDR has a seasonal tropical climate with pronounced wet and dry seasons. The rainy season is generally from May to October, while the rest of the year can be quite dry (Duckworth, 1999). Fires are more common in March, April and May during the hot and dry season.

Lao PDR is a member of ASEAN. On the United Nations Development Programme (UNDP) Human Development Index, Lao ranks one-hundred-and-fortieth out of 174 countries, and it receives large amounts of foreign aid. The largely rural population is primarily engaged in agriculture. In 1998, the estimated annual per capita income was US\$330. An estimated 46 percent of the Lao people live below the poverty line. The incidence of poverty is generally higher in remote areas, especially in the northern and southern provinces. As in neighbouring countries, strong economic growth in the 1990s in Lao PDR was reversed by the 1997 Asian economic crisis, but the economy seemed to be on the rebound at the time of writing. The country's 2.8 percent growth rate in 2000 (National Statistics Center, 1997) was one of the highest in Asia.

Lao PDR has a population of 5.09 million. The country is rich in natural resources and culture. Almost all of its 18 provinces border on at least one of the five neighbouring countries. Approximately 80 percent of the population lives in small villages in rural areas, with an average of about 300 inhabitants per village (National Statistics Center, 2000). For broad comparative purposes, ethnic groups are divided into three categories: Lao Loum (Lao of the lowlands), Lao Theung (Lao of the mountain slopes) and Lao Sung (Lao of the mountain summits). These terms refer to geographical distributions and do not adequately account for the linguistic or cultural

diversity of the population. In order to represent the people of Lao PDR more accurately, ethno-linguistic characteristics should be used.

The Lao Government census of 1995 identifies 48 different ethnic groups in the country (National Statistics Center, 1997), while other sources identify up to 230 ethnic groups (ADB, 2000). There are four major ethno-linguistic groups: Mon-Khmer, Hmong-Mien, Tibeto-Burmese and Tai-Kadai. Each ethnic minority has its “own language and complex system of religious beliefs, which might be labelled collectively as animistic, with totemic nuances,” (ADB 2000). All four ethno-linguistic groups occur in both the lowlands and the highlands. However, the Tai-Kadai groups dominate in the lowlands where they cultivate paddy rice. The Mon-Khmer, Hmong Mien and Tibeto-Burman groups occur more commonly in the uplands and practise swidden agriculture. These three groups live primarily in rural areas and are dependent on forests for their basic needs.

Most of the Lao PDR population is Buddhist, Animist or a combination of the two. Both of these religions place importance on great respect for elders and for working collectively. Community cohesion is very strong in Lao PDR. A village head is usually leader of the community, and family ties are very strong.

Forests and fire occurrence

Forest cover in Lao is estimated to be between 40 percent (Galt, Sigaty and Vinton, 2000) and 47 percent (DoF, 2000). Forest products are the main source of foreign exchange, accounting for 42 percent of foreign exchange revenue in 1998 (STEA, 2000). Forests provide habitat for a large number of plant and animal species. Surveys have identified more than 250 wildlife species of regional or international importance, and 20 bird and 14 mammal species that are endangered or vulnerable. These include two species new to science: the saola (*Pseudoryx nghetinhensis*) and the giant muntjac (*Mehamuntiacus vauquangensis*).

Forest habitats in Lao PDR can be divided into four broad types: dry dipterocarp lowland (below 800 to 1 000 m), montane (above 800 to 900 m), mixed evergreen, and pine. Of these, dry dipterocarp forests, and possibly pine forests, may be actively maintained by fire. In addition, there are 20 National Biodiversity Conservation Areas (NBCAs) comprising 13 percent of the total land area, most of which is forest habitat.

There are no confirmed data on the extent or type of forest fires in Lao PDR. A distinction between fires caused by careless shifting cultivation and forest fires (meaning all other fires started in the forest or intruding on forests) is not always made when tabulating data. In addition, the area of mature forest that burns is not distinguished from areas of previously degraded shrub and grasslands that have been used for numerous previous cycles of shifting cultivation.

The impact of forest fires caused by war is another key element in Lao PDR. During the Indochina War, much of the forest along the legendary Ho Chi Minh Trail, on the Lao–Viet Nam border, was bombed by United States forces. In 2000, natural resource surveys of the villages in and around Hin Namno NBCA in the Annamite Chain found that the forest is healthier now than it was immediately following the war because it has had time to recover. It is not known how much forest was permanently damaged by fire from bombs and by exfoliants used during the war.

Fires caused by shifting cultivation

There are numerous relatively recent statistics on the extent of shifting cultivation in Lao PDR. In March 1999, the Department of Forestry (DoF) stated on a Web site that in 1992 there were 1.6 million ha under shifting cultivation, and that in 1998 this area had decreased to 132 500 ha. It is estimated that 90 percent of forest fires are due to shifting cultivation, with the rest attributed to hunting (Bouaket, 1999). However, the emphasis on shifting cultivation was later reduced and further qualified. In its Strategic Vision, the Lao Government takes credit for reducing the area of shifting cultivation, but states that more than 100 000 ha per year are still burnt (DoF, 2000).

The National Environmental Action Plan 2000 (STEA, 2000) offers a set of statistics about the extent of shifting cultivation. The plan quotes the Lao Agricultural Census (1998/1999) figure of 200 000 ha of deforestation due to shifting cultivation by hill tribe ethnic minorities. In addition, it estimates that 600 000 ha of forest is degraded by a five-year fallow period (i.e. approximately 120 000 ha per year). Lastly, it quotes the Department of Forestry to say that 300 000 ha per year is cleared by shifting cultivation practices and that some of this is caused by the “encroachment of upland areas by lowland farmers”. The expansion of permanent agriculture is estimated to be about 30 000 ha per year (STEA, 2000).



Forest fire caused by slash and burn agriculture

Fires that escape from shifting cultivation to nearby forest were recognized to cause more damage than the shifting cultivation fires themselves, especially in the northern provinces (DoF, 2000). This is probably because villagers have been using fire for centuries and know how to control it. When villagers in Luang Prabang Province were asked to identify threats to upland crops, they did not even mention fire (McAllister, Gabunada and Douangsavang, 2001), presumably because they keep their swidden fires under control.

These statistics could be further qualified. Suggestions for research include:

- determining the area and rate of return of shifting cultivation;
- distinguishing the area of shrub and grass that has been used and reused for swidden agriculture from the area of more mature forest that is newly converted to swidden agriculture;
- conducting studies on the area of permanent agriculture versus repeated shifting cultivation.

Fires in natural forest and plantations

Forest species and forest types react to fire differently. For example, teak (*Tectona grandis*) needs fire to promote seed germination (Rundel, 1999). Mixed deciduous forests, particularly those that formerly contained teak, are especially adapted to fire owing to their strong seasonality and the consequent accumulation of leaf litter on the forest floor during the dry season. Likewise, many species found in the dry dipterocarp forests have unusually thick bark and maintain a canopy that is high enough to avoid most grass fires. Plantations also have variable risk of fire, depending on species and age. Eucalyptus (*Eucalyptus spp.*) is quite fire-resistant, but a plantation of acacia is susceptible to fire owing to its high litter volume (Linton, personal communication).

In northern Thailand and Lao PDR, where cultural and agricultural practices are almost identical, it has been reported that forest fires are started for clearing grasses, improving movement, ease of hunting, providing cattle forage and cultivating mushrooms (Makarabhirom, Ganz and Onprom, 2000). Escaped fires started for human use are probably the more harmful type of fire for forests, but statistics on the exact extent of this problem do not exist.

LAO GOVERNMENT AND CBFiM

The impetus for forest fire management in Lao PDR has both external and internal drives. Some argue that forest fire management is not an important issue for the country, especially since the health and environmental problems associated with fire are minimal when compared with those in other countries in the region, such as Indonesia (Sukata, personal communication). The perceived importance of fire management is reflected in the structure of the DoF. Nowhere in the system, from district to province to the central office, is there an official whose sole purpose is fire management. However, at all these levels, there are officials who carry out fire management as one of their responsibilities.



Forest after fire, surveying in XE Bang Nouan
NBCA by the NTFP project team

The following are the two reasons why Lao PDR is concerned with forest fires (Pheng, personal communication):

- 1) *Managing the environment*: this is the main impetus for forest fire management in Lao PDR, especially since deforestation is occurring at a rapid rate and much of the country's revenue comes from timber exports and other natural resources that might be reduced by forest fires.
- 2) *Funding opportunities*: donor-driven projects are common in countries with limited sources of revenue. As a result, more impetus for forest fire management may come from outside Lao PDR than from within it.

Managing the environment

Sustainable management of natural resources is a high priority in Lao PDR, because natural resources are an important source of revenue. The two key issues tied with forest fire management are control of shifting cultivation, where escaped fires may cause forest destruction; and protection of plantations and reforestation efforts (Bouaket, 1999). Shifting cultivation is thought to be a problem because local people use slash and burn methods to clear shrubs and prepare fields for planting crops and growing rice. Increasing forest cover in the form of plantations is a primary concern of the Lao Government. Plans have been drafted to ensure that 500 000 ha of plantation cover is reached between 2000 and 2005 (STEA, 2000). Reforestation seems to be a lesser objective, although some projects are working towards this goal, such as a project at Dong Dok National University funded by the German Government, and Japanese afforestation efforts in Vientiane.

However, plantations are particularly susceptible to fire, especially for such popular, quick-growing species as acacia. According to BGA Lao Plantation Forestry Ltd, most plantations have firebreaks, but not all of these are well maintained and some would not even function were a fire to occur (Linton, personal communication).

According to the DoF Strategic Vision for 2020 (DoF, 2000), other topics related to forest management and, indirectly, to fire management include the following:

- *Effects of war*: aerial bombardment started fires that devastated much of the landscape along the Ho Chi Minh trail during the Indochina War, resulting in the long-term reduction of forest cover.
- *Production forests and NBCAs*: management plans that include forest fire management are being written for these areas.
- *Village forests*: a land allocation process is now under way that should give villagers more access and rights to use their land, and that will include discussions about forest fire management
- *Legal framework*: better laws to deal with forest fire management are being created.
- *Capacity of local forest officers*: staff capacity is limited and needs to be improved, particularly in terms of forest fire management (DoF, 2000).

Specific laws relating to CBFiM

There are numerous laws relating to forest usage and forest management. Laws most relevant to CBFiM are those related to forest usage and protected areas. Table 1 outlines the relevant laws made in the past ten years. They give local people rights to use the forest according to their customary beliefs, but limit the areas where shifting cultivation is permitted, particularly in protected areas on steep slopes.

Order 2094 is the only law directly related to forest fires. It gives authority to officials from the Provincial Agriculture and Forestry Office (PAFO) or the District Agriculture and Forestry Office (DAFO) to implement forest fire management activities and supports the involvement of local communities in forest fire management.

Table 1: Lao Government laws related to forest fire management

Law	Key provisions
Prime Minister Decree No. 164, 29 October 1993	<ul style="list-style-type: none"> Established protected area system of Lao PDR, composed of 20 NBCAs Forbids burning or planting in protected areas (Article 4.7)
Prime Minister Decree No. 169, 1993	<ul style="list-style-type: none"> Gives local people the right to use forest resources according to their customs and village regulations (customary rights) State measures will be taken against offenders who burn or destroy the forest Establishes Village Forestry Officers for the protection of the natural environment within each village (Article 50)
Order 54/Ministry of Agriculture and Forestry (MAF) on the Customary Rights and Use of Forest Resources, 7 March 1996; followed by recommendations 377/MAF on the Customary Use of Forest Resources	<ul style="list-style-type: none"> Secures legal rights for local people to use forest resources for subsistence Limits customary rights that negatively affect collectives or individuals, or that are inconsistent with government policy such as “undifferentiated slash and burn” and forest fire for hunting
Forestry Law 1996 (Amendment to Decree 164)	<ul style="list-style-type: none"> States the prevention and control of forest fire as the responsibility of all people Gives PAFO and DAFO responsibility to educate local people about the “serious danger of forest fire” and to “work out necessary rules and measures to prevent forest fire” In case of fire, DAFO and local community leaders should find or borrow equipment, vehicles and labour (which should be returned and compensated promptly) Individuals and organizations (including the army) should cooperate with authorities in case of fire
Order 2094/MAF on Fighting Forest Fires During the Dry Season of 1999–2000, 31 December 1999	<ul style="list-style-type: none"> Makes PAFO/DAFO responsible for fighting forest fires Makes PAFO/DAFO responsible for educating local communities about forest fires (including managing, putting out and reporting fires in their area) Staff should target areas of shifting cultivation, poor soil and deforestation that are at least 500 m from streams Prohibits shifting cultivation in evergreen forests, NBCAs, watershed protection areas and forests on steep slopes that could cause landslides Advises PAFO/DAFO staff to tell local people: <ul style="list-style-type: none"> - the proper technique for cutting before setting fires - to burn before sundown and when there is no wind Prohibits burning trees, burning wild grass for hunting, dropping cigarette butts, making campfires without shelters and failing to extinguish campfires before leaving them
Prime Minister Decree, Instruction No. 01/PM 11 March 2000	<ul style="list-style-type: none"> Implements countrywide decentralization Declares provinces as strategic units, districts as planning and budgeting units and villages as implementing units

Decentralization

There is a strong push for decentralization from the top levels of the Lao Government. With the support of UNDP, round table meetings in 2000 encouraged the development of work plans at the provincial and district levels rather than at the central government level. In March 2000, the Prime Minister of Lao PDR signed an instruction that called for “building up provinces as strategic units, districts as planning and budgeting units and villages as implementing units” (Instruction No. 01/PM [11/03/2000]). According to the round table report “the decentralization policy represents a conscious effort to empower provincial and district authorities to achieve and defend a vision and to identify dynamic elements and to ensure coherence in their undertakings” (Government of Lao PDR, 2000).

The plan would make villages, districts and provinces “the masters of their own development and destinies, by empowering the grassroots level to participate in their own socio-economic development, thus lessening their dependence on the central level”. However, a more likely scenario will be that community-based management of resources will require support from the district, the province and, ultimately, the central government. Although the province or district may write a plan, they will still need approval from their superiors. As the new Prime Minister (PM) Decree states, the communities will implement plans and, in the case of CBFiM, take part in managing their own land. However, although communities can create plans on their own initiative, the current regulations require political approval, especially at the district and provincial levels. They also require that government officials support and possibly facilitate community-based resource management. This will require additional capacity building for government officials. Capacity levels vary among provinces, districts and villages.

Some areas, such as protected areas, are clearly no fire/no use zones, but in an extremely forest-dependent country such as Lao PDR, much of the forest is still used even when it lies inside a protected area. Furthermore, in a country where limited government staff control vast amounts of resources and where local people are the main users of those resources, more coordination is necessary between government staff and local people. Shifting agriculture, especially the need to maintain forest cover, is also a key issue. A 1999 report by the Lao Government suggested the following plans to deal with fire and summarized the main goal of the laws:

- motivate the shifting cultivators to understand how to prevent, detect and control fires;
- provide sustainable land-use and job opportunities for shifting cultivators;
- prepare standard working groups and set up an organization for the coordination of regional fire control organizations or other government agencies;
- prepare materials/guidelines for forest fire prevention and suppression (Bouaket, 1999).

From these suggestions, it is obvious that forest fire management is on the agenda of the Lao Government, although other issues related to basic livelihoods may be more pressing.

CURRENT FOREST FIRE MANAGEMENT PLANNING

Current initiatives in Lao PDR related to forest fire management come primarily from either the government or donor-initiated projects. Forest fires are not seen as a major threat, so few projects are based solely on forest fire management, which is instead part of larger forest management initiatives. Forest fire management can be found in NBCA management planning, in some development project initiatives where forest fires are considered a problem and in land-use planning, particularly at the village level.

National Biodiversity Conservation Area management

NBCAs have the clearest mandate for village involvement and forest fire protection, particularly in the terms of Order 2094 and Decree 164, which declares there is to be no burning in NBCAs. NBCAs often contain the best forest and cover 13 percent of the entire country area. Fifteen of the country's 20 NBCAs have or have had donor assistance. Most NBCAs have limited staff or equipment and try to work with local communities.

NBCA managers in 2000 were increasingly asked by DoF officials to be sure to include forest fire management in their quarterly work plans (Louangoudom, personal communication). For example, plans for Hin Namno NBCA stipulated that the dangers of forest fires should be discussed when conducting land allocation or socio-economic surveys in villages around the protected area. Other NBCAs, such as projects funded by the Swedish International Development Agency (SIDA) at Phou Song He and Dong Hua Sao, also encouraged discussions with villagers about fire management during visits to villages for other development initiatives (Mossberg, personal communication). An entire chapter of Phou Hin Boun NBCA's management plan is devoted to forest fire management (Claridge, 2000). Although not specifically ordered by law or government decree, NBCA managers and advisers have found that DoF officials encourage the inclusion of the following five items in NBCA work or management plans:

- forest fire prevention (including village visits and the purchase of tractors to build breaks and other infrastructure);
- land and forest allocation;
- forest inventories and boundary demarcation;
- tree planting;
- community development (with an emphasis on stabilizing shifting agriculture).

Community development projects

Development projects, whether they are associated with protected areas or not, have mentioned forest fire management in their work with local communities. For example, the Phou Xieng Tong NBCA community development project (funded by German Agro-Action and implemented by Population and Development International [PDI] Thailand) in Champassak Province in southern Lao PDR used a campaign board in the NBCA buffer zone to encourage local communities to control forest fires during the dry season (Thongmak, personal communication). In another example, a Cooperative for Assistance and Relief Everywhere (CARE) project in Sayabouri Province in western Lao PDR conducted fire awareness activities with villagers as part of the contract to build and protect gravity-fed water systems. Forest protection (and fire) was linked to community resources, which included protecting watersheds at the spring source (Bluhm, personal communication). Fire management is a key component of a CESVI-funded project in Sayabouri Province (see Case study 2).

Land management at the village level

According to the Lao Government policy of decentralization and land allocation policies, which encourage *participatory* land management, CBFiM has the potential and recognized right to be implemented at the village level. Land allocation is occurring in every village throughout Lao PDR, and should be conducted in a participatory eight-step process: preparation, survey and mapping, data collection, land-use planning and allocation, field measurements, land agreements, land extension, and monitoring and evaluation. However, in reality, the process is usually completed in only one or two steps, so the full benefits of participatory management intended by

the programme are not being fully realized. Better training and capacity building for everyone involved may improve this process. In most cases, the experiences of people who have conducted land allocation from the field suggest that community participation seems to be the result of obligation rather than self-motivation.

In addition, according to PM Decree 169 Article 50, each village should have a Village Forestry Officer as a key contact for forest fire management. A number of protected areas are working with the strategy of co-management, particularly Xe Pian NBCA in southern Lao PDR, which was part of the Forest Management Conservation Project (FOMACOP). Although still in its early stages of development, the concept of co-management is a way for villagers to become involved in protected area and forest management activities. Other community forestry activities are being directed to Village Forestry Officers, for example by a WWF Community Forestry project in southern Lao PDR. An example of how communities have managed their land at the village level in the NTFP project in Salavan is described in Case study 1.

CASE STUDIES

Case study 1: Non-Timber Forest Product Project, Salavan

The IUCN Non-Timber Forest Product (NTFP) Project¹ in Salavan Province, Lao PDR, is possibly one of the best examples of CBFM in the Southeast Asian region. The project began at the end of 1995 in three provinces in Lao PDR, and ended in April 2001. The project goal was to promote the sustainable exploitation of NTFPs and biodiversity conservation by supporting community-based initiatives for forest conservation to improve the well-being of people and the forest. Fire management was not the original goal of the project, but became an important project subcomponent in Salavan Province, effectively implementing the Lao Department of Forestry Notice 2094 for community involvement in forest fire protection.

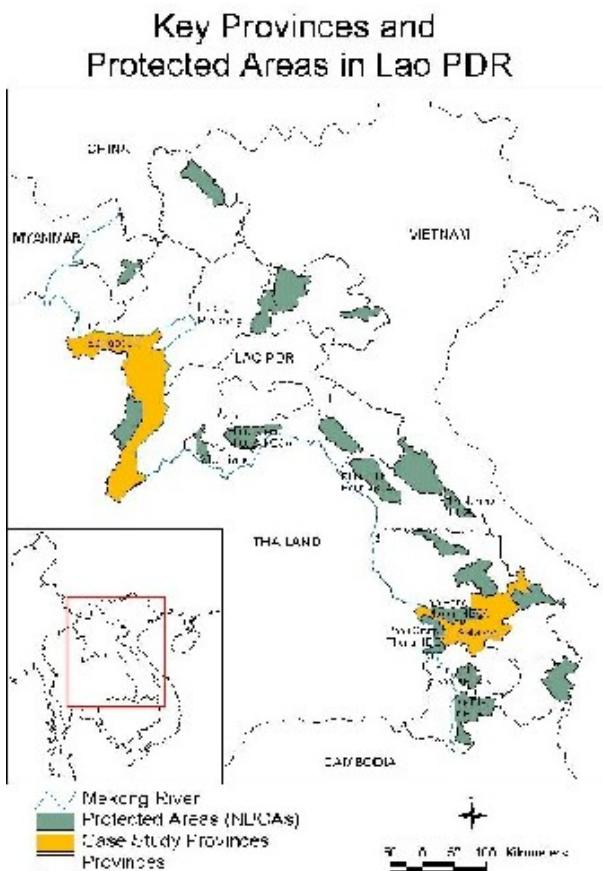
Background

Salavan Province is located in southern Lao PDR and borders Viet Nam to the east and Thailand to the west (see Map). The NTFP project worked with two villages located on the perimeter of Xe Bang Nouan NBCA. The project and the communities aimed to develop models for sustainable harvesting systems of NTFP in the protected area. With project support, community members in two target villages identified two key threats to sustainable livelihoods: the recognition of users' rights by other villages, and fire.

The project emphasized sustainable resource use and helped communities work together to understand forest conservation and develop multivillage agreements on land usage. It used existing committee structures to establish natural resource use committees, which were gender-inclusive and sought inputs from both men and women. Sustainable use, rather than conservation, was emphasized because the Lao term for conservation – *anulak* – suggests “no usage” and thus has a negative connotation. The project has worked hard to challenge the Lao

¹ Funding for the NTFP Project came from the Government of the Netherlands and IUCN. The project was implemented by the Lao Government with IUCN support. At the central level, it worked with the National Agriculture and Forestry Research Institute (NAFRI). At the field level it was executed by NAFRI and IUCN, with field teams working under PAFO and DAFO in three provinces in Lao PDR.

notion that conservation means no usage or prohibited usage, and seeks to associate the term with sustainable usage, which can be brought about through co-management plans (Deschaineaux, personal communication).



The traditional practice of villagers in this area is to use fire to encourage the growth of a grass locally called *yah kah*, which is used to make roofing for bamboo huts and as fodder for the livestock that graze in the forest during the wet rice production season. Villagers also light fires to facilitate hunting. Other causes of forest fires reported by villagers include clearing tracks and trails for more convenient access and escaped fires from the burning of *nam man yang* (*Dipterocarpus alatus*) to extract oleoresins.

Approach

A wildfire that burned from 4 to 6 January 1999 on Phou Thanaem Mountain in Xe Bang Nouan NBCA burnt a large area of the forest inside the NBCA. Local communities in the area did not recall other fires of this magnitude. Only those villages with immediate boundaries on the NBCA fought the fire using buckets, spades and natural firebreaks, such as rivers and streams. Unfortunately, there were not enough people available to fight the fire, nor was there any official responsibility or coordination among villages as many of the people living in the area were reluctant to act without official government orders. The cause of the fire is unknown, but it is likely that irresponsible lighting of grass for livestock grazing, trail blazing fires to round up animals for hunting, or possibly more deliberate fire setting may be to blame. The ability to harvest NTFPs declined significantly as a result of the fire.

A few weeks after the fire, on 25 January, the district governor initiated a meeting to discuss forest fire management with the local communities that use forest resources from the NBCA. The governor decreed that fire control committees would be established in each village to protect the forest inside the NBCA. (Very little forest remains outside the NBCA.) The government staff advocated that all villages with access to the NBCA should coordinate fire protection and control and meet once a month. However, no strategies or procedures for fire management were developed or sanctioned. The local district government also conducted a post-fire survey to determine the area of land damaged by the fire. Members of the NTFP project also attended the meeting to identify corresponding needs of the local district staff and the project target communities and to plan and coordinate local fire management and sustainable resource use.



Community mapping in Xe Bang Nouan NBCA by

In collaboration with the district government, the NTFP project conducted a series of four-day workshops for district-level stakeholders. These included representatives from 23 villages who used more than 5 000 ha of forest inside the NBCA, as well as a Lao Women's Union member from each village. Participatory learning techniques were used to teach conservation awareness and to disseminate information about co-management of resources in the NBCA. Villagers engaged in a participatory resource analysis in which threat ranking exercises and problem analysis clarified their understanding of forest fires. Activities included defining good fires as opposed to bad ones and setting up a system for fire preparedness. The main workshop output was a multivillage agreement on rules and regulations for the use of important NTFP resources, fire management and local networking and coordination. The workshop participants returned to their villages and acted as facilitators for conservation awareness, threat ranking and problem analysis activities at the village level. The newly trained trainers reported back to the district, the NTFP project and the NBCA about their village activities.

After the workshops and subsequent village activities, community members had a clearer understanding of the value of their resources, as well as the impacts that threats such as fire have on ecological systems. They were eager to exchange information on conservation and to promote proper use of resources for long-term benefits in their villages. This process gave local people the tools and capacity to conduct information exchanges. It also involved them in decision-making processes, which empowered the group and helped develop a sense of responsibility.

In January 2001, a year after the fire, a formal meeting was held at the beginning of the fire season and included the district governor, PAFO and DAFO staff and villagers. The local district reviewed and endorsed the village co-management plans, which included improving roles, coordination and procedures for existing village forest fire management committees and securing local government support. The NTFP project provided notebooks and pens, as well as a per diem to government staff for initial facilitation. Meetings among villages continue to occur once a month during the dry season (of six months) and twice during the wet season. The meetings provide a forum for consolidating information on local resource use.

The January 2001 meeting highlighted one of the constraints of the project: how to negotiate the sharing of benefits after prosecuting encroachers, as well as how to secure incentives for local communities to implement their own co-management plans effectively. The district government insisted on following the central decree from the Ministry of Finance (No. 266 of 3 February 2000), under which 70 percent of fines goes to the local district government and the remaining 30 percent is divided among key players at the community level. The villagers proposed that 40 percent go to village funds, 10 percent to the local district government, 30 percent to the informant and 20 percent to the village committee for administration and follow-up. The NTFP project advocated for village law with district approval. However, attempts to negotiate a more realistic incentive for local resource management were inconclusive and the plans were endorsed according to the existing decrees.

Lessons learned in Salavan

The NTFP project in Salavan provided support for fire management in addition to other natural resource management activities. The original impetus for fire management came from the district, with support from the local people because they were negatively affected by forest fires. Villagers and district staff received additional support from the project in terms of community organization, planning, and training and funding for meetings. The villagers and district would have established committees even without NTFP project support, as they were implementing DoF Notice 2094, but organization was probably more effective with project support. The project also provided facilitators who valued local knowledge and encouraged local people to make their own decisions.

Another important outcome of the project was stakeholders' new understanding that conservation of natural resource management does not mean no-usage, but rather sustainable usage of natural resources. Changing the perception of conservation (*anulak*) is crucial for success in all projects in Lao PDR and is an extremely difficult task. Efforts should be made to use a translation of the term "sustainable resource use", rather than the direct translation of conservation.

The project also helped to increase the participatory tools of local people and resource users, as well as to disseminate ideas about the links among conservation, biodiversity and resource use. The process respected local knowledge and provided technical information for decision-makers at the district and village levels, as well as promoting links between indigenous knowledge and natural resource decision-makers. Other benefits included:

- increased stakeholder involvement;
- improved understanding of the economic and cultural value of NTFPs;
- promotion of local ownership;
- clarification of tenure use rights;

- capture of knowledge and ideas on the details of planning co-management that is appropriate to the socio-cultural context, for more effective natural resource management;
- new opportunities for local users to engage as a level of authority in the process of planning resource use and developing a regulatory system appropriate to the real context;
- enhanced and strengthened village-level capacity to be more aware and responsible for resource management and the monitoring of use and impacts;
- support to new policy reforms for decentralization by developing strategies for effective application of provincial-, district- and village-level roles as the local district government played a supportive role to the local villages.

This example of a project that gained multivillage agreements on the co-management of natural resources can still be improved. The experiences from the NTFP project show that in order to fulfil commitments and implement collaborative natural resource management effectively, additional support is required to:

- promote the capacity of district and NBCA staff to support local management systems through training facilitators in specific technical skills, including participatory NTFP resource use planning, monitoring and evaluation, participatory conflict management, marketing and processing;
- follow up dissemination activities and produce materials;
- strengthen local monitoring of procedures and resource use so as to capture lessons learned from implementation, identify gaps and influence policy design and implementation;
- develop networks to improve access to and exchange of information among local stakeholders, districts, provinces and other NBCAs.

Case Study 2: CESVI, Sayabouri Province

Background

Cooperazione e Sviluppo's (CESVI's) Disaster Preparedness and Prevention of Forest Fires (Fire Prevention Training Project in Sayabouri Province) is the only project in Lao PDR that has forest fire prevention as its main objective. The official goal of the project is: "to decrease uncontrolled forest fires in the project area and reduce the risk brought to the population, communities and environment." CESVI is an Italian non-governmental organization (NGO) that has been present in Lao PDR since 1998, when it started a food relief project in Sayabouri Province in the west of the country. The impetus for CESVI's support to forest fire prevention came from the Sayabouri provincial government and was a result of the extensive practice of slash and burn agriculture in the Sayabouri area. Drawing on lessons from Thailand, CESVI has taken a capacity building approach of training trainers at the provincial and district levels, who then return to the province and train other PAFO/DAFO staff and villagers. The project also has a strong public awareness component.

Approach

Phase 1 of the project was implemented in 1999 and involved 60 villages in five districts in Sayabouri Province. CESVI took a traditional approach to forest fire prevention, which involved capacity building and a public awareness campaign.

Capacity building. The project worked to build community capacity for the prevention and fighting of uncontrolled fires, at both the village and the administrative levels. This included a forest fire fighting training course in Thailand for district and provincial staff who then

conducted training in the province, as well as the establishment of village fire prevention committees and a group of volunteer firefighters. The project also distributed 900 sets of fire fighting tools and conducted a study tour to Thailand to look at how forest fire issues were dealt with at the legislative and administrative levels.

Public awareness campaign. A campaign was conducted to raise villagers' awareness of the causes, consequences and dangers of uncontrolled forest fires. This involved training district officials, visiting villages to explain the implications of uncontrolled forest fires and distributing booklets, leaflets, T-shirts, flip charts and posters. The project used creative methods in its public awareness campaign, such as supporting the Lao Children's Cultural Center to create a show which toured in the five target districts. The National Theater Troupe of Lao performed a similar show for adult audiences. Radio and television broadcasts were used to highlight project activities throughout Sayabouri Province.

Phase II began in October 2000 and ended in September 2001. This phase included the first CBFiM training course for Lao Government staff. In April 2000, ten government staff members attended the course, which was conducted in Thailand. No Lao villagers attended.

The course used experiential learning and participatory training techniques to develop participants' skills and understanding of forest fire, and participatory methods to promote the participation of local communities in planning and managing their own forest fire regimes. The course also focused on participatory planning and mapping approaches that actively involve local communities in discussions of how fire should be managed actively in their own land areas (Ganz, 2001).

Lessons learned in Sayabouri

Critics of the CESVI project during Phase I pointed out that it used a simplistic approach to deal with a complex issue. It was less a community-based or participatory project than a community-involved, government-imposed one. As with the NTFP project, initial motivation for forest fire management came from the government, but required local involvement to be successful. The local people may have had a need for fire management, but they did not ask for help. Furthermore, Phase I of the CESVI project focused on prevention and management of fire, but did not go further. This is an issue throughout Lao PDR. Nevertheless, CESVI at least dealt with the issue and was willing to improve its programme. It was also the first fire management programme in Lao PDR. Depending on the results of the project, it could be used as an example for others looking for ways to educate and to disseminate forest fire prevention material. The project could also develop fire-specific materials and serve as both a pilot project and an information resource centre for other projects.

It can be problematic to train personnel in another country such as Thailand, especially if Thai issues are different from those in Lao PDR. It is necessary to ensure that Thai trainers understand the issues in Lao PDR (although it is not always easy to share information between the two countries; sharing between Lao PDR and Viet Nam is often easier). However, staff who attended the training course said that learning in Thailand was not a problem. Although not all of the case studies were immediately applicable to the Lao situation, the main concepts, which participants described as "listening to villagers' needs on a case-by-case basis", did come across clearly. It may also be useful to involve villagers in training to ensure understanding and ownership at all levels, not just within the government.

The real effectiveness of the CESVI training is not yet known, and will be evaluated as government officials facilitate CBFiM processes in their districts. It is hoped that the CESVI project will be able to generate some lessons from the field that are applicable to other parts of Lao PDR, or other countries (Ganz, 2001). CESVI is willing to collaborate with other organizations and invited participants from other NBCAs to join the training in Thailand. The NGO is also willing to allow other PAFO or project staff to join future training courses in Sayabouri.

CONCLUSION AND RECOMMENDATIONS

Projects based solely on CBFiM are not likely to be initiated in the near future because Lao PDR is facing other, more pressing, development needs. Fire does not pose the same threats as it does in some other countries in the region where it is a critical issue, such as it is in Indonesia and Malaysia. However, if devastating wildfires begin to occur more frequently as a result of climate change or deforestation (or a combination of both), the need for CBFiM will increase. Projects such as CESVI in Sayabouri may then be used as pilot projects for others in Lao PDR. CBFiM as a component of larger projects is likely to continue, such as in the NTFP project in Salavan. This will be especially important for projects dealing with shifting cultivation or protected area management, for which forest fire management falls directly under Lao Government law.

Incorporating CBFiM into forest management will require sincere commitment from all stakeholders, particularly the Lao Government, the donor community and the local people involved. Many of the key elements necessary for establishing CBFiM already exist or are in the process of being established. These include the Lao Government's commitment to decentralization, laws encouraging local involvement in natural resource management (particularly land allocation, which supports personal land-use rights), local institutions' support to community decision-making and regional support for forest fire management. However, many of these areas still need to be tested and implemented in the field. Capacity building and funding will also be necessary before any change can occur. Suggested strategies and research to establish CBFiM in Lao PDR are discussed in the following paragraphs.

Strategy

A clear strategy should be created to ensure that CBFiM is meeting the needs of all stakeholders. Strategies should consider, but not be limited to, the following:

- *Law and policy:* continued support to Lao Government laws that encourage participatory planning, such as Decree 2094. It is important that communities are not expected to conduct work without incentive, and that if they are involved it is by choice. The idea of decentralization is good, so long as there is technical support, such as capacity and funding. More emphasis should be placed on preventing grass burning and escaped fires rather than on shifting cultivation.
- *Definitions:* define fire. What makes a good fire? What makes a bad fire? Both projects and governments should avoid blanket statements such as “no fire”. A no fire policy may not be necessary if the fire does not get out of control and may, in fact, be good for clearing fuel.
- *Indigenous knowledge:* when working with local communities and ethnic groups, try to understand their “ritual technology”. A statement made frequently by poor people interviewed for an Asian Development Bank participatory poverty assessment (ADB, 2000)

was: “Please, start the development process by building on what we already know: swidden fields, livestock and the forest.” Swidden agriculturists know how to burn. With the participation of local people, assess whether or not fire is even an issue. Asking villagers how to solve the problem, rather than offering a pre-packaged solution may provide unexpected solutions that benefit everyone.

- *Terminology/translations:* be careful of how concepts are translated and of the implications that they may have. In the Lao language, success is more likely if the term “sustainable resource use” is used rather than “conservation”.

Research

Further research is necessary in order to understand fully the issue of forest fire management in Lao PDR. Suggestions for research include, but are not limited to, the following:

- *Effects of Lao Government policy:* assess how the land allocation programme, agricultural methods and fire can coexist without damaging forests.
- *Indigenous use of fire:* learn more about local people’s uses of fire (including those of both men and women).
- *Fire ecology:* learn more about forest types and the impact of fire on different ecosystems. Fire may not damage the forest, and could even be beneficial, and this may have an impact on forest fire policy. For instance, teak forests are well adapted to periodic fires. Suggested areas to study include Phou Khao Khouay, with its unique pine forests and convenient location, and forests along the Ho Chi Minh trail, to learn about the effects of war.
- *Monitoring and evaluation:* use satellite imagery from government offices to monitor forest cover change and fire extent throughout the country.
- *Indicators:* establish indicators of what has been burnt, and how much, for all district offices on a quarterly basis. Such a standardized collection system can be used to determine the extent of the problem and the success of the project. For example, defining classes might include:
 - * hectares of shrubs (< 2 m high) burnt for agriculture;
 - * hectares of woodland (> 2 m high and < 8 m high) burnt for agriculture;
 - * hectares of forest (> 8 m high) burnt for agriculture;
 - * hectares of these classes accidentally burnt.

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Management of forest fires through the involvement of local communities in Turkey

by Mustafa Kurtulmuslu and Ekrem Yazici; April 2000

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EXECUTIVE SUMMARY

In Turkey, forest degradation is the result of overutilization, forest fires, unsustainable forest management, the socio-economic problems of local forest dwellers, ownership and land tenure problems, converting forest land to agriculture and settlement and unsound legislation. Turkey is in the Mediterranean region and is mostly under semi-arid climatic conditions, with 7 million ha of forests being very sensitive to fire. In Turkey, nearly all forest fires are the result of human activities. In order to develop sound measures regarding forest fires, it is necessary to know what lies behind these human activities and how communities take an active role in forest fire management.

This study discusses the social aspects of forest fires, particularly community involvement in forest fire prevention and public policies affecting that involvement. The study assesses community involvement in forest fire prevention, control and management in the Çal and Bergama Forest District Directorates, where there is active participation of the local people, and results are compared with neighbouring forest district directorates that have similar climatic and ecological conditions. Results from the case study show that rural people participating in community-based fire management (CBFiM) have lower than average levels of intentional fires compared with national statistics. The rate of intentional forest fires in Çal is 12.1 percent and in Bergama 10.8 percent, while the national average for the last ten years is 14 percent (not including unreported fires). In addition, when villagers carry out early fire control interventions (without waiting for fire fighting teams to arrive on the site), fire sizes are smaller than the national average. Average fire sizes are 2.4 ha in Çal and 3.9 ha in Bergama, while the national average for the last ten years is 6.5 ha. This demonstrates the effectiveness of CBFM. Both Çal and Bergama are thus very good examples of how the active participation of local people can increase the success of forest fire prevention and control measures.

Gestion des incendies de forêt grâce à la participation des communautés locales en Turquie

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RÉSUMÉ

En Turquie, la dégradation des forêts est due à la surutilisation, aux incendies, à la gestion non durable, aux problèmes socio-économiques des habitants des forêts, aux problèmes de propriété et de régime foncier, à la mise en culture des terres boisées, à la colonisation et à la législation peu judicieuse. La Turquie, pays méditerranéen, a dans l'ensemble un climat semi-aride de sorte que 7 millions d'hectares de forêts sont fortement exposés à l'incendie. Dans ce pays, les feux de forêt sont presque toujours provoqués par les activités humaines. Afin de mettre au point des mesures bien fondées dans ce domaine, il est nécessaire de savoir quelles sont les causes profondes de ces activités et comment les communautés participent activement à la gestion des feux de forêt.

L'étude expose les aspects sociaux des incendies de forêt, en particulier la participation des communautés à la prévention et les politiques officielles qui influent sur cette participation. La participation des communautés à la prévention, à la lutte et à la gestion des incendies de forêt dans les directions des districts de Çal et de Bergama où les populations locales interviennent activement, est étudiée et les résultats obtenus sont comparés à ceux des districts forestiers voisins qui ont un climat et un environnement analogues. Il ressort de l'étude que les populations rurales participant à la gestion à base communautaire des incendies enregistrent un taux d'incendies volontaires inférieur à la moyenne nationale. Le taux d'incendies de ce type atteint 12,1 pour cent à Çal et 10,8 pour cent à Bergama, contre une moyenne nationale de 14 pour cent pour les dix dernières années (compte non tenu des feux non déclarés). En outre, lorsque les villageois interviennent rapidement pour lutter contre les incendies (sans attendre l'arrivée des équipes de pompiers), les incendies restent d'une ampleur inférieure à la moyenne nationale. En effet, l'ampleur moyenne se chiffre à 2,4 hectares à Çal et 3,9 hectares à Bergama, contre une moyenne nationale de 6,5 hectares pour les dix dernières années. Ces chiffres montrent bien l'efficacité de la gestion à base communautaire des incendies de forêts. L'exemple de ces deux zones fait clairement ressortir comment la participation active des populations locales renforce l'efficacité des mesures de prévention et de lutte contre les incendies de forêt.

Manejo de Incendios Forestales a Través de la Participación de las Comunidades Locales en Turquía

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RESUMEN DE ORIENTACIÓN

En Turquía, la degradación de los bosques obedece a la utilización excesiva de las quemas forestales, así como al manejo insostenible de los bosques, a los problemas socioeconómicos de los habitantes del bosque, a los problemas relacionados con la propiedad y tenencia de la tierra, a la conversión del bosque en tierras agrícolas y en áreas de asentamiento, así como a la legislación inadecuada. Turquía se sitúa en la región mediterránea y sus condiciones climáticas son semiáridas, contando además, con 7 millones de ha de bosques, muy vulnerables a los incendios. En Turquía, casi todos los incendios forestales son consecuencia de las actividades humanas. A fin de desarrollar las medidas apropiadas en materia de incendios forestales, es necesario conocer las causas que subyacen en estas actividades humanas, y entender cómo las comunidades participan de manera activa en el manejo de los incendios forestales.

El estudio aborda los aspectos sociales que conllevan los incendios forestales, especialmente la participación de la comunidad en la prevención de los incendios forestales, así como las políticas gubernamentales que influencian esta participación. El estudio evalúa la participación que la comunidad tiene en la prevención, control y manejo de los incendios forestales en las juntas directivas de Çal y Bergama del distrito forestal, en donde existe una participación activa de la población local, y cuyos resultados están siendo comparados con los de las juntas vecinas del distrito forestal, cuyas condiciones climáticas y ecológicas son similares. Los resultados que arrojó el estudio de caso muestran que la población rural que participó en el manejo comunitario de incendios forestales cuenta con niveles de incidencia de incendios intencionales por debajo del promedio de las estadísticas nacionales. El ritmo de incendios forestales intencionales en Çal es del 12.1 por ciento, alcanzando el 10.8 por ciento en Bergama, mientras que el promedio nacional, en los últimos diez años, asciende al 14 por ciento (excluyendo los incendios no señalados). Además, cuando la población lleva a cabo actividades de control temprano de incendios (sin esperar a que los equipos contra incendios lleguen al lugar) la extensión de los incendios suelen ser menores respecto al promedio de las extensiones que se queman en el resto del país. La extensión promedio de los incendios es de 2.4 ha en Çal y de 3.9 ha en Bergama, mientras que el promedio nacional, durante los últimos diez años, llegó a 6.5 ha. Estas cifras demuestran que el manejo comunitario de los incendios forestales es eficaz. Tanto Çal, como Bergama constituyen ejemplos muy buenos de cómo la participación activa de la población local puede incrementar el éxito de las medidas de prevención y control de incendios forestales.

INTRODUCTION

Forests are one of the world's most important renewable natural resources. For centuries, populations have degraded these resources in their attempts to satisfy their wood and fuelwood demands and to open additional agricultural lands and settlement areas. One of the most important reasons for forest deterioration has been the increase in forest fires. Forest fires are the main environmental disaster suffered by countries in arid and semi-arid climatic regions. Turkey has such a Mediterranean climate, and some 7 million ha of its forests are sensitive to fires. In Turkey, nearly all forest fires are the result of human activities. In order to develop sound measures regarding forest fires, it is necessary to know what lies behind these human activities and how communities play an active role in forest fire management. This study discusses the social aspects of forest fires, community involvement in forest fire prevention, control and management, and public policies that affect fires in Turkey.

Objective of the case study

The objective of this study is to examine the impact of community involvement in forest fire management. The study includes a review of how active participation helps to prevent and control wildfires, acknowledging that this varies from place to place depending on socio-economic and political conditions and on whether management is government- or community-driven.

BACKGROUND INFORMATION ON TURKISH FORESTS AND FORESTRY

Turkey has a unique geographical and cultural position at the crossroads between Europe and Asia. It covers an area of 777 971 km², including 78 000 ha of lake and water surfaces. Rich diversity of ecological conditions prevail in different regions of the country. Depending on the topographical and climatic conditions, vegetation types may show distinct variety even within short distances. The average altitude is about 1 132m above sea level, and only 10 percent of the country lies below 250 m above sea level

Mixed farming is the predominant farming system, with 72 percent of farms producing both livestock and crops. Animals feed on range and pasture grasses in summer and on crop residues, conserved forages and purchased concentrates in winter. The winter diet is often deficient, and animals are frequently put out to graze on communally owned rangelands very early in the spring, before vegetation has become well established. Large areas of degraded forests are used by villagers as grazing lands, causing further degradation as well as conflicts between villagers and forestry organizations. The young shoots and leaves of some forest trees (mostly oak species) are cut and dried by villagers to be used as winter feed.

The population of Turkey was an estimated 64.3 million people in 1997, and there is an annual growth rate of 1.6 percent. The population of forest village communities has decreased significantly, especially during recent decades, as a result of a high rate of migration from such areas to find jobs and better living conditions in urban centres.

Forest area and forest resources

The forest area of 20.7 million ha accounts for 26.7 percent of the country's total area (National Forestry Inventory, 1972 to 1996). However, productive forests cover only about 48.2 percent (10 million ha) of the total forest area, the remaining 51.8 percent (10.7 million ha) being

degraded or severely degraded unproductive forest cover. Conifer forests dominate the high forests, occupying 32 percent of the total forest area and 80 percent of the high forest. High broadleaf forests occupy only 8 percent of the total forest area and 20 percent of the high forest. Concerning forest fires, it is worth mentioning that Calabrian pine and black pine, both fire-sensitive species, account for 20.2 and 15.97 percent, respectively, of the total forest area.

The production of various non-wood forest products (NWFPs) (fodder, resin, nuts, mushrooms, bulbous plants, herbs, game, etc.) provides significant contributions to the local and national economies. Export revenues from NWFPs (about US\$70 million annually) are greater than wood export revenues. The potential contribution of NWFPs is much higher, and could be realized through more efficient management and utilization of such resources.

Forest resources provide vital socio-economic contributions, especially for local communities – i.e. the 7 million people living in approximately 19 000 forest villages. Almost all the energy needs of such communities are provided by fuelwood, which is supplied to them at highly subsidized prices from the state forests. (The state forests provide almost 80 percent of the total fuelwood production of about 10 million m³.) The roundwood needed by forest villagers is also provided at subsidized prices from the state forests, which produce about 380 000 m³ annually. The total value of the subsidies that the General Directorate of Forestry provides to forest dwellers as fuelwood and roundwood was estimated to be about US\$100 million in 1997.

Employment in forestry activities (i.e. protection, harvesting, transportation, nursery production, plantation, etc.) is another important contribution of the forest sector. A total of 47 million worker days were provided by these activities during 1996. The great majority of people employed in these activities come from forest villages where incomes are very low and alternative employment opportunities are scarce.

Credits and grants provided through the Forest Village Development Fund for the development and support of various small-scale income-generating and village development activities (i.e. beekeeping, animal husbandry, energy-saving stoves and cooking devices) represent another important socio-economic contribution from the Ministry of Forestry.

Socio-economic conditions of forest village communities

According to forest legislation, villages located within or adjacent to forest areas are considered to be forest villages. Their estimated population of 7 million accounts for half of the rural population and 11.5 percent of the national population. The ecological, social and economic conditions of forest village communities show significant diversity.

Forest villages are poorer than other Turkish villages. The most important poverty indicators are far below national averages. Landownership, the most important indicator, is significantly lower than the national average of 64 decares per household. Regional averages for forest villages are 20 decares in the Black Sea region, 24 decares in the Mediterranean region and 28 decares in the Aegean region. Livestock ownership is also very low. The main income sources of forest villages are farming, livestock raising and horticulture. Families earn one-third of their income from farming and another third from raising livestock. Only 8 percent of villagers earn their living from work in forest-related activities.

According to the Forestry Sector Review, high rates of out-migration, particularly of the younger generation, are changing the demographics of forest villages. As a result, elderly people (more than 60 years of age) now make up 14 percent of the total forest village population. Migration

from rural to urban areas is particularly visible in forest areas. As most migrants are men, there is a disproportionately high female population in forest villages. Migration of the younger generation, particularly men, has created a serious disproportion in terms of demography and gender balance. The trend significantly limits forest villages' workforce capabilities. Furthermore, when men work outside the village women take over timber harvesting and other traditional male activities. This is especially significant because women perceive that they obtain more benefits from the forest than men perceive and, as a result, they attach greater value to it.

Animal husbandry is a major economic activity in forest villages. Pastures within or near forests cover a total area of only about 1.5 million ha, which is far from being sufficient to meet the needs of existing animal populations. Controlled grazing, range improvement and fodder production efforts and practices are scarce owing to economic and traditional reasons. Heavy grazing in the forest creates serious damage, especially by destroying regenerations, and the cutting of young oak shoots and leaves for winter feed is a widespread traditional practice.

Employment in forestry activities (felling, extraction, transportation, nursery production, plantation, forest maintenance) is one of the main sources of income for forest village communities. However, other than in the limited regions where intensive harvesting and other large forestry programmes are implemented, employment in forestry activities is generally seasonal and only for short periods (according to one evaluation, only 8 percent of forest workers are permanently employed, while the remaining 92 percent are employed temporarily in seasonal work).

The potential for gaining good additional income from other income-generating activities, such as carpet weaving, handicrafts, apiculture, mushroom and NWFP harvesting, has been utilized to only a limited extent owing to a lack of sufficient awareness, training, financial support and marketing experience. Ecotourism and recreation activities in forest areas provide no significant contribution, although they have good potential in several regions. At present, the per capita income in forest villages is estimated to be about US\$200, which is well below the national average.

MAJOR CAUSES OF FOREST FIRES

Most deforestation and forest degradation originate from the interventions of the large forest village population who are heavily dependent on excessive use of forest areas and resources for their livelihood. According to statistics, about 5 000 forest encroachment cases take place annually. On average, 15 000 ha of forest area is cleared every year by forest-dependent villagers through intentional forest fires and illicit cutting.

Meeting family fuelwood needs is the main reason for illicit cutting. The fuelwood that the forestry organization provides at subsidized prices accounts for only a small portion of actual consumption. The remainder is provided from illicit cutting in neighbouring forests, which exceeds 10 million m³ annually. Illicit grazing in degraded and productive areas is another serious problem in most forest regions. Grazing goats cause severe damage because they eat the shoots of young trees in regeneration sites. Controlled grazing has a very important role in preventing forest fires, especially in coastal areas where the climate and vegetation are very likely to lead to forest fires.



Charcoal production in the forest

Turkey's climatic conditions are highly favourable to forest fires, especially in the Mediterranean, Aegean and Marmara regions. The large number of settlement areas within or near forest areas further increases the fire risk, and a great majority of fires are caused by accidental or intentional human interventions.

Some 6.9 million ha of Turkey's 20.7 million ha forest area are very sensitive to forest fires. The areas of highest risks are the Aegean region (41 percent of all fires), the Mediterranean region (24 percent) and the Marmara region (22 percent). About 43 percent of the forest areas in 16 of Turkey's 27 Forest Regional Directorates and 126 of its 243 District Forest Directorates are deemed at risk from forest fires. Data indicate that four Regional Directorates account for about 56 percent of the total area burnt. The largest forest area burnt is in Muğla (21.3 percent), followed by İzmir (13.3 percent), Antalya (11.3 percent) and Çanakkale (10.0 percent). Some 41 percent of all forest fires occur in these four Regional Directorates.

Most of the forest fires in Turkey occur between June and October: according to observations about 83 percent of forest fires occur in this period. Fire causes maximum damage in terms of area burnt during the month of July (30.8 percent), followed by August (27.1 percent), September (13.4 percent) and October (9.3 percent). Most forest fires start between 10:00 and 20:00 hours, when human activities levels are very high and humidity levels are very low.

The majority of forest fires in Turkey are the result of human activities. Human-caused fires account for 97 percent of all fires. The causes of forest fires in Turkey are: 36 percent caused by human negligence or carelessness (camps, shepherds' campfires, cigarettes), 13 percent caused by intentional human interventions (clearing for agricultural land and settlement areas), 3 percent caused by lightning and other natural causes, and the remaining 48 percent caused by unidentified human activities. The causes of nearly half of forest fires are unknown, making it very difficult for decision-makers to develop effective fire prevention strategies. Fires are registered as unknown fires for the following reasons:

- Forestry staff sometimes register a fire as an unknown fire in order to avoid having to investigate it and follow legal procedures. (When the cause of a fire is registered as carelessness or intentional, questions such as who the offenders were, how it happened, how it spread, who witnessed it have to be answered.)
- Forestry staff might conceal the cause of a fire for some personal reason.
- Sometimes, villagers do not inform the authorities, even if they know the causes of the fire.

However, it is very likely that fires caused by negligence and carelessness and by intentional activities account for shares of the unknown fires that are similar to their shares in known causes. It can therefore be concluded that 70 percent of all forest fires are the result of negligence and carelessness and 27 percent are the result of intentional activities.

It is worth mentioning that the share of unknown fires has decreased considerably over the last five years. This is the result of very detailed investigation of the causes of fire. In the period 1997 to 1999, the main causes of forest fires, by average numbers, were: agricultural residue burning (172 fires), shepherds' fires (164), cigarettes (134 fires), arson (91 fires), opening forest lands for agriculture and settlement (134 fire) and energy lines (56 fires). Unknown fires accounted for 23 percent of fires (1 175 out of 5 345), which is well below the average for the previous 63 years of statistics.

In recent years, the number of fires has increased as a result of increased population, industrial development and mass tourism activities. However, the total area burnt and the average area burnt per fire have decreased with the implementation of effective measures including developed communication, increased public awareness and strategic suppression efforts.

Fire suppression and control are carried out by the Forest Protection and Fire Fighting Department of the General Directorate of Forestry at the central and field levels through 27 Forest Regional Directorates. There are no fire control or fire fighting plans at the regional directorate level. Fire control and fire fighting plans are prepared and implemented at the forest district directorate level.

TRADITIONAL USE OF FOREST FIRE AND RELATIONSHIP WITH OTHER PRACTICES

Fire use is not very common in Turkey. Prescribed burning is not a part of forest fire management. In forest management, fires are used locally for land clearance (for afforestation) and for promoting natural regeneration in cedar and Calabrian pine stands.

The use of fire in agriculture frequently results in forest fires that destroy forests. Over the three years from 1997 to 1999, an average of 9 percent of forest fire occurrences and 10 percent of the total burnt area were caused by agricultural burning.

There are three types of traditional fire use in agriculture:
burning of agricultural residues (stubble burning);

- burning of rubbish from orchards and vineyards (branches, roots, etc.), especially after autumn maintenance;
- burning of shrubs, brush and thorns for the improvement of rangelands or to gain new grazing lands.

Stubble burning

Stubble burning is a very common tradition in Turkey and is widely practised throughout the country. After harvesting cereals, farmers burn the crop residues (stubble) during May and June, when the weather is hot and dry. This was not a common practice until the 1950s, when agricultural machines were first introduced. Prior to that, farmers left some lands fallow and reaped cereals by hand (with sickles or scythes), cutting the crops at the soil level. Reaping–threshing machines, which have been used for the harvesting of cereals since the 1950s, cut the crops 15 to 20 cm above soil level (because soil surfaces are usually uneven) and leave stubble on the ground. Although stubble burning is forbidden by law, it is very common. Although scientists disagree, farmers believe that stubble burning is useful, especially for soil fertilization. They give the following reasons for stubble burning:

- It reduces fuel (diesel) expenses; ploughing agricultural lands with stubble increases the fuel expenses of the machinery used.
- It reduces weeds and pests; according to farmers, it is the easiest and quickest way to get rid of unwanted vegetation in dry regions.
- There is no market for straw, so farmers do not collect the stubble for straw.

As already mentioned, legal restriction has not solved the problem. Statistics indicate that forest fire damage resulting from agricultural burning has increased, rather than decreased, since legal restrictions were introduced in 1995. The problem and possible solutions should be discussed with farmers, who should also participate in decision-making, along with local authorities, muhtars and members of village elders' councils. The following are some of the potential ways of integrating stubble burning with land management practices:

- Stubble could be burnt after the fire season, preferably in late autumn. When rotational agriculture is practised (at least two crops are cultivated in rotation every year), farmers could be convinced to change their crop types. At present, stubble burning is mainly practised in rainfed agricultural areas by farmers who generally cultivate wheat and barley in one rotation.
- Firebreaks should be established between agricultural lands and forest borders by ploughing the agricultural land to keep the fires in the agricultural areas.
- Markets and potential uses for straw should be sought, and straw utilization should be encouraged.
- The effects of stubble burning on soil productivity, microorganisms and climate should be researched, and farmers' awareness of fire's effects should be increased through effective extension activities.
- Traditional agroforestry/agro-silvipastoral systems should be examined and extended, where appropriate, to agricultural and forest border areas. In some regions, the use of such traditional systems has resulted in reduced fire spread and damage. Firebreak shelters should be established on both private agricultural land and forest land.

Burning of rubbish from orchards and vineyards

The aim of this kind of burning is to clear and prepare gardens for the following year. In autumn, after harvesting, farmers carry out pruning, selection and clearing activities in their orchards, olive groves, vineyards and citrus gardens. They collect rubbish (branches, roots, leaves and stems), gather it on the edges of their gardens and burn it. Such fires frequently get out of control and spread to the forests. As forest fires resulting from rubbish burning occur in late autumn, when timber is dry and fire prevention and control measures are at their lowest level, they can easily spread and cause severe damage. This kind of burning is forbidden by the Forest Law (No

6831 Article 76/d), but legal prohibition is not always effective and farmers should be trained on controlled burning techniques and fire behaviour.

Burning for grazing purposes

The aim of this kind of burning is to clear the unwanted vegetation (shrubs, brush and thorns) that grows in range areas and reduces the quality of the range. This burning is also used to create new grazing land, but such use of fire is not very common. As a result of decreasing rural populations and fewer animals, the need for grazing lands has been reduced. In order to prevent burning to create grazing lands, farmers should be trained on controlled grazing, range improvement and fodder production, and these activities should be supported with appropriate incentive and credit policies. The effects of fire – especially in the long term – and range management options should be discussed with farmers. Afforestation areas in which the trees have reached a certain height can be opened to controlled grazing in order to reduce both the fire risk and the grazing pressure. However, it should not be forgotten that range as well as fire management are inseparable parts of forest management in Turkey.

AWARENESS LEVEL OF THE RURAL POPULATION

In order to assess the awareness level of rural people, field-level studies were carried out in two different Forest District Directorates located in the Mediterranean and Aegean regions. Questions and discussions focused on villagers' awareness about forest fires, their perspective on forestry staff and forestry management, their attitudes to forest fires and their attitude changes when they take part in forest management.

The study showed that, when villagers are included as partners in forest management and when they are able to derive benefits from forestry activities, the number of deliberate fires decreases considerably. Furthermore, as a result of villagers' rapid intervention whenever a fire breaks out, the total burnt area and the burnt area per fire also decrease. Even so, and in spite of the fact that they are aware of forest fires and have knowledge of forests and forest management, rural people still cause fires, either intentionally or unintentionally. The discrepancy between awareness and behaviour is the result of economic and social factors and, in order to explain it, it is necessary to assess human behaviour in terms of the causes of fire.

Intentional fires

It is clear that most intentional forest fires are set by the rural population (forest dwellers) for various social and economic reasons. However, this does not mean that forest dwellers are unaware of forest fires and their effects. Several factors induce rural people to set forest fires:

- As the forests are owned and managed by the state, all decisions on forestry matters are taken by the government and implemented by government staff. Most government staff do not have communication and interpersonal skills, and sometimes their behaviour creates conflict with forest villagers. Forest villagers do not have enough legal or political power to change decisions. One local forestry staff member stated that most deliberate forest fires are set by villagers reacting against unjust decisions of the Forestry Department or unfair behaviour of forestry staff.
- Forestry activities are labour-intensive and provide temporary or permanent employment for thousands of forest villagers. The Forestry Department can reduce or stop harvesting, afforestation and other forestry activities in the region, thereby affecting the economic situation of the region. Some villagers set forest fires as a way of creating new employment

opportunities. Post-fire activities include clearing dead trees, transportation activities, land preparation for plantations, and the maintenance of plantations for four to five years. Forest villagers are employed in these activities in accordance with the Forest Law. Fires that are set to create employment opportunities are mainly caused by selfish people and are individual cases rather than the norm.

- Most agricultural land was cleared from forests. Severe erosion is evident in these lands with soil gradually losing its fertility and production capacity. Irrigation is not possible on most agricultural lands, and artificial fertilization is not economic. Villagers have few alternatives for increasing agricultural production. The expansion of agricultural lands is one such alternative, which is widely practised. In order to obtain new agricultural lands, forests are cleared through fire and other means.

Intentional fires are the result of deep-rooted socio-economic problems that have prevailed in the country for decades. It is not possible to prevent these kinds of fire with education and extension programmes alone. Long-term strategies including substantial changes such as joint management of forest resources, land classification and economic development programmes should be prepared and implemented for this purpose.

Negligence and carelessness

Some forest fires are caused by the negligence or carelessness of rural people. Agricultural burning and shepherds' fires are the most common causes. Such fires can be explained in terms of socio-economic analysis of rural life and activities:

- As a result of migration, the social structure in rural areas has changed considerably. Migration of the younger generation, particularly men, has created a serious disproportion in terms of demography and gender balance. The trend significantly limits forest villages' workforce capacities. Women and children are undertaking most of the daily work, including animal breeding and agricultural activities, and they are also employed in forestry activities such as afforestation, land preparation and maintenance of plantations. A very high proportion of women are illiterate and their social and cultural levels are relatively low compared with those of men. Most shepherds are children (of between 8 and 14 years of age), women and, in some cases, men who are suffering from mental illness or who are disabled. While grazing animals, these people light fire for heating or to prepare food. This high fire risk and ignition frequency results in an increase in forest fires.
- After migration to the cities, rural people maintain ties to the rural areas. During the summer (the harvesting season), when the schools are closed, most migrants return to their villages to carry out farming activities, particularly harvesting. The second generation of migrants do not have the necessary rural background and knowledge. When this generation performs agricultural activities or animal grazing, they cause forest fires because their knowledge of fires is not sufficient.
- Forest villagers regard agricultural burning as an economic and quick way of getting rid of unwanted vegetation. They do not believe that agricultural burning is harmful to agricultural lands – on the contrary, they believe that it is useful, especially for soil fertilization. Agricultural burning in areas adjoining forest was forbidden by law in 1995. However, legal prohibition has increased the effects of forest fires by converting agricultural burning into uncontrolled burning. The ban is thus not practical and results in villagers burning without control. For example, villagers secretly light fires in neighbouring agricultural areas and leave them to burn unattended for fear of being caught. Such fires often reach the forests and turn into uncontrolled forest fires.

In order to prevent fires resulting from negligence, a detailed target group analysis should be carried out. According to the results, appropriate extension methods should be used in an awareness programme. Target groups should include rural women, children, shepherds, rural hunters, disadvantaged groups and adults. For cultural reasons, it is very important to employ female extension agents to reach rural women in Turkey.

COMMUNITY INVOLVEMENT IN FOREST FIRE PREVENTION, CONTROL AND MANAGEMENT

Before discussing community involvement in forest fire prevention, control and management, it is necessary to have a good understanding of forest management in Turkey.

Nearly all forests are owned and managed by the state. Forest lands and resources are managed according to the forest management plans prepared by the planning department of the General Directorate of Forestry. These plans are the most basic and strictly binding documents for all sorts of forestry activities. Their main concerns and orientation are the planning of timber and fuelwood production, the development of growing stock and the implementation of regeneration and silvicultural activities. Consultation with local people (forest dwellers) and studies of socio-economic conditions and needs are typically very weak. This means that local people do not take part in decision-making and planning process, and they have very little influence on decision-makers or planners. In addition, local people do not take part in the management and utilization process. Local people's utilization of forest resources, for example, grazing animals inside forests or collecting NWFPs – which they perceive as a traditional right – is subject to the permission of the forestry administration. In participatory management systems such decisions are made with the participation of all the parties involved, and villagers are thus able to see themselves as partners in the management of forest resources. This is also the case in the management of protected areas. Protected areas are established without consulting the people living in the area, and some of their rights are restricted by the forestry administration and protection statutes. Moreover, the revenues from protected areas (such as national parks, nature parks, recreational areas) usually go to private contractors, the forest administration and the treasury. In some cases, villagers have to pay to enter local protected areas. During discussions, one villager showed his reaction by saying: "some times, I am thinking to light fire to the forest so that the area will lose its value and protection statutes will be lifted".

Another important point is that there is no two-way communication between the Forestry Department and local people owing to the central-based institutional structure of the department and the inadequate interpersonal and communication skills of forestry staff. On the one hand, the Forestry Department has its own objectives and priorities regarding forest management, which it has set without giving much consideration to the needs and priorities of forest villagers. On the other hand, the forest villagers have their own objectives and priorities, which are not generally consistent with those of the Forestry Department. Long-lasting conflicts and lack of communication have aggravated this situation.

Villagers are employed in forestry activities and are supplied with some timber and fuelwood at subsidized prices. These are very important contributions of the forest sector to the income of local communities, but the management system has caused conflicts between forestry administration and local people (forest dwellers) and has resulted in forest degradation. The objective of government policies is to reduce the pressure on forests, and not to achieve public participation in forest management. There are some exceptions to this management system. The management of coppices, chestnut and stone pine forests are among the best examples of community forestry in Turkey. Turkey has much potential for the development of participatory forest management systems.

Community involvement in forest fire prevention, control and management is also affected by the forest management approaches adopted. In this area, the government is trying to achieve public involvement in forest management through legislation.

PARTICIPATION OF THE RURAL POPULATION

Rural people living in villages or towns are legally responsible for participating in forest fire prevention and control. The Forestry Law gives rural people the following responsibilities:

- Individuals who notice a fire or signs of a fire within or around the forest are obliged to inform the Forestry Department or other government authorities.
- Men aged between 18 and 50 years of age and living in the villages around the forest are obliged to join fire suppression activities with their own fire control equipment.

The areas over which villages are responsible for preventing and controlling fire are allocated in district-level fire control plans. According to these plans, some 766 000 people living in villages and towns are responsible for forest fire suppression.

Rural people generally react against such legal obligation. The following are some of the reasons for this reaction:

- The Forestry Department pays fire workers who, villagers argue, should have full responsibility for fire fighting. These fire workers receive very high salaries (even higher than those of technical staff, because workers are members of unions), which creates jealousy among other people in the local community and reduces their participation in fire control activities.
- Rural people do not see themselves as partners in forest management and they do not believe that they derive any benefit from the revenues generated by forestry activities.
- The relation between rural people and forestry staff is based mainly on the personality of local forestry staff. The dictatorial behaviour of top-down forestry causes reactions and reduces participation. The local people make excuses to escape from their legal responsibilities regarding participation in fire suppression.
- Most fires occur during the harvesting season, when people do not like to leave their work to go to perform fire suppression, especially if it does not threaten their own settlement and agricultural areas.

Legal obligations are not producing the expected results. The Forestry Department is trying to carry out fire prevention and control activities through employing fire workers, who account for 79 percent of total fire prevention and control expenses. Under current economic conditions, it would not be realistic to expect the government to allocate the financial resources necessary for this purpose in the medium and/or long term.

The rural people actively participate in forest fire prevention and control when they, in some way or other, take part in forest management and derive benefits from the forests (i.e. have a vested interest in protecting the resource). As the forests are owned and managed by the state, rural people's participation in forest management is limited to local cases, with the exception of coppice management in which forest villagers take part actively. Coppice areas were not included in the case study, as they consist mainly of broadleaf trees (80 percent oak species) and have a low level of fire risk. Coppice areas could, however, provide a model that is transferable to other forested regions of Turkey.

During the study, community involvement in forest fire prevention, control and management was assessed in the Çal and Bergama Forest District Directorates, where local people participate actively in forest management. The results were compared with neighbouring Forest District Directorates under similar climatic and ecological conditions.

Çal case

The total area of Çal district is 387 000 ha, of which 106 000 ha is forested and consists primarily of black pine and Calabrian pine. The government has established a lease agreement on behalf of forest growers for a period of 49 years. Privately managed forests have a second degree risk of forest fire. Local people are well organized for managing the forestry plantation and have their own local leaders. They have very good relations with the local forestry administration. The people are alerted to forest fires through a municipality siren and intervene immediately, with their hand tools, before the Forestry Department requests assistance.

During discussions, local leaders stated that the Forestry Department should trust the local people and, rather than dictating, should play a guiding role in the development of community-based or private forestry activities. They also stated that the community's awareness level about the long-terms benefits of forests is generally low. They complained that the Forestry Department's training and extension activities on forest and fire management are insufficient and they are trying to solve this problem through their own efforts.

During the last ten years, the average number of fires per year is 8.0 with an average size of 2.4 ha each. Regarding the causes of fire, 5.9 percent of the total number of fires were caused by shepherds, 4.2 percent by agricultural burning, 12.1 percent were intentional, and 54.3 percent were caused by carelessness; the causes of 23.4 percent of fires were unknown. A comparison of Çal District's fire figures with those of neighbouring district directorates is given in Table 1.

Table 1: Çal district's average fire figures for the last ten years, compared with those of neighbouring district directorates

District Directorate	Average number of fires per year	Average area burnt per year (ha)	Number of fires per 100 000 ha	Area burnt per 100 000 ha
Çal	8	19	7	18
Uşak	36	128	20	70
Denizli	27	203	21	157
Afyon	13	44	7	25
Tavas	9	25	10	26
Acipayam	11	18	11	18

It can be concluded from Table 1 that the average number of fires and the average area burnt are lower in Çal district than in the neighbouring district directorates (which have similar climatic and ecological conditions). Smaller areas burnt per fire indicate that local people perform early intervention well. Fire figures for Çal district are well below national averages.

Bergama case

There are 107 000 ha of forested area in the Bergama district, of which 16 000 ha consist of stone pine stands. Stone pine farming in the region is a very good example of agro-silvipastoral systems. Of 16 villages, 13 are involved in pine seed production in the Kozak subdistrict.

Because the distances between trees are wide enough to allow plant growth, grazing is practised under the trees. As a result of cone collection, pruning and grazing, there is very little fuel accumulation in stone pine stands, and the height to live crown has increased significantly.



Afforestation campaign organised by villagers

Local people have very good relations with the local forestry administration. Villagers participate voluntarily in afforestation activities. Bergama Forest District Directorate produces 200 000 pine seedlings every year for distribution to poor or disadvantaged villagers. Villagers are well organized among themselves. The revenues from commonly owned pine stands are used to meet the village's expenses. As in the Çal case, villagers tend to be the first to intervene in fires, with their hand tools. As they know the region very well, villagers also guide firefighters to fires in remote locations.

Bergama district has a first degree risk of fire. According to the last ten years' statistics, there have been an average of 16 fires per year with an average size of 3.9 ha each. Of the total number of fires, 3.4 percent were caused by lightning, 4.7 percent by cigarettes, 10.8 were intentional, 12.2 percent were caused by shepherds, and 52.7 percent by carelessness; the causes of 16.2 percent of fires are unknown. Bergama district's fire figures are compared with those of neighbouring district directorates in Table 2.

Table 2: Bergama district's average fire figures for the last ten years, compared with those of neighbouring district directorates

District directorate	Average numbers of fires per year	Average area burnt per year (ha)	Number of fires per 100 000 ha	Area burnt per 100 000 ha
Bergama	16	62	15	56
Izmir	83	612	35	256
Manisa	36	155	20	88
Akhisar	31	193	21	132
Edremit	22	239	26	284
Balikesir	23	170	12	90

It can be concluded from Table 2 that the fire figures of Bergama district are better than those of neighbouring district directorates. Although the region has first degree fire risk, the average number of fires, the average burnt area and the average fire size are well below national statistics. Local people state that the number of fires has decreased considerably for the last three to four years. Another important point is that the number of intentional fires has decreased as the people have developed a sense of ownership in the forests (and their vested interest has increased).

Considering these two cases, the following recommendations can be made concerning rural people's participation in forest fire prevention and control:

- It is very important to mention that rural people are very proud. They like to be seen as partners in forest management and they require the Forestry Department's respect for their rights to the forests and forest resources. When they take part in forestry management and derive benefits from forests and forestry activities, they can undertake some of the Forestry Department's responsibilities regarding forest fire prevention, control and management. For example, people can be trained and organized as rural fire crews, which would be of great help in fire prevention and control. In this way, worker expenses (79 percent of current fire control costs) could be reduced considerably. As they know local geographical and climatic conditions better than outsiders, local people can also be very useful for guiding fire fighting teams.
- Although the Çal and Bergama cases have local characteristics, they can be used as a model for the improvement or development of community-based forest management practices, including a CBFiM component. Community-based forestry practices play a very important role in improving the relations between the forestry administration and local people and pave the way to participation. In this context, the Çal and Bergama cases are very good examples of how the active participation of local people can increase the success of forest fire prevention and control measures.
- Another important result of rural people's participation in CBFiM is the resulting low level of intentional fires compared with national statistics. The rate of intentional forest fires in Çal is 12.1 percent and in Bergama 10.8 percent, while the national average for the last ten years is 14 percent (not counting fires of unknown cause). Participation creates a type of self-initiated control among the community and prevents individual or selfish human activities.
- As the first intervention against fire is carried out by villagers without waiting for fire fighting teams to arrive, the total area burnt and the fire size are low compared with national statistics. Average fire sizes are 2.4 ha in Çal and 3.9 ha in Bergama, while the national average for the last ten years is 6.5 ha. This also shows the effectiveness of CBFiM.

CONCLUSION

Of the 1 000 forest fires that occur annually in Turkey, approximately 97 percent are caused by humans. Therefore, the emphasis in risk reduction should be placed on preventing human-induced forest fires. Although the fires are increasing in number, the total area burnt and the area burnt per fire are decreasing. From these figures, it can be concluded that fire detection and suppression are relatively effective. However, the costs of these activities are very high; in other words, these activities are not cost-effective and it is not clear whether the government will finance them in a continuous way in the future.



Public campaign on forest fire prevention organised by TEMA (national NGO)

The fact that the number of fires has increased indicates that fire prevention alone is not effective. Prevention measures are not corresponding to the economic and social conditions that prevail in the community. It can be added that post-fire assessments are not carried out properly. For these reasons, forest fire strategies for the future should concentrate on fire prevention in order to reduce the number of fires, fire hazards and fire control costs. Post-fire assessment should be carried out in a neutral and transparent forum with the participation of stakeholders, and new fire prevention and control strategies should be based on the assessments.

The first step in this process is to investigate the causes of fires and the driving factors of human activities. Once the causes are identified and classified, specific remedies should be planned accordingly. Research on the causes of human-induced fires and driving factors is very weak and statistics do not give a clear idea of the causes of fires. However, it can roughly be calculated that 70 percent of fires are the result of negligence and carelessness and 27 percent are caused by specific intentional activities. Of the fires caused by negligence and carelessness, approximately 10 percent are classified as accidental fires.

The fire suppression programme is effective in terms of total area burnt and average size of fire. This is primarily because of the large number of personnel and quantity of equipment that are deployed in the fire season. However, fire suppression costs are very high and it would be very difficult for the government to provide additional funds for this purpose. In order to develop a community-based fire suppression strategy and to reduce suppression costs, the following approaches and actions should be integrated into the fire management programme:

- Rural people living in villages and towns are legally responsible for participating in fire detection and fire suppression. However, they often react against this legal obligation for several reasons. Participation of the rural community in fire control is based largely on forest management approaches, so activities in the short term should be based on improving forest–village relations and income-generating activities. In the medium and long terms, participatory integrated mechanisms for joint forest management, including fire issues, should be developed and implemented. Regarding fire detection and suppression, the local people can play a very important role because they live in or near forest areas. Rural people can be trained and organized as rural fire crews and can be a great help in fire control. Through this involvement of local people, worker expenses (accounting for 79 percent of total fire prevention and control expenses) could be reduced considerably. Teams could be trained and equipped by the Forestry Department and payment could be made to the village fund for the common expenses of the village community. The strategy could be implemented in pilot areas such as Çal and Bergama, where there is active participation of the local people.
- As they know the local geographical and climatic conditions, local people can also be very useful in guiding fire fighting teams.

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