Plan of Action for Strengthening the Forest Fire Management System in India

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Abstract

Forest fire is a major cause of injury and loss to forests. In most of the cases forest fires are caused by human beings. In the present day context forest fire is said to have developed a dangerous relationship with the global warming by adding Green House Gases. In the present paper an attempt has been made to identify the key gaps in forest fire management through analysis of secondary as well as primary information collected from various stakeholders. A comprehensive action plan, incorporating various issues to fill the gaps has been suggested to capacitate forest departments at national, regional and local levels for making forest fire management system more effective and reducing the vulnerability of the Indian forest to fires. The plan discusses in brief various strategic areas, which need to be strengthened to make the forest department at various levels more capable of dealing with the menace of forest fire in the country. The plan gives an idea about the gaps, the goal and the strategy to be adopted to fill the gap. The plan has been developed through an interactive consultation process with a variety of key stakeholders on forest fire management within and outside of forest department.

Keywords: *Forest fire, Forest department, Forest fire management, Green House Gases*

Introduction

Forest fire is a major cause of injury and loss to forests. With the population increase, the frequency and subsequent damage of the forest fire is increasing day by day. The impact of the fire is diverse on the forest ecosystem. Besides directly damaging the forest trees, the fire also affects forest regeneration, microclimate, soil erosion, and wild life etc. adversely. In most of the cases, the forest fire causes retrogression of forest vegetation. Forest fire is one of the major degenerating factors, which extensively damages the growing stock and its generations and making area vulnerable to erosion. It has wide-ranging adverse ecological, economic and social implications. In most of the cases forest fires are caused by human beings, especially to promote new flush of grasses, collection of minor forest produce or to prepare land for shifting

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cultivation. While statistical data on fire loss in India are very weak, it is estimated that the proportion of the forest areas prone to forest fire annually ranges from 33 percent to over 90 percent in different states.

The 'disaster' brought by fire is though usually very small in geographical scales, yet its effects can spell devastation. In general there is a lack of concern about the detrimental impact of forest fire on society, mainly because the direct loss in term of human lives loss, property damage (house building, infrastructures etc.) is not much in comparison to other natural disasters like flood, cyclones, tsunami etc. However, if viewed in term of intangible impact of forest fire, it is much more than that of other common disasters. The intangible loss due to forest fire include impact on biodiversity, damage to watershed services, loss of soil fertility, increase in soil erosion and landslides etc. In the present day context forest fire is said to have developed a dangerous relationship with the global warming by adding Green house Gases. Albeit, the direct loss due to forest fire may not be much evident in economic term, its long term impacts, mainly on environment are more devastating and need sincere efforts to manage forest fires in more effective manner.

Forest fire management in India has to deliberately set to gain specific ecosystem services as a tool to reduce degradation as perceived by the beneficiary of these services, while on the other hand, the same fires may be considered by foresters, ecologists, and forest managers, to cause forest degradation. The approach of Integrated Forest Fire Management (IFFM) referred also as Community-based Forest Fire Management (CBFFM), is based on the assumption that communities can successfully incorporate fire usage into sustainable land use and vegetation management systems. According to the Indian Forest Act of 1927, setting fires is a punishable offence and it is mandatory for all forest dwellers to assist in the prevention of fire. The National Forest Policy of 1988 has the same spirit although it lays greater emphasis on the use of modern fire prevention tools while continuing to stress the involvement of local communities including Panchayati Raj Institutions, youth and women of remote particularly adivasi areas residing close to forests, who can be helpful in the prevention of fires. The present study is an attempt to fill the gaps and strengthen the existing forest fire management system by implementing a comprehensive plan of action based on identified key gaps at various levels in the country.

Managing Forest Fire: the Key Gaps

The key gaps in Forest Fire Management (FFM) have been identified through analysis of secondary as well as primary information collected from various stakeholders i.e. forest officials, policy makers and implementers, district and local level

administrative officials and staff, NGOs and CBOs representatives, and community through interaction, meetings, workshops etc. are enlisted as –

- Lack of appropriate policy and planning to tackle forest fire- Existing forest policy and other documents, including plans etc. lack clear cut guidelines for effective forest fire management.
- Lack of proper Institutional mechanism: In general forest fire management-related work in the country is carried out by the forest department along with other activities. There is no separate wing in the department, even in very fire prone regions to look after the forest fire.
- Emphasis on response only: In general response to forest fire is the main concern of forest department. Very less or casual importance is given to other issues i.e. mitigation, preparedness, human resource development, providing scientific input, awareness generation.
- Lack of proper Hazard Risk Vulnerability Assessment (HRVA) study: There is rarely any systematic hazard, risk, vulnerability analysis done in respect of forest fires in the country.
- Lack of funding: In general there is no provision for separate budget for forest fire management at state level. Forest fire management activities in general are carried out using forest protection fund. The State Forest Departments are being financially supported under Centrally Supported Schemes rationalised by the Ministry of Environment & Forests time to time and recently during 2012-13, however this allocation is not sufficient to meet the challenges
- Not many initiatives to involve local community: The local community may play significant role in forest fire management, however, except in few states, there is not much sincere effort in this regard.
- Poor response to Human Resource Development (HRD) and other capacity building initiatives: The officials and other staff of the forest departments in most of the cases are not trained and have little knowledge about forest fire and its behaviour. The forest department training institutes are also not well equipped to provide training in the field of forest fire management. Though forest fire has been included in the list of disasters (HPC, 2002), it is however, not being given due consideration in the training programmes being conducted by various disaster management training institutes at national and regional levels.
- Lack of proper contingency plan and rehearsal/ drills for fire suppression: There is need to develop a proper contingency plan at beat level and update it every year before the fire season.

- Poor early warning system: In the recent past there have been many developments in the field of early detection of forest fire using various indicators and disseminating the information received to the field staff to take quick possible action. However, the techniques and methodology used by most of the forest departments are not showing many changes and still using the traditional methods to detect fires and disseminate information at field levels. There is urgent need to revitalise the system using modern techniques and train the field staff to use them more effectively.
- Lack of preventive and preparedness measures to ensure better response: Preparedness activities like clearing fire lines, removing the fuel (dead wood, leaves etc.), recruiting forest fire watchers, making the equipment ready to use, rehearsal and drill practices, reuniting fire protection committees etc. are essential to prevent and get prepared for an any forest fire incident. But in general these issues are not taken seriously leading to frequent fire accidents.
- Lack of coordination: The coordination of forest department with other agencies, whose support may be very important in forest fire management, is very poor. The sharing of information is minimal, causing huge gaps in knowledge sharing and using knowledge available for better forest fire management planning. There is no proper coordination among research institutes in forestry sector and the service provider. Similar situation exists for the data generating institutes and the user groups. The meteorological, forest and disaster management departments may play significant role in forest fire management; however, the forest department coordination with these departments and their regional and local level offices is very poor; which prevents eliciting valuable support in detecting/ identifying forest fire and its suppression.

Plan of Action

Forest fire management in India is the mandate of the forest department, therefore it is imperative that forest department be capacitated at national, regional and local levels for making forest fire management system more effective and reducing the vulnerability of the Indian forest to fires. This needs a comprehensive action plan, incorporating various issues mentioned in the preceding text. With this background a Plan of Action for Forest Departments has been developed. The plan briefed in the succeeding text in discusses various strategic areas, which need to be strengthened to make the forest department at various levels more capable in dealing the menace of forest fire in the country. The plan gives an idea about the gaps, the goal and the

strategy to be adopted to fill the gap and make the department more effective in dealing with forest fire.

The plan has been developed through an interactive consultation process with a variety of key stakeholders on forest fire management within and outside of forest department.

Objective and purpose: The objective of the plan is to strengthen forest fire prevention, preparedness and response mechanism within the forest departments at various levels to deal forest fire more effectively.

The plan of action will be used to–

- Provide Forest Department with a framework to strengthen skills and increase capacities for FFM, enabling it to play effectively the role of a service provider in times of need;
- Upgrade Forest personnel's services to manage forest fire and reduce the risk;
- Contribute to better coordination between key stakeholders at different levels, and in particular at local levels; and
- Provide a framework within which to report performance and success.

Principles and philosophy: The plan is designed on the vision of the Government of India policy statement on Forest Fire Resolution No.13/52-F, dated the 12th May 1952, as well as New Forest policy, 1988 Resolution No. No. 3-1/86-FP, dated the 7th December 1988. Within this context the Plan of Action:

- Considers Forest Fire management as an integral component of forest management planning,
- Proposes to build on what already exists and strengthen it in respect of Forest Fire Management i.e. to upgrade the existing capacity of forest department in context of forest fire management,
- Counts on partnerships with other stakeholders, including National and State Government line departments, GOs, NGOs and CBOs, based on complementarities and mutual comparative advantages,
- Promotes the development of high professionalism in Forest department on forest fire management and
- Defines forest dwellers and other community and also country as a whole the ultimate beneficiaries.

Thrust areas proposed for forest department interventions

To strengthen Forest Department in respect of Forest Fire Management, the identified main result areas (MRA) are as follows:

1. Institutional Setup for Forest Fire Management within the Forest Department at various levels
2. Policy frameworks for Forest fire management
3. Capacity building and awareness creation
4. Technical options for forest fire management
5. Collaboration and coordination
6. Strengthen Early Warning System

Institutional Setup for Forest Fire Management within the Forest Department at various levels

Gaps to be Addressed: At present there is no specific entity mandated within Forest Department to be responsible for fire risk reduction. The new role of Forest Department in FFM requires a well defined institutional set up, partnerships and networks.

Goal: Ensure efficient institutional mechanism within Forest Department at various levels covering all aspects of FFM and coordinating with other stakeholders and role players.

Proposed Strategies: What needs to be done?

- Institutionalise capacities for FFM in forest department
- Develop a well defined institutional framework within forest department at national and state levels
- Identify duties and responsibilities of various role players in the newly developed framework

Proposed Institutional Framework

Keeping in view the severity of forest fire, the existing organisational structure, both at central and state level seems to be unsatisfactory. At present, the Forest Protection Division, headed by Inspector General (IG) level officer looks after the forest fire management work at national level. It is required that for an effective dealing, a

separate division is to be established for forest fire management, which exclusively can address this issue. Air Operation Wing, which has been wrapped up long back, may again be operated to tackle any unforeseen severe forest fire as of 1995 in Uttar Pradesh and Himachal Pradesh. Establishing such wing, though a costly affair, may also be used for regular forest surveys and other associated activities. The wing is to be established at par with international standard to face any type of mishappening. The air craft or helicopters of the wing may also be utilised during other types of disasters like flood, earthquake etc. and may be very useful in supplying relief and rescue team without wasting time.

The Ministry of Environment & Forest has regional offices, which act as coordinating offices with the state forest departments. These offices may be used to regulate forest fire management activities and for this a separate wing may be established exclusively to look after forest fire.

At State level, the forest fire management operations are looked after by regular forest staff, which is already over burdened. It will be appropriate, if a separate wing is established at state forest headquarter, headed by Chief Conservator of Forest level officer. This wing may work in collaboration with central level unit and provide all types of guidance, supervision etc. to all forest divisions of the state regarding forest fire management. In the lean period, the wing may work on data compilation, preparedness and mitigation measures. Training programmes for forest officials in fire fighting may also be organised at training schools. Sufficient fund provision is to be made for research and development and suitable projects may be sanctioned to state level research institutions to establish a strong data-base. The wing in collaboration with publicity division of the forest department may carry out effective awareness generation programmes among community through various Information, Education and Communication (IEC) materials. In sensitive areas, Forest Fire Protection Committees may be established ensuring community participation. During forest fire situation, this wing may work as Emergency Operation Centre (EOC) equipped with all communication and other facilities and may supervise and guide suppression work. In the case of severe fire conditions, necessary assistance may be sought from central level too, if required.

Depending upon the severity of the situation, similar arrangements may be made at Divisional level too. In fire-prone divisions, a range office or Assistant Conservator of Forest (ACF) level officer may be deputed to look after all forest fire related activities of the division under the overall supervision of Divisional Forest Officer.

Policy framework

Gaps to be addressed

The present policy/planning documents do not give due consideration to Forest Fire Management. Revised key policy documents need to incorporate clear guidance about Forest Department and other stakeholders' role and contribution to FFM.

Goal

Revised policy and planning framework includes FFM in more comprehensive and systematic manner.

Proposed strategies

- Incorporate FFM issues in existing policy and planning documents in more systematic way: Though National Forest Policy 1988 is in place, yet there is need to incorporate clear cut guidelines and responsibilities of different role players to capacitate forest department and other stakeholders to manage forest fire in more systematic manner.
- Develop/update forest fire manuals for field staff for guiding them in simple way, to detects report about and suppress forest fire and handle related issues.
- Incorporate FFM issues into other national/regional/local level Disaster Risk Management programmes.
- The approach to fire management at the policy level runs counter to the approach to fire management at the level of local, forest-dependent communities. The approach to fire management at the policy level also runs counter to the possibility that some ecosystems may have evolved with fire as a natural disturbance, and that fire is an essential component in dynamics of ecosystem. The mismatch between the policy level and local level approaches to fire management is likely to exist so long as there are people who directly depend on forests for their livelihoods.

Though legal and policy framework exist in favour of fire protection, there is need to strengthen and make it more practical and implementable. Existing acts though quite effective in forest and wild life conservation, do not give specific attention to forest fire management. Since in more than 90 percent cases forest fire is a human-induced phenomenon, there is urgent need that some special Act be formulated and enacted to provide appropriate legal frame-work at national and state level both. Such Forest

Fire Prevention Act will also strengthen the forest department in controlling and checking the illegal activities within or near the forest, leading to severe forest fires.

Subject to the enactment of suitable legislation, it is also necessary to evolve detailed regulations to help in enforcement of the law. The existing codes/regulation/laws related to forest / wildlife protection and preservation are to be reviewed and suitable mechanism be evolved for their effective enforcement.

Knowledge management, capacity building and awareness generation

Gaps to be Addressed

The knowledge of Forest staff about FFM and the operational skills needed to implement fire prevention, preparedness and suppression activities needs to be updated and upgraded. Therefore, awareness creation and capacity building on FFM are keys. There is also a lack of knowledge and awareness about FFM at the community level. Forest department can play a crucial role in creating awareness and translating FFM policies into concrete action.

Goal: Use knowledge and training to build a culture of innovation, safety and resilience, and institutionalise training on FFM for Forest Department, other role players and also at community levels.

Proposed strategies

Enhance and maintain Forest fire specific data base and enlist good practices: Forest fire specific data is very limited and if available, not very reliable. For most of the states, forest fire database is either not available and if available is very sketchy. This prevents in designing an appropriate forest fire management planning and to make necessary resources available to deal the problem effectively. There is need to use modern scientific technique to collect, compile and document forest fire-related data. To prepare an effective strategy for forest fire management, it will be of immense significance that a robust and sound information data base is prepared. The Forest Survey India may be strengthened to collect and compile strategic information regarding forest fire at national level. Efforts are required to be made at state level also to verify and enrich data network.

The data network may consist of:-

- Information about climate, weather, etc.
- Historical documentation of forest fires, including location, type of vegetation, history, causes and other details.
- Number of forest fires, the area burnt and other adverse impact.

- Type of vegetation burnt, the flora and fauna of the area.
- Resources, including human resource available with the state govt. to detect and and combat forest fire.
- Other area-specific relevant information.

  Various modern techniques including remote sensing may be used to collect and compile information related to forest fire. Remote sensing, GIS etc. can provide data base which can be used in forecasting and locating forest fire, its extent and appropriate technique to suppress the same.
- Documentation of good practices: At national and international levels there are many good practices in forest fire management. There is need to document such practices in proper way so that good lessons are adopted for utilise them in making forest fire management system more effective and practical. These good practices need to be shared with other stakeholders and role players to be implemented with an objective to reduce fire risks.
- Systematically utilise outputs and knowledge created by different projects for FFM: Several forest fire management-related projects has been implemented in different states in the past with national and international support. The learning and outputs of these projects will be of immense use in making forest fire machinery at national and state level more effective.
- Develop/update operational field manuals and guidelines for field staff with sufficient inputs on FFM: Several state forest departments have developed field manuals for forest staff; however, such manuals in general lack proper guidelines and techniques to detect, communicate and suppress forest fires. There is need to upgrade such manuals and develop new ones in the states where such manuals are not available.
- Enhance capacities of Forest Department training institutes and trainers: Almost all the state Governments have their State Forest Training Institutes and Colleges. Forest fire management needs to be an integral part of course curricula of these institutes. The course being taught in such institutes about the forest fire management should be updated and enriched with latest information about forest fire detection, suppression and rehabilitation.
- DM institutes: For wider dissemination of forest fire management knowledge and capacitating more resources and skilled force, it is required that forest fire management be included in the course curricula of the Disaster Management Institutes at national and regional levels. It will also help in better coordination among forest department and disaster management functionaries.

- Increase community awareness: Community participation has proved very useful in forest fire management. More people participation may only be ensured by making community aware about the significance of FFM and its benefit to community. Different methodology and IEC means may be used for it. As in more than 90 percent cases forest fire is ignited by human being, community awareness can play significant role in preventing forest fire.
- Local people particularly of adivasi areas should be involved through participatory and/or community-based approaches including environment-friendly sustainable livelihood programmes implemented at village level. Because they are often main actors in landscape fire management activities, they suffer directly from the fires which threaten their livelihoods and might also be involved in some of the fire causes.
- Local publicity through mass media and cultural activities like dramas/melas should be organised in forest fire-prone forest areas. The publicity can be carried out by using IEC materials such as pictorial booklets and brochures being designed for generating awareness and publicity amongst local people and the field staff of forest departments time to time by MoEF and National Institute of Disaster Management (www.nidm.gov.in.

Assess and monitor forest fire risks and enhance sustainable application of warning systems

Gaps to be Addressed

For the efficient and timely generation and transfer of information related to fire warning it is necessary to enhance the capacity of forest management functionaries at various levels to generate timely warning and translate it into useful information for field staff and others. In addition there is need to prepare forest fire vulnerability maps based on past experiences and other variables like forest vegetation, weather conditions etc.

Goal

Increased capacity in generating relevant warning, increased understanding of warning systems by forest management functionaries and sustained support and coordination between the partner organisations.

Proposed Strategies

- Capacity building for the better use of early warning (technical efficiency and HRD): The forest officials need to be trained in using various indicators to get

prior information about forest fire and identify them in time to take timely action. The forest department may be provided with necessary equipment for detecting forest fire at the earliest possible. Forest officials are to be trained in using valuable information, available at national and international levels and translate it into local languages.

- Strengthen collaboration with partner organizations involved in generating warning: Necessary collaboration is required with organisations involved in generating early warning about forest fire. Meteorological Departments and other national and international sources providing weather-related information may be collaborated to get prior information about the temperature and rainfall situation, which are two main deciding factors for forest fires.
- Disseminate refined early warning product outputs at field levels in user-friendly way: The information available from different sources need to be dovetailed for making use at local level and necessary arrangement be made to disseminate this information at field level for appropriate preventive, preparedness and response actions in time.
- Assess risks and prepare vulnerability & risk maps: To get prepared and necessary preventive measures in time it is necessary that the vulnerability/ risk maps of forest area be prepared, depending mainly on past history, climatic conditions and other human-induced factors like population density, socio-economic conditions etc.

Technical Options to Reduce Underlying Risks

Gaps to be Addressed

A significant amount of technical options to assist Forest Department in increasing their resilience, preparedness and response capacities against forest fire are known and available at regional, national and international levels. However, the spectrum of available options is often not known or easily accessible. To make FFM more effective, it is of utmost significance that available options are systematically assessed, documented, shared and adapted to location-specific needs in a participatory way.

Goal

Increased capacity to manage forest fire, involving community and using a variety of tested technical interventions.

Proposed Strategies

- Assess indigenous knowledge and techniques to detect and suppress forest

fire, and upgrade it with scientific inputs and research: At local and regional levels many indigenous techniques and knowledge are available, there is need to compile and collect such information and upgrade with scientific input and field test to find its suitability in making forest fire system more effective, useful and less expensive.

- Promote FFM-related research and technology innovations: The research institutes involved in forestry and related research may be pursued to do research in developing appropriate techniques in getting prior information about forest fire, detecting it, and suitable mechanism to suppress it.
- Technology transfers at various levels and use it with required location-specific modification, involving scientific inputs: Tested and useful technologies in forest fire management may be shared at regional, national and international levels. The technologies such borrowed need to be further modified as per the location-specific requirement.

Collaboration and Coordination

Gaps to Be Addresed

To address the issues of forest fire management effectively, forest departments need to strengthen collaboration with other organisations and agencies, such as Disaster Management Authorities (National, Regional levels), Meteorological Departments, Research institutions and other stakeholders and role players.

Goal

A strategy and operational mechanisms in place in forest departments for efficient coordination and collaboration.

Proposed strategies

- Enhancing collaboration with Disaster Management Authorities: Forest Department is challenged to develop a strong operational mechanism for close interaction with the Disaster Management Authorities at national and regional levels aiming to mainstream forest fire disaster in the disaster management agenda of these institutions. Forest Department needs to share forest fire-related data and other relevant information with the Disaster Management Institutes at national and regional levels for optimum utilisation. While redesigning its training policy, Forest Departments will seek optimum support from disaster management departments.

– Strengthening linkages with other stakeholders at national level: Forest Department will intensify its collaboration with other GOs, CBOs and NGOs, through the introduction of an annual technical working session, organises hosted by the DRM Core Group; these sessions will focus on annually selected technical areas of joint interest; they will have the main purpose of experience/ information sharing and enriching and sharing of training material and modules.

o Sharing knowledge about forest fire management-related technologies: Through the dissemination of its quantitative and qualitative forest fire-related information through the Disaster Management Information Centre (DMIC) forest departments will increase accessibility of its data to the wider audiences, including NGOs and CBOs.

Conclusion

In present scenario forest fire management system of the country needs a comprehensive action plan to strengthen the forest departments at various levels to be more capable of dealing with the menace of forest fire in the country. This plan of action has been developed through an interactive consultation process with a variety of key stakeholders on forest fire management within and outside of forest departments. Thus it is comprehensive and provides an idea about the gaps, the goal and the strategy to be adopted to fill the gaps and make the forest departments more effective in managing forest fire by the involving the local communities including Panchayati Raj Institutions, youth and women particularly from remote or adivasi belts prone to forest fires through the implementation of environment-friendly sustainable livelihood programmes at local level.

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