

Community Based Wildfire Management in India

Durgadas Mukhopadhyay

Abstract

In spite of high technology and plentiful research, there are increasing numbers of large and severe wildfires, lengthened wildfire seasons and significant increase in area burnt and property lost. The community is the ultimate sufferer and they should devise ways and means of fighting wildland fire and introduce efficient fire and fuel management.

CBFiM is a type of land and forest management in which a locally resident community has substantial involvement in deciding the objectives and practices involved in preventing, controlling or utilising fires. Community based forest fire management is a type of land and forest management in which a locally resident community has substantial involvement in deciding the objectives and practices in preventing, controlling and utilising fires.

India is one of the pioneering countries in the world where forest management regimes stressing on partnerships between the state forest departments and the local communities, generically known as Joint Forest Management (JFM) have been introduced. In addition to the JFM promoted by the Forest Department, there is also a grass roots forest protection movement in the country. There are traditional Community forest organizations known as Van Panchayat which had been functioning in Uttaranchal for more than hundred years. There is need for rejuvenating such community organizations like Van Panchayat and Sacred Groves in different parts of India. (Mukhopadhyay :2003).

Recent research is clarifying the importance of climate variability and change in determining the patterns of fire across wide regions. The agencies should work with communities to support community preparedness; planning, landscaping and construction that will lesson the likelihood of damage when fires do occur.(Hubbard:2006). Communities with stake in forests would be sufficiently motivated to prevent and control forest fires if their livelihood and subsistence needs are met. Innovative community-based fire and fuel management would have long-term impact on ecology, forestry and environment.

Introduction

The total geographic area of the India is 328.7 million ha. out of which the recorded forest cover is 76.50 million ha. The forest cover constitutes 23.4% of the total geographic area of the nation. As per the latest state of forests report of the Forest Survey of India (FSI 1997), the actual forest cover exists only over 19.27% of the geographic area (63.3 million ha) out of which only 38 million ha of forests are well stocked (crown density >40%).

Forest fires are a major cause of degradation of India's forests. While statistical data on fire loss are weak, it is estimated that the proportion of forest areas prone to forest fires annually ranges from 33% in some states to over 90% in others. About 90% of the forest fires in India are started by humans. Forest Fires cause wide ranging adverse ecological, economic and social impacts. The impacts of forest fires are

Loss of valuable timber resources and depletion of carbon sink

Degradation of water catchment areas resulting in loss of water

- Loss of biodiversity
- Loss of wild life habitat and depletion of wild life
- Loss of natural regeneration and reduction in forest cover and production
- Global warming resulting in rising temperature
- Loss of carbon sink resource and increase in percentage of CO₂ in the atmosphere
- Change in micro climate of the area making it unhealthy living conditions
- Soil erosion affecting productivity of soils and production
- Ozone layer depletion
- Health problems leading to diseases

The indirect effects on agricultural production are :Loss of livelihood for the tribals as approximately 84 million people are classified as tribals who directly depend upon collection of non-timber forest products from the forest areas for their livelihood.

Wildfire Management

During the last few years, there has been quite a lot of discussion about what is now referred to as Community-Based Fire Management (CBFiM). The term has been used to describe such a wide variety of different ways in which communities are involved in fire management, that it is difficult to make any systematic

comparisons or generalisations (Moore:2003). A definition should be precise enough to enable us to make useful generalisations about somewhat similar things, while being flexible enough to accommodate a variety of approaches, a definition based on essential features.

The definition proposed in recent work (Ganz et al 2003) is:

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

Community based forest fire management is a type of land and forest management in which a locally resident community (with or without the collaboration of other stakeholders) has substantial involvement in deciding the objectives and practices in preventing, controlling and utilising fires. The essential feature of the definition is that it takes seriously the idea of fire management being *community-based*. It does not include situations where people simply carry out paid work for a fire control agency or another agency outside the community. In this approach to the management of fire in the landscape rests on communities in decision-making roles for the application and control of fire. Forest community responsible for forest fire management can act as guard against man made causes of forest fire where forest fire is used as a means of increasing soil fertility and to get excess fuel and fodder after the harvest season.

Based on in-depth interview and participatory research with the community living on the forest resources the data derived suggest remedial strategies in the occurrence of forest fire and management of resources. Local scale fire management where traditional or indigenous knowledge plays the major role in informing and undertaking fire management, which is also planned, conducted and controlled by local people. Livelihoods and maintaining the landscape are probably key to this node of CBFiM. The practices of Australian aborigines are an example of this node of CBFiM (Moore:2003).

Joint Forest Management

India is one of the pioneering countries in the world where forest management regimes stressing on partnerships between the state forest departments and the local communities, generically known as Joint Forest Management (JFM) have been introduced. The driving force behind this path-breaking initiative is the National Forest Policy of 1988. Conservation and meeting local community needs have been made the main objectives of forest management, and have been accorded much higher priority than revenue generation through commercial exploitation. JFM is a forest management strategy under which the Forest Department and the village community enter into an agreement to jointly protect and manage forest land adjoining villages and to share responsibilities and benefits. The village community is represented through an institution specifically formed for the purpose. This institution is known by different names in different states (e.g. Vana Samaraksha Samitis in Andhra Pradesh and Hill Resource Management Societies in Haryana) but most commonly referred to as Forest Protection Committee or FPC. JFM is an outcome of the realisation that active and willing participation of the forest fringe communities is necessary for any forest regeneration and forest protection programmes to succeed.

Further, village communities would have little incentive to participate unless they benefit directly and have sufficient authority to be effective.

In addition to the JFM promoted by the Forest Department, there is also a grass roots forest protection movement in the country. There are several villages that have started protecting forest patches adjoining their villages on their own without any outside help or advice. These are commonly referred to as Self-Initiated Forest Protection Groups or SIFPGs. The movement is especially strong in Orissa and South Bihar and Uttaranchal. There are traditional Community forest organizations known as Van Panchayat which had been functioning in Uttaranchal for more than hundred years. There is need for rejuvenating such community organizations like Van Panchayat and Sacred Groves in different parts of India. (Mukhopadhyay :2003) According to one estimate, thousands of village groups are regenerating an estimated 800,000 hectares of forests in the eastern States of Orissa and Bihar and, on a smaller scale, in Gujarat , Rajasthan, Karnataka, Madhya Pradesh and Andhra Pradesh

Community Involvement

Community involvement in fire management that involves a range of local actors, including agencies and NGOs, that work on fire management. Livelihoods dependence, some traditional practice and community institutions may be characteristics. Elements needing support may include; analysis of the fire problem, technical capacity, regulatory framework or logistical assistance. Volunteers from the community, perhaps with agency involvement, conduct fire management on behalf of the community across private and public lands. Volunteer Bushfire Brigades in Australia are an example of this. There is perhaps very little direct involvement of local people in the rural landscape and livelihood dependence on lands or forests is low.

The statistics on forest fire damage are very poor in India. In the absence of proper data, it is difficult to arrive at the accurate losses from the forest fires. Moreover, the losses from fires in respect of changes in biodiversity, carbons sequestration capability, soil moisture and nutrient losses etc. can not be measured .But, they are very significant from the point of view of ecological stability and environmental conservation. To a certain extent, the loss due to forest fires can be estimated based on the inventories made by the FSI as reported in the state of forest report 1995 and subsequent field observations conducted by them. Much of the data available does not reflect the ground situation and is grossly under reported. The total reported loss from the states of the union is around Rs 35 crores (US\$ 7.3 million) annually (Bahuguna:2001).

Most of forest fires in India are man-made and the main causes of fire are:

- Deforestation activities: conversion of forestland to agriculture, pasture development etc.
- Traditional slash and burn or shifting agriculture

- Setting of fires in forests by villagers for getting fresh blade of grass, fodder etc. Fires set for the purpose of collection of honey, Sal (*Shorea robusta*) seeds, flowers of Mahua (*Madhuca indica*) etc.
- Fire caused by negligence

Community level Initiatives

The goal of any disaster management initiative is to build a disaster resistant/resilient community equipped with safer living and sustainable livelihoods to serve its own development purposes. The community is also the first responder in any disaster situation, thereby emphasizing the need for community level initiatives in managing disasters. To encourage such initiatives, the following are required:

- (a) Creating awareness through disaster education and training and information dissemination are necessary steps for empowering the community to cope with disasters.
- (b) A community based approach followed by most NGOs and Community Based Organisations (CBOs) should be incorporated in the disaster management system as an effective vehicle of community participation.
- (c) Within a vulnerable community, there exist groups that are more vulnerable like women and children, aged and infirm and physically challenged people who need special care and attention especially during disaster situations. Efforts are required for identifying such vulnerable groups and providing special assistance in terms of evacuation, relief, aid and medical attention to them in disaster situations. Disaster reduction form the basis for educating people, formulating policies and undertaking activities that contribute to protecting the livelihoods, material property and environments. But women are important agents for social and economic change. Recognizing and mobilizing their skills and capacities as social force in the safety of the communities is a major task in any disaster reduction strategy.

Women are active throughout the disaster cycle mitigation, planning/preparedness, emergency (response and recovery)) although their activities may remain in the invisible or undervalued and often located in the informal rather than the formal disaster management domains. Women's active contribution to disaster prevention and management has yet to receive all recognition or, indeed, acceptance in the professional circles.

Women already play a valid but often unrecognized role during disasters or that they will be able to do so when their potential is unleashed through proper recognition, training, and involvement in disaster work. A better understanding of women's role in and contribution to disaster prevention and mitigation lies in a construction and integration of the two positions. Irrespective of disaster, women's strengths and abilities often cannot be mobilized or maximized due to the social and other constraints they face. The burden of keeping the family together and alive rests disproportionately on women's shoulders and their organization and reconstruction work are usually not understood, recognized, or incorporated into disaster mitigation strategies as fully as they should be. Women are used to coping in deplorable circumstances and this ability is of special use in disaster and post-disaster situations.

The women fire users, know very well that fire outbreaks threaten the very resources they need for survival in addition also their housing, children and elderly people. In the baseline study in Mozambique 17 % of women said that their crop had burned during the last year and 16% that their house had burned down; all in all 39% of women confirmed that their house had burned down one time or the other. Out of men 48% and out of women 36% confirmed that they had experienced losses due to wildfires encroaching into their land (Moore:2002)

Local communities must establish fire management systems at village, sub-district and district levels. Such management systems aim to reduce the frequency of uncontrolled fires, encompassing both prevention and control methods. Communities need to be strongly supported by private companies and government agencies. With co-operative agreements, it is essential that neighbouring partners co-operate and co-ordinate to protect their areas from fire.(Goldammer:1993)

A prime need is to bring together villagers, NGO's and government agencies at the local level to prepare the ground for joint development of fire protection initiatives. District level fire crews are the foundation of any future system and must be formed, trained and equipped. Fire prevention is preferable to later fire control, thus fire prevention and pre-suppression procedures are considered paramount. Crew safety and the necessity for protective clothing and first-aid must be stressed. Training is continuing in the choice and use of equipment to suppress vegetation fires, and in basic fighting tactics. Field experience has shown the necessity to keep equipment simple, compatible and adaptable. (Goldammer et.al :2003)

In poor countries the use of fire is mainly about the lack of economic choice and alternatives. The implication for fire management of women handling most of the fire activity is strong.

- To inform and educate the rural population, commercial farm communities and the general public in the role of forests and its contribution to the national economy. Numerous are still the people who see the forest as merely a source of income for timber and non-wood forest products.
- To inform and educate the public about adverse environmental and economic effects of bush encroachment on commercial farming communities.
- Encourage the formation of Fire Protection Associations in commercial farming areas and Fire Committees in communal areas.
- Encourage NGO's, CBO's and private initiatives regarding forest extension and law abiding activities.
- Encourage civic organizations, religious organizations, womens groups, listener-reader-viewer groups, conservation groups, handicraft producers, local artists and environmental organizations to upgrade their understanding and appreciation of forests.
- Enhance the role of civic organizations in motivating community participation in forest protection activities including fire prevention and suppression.

CBFiM is anchored in community level influence, if not control, of fire management decision-making. The active, intentional use of fire is an important factor in many, perhaps most, communities especially in developing nations. The initial focus for CBFiM should be on improving skills in the use of deliberate fires, incorporating key aspects of gender, community institutions and appropriate

Control of Forest fire

It is however recognized that fire prevention is preferable to later fire control. For fire prevention and pre-suppression, subjects covered include the access roads, firebreaks and fuelbreaks, water supplies and lookout towers. They are readily defensible zones around an area to be protected. The breaks will not in themselves stop a fire from entering a protection area but they do provide a site from which to more easily stop an advancing fire. Fuelbreaks can be planted with merchantable timber if the species are fast growing and form a dense canopy under which grasses and other flammable species are quickly shaded out. They require regular cleaning prior to and during the dry season. A reasonable network of access roads exists within the forest, built to serve villages or to allow commercial exploitation. Roads are absent within the coastal wetlands of Indonesia but access rivers are numerous and there is an extensive system of canals dug for failed drainage schemes. Logging concessions use also light railway systems with moveable tracks that lead into the areas being logged. Access roads, canals and railways are an important part of the fire prevention plan. Easy access is essential to allow patrolling, early detection and, to arrive as quickly as possible at a fire strategy.

Firebreaks are a bulldozer-made discontinuity in a bed of fuel and are used to segregate, stop and control the spread of fire; or to provide a control line from which to suppress a fire. Firebreaks differ from fuelbreaks in that they have a complete lack of combustibles down to mineral soil. Firebreaks are best constructed in strategic locations while not under pressure during the wet season rather than as a hasty necessity as a fire approaches. Water has a high capacity to absorb heat and is therefore a very efficient agent to extinguish forest fires. Ready supplies from rivers, lakes or dams are needed to fill tanks, trucks and sources for pumps as well as for use in camp. Quantity and the accessibility are points to consider. The installation of man made sources and access are a part of fire management planning where natural sources of water are limited. Lookout towers are a way of providing early warning of fire occurrence. They are permanently manned during times of high fire risk. Towers are useful in conservation forest and plantations where the area to be protected remains unchanged from year to year. Towers should be built on hill top sites to increase the area of view (Darlong:2002)

In India, Joint Forest Management (JFM) assumes an important role in fire prevention and control. JFM has been a significant development in the context of institutional arrangements pertaining to forest management in India. The effective involvement of local communities in evolving sustainable forest management systems was looked upon as an important approach to address the long-standing problems of deforestation and land degradation in India. At present about 36,130 forest protection committees are protecting about 10.25 million ha of forest area in the country. These committees operational in various states are assisting the forest department in forest protection (including fire prevention and control) and management, though the extent of participation and contribution to efforts varies.

A very definitive lesson and pre-requisite for community based approach to fire management, which emerges out of the JFM experience in forest protection, is that the for communities with stake in forests would be sufficiently motivated to prevent and control forest fires if their livelihood and subsistence needs are met. The JFM program is an example of a participatory approach in which people co-operate

with forest department in forest protection in return for economic benefits. The community based fire management has to rely extremely on the positive relationship between the people in the rural space and their forest. Mutual confidence and public support has to be created by participatory approaches e.g. incentives, income generation activities, involvement in production enterprises etc. for involvement of communities in fire prevention and control (Goldammer 2001)

Within the village forest protection committees (VFCs) in JFM villages, interestingly it was observed that the assurance of economic incentives in the form of fuelwood, fodder or non timber forest produce etc. need not be the sole factor which motivated the communities to protect the forests from fire. The JFM experience across the states has clearly brought out that the community involvement can play an important role in minimising the damage caused by forest fires. However it needs to be emphasised that community participation in fire prevention is not an end in itself. Proper planning is imperative for fire prevention.

Awareness and Education

Awareness should be generated through local and folk media. In India 70% of the population live in rural areas. Folk art is functional and spontaneous. Every activity in the village has its relevant music, dance or theatre. The folk performing art is making it functionally relevant for education and awareness generation in the society. A discourse by the local saint Murari Bapu can change the attitude and mindset of a million people. A Baul singer can motivate thousands in taking preventive actions in case of drought, flood and forest fire.

Over the years, a huge propaganda machinery has been assembled by the government. It is linked with All India Radio, Doordarshan and Audio-visual publicity to generate thousand of meters of celluloid, video and audio tapes, TV and radio fillers, full length documentaries, soap opera and millions of reams of paper. But neither it is cost-effective nor it has reached the desired population. Oral tradition survives in a particular society only because it fulfill some social functions. There are many diverse functions of oral tradition in folk societies. These may be broadly grouped into the functions of recreation or amusement, education, socialization, social control, pretest, propaganda media, communication of new ideas, knowledge and values.

Puppetry is an indigenous theatre form of India. From time immemorial, it has been a popular and appreciated form of entertainment in rural India. The stylized vocabulary of puppet theatre in India carries a relevant message of social awareness, historical and traditional identity and moral value system in disaster. Puppet theatre is fully integrated in the ritual observances and the social milieu of the masses in India.

Women are important carrier of oral tradition. Madhubani painting of Bihar and pad of Rajasthan are complete audio-visual communication structure, perpetuated by women in the rural areas of India. Secular themes and messages are interpolated easily into these ritual performances. Calenderic annual festivals are celebrated with the telling of particular type of tales and the singing of special songs. Putting riddles to each other is still a favorite pastime. Large crowds assemble to listen to the singing of epic-lays and even now one can find female singers of epic-lays or *kathas* who instantly compose narrative poetry intermingling religious and

secular traditions during drought, earthquakes and flood. The oral tradition is not static. It is changing its structure continuously responding to and incorporating the influences of industrialization and modernisation. By using folk media rural people can be educated about the utility of forest and the need for protecting the damage caused by forest fire. Through the personalized folk media villagers can be motivated in preventing and in reducing the occurrences of forest fires in the rural and mountain areas of India.

Conclusion

The challenge is to go beyond the study of the impact of disaster, the emergency phase, and look into the role of community to cope with risk and reduce vulnerability, through capacity building, education and awareness. In the first place, development and sectoral research need to be reviewed to identify gaps and constraints to community involvement in disaster management and risk reduction.

Community based fire control not only ensures environmental safety and resource management but brings community well-being and healthy society as well. Forest in Uttaranchal in India is degrading day by day with high incidence of 'forest fire' and preventing development activity in the local community. Local Self Government (Village Panchayats), community and other stakeholders jointly should shoulder the responsibility of action, planning and managing forest resources creating opportunities and participation of the community. Proper incentive and delegation of power and authority may work better in forest fire management. Community based forest fire management would involve-

- Planning at village, GP, Block and District levels
 - Identifying and training key local volunteers
 - Village level vulnerability and risk mapping
- Village level preparedness and contingency plan of use of deliberate fires
- Disaster Management task force at village level
 - Skill training and drills in emergency response in case of forest fire

The basic strategy for forest and pasture management should have strategic plans for fuel and grazing facility for the local community. The joint forest management projects in India try to develop forest area and plant growth by involving the community as a stakeholder in forest fire management.

References

- Bahuguna, V.K., & Singh, S. (2001). The forest fire situation in India. *International Forest Fire News* No. 26: 23-27.
- Darlong, V. 2002. Traditional community-based fire management among the Mizo shifting cultivators in Mizoram in Northeast India. in "Communities in Flames: Proceedings of an international conference on community involvement in fire management (P.F. Moore, D. Ganz, L.C. Tan, T. Enters, and P.B. Durst, eds.), 119-124. FAO & Project FireFight South East Asia, RAP Publication 2002/25.
- Everett, Y. 2001. Community participation in fire management planning: a case from California, USA. In: *Communities in Flames: Proceedings of an international conference on community involvement in fire management (P.F. Moore, D. Ganz, L.C. Tan, T. Enters, and P.B. Durst, eds.), 125-133. FAO & Project FireFight South East Asia, RAP Publication 2002/25.*

Session No.2—Community Based—Mukhopadhyay

- FAO (2003) Case Studies of Community Based Fire Management. FAO, Rome.
GTZ Integrated Forest Fire Management Project, Samarinda, East Kalimantan, Indonesia:
<http://www.iffm.org>
- Goldammer, J. (1993). Long-term national integrated forest fire management programme initiated at Bandung. *International Forest Fire News* No. 8: 9-12.
- Goldammer, J.G. & de Ronde, C. (eds.). (2001). Fire management handbook for Sub Sahara Africa. SPB Acad. Publ., The Hague, The Netherlands.
- Jurvélius, M. 2001. National Guidelines on Forest Fire Management in Namibia. *Int. Forest Fire News* No. 25, 73-102.
- Moore, P.F., D. Ganz, L.C. Tan , T. Enters, and P.B. Durst (eds.). 2002. Communities in Flames: Proceedings of an international conference on community involvement in fire management. FAO & Project FireFight South East Asia, RAP Publication 2002/25.
- Moore, P.F. 2003, Position Paper 5, Global Fire Summit, Sydney 2003
- Mukhopadhyay, Durgadas, 2003 “Management of Forest Fire In India” Paper presented in the ICSSR Conference on Disaster Management, New Delhi
- Mukhopadhyay, Durgadas 2003 “Forest Fire in Uttaranchal” in Economic and Political Weekly, Mumbai
- Mukhopadhyay ,Durgadas 2006, ICSSR project on “Annotated Bibliography of Disaster Management in India”, New Delhi
- Mukhopadhyay, Durgadas, 2000, Report on “Forestry and Tribals”, Ministry of Environment and Forest, Government of India, New Delhi.
- Mukhopadhyay, Durgadas , 2006 “Causes, Impact and Control of Forest Fire in India” Paper presented in the International Disaster Reduction Conference “ in Davos, Switzerland
- Mukhopadhyay, Durgadas 2005, Proceedings of the Training Course on “Management of Forest Fire” Ministry of Environment and Forest ,Government of India, New Delhi
- NFFP (Namibia-Finland Forestry Programme). 2000. Progress Report
- Wingard, J.R. & Moody, W. (2000). Integrated fire management: the Mongolia experience. *International Forest Fire News* No. 23: 16-21

...