



DISASTER MANAGEMENT PLAN

DEPARTMENT OF FOREST

GOVERNMENT OF HIMACHAL PRADESH

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1. INTRODUCTION

1.1 OVERVIEW OF THE DEPARTMENT

Himachal Pradesh is predominately a mountainous state in which 66.52% of the geographical area is covered by the forest. The abundant rich forest resource in the state comprises a diverse range of flora and fauna which are home of some rare and endangered faunal and floral species such as snow leopard, musk deer and Himalayan yew and a number of pheasants like Western Tragopan, Monal, Chir pheasant etc.

The Forest Department in Himachal Pradesh has the responsibility for managing and protecting some of these richest forests and biodiversity in India. It is one of the oldest department and one of the biggest in terms of its vast spread. The Department performs multifarious functions apart from fulfilling its traditional role of a regulator and protector, is now being called upon to take up the emerging challenges relating to the management of forests, climate change, fulfilling the aspirations of various forest-dependent communities and other stakeholders and generally being in sync with the changing times.

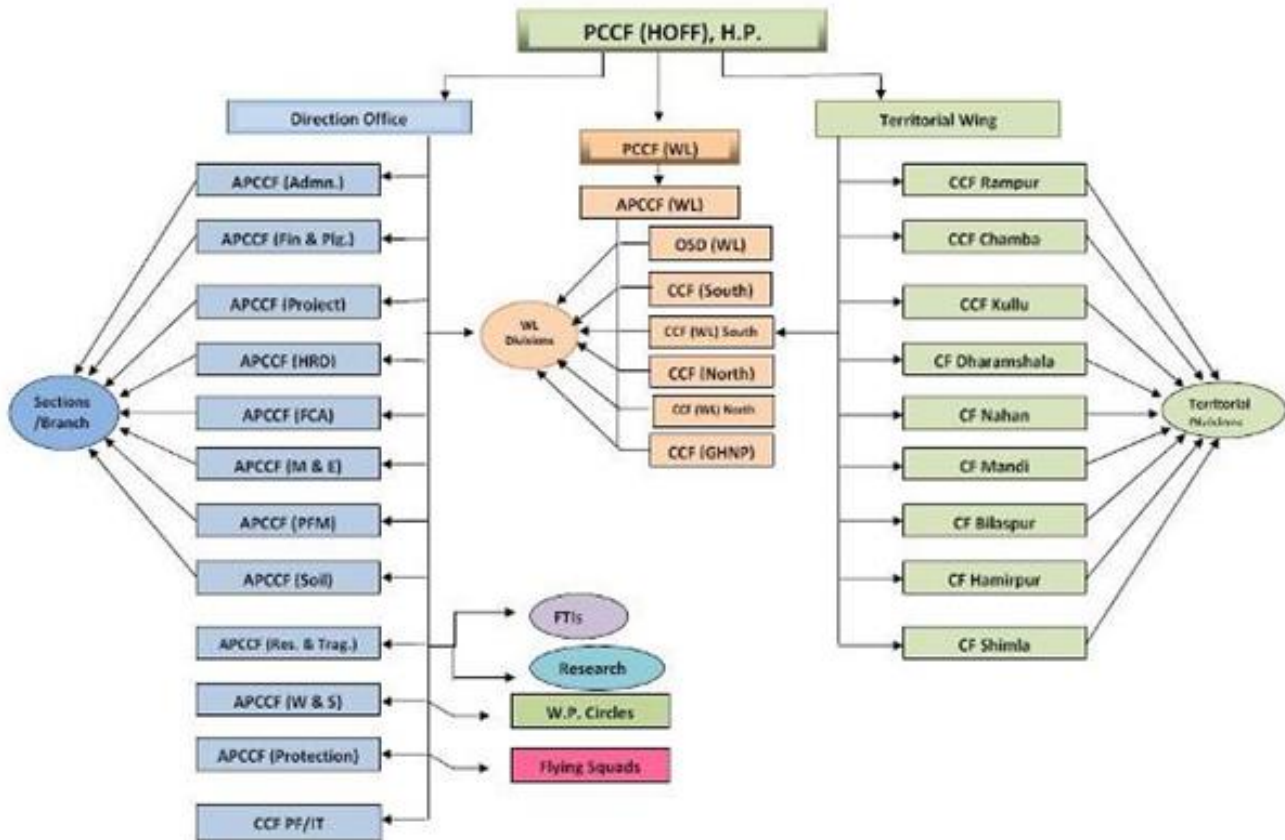
The main function of department:

- To increase substantially the forest / tree cover through massive afforestation and social forestry programmes and restoration of degraded forest areas so as to maintain ecological balance in accordance with the principles laid down in the State and National Forest Policy
- Conserve and manage forests scientifically, contemporarily and incorporating the best practices from within and outside the state.
- Conserve and improve the status of Wildlife and Biodiversity in the state.
- Checking soil erosion and denudation in the catchments of five major river basins and other areas of the state.
- Improving the productive potential of natural resources in the degraded watersheds by involving communities through EAPs (Mid Himalayan & SWAN projects).
- Strengthening research, and awareness about Forestry
- Rehabilitation of degraded forest areas through watershed approaches thereby supplementing the income of the poor.

1.2 ORGANIZATIONAL STRUCTURE

Himachal Pradesh forest department is headed by the Principal Chief Conservator of Forest (Head of Forest Force) who controls all forest affairs and administration and working of the forests. He is assisted by the Principal Chief Conservator of Forest (Wild Life) who is the Chief Wild Life Warden of the State. Various Additional Principle Chief Conservator of forest (APCCF) have the responsibility of wings such as Administration, Finance and Planning, Project, HRD, FCA, Monitoring and Evaluation, PFM, Soil, Research and Training, WS and Protection.

The department is further divided into six Wild Life Division and nine Territorial Wings. Each of these divisions and wings is headed respective Chief Conservator of the forest. These are further divided into Circles / Divisions / Ranges / Blocks and Beats.



1.3 PURPOSE OF PLAN

The basic purpose of departmental DM plan is to provide guidance to the department manage the risks of disasters before, during, and after disasters. These include assessing the sectoral and departmental risks of disasters, mitigating the existing risks of disasters, preventing the creation of new risks of disasters, presenting the status of its preparedness to perform its role and responsibilities as defined in the State DM Policy and State DM Plan, measures proposed for strengthening capacity-building and preparedness. Thus the main objective of forest department disaster management plan is

The objectives of this plan are to facilitate the forest department in the following:

- i. Identifying risk of forest resources to natural hazards in general forest fire in particular
- ii. Adopt proactive measures by the departments to prevent disaster and mitigate its effects;
- iii. Undertake preparedness measures;
- iv. Assign different tasks and responsibilities to department officials during the pre-disaster and post-disaster phases of the disaster
- v. Mount prompt and coordinated response and recovery at various levels in the post-disaster phase

1.4 SCOPE OF THE PLAN

Himachal Pradesh forest department has prime responsibility for managing forest fires in the state. Moreover, majority geographical area of the state is covered by forest. A vast majority of the population of the state is rural and depends mainly for its livelihood either directly of forest products or on those, which are produced by using the resources, conserved or protected by the forest. Various natural disasters occur in the forest which adversely affects the economy of the hill people. Moreover, forest resource offers an

important ecosystem service that provides a natural shield against disasters. Hence the scope of this plan is to plan and prepare for the opportunity for managing disasters and challenges to the forest sector:

- Identify hazards and analyze risks to the vulnerable forest lands and community of the living in the forest.
- Carry out risk mapping and assessments and incorporate strategies to support fire management decision-making.
- Identify various opportunity provided by the forest sector for managing recurrent forest fire of the state
- Undertake measures for prevention and mitigation of disasters impacting forest in the state.
- Integrate disaster mitigation measures in all the central and state-sponsored schemes and programmes being implemented by the Department of Forest.
- Undertake awareness and capacity building measures for the local community and staff members.
- Assign roles and responsibilities of each agency in relation to pre-during-post disaster phases.

1.5 AUTHORITIES, CODES AND POLICIES

The first state forest policy for Himachal Pradesh was adopted on 3rd September 1980 in furtherance of National Forest Policy Resolution 1952. The National Forest Policy 1988 established a principal aim to “ensure the environmental stability and ecological Balance”. The Government of Himachal Pradesh introduced the concept of Joint Forest Management (JFM) through its resolution in 1993 and subsequently Participatory Forest Management Rules were formulated in 2001. The PFM was promoted across the entire state by *Sanjhi Van Yojna* (SVY). The Biodiversity and wildlife conservation and management are supported by central legislations such as Biodiversity Act, 2002 and Wildlife Act, 1972.

Functioning of forest department for Disaster Management in Himachal Pradesh is governed as per the Disaster Management Act 2005 and Himachal Pradesh Disaster Management Plan 2012. State Disaster Management Authority (SDMA) has assigned Forest department of Himachal Pradesh as a Nodal agency for the management of forest Fires and during an emergency situation to support SDMA with resources. Apart from these Himachal Pradesh Forest Fire Rules, 1999 (Clause (h) of Section 32 of the Indian Forest Act, 1927 (Act No. XVI of 1927), has provision of disaster risk reduction with reference to forest fire management are given as follows:

- Kindling of fire within one hundred meters from a forest without permission of the Divisional Forest Officer, or his authorized representative shall be prohibited.
- Any person lighting a fire even beyond one hundred meters from the boundary of a forest shall take precautions, by clearing a fire path, not less than 10 meters in width between such place and such boundary, by employing watchers or otherwise, to prevent the fire from spreading.
- Precautions to be taken in burning agriculture residue bushes or “ghasnies” near the forest.
- Restrictions on the collection and stacking of inflammable forest produce of inflammable material outside the boundary of or in the forest.
- Precautions to be taken at camping places to prevent forest fire

1.6 INSTITUTIONAL ARRANGEMENTS FOR DISASTER MANAGEMENT

State Disaster Management Authority (SDMA) has assigned Forest department of Himachal Pradesh as the nodal agency for the management of forest fires and during an emergency situation to support SDMA with resources.

1.6.1 NODAL OFFICES

Forest Department has nominated a Chief Conservator of Forests (Forest Protection & Fire Control) at Bilaspur as the Nodal Officer for Disaster Management in respect of Forest Fires.

Roles and responsibilities of the nodal officers

- Act as a focal point for disaster management activities of the department. The department may ensure that he/she has the mandate to work immediately without waiting for directions from the higher authorities.
- Provide his/ her contact and alternate contact details to SDMA / DDMA and Revenue Department, State and District Emergency Operation Centre, all line departments and agencies.
- Take lead to prepare the department's disaster management plan, Emergency Support Function (ESF) plan and Standard Operating Procedure (SOP).
- Constitute the Rapid Response Team (RRT) in the department as per the need and organize training for the members.
- Help the department to procure the equipment necessary for search and rescue, first aid kits and disburse the same to RRTs and for the department if required.
- Attend Disaster management meeting, training, workshops or any related programme on behalf of the department. Also, identify an alternate nodal officer and build his/her capacity.
- As per the need of the department, set up a control room and assign another official (s) for control room duty.
- Identification of staffs for deployment on-site operation centres (on-site control room during a disaster).
- In consultation with the department, make an arrangement of an alternative communication system for the department.
- Mobilize resources for disaster response activities as per the resource inventory put in the department, DM Plan if it is needed by the department or other line departments.
- Organize regular awareness programmes in the department.
- Organize the periodic mock drills at least twice a year as per the suitability of the department and update the plans at all levels and ensure participation of the department in mock drills of other agencies and other departments.
- To have a liaison with other departments and functionaries working in the field of DM.

Depending on the severity of the situation, similar arrangements may be made at a 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 who can be assisted by District Disaster Management Authority (DDMA) and Range Officer.

1.6.2 RAPID RESPONSE TEAMS

As per the Action Plan for the deployment of manpower for combating forest fires, a Control Room is set up at each Forest Division level. A forest range level forest firefighting task force is constituted at each range. It consists of Range Officers, Deputy Rangers, Forest Guards, Forest Workers and other staff.

Roles and Responsibilities of the Incident Response Team are:

- To coordinate with SDMA, NDMA, and other concerned Government Departments.
- Visit the spot and assist the Circle level Response Team for pre-disaster planning
- To prepare a status report regarding the disaster.
- To facilitate execution of orders for declaring the disaster.
- Assess the staff and another logistic requirement for field operation and monitor effectiveness.
- To attend training and refresher courses as to how to respond to receiving any information related to the disaster.
- IRT should be familiarized with the SOP / ESF / DM plan of the department as well as State DM Plan and their roles and responsibilities.
- IRT should prepare and update the DMP periodically by incorporating the views of stakeholders for the effectiveness of the plan.
- To ensure availability of funds at District level to meet contingency expenses.
- To develop the media messages so as to update the status of disaster mitigation and response work.
- To monitor and guide the District Response Teams.
- To maintain an inventory of all related guidelines, procedures, action plans, district maps and contact numbers.
- To document the lessons learnt at different stages of disaster management and make suggestions for necessary addition / alteration.

1.7 PLAN MANAGEMENT

The disaster management plan prepared by the department is subjected to regular improvement and it must be updated every year for the effective disaster Management by the department. The nodal officer of the department will be responsible for overall coordination for updating and revision of plan on annual basis in consultation with the State Disaster Management Authority. For this, a proper consultation should be done with all stakeholders of the forest department. Moreover, the disaster management plan prepared by the department shall be circulated to its entire circle, division range offices and other major stakeholders of the department

The approved disaster management plan by the state disaster management authority should be implemented in the various stages of disaster management. The office of the Principle Chief Conservator for the forest (HFF) shall be responsible for implementation of the Plan. However, the nodal officer of the disaster management shall coordinate with all stakeholders for implementing the Plan. For this regular meeting shall be conducted to disseminating the Disaster Management Plan. Annual Progress on implementation of the Plan will be submitted to State Disaster Management Authority.

2. HAZARD RISK VULNERABILITY ANALYSIS

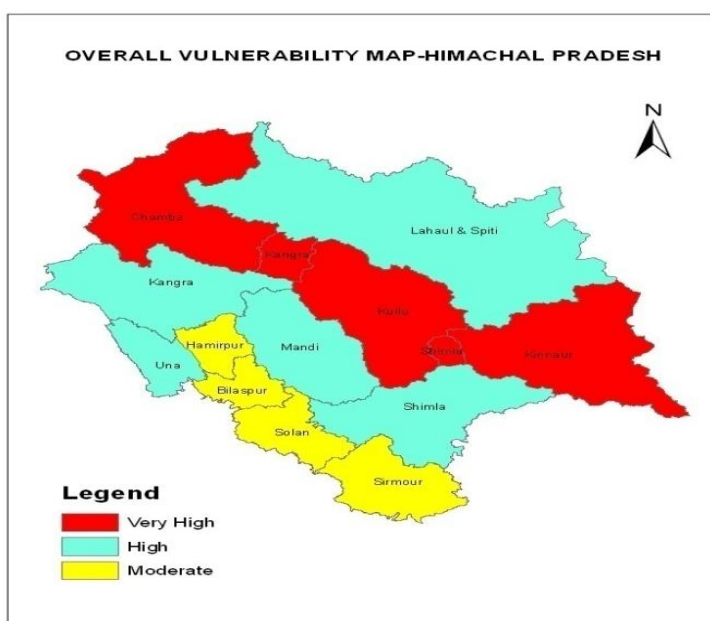
2.1 POTENTIAL HAZARD IN THE STATE

In Himachal Pradesh, two-thirds of the geographical areas are forested, which is a multi hazard-prone area of the state. Unique geo-climate setting makes the state into a one of the multi hazard-prone states in the country. It is vulnerable to host of major natural hazards such as earthquakes, landslides, flash floods, snowstorms and avalanches, droughts, forest fire etc.

Potential Hazards	Earthquake	Landslide	Floods	Avalanches	Forest Fire	Drought	Cloud burst
Kangra	VH	L	M	M	H	H	M
Chamba	VH	VH	H	M	H	M	H
Hamirpur	H	L	L	-	VH	M	L
Mandi	VH	H	H	-	VH	M	H
Kullu	VH	VH	H	H	H	M	VH
Bilaspur	H	M	L	-	VH	M	L
Una	H	L	H	-	M	H	L
Sirmour	H	L	L	-	VH	M	M
Solan	H	M	L	-	M	M	L
Kinnaur	H	H	H	VH	M	M	VH
Lahaul & Spiti	M	M	M	VH	M	M	H
Shimla	VH	H	H	M	H	M	H

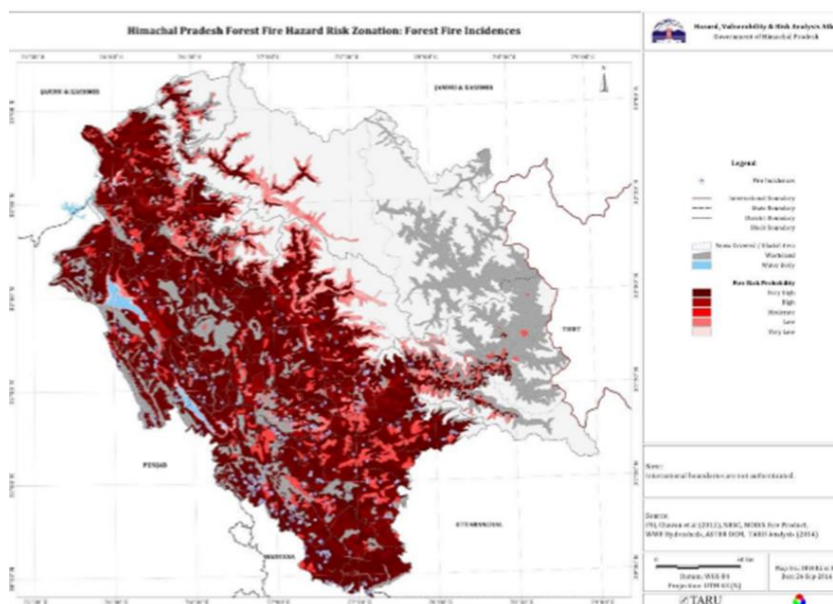
Table 2.1: Overall vulnerability of State
(Source: Science and Tech Council of Himachal Pradesh)

In the state the districts of Chamba, Kinnaur, Kullu and part of Kangra and Shimla fall in very high vulnerable risk. Similarly, districts of Kangra, Mandi, Una, Shimla and Lahaul and Spiti fall in high vulnerable risk status. The district Hamirpur, Bilaspur, Solan and Sirmour falls in moderately vulnerable risk status.



2.1.1 FOREST FIRE

A forest fire is a major cause of degradation of forest. With increasing population pressure, the forest cover is deteriorating at an alarming rate. The forests of the Himachal Pradesh are more prone to forest fire compared to forests in other parts of India due to various biotic and geographic reasons. In Himachal Pradesh, the recorded forest area is 10, 46,900 hectares, of which around 9, 74,800 hectares are fire prone. About 90 % of forest fires are due to intentional or unintentional human interventions. In Himachal, forest fires are an annual and widespread phenomenon. Most fires are witnessed during summers when the forests become littered with dry senescent leaves and twinges thereby increasing the probability of starting and spreading of fire.



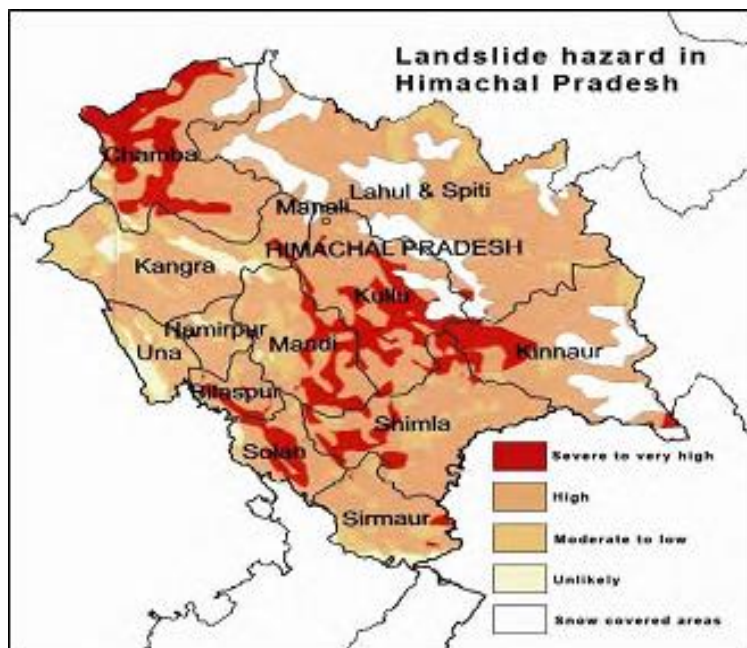
Source: TARU, 2013, Forest Survey of India, 2013, MODIS Fire Product, 2013, Global Land Cover 2000

The fire season in HP starts from the month of April (SAARC-SDMC, 2007) and extend till monsoons. Without a proper understanding of the causes and effects of fire such as ecological or socioeconomic, or cultural, it is not possible to strive for fire. The understanding is essential to arrive at negotiated tradeoffs in integrating actual fire management practices into existing forest management. TARU made study indicate that districts in HP, Chamba, Kangra, Kullu, Mandi, Shimla, Sirmaur, are under high to very high fire risk zones. Within each of these high-risk districts, more than 56% of the area is prone to or have the possibility of being affected by fires.

District	District wise Forest Fire Risk Zones (in Sq. Km.)						Total Area (Sq. Km)
	No Risk	Very Low	Low	Medium	High	Very High	
Chamba	27	2,098	926	41	1,302	2,007	6,402
Bilaspur	87	25	214	27	561	247	1,162
Hamirpur	-	2	236	4	615	255	1,113
Kangra	208	872	959	27	2,045	1606	5,718
Kinnaur	10	4,444	1,446	9	56	502	6,468
Kullu	13	2,699	223	49	1,187	1324	5,495
Lahul & Spiti	56	12,702	823	5	72	188	13,845
Mandi	3	242	788	29	1,71	1,419	3,951
Shimla	-	469	826	13	1,658	2,147	5,113
Sirmaur	-	3	377	6	1,092	1,324	2,802
Solan	-	4	819	10	583	507	1,923
Una	44	57	505	14	720	194	1,534

Source: TARU Analysis, 2013

2.1.2 LANDSLIDE



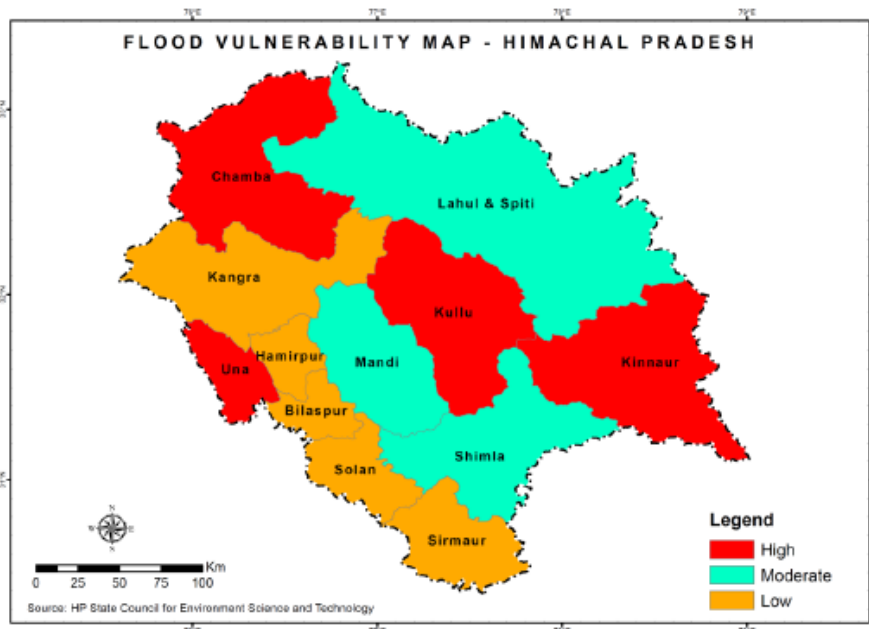
The hills and mountains of Himachal Pradesh are liable to suffer landslides during monsoons and also as a result of high-intensity earthquakes. The vulnerability of the geologically young and not so stable steep slopes in various Himalayan ranges, has been increasing at a rapid rate in the recent decades due to inappropriate human activity like deforestation, road cutting, terracing and changes in agriculture crops requiring more intense watering etc. The fragile geology also renders the slopes prone to landslides.

Based on the BMTPC Atlas on Landslides, Lahaul & Spiti District occupies a maximum area of 13591 sq.km which is

prone to landslides, whereas Kinnaur (6322 sq.km) and Chamba (6370 sq.km.) has the total area which is prone for landslides in the district. Una being in Shiwalik system occupies about 1500 sq.km. is an area prone to landslide.

2.1.3 FLOOD / FLASH FLOOD

Floods are another form of natural disaster the State experiences every year. Southwest Monsoonal rainfall during the months of June to August is the dominant cause for triggering floods when rainfall happens to be in excess i.e. 125% or more than the normal. During 1951-1999, Chamba district in the northwestern part of the state had received the highest amount of rainfall expressed as a percentage of the normal with more numbers of successive years of excessive rainfall.



Flash flood is the most frequent and damaging floods that occur with little or no warning causing immense loss to life and property. Flash Floods usually takes place when rapidly rising and flowing surge of water reaching a full peak within few minutes is generated as a result of excessive rainfall or failure of impoundment.

The major causes that are responsible for floods and flash floods in the state of Himachal Pradesh are:

- Cloudburst in upper catchments of the river
- Excessive rainfall in the catchments
- Melting and Bursting of glaciers due to global warming
- Sudden breach or failure of manmade or natural barriers
- Change of river course
- Landslides triggered due to slope failure or tectonic movements leading to LDOF phenomena

Over 40 incidents of flash flood and cloudbursts occurred in Himachal Pradesh in the last 12 years and over 35 were feared dead. In August 1994, the Manimahesh cloudburst and a flash flood washed away almost the entire length of Chamba-Bharmour road (62 km) where over 50 people were killed and 2000 injured. The estimated loss was over 450 crore of Rupees. 1997 again saw a heavy flash flood in Maglad in Rampur tehsil of Shimla district.

The flood hazard vulnerability map indicates that the areas falling in the districts of Chamba, Kullu, Una and Kinnaur falls in the highly vulnerable zone, Lahaul and Spiti, Mandi, Shimla fall in the moderate flood vulnerable zone and Kangra, Hamirpur, Bilaspur, Solan and Sirmour fall in low flood vulnerability zone.

2.1.4 CLIMATE CHANGE

In the state of Himachal Pradesh various indication of climate change can be observed. Percentage of warm days and warm nights is projected to increase while the percentage of cool days and cool nights is projected to decrease for all the districts implying warming up. The long-term trends in observed seasonal precipitation and temperature over Himachal Pradesh using IMD gridded rainfall and temperature at daily time scales has been performed to arrive at current baseline climatology for the state. IMD gridded data was used for Climate change hazard risk analysis.

In the state Kullu, Kinnaur and Mandi districts are expected to get the warmest in MC and EC compared to the BL, while for Lahul & Spiti temperature increase is expected to be the least compared to the other districts. In other side increase in precipitation in MC and EC is projected to be the maximum for Salon, Bilaspur, Hamirpur districts of Himachal Pradesh compared to the BL, while increase in extremely wet days (annual total rain when rainfall is greater than 99th percentile of baseline) is projected to be the maximum for Mandi, Hamirpur and Bilaspur districts. Increase in count of very heavy precipitation days is expected to be the maximum for Salon, Bilaspur and Kangra of Himachal Pradesh districts compared to the baseline

Climate extremes show that minimum of maximum and minimum of minimum temperatures is consistently increasing in Mid-Century (MC) and End Century (EC) compared to the Base Line (BL), indicating significant warming up increasing over the Himachal Pradesh districts. Very wet and extremely wet day precipitation is projected to increase for all the districts in Mid Century and End Century compared to the BL implying that rainfall and its intensity would increase in the future.

The sectoral risks of disasters consist of the risks for the entire sector that the department represents. The potential risk in the Himachal forest sector will come more frequent flood, landslide, and avalanche will be compounded with fast degrading states forest. It too gas its impact on Himalayan forest resulting in change in forest community structure and forest ecosystem

District wise Forest Fire Risk Zones (in Sq. Km.)							
District	No Risk	Very Low	Low	Medium	High	Very High	Total Area (Sq. Km)
Chamba	27	2,098	926	41	1,302	2,007	6,402
Bilaspur	87	25	214	27	561	247	1,162
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Solan	-	4	819	10	583	507	1,923
Una	44	57	505	14	720	194	1,534

The results of the analysis done by TARU indicates that majority of districts in HP are under high to very high fire risk zones. Within each of these high-risk districts, more than 56% of the area is prone to or have the possibility of being affected by fires. The district Sirmaur has around 86% of its area under high to very high-risk zone followed by Hamirpur (78%), Shimla (74%) and Mandi (73%). The district of Solan has experienced a maximum number of forest fires over the last 8 years (since 2005) followed by Una and Mandi. But the extent of fire damage has been found to be more in the district of Shimla followed by Kangra and Chamba.

2.2 ASSESSMENT OF SECTORAL AND DEPARTMENTAL RISKS

The sectorial risks of disasters consist of the risks for the entire sector that the department represents. More than 60% of the geographical area of the state is covered by the forest. Most of the villages in the state are situated in the forested areas. A vast majority of the population of the state is rural and depends mainly for its livelihood directly or indirectly on forest products. Moreover, the villages are either adjacent to or enclosed by forest, which is thus deeply integrated with the livelihood of the local people. They depend on the forest for timber for the construction of houses, firewood, agriculture implements, fodder and a variety of other products and services, including certain medicinal herbs. Besides providing economic gains several indirect benefits through the use of forest-related activities at far-off places. Forest resources in the state have an important on the climate stability of the many other states of Punjab, Haryana, Rajasthan and parts of Uttar Pradesh. It is therefore imperative to assess the risk of the forest sector to various hazards such forest fire, landslide, avalanche, flood, earthquake etc.

The Forest Department is specified as a Nodal department for forest fires. More than 60 % of its geographical area is covered by the forest. The most vulnerable areas are Chir Forests and Scrub Forests, which are mostly located in the Forest Circles of Chamba, Dharamsala, Hamirpur, Mandi, Bilaspur and Nahan. The Chir pine forests are vulnerable to fire hazard due to the presence of resin and the shedding of pine needles. The carpet of pine needles on the forest floor is highly inflammable coupled with the presence of resin in the chir pine trees especially during the fire season during 15th March to 15th July. The most the fire incidents reported in 2012-13 over the past five years and the total area affected is about 20774 (in ha).

2.2.1 ASSESSMENT OF CAPACITY GAPS AND NEEDS

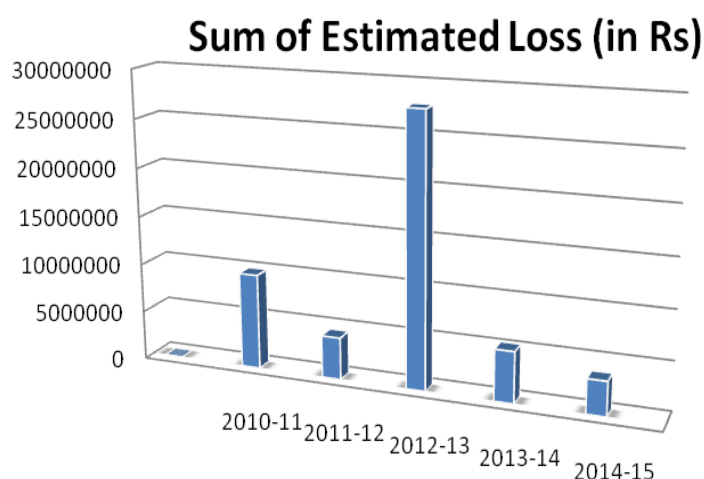
Forest department is a Nodal Agency for Forest fires in the state. The main duty of the department is to maintain the Biodiversity and sustainable development of forest areas. In recent times the frequencies of forest fire incidents have increased. As a result of an increase in fire incidents the department has identified some of the existing capacity gaps as under:

- In the past, it is noticed that during forest fires the required assistance is not received from the Fire Department / Home Guards / District Police / District Administration.
- Other Stakeholders only assist the Forest Department in case of forest fires to come close or spread across the habitation areas.
- It is essential to reorient the Civil Defense and Home Guards regarding forest fire prevention.
- The resources available are not adequate at the departmental level.
- There should be enough modern Fire Fighting equipment at the disposal of ROs, BOs & FGs. The vehicle, mobile phones, fire safety dresses, shoes and gear to all the Forest Guards deployed in fire-sensitive duties.
- Lack of incentive to the public for conveying the information.
- Not sufficient funds are received from CSS / State for cleaning of the existing fire lines or even cleaning the roads passing through the forests, which allows spreading of forest fires across the forests easily from one corner to other
- Funds are not received at appropriate time from Centre resultantly are not utilized at appropriate time
- There is no connectivity of forests and most of the forests are far-flung.

2.2.2 ASSESSMENT OF PROBABLE DAMAGE AND LOSS

Over the last five years, most of the loss recorded is Rs 27682589 in the year of 2012-13. The total sum of loss recorded over five years is Rs 50502047

Year	Sum of Estimated Loss (in Rs)
2010-11	9769363
2011-12	4307878
2012-13	27682589
2013-14	5231011
2014-15	3511206



3. RISK PREVENTION AND MITIGATION

3.1 RISK PREVENTION

- To conduct Hazard, Risk Vulnerability and Capacity Analysis (HRVCA) of a forest fire.
- Assessment of the ecological, social, and economic impact of fires.
- Develop new infrastructure on the recommendation of Hazard, Risk Vulnerability and Capacity Analysis (HRVCA)
- Strengthen fire flying squads and fire monitoring teams activities taken during fire season and circulated up to Forest Range Level and the instructions contained in that are followed religiously.
- Creation of fire database and the introduction of suitable software for effective fire management.
- Conduct detail Environmental Impact Assessment before initiating any project implemented in the forested areas

3.2 RISK MITIGATION

- Prepare and maintain the fire lines.
- On the Recommendation of HRVCA study, preparation of non-structural mitigation plans for the departmental buildings and infrastructure.
- Construction of fire watchtowers and water harvesting structures at most sensitive places.
- Construction of soil and water conservation structures so as to minimize the soil erosion and to reduce the landslide risk in the forest areas besides improving the moisture regime of the forests to regulate spreading of forest fires
- Planned and periodic removable of combustible material including the pine needles and cones filled with resin, and utilizing them for making fire briquettes to be used as biofuel.

3.3 STRATEGIES FOR RISK PREVENTION AND MITIGATION

The Department prepares an Annual Plan of Operation (APO) each year for prevention of disaster and mitigation measures. The main components are

- Forest fire control and management
- Strengthening of infrastructure in forests
- Working Plan preparation

3.4 MATRIX OF HAZARD SPECIFIC MITIGATION MEASURES

Hazards	Prevention and Mitigation measures
Forest Fire	<ul style="list-style-type: none"> • Creation of new Fire lines. • Control Burning. • Raising of Mixed Plantation over a period of time to act as fire breaks • Disposal of inflammable material before fire season (Pin Needles, cones, bark, spilt resin or old resin tins in the forests left by the contractors while tapping the resin in the last year) • Construction of fire watch-towers and water harvesting structures at most sensitive places.
Uprooting of Tree	<ul style="list-style-type: none"> • Identification of landslide vulnerable areas near habitation and marking vulnerable trees to be cut down. • Branching, lopping of the vulnerable trees.
Landslides	<ul style="list-style-type: none"> • Treatment of the catchment area to protect vulnerable areas from landslides. • For protecting vulnerable areas Bioengineering Methods to be applied. • Road constructions to be taken care of technically for steep slopes • Disposal of muck properly during construction of roads and other development activities to be ensured
Soil Erosion	<ul style="list-style-type: none"> • Construction of Soil and Water Conservation structures so as to minimize the soil erosion and to reduce the landslide risk in the forest areas. • Plantations near the water streams and near the steep slopes to minimize the soil erosion. • Strengthening the river bedside to control the soil erosion along the riverbed during high discharge.
Wild animals and Human conflicts	<ul style="list-style-type: none"> • Proper fencing of forest areas near the habitation. • Mapping of highly prone wildlife-human conflicted areas to be mapped. • Plantation of fruit species to maintain the food availability in the forest areas. • Elimination of man-eater in accordance with the provisions of Wildlife Protection Act • Bringing awareness among the people living in the areas adjoining to wildlife concentrated areas
Flora Fauna Epidemics	<ul style="list-style-type: none"> • Timely detection and adopting appropriate measures to prevent its growth or spreading viz., Alien Invasive Species such as lantana, ageratum etc., • Vaccination of domestic animals

3.5 CALENDAR OF ACTIVITIES DURING THE FIRE SEASON

#	Activity	March	April		May	June	July
		15-31	1-7	8-30			1-15
1.	<ol style="list-style-type: none"> Establishing of control Rooms & Mobile / Wireless Communications. Issue of orders regarding duties of the staff to be deployed on Forest Fires 						
2.	<ol style="list-style-type: none"> Got the “Thikri” Paras” invoked from the respective Deputy Commissioners. Deployment of the Mobile Fire Fighting units on the Sensitive places. Meetings by the CFs / DFO with field staff. 						
3.	<ol style="list-style-type: none"> Mass Contact (Awareness Campaign) i.e. Contact with the Local People, Panchayats, School Children, JFMCs / VFDCs, NGOs, Tourists, etc. to make them aware about the damages by the Forest Fires to the Forest Resources, Wild Life and the Environment. Distribution of Pamphlets as part of the awareness campaign. These should also contain the names, contact numbers of the control Rooms, CFs, DFOs, ROs, etc. Visit of the Publicity Staff to the field for Mass Contacts / organizing the film Shows, Workshops and wide publicity through Electronic / Print Media. 						
4.	<ol style="list-style-type: none"> Patrolling by the Mobile Units in the Sensitive Areas and contact/helping the field Staff. Daily reporting of the Fire incidences to the Control Rooms, CCF (FP & FC), Bilaspur, PCCF HP, Shimla by the field Staff through DFOs & CFs. 						

4. MAINSTREAMING DISASTER RISK REDUCTION IN DEVELOPMENT

Mainstreaming disaster risk reduction can be considered as the process of incorporating disaster risk reduction into normal development practice and fully institutionalized within a department's development agenda. The DRR mainstreaming process in development sectors is new to all departments. Forest Department has already taken few initiatives in this regard when Green India Mission under National Action Plan on Climate Change have clearly mentioned the mainstreaming of climate resilient and disaster risk reduction strategies and has thus paved the way for such mainstreaming to happen. Following are the few possibilities of mainstreaming areas of disaster risk reduction in the activities of the department

Activities of Department	Mainstreaming DRR Actions
Forest area development: Plantation activities	<ul style="list-style-type: none"> ● Implementing Bio-Engineering principles for landslide protection in forest land. ● Promote Mix vegetation in forest areas to control fire incidents. ● Promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation
Development of Departmental Infrastructure	<ul style="list-style-type: none"> ● During construction of new building, the BIS code for earthquake resistant building should be followed. ● Construction of infrastructure should be hazardous free or implementation of mitigation measure before construction.
Watershed plans in the hilly region and forest region	<ul style="list-style-type: none"> ● Integration of Watershed Plans with Disaster Management (DM) Plans. Watershed plans involve EcoSystem Services and their restorations whereas DM Plans involves Disaster Risk Reduction (DRR) Activities. Integration of watershed plans with Disaster Management plans will lead to a holistic approach to creating multi resilience path to makes forest areas and habitats settled around forests less prone to forest fire, landslide and drought.
Departmental Management Plan	<ul style="list-style-type: none"> ● Departmental management plan should have involved disaster management as an important part and implement Disaster Risk Reduction principles in every departmental project

<ul style="list-style-type: none"> • Eco-Tourism destination in the forested areas: Project initiated by the forest department to bring the tourist close nature and ensure adequate economic return to the state and livelihood opportunities to the local communities 	<ul style="list-style-type: none"> • Conduct community capacity-building and awareness programmes on anticipated risk • Planning and investments in order to promote resilient livelihoods and ecosystems
<ul style="list-style-type: none"> • Green India Mission acuties: • The components of Green India Mission has been launched in the state which aims to address key concerns related to climate change in the forest sector, namely adaptation, mitigation, vulnerability and ecosystem service 	<ul style="list-style-type: none"> • Incorporate various disaster risk reduction strategies along with climate change adaptation action under Green India Mission
<ul style="list-style-type: none"> • Mid Himalayan Water Development Project • Project description: Reverse the process of degradation of the natural resources base and improve the productive potential of natural resources and income of the rural household in the project areas in the state using Community-driven development approach 	<ul style="list-style-type: none"> • Incorporating of DRR methods like drought management measures
<ul style="list-style-type: none"> • Wild Life Conservation Projects: Varooiu species conservation initiatives such as project snow leopard, western Tragopan conservation programme, Vulture conservation and Cheer Pheasant conservation 	<ul style="list-style-type: none"> • Incorporation of DRR methods by forest fire measures in all the project areas • Conduct hazard risk vulnerability of fragile ecosystem to various hazard in the project site

5. DISASTER PREPAREDNESS

5.1 STRATEGIES FOR DISASTER PREPAREDNESS

Disaster preparedness has been defined as “the state of readiness to deal with a threatening disaster situation or disaster and the effects thereof”. The Department may review their “state of readiness” and prepare a strategic action plan to deal with possible disaster situations.

5.1.1 PREPARATION OF CONTINGENCY PLAN FOR DEPARTMENT

There should be a contingency plan of department i.e. how department responds at the time of disaster event. Action required are:

- Define rules and regulations for the functioning of the department especially during disaster time.
- All department staff shall nominate his/her buddy to take on the additional activities of his/her buddy, in case of any eventuality and / or absence of the member.
- Define protocols for normal time activities in non-affected areas and emergency activities in disaster-affected areas, sharing of the workload for above arrangement, special measures like additional budgets, and human resources during an emergency event.
- Identify safe building/location for operational work and meetings of the key department staff, if the department offices and working premises become inaccessible due to disaster.
- Secure important files and information of the department. Create backups, wherever possible.
- Develop a mechanism for quick sharing of information among department staff. If working on mobile networks, develop alternative mechanism(s) for the exchange of information especially during emergencies like Ham radio, community networks etc.

5.1.2 EMERGENCY PREPAREDNESS

- To identification potential emergency situations and be prepared for the response.
- Identify potential emergency situations. Make references to contingency specific action plans for the same.
- Stockpile and preposition other necessary repairing material at a safe place for the immediate repairs. Keep the equipment, telephone, telex, wireless etc. functional and ready.
- Awareness to the officials for the safety of life, material, equipment and for this placement of the items at safe places
- Drawing up mitigation, preparedness and response plans, capacity-building, data collection and identification and training of personnel in relation to disaster management.
- Activate various Joint Forest Management Committee for immediate response

5.2 MEASURE OF DISASTER PREPAREDNESS

5.2.1 CAPACITY DEVELOPMENT

Build sufficient capacities within the department staff and other stakeholders to be able to better perform the roles and responsibilities are the main objectives. Actions required are:

- Maintain the database of all resources (Human, Programs, Finances and Materials) of the department that could be used for disaster risk reduction and emergency response activities.
- Coordinate with SDMA, DDMA, IAGs and other agencies for the nomination of the department staff in the specialist training being organized from time to time by different agencies.
- Analyze past experiences of the Department to know what went well and what could have been done better for risk reduction and emergency response by the department. Document it as lessons learnt annually and after every disaster.
- Develop a minimum inventory list required for achieving desired performance standards and develop a plan to acquire it over next few years.
- Create a mechanism for regular Inspection and maintenance of equipment and acquisition of new equipment as per your minimum inventory list for disaster risk reduction. Promotion of shelterbelt plantations.
- Publishing for public knowledge details of forest cover, use of land under the forest department, the rate of depletion and its causes.

5.2.2 TRAINING, SIMULATION AND MOCK DRILLS

- To conduct training programmes for the forest officials and associated stakeholders to prevent, detect and control forest fires.
- Organize periodic mock drills of the Department Staff and key stakeholders for different contingency situations.
- Take part in block and district level mock drills and capacity building programs organized by District authorities from time to time.

5.2.3 EMERGENCY OPERATION CENTRE

As part of the emergency operation, a Control Room is to be set up at each Forest Division level. 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 the emergency situation. In case of severe fire conditions, necessary assistance may be sought from State Emergency Operation Centre (SDMA), District Control rooms and Disaster Management Department, if required

5.2.4 COMMUNITY BASED DISASTER MANAGEMENT

- Promote community involvement in planning and implementing actions to mitigate the risk posed by forest fire to communities situated near or adjacent to the forested area.
- Pursue and develop building codes that mitigate fire risk to protect life and property from wildfire
- Ensure forest fire mitigation strategies considering protection of community infrastructure
- Programs that target the prevention of human-caused ignitions have the potential to substantively affect wildfire occurrence.
- Prepared Community Forest Fire Preparation Plan as per the suggestion from the local community to curb forest
- In sensitive areas, Forest Fire Protection Committees may be established ensuring community participation.
- Provision of the seedling to the community and encouraging plantation activities, promoting nurseries for providing seedlings in case of destruction of trees during natural disasters.

- Create awareness among the masses about the effects of forest fires on the forests and environment.
- Encourage local community to adopt various fire preventive measures

5.2.5 COMMUNICATIONS AND INFORMATION TECHNOLOGY SUPPORT

The Himachal Pradesh Forest Department has collaborated with National Remote Sensing Centre (NRSC), Hyderabad for providing fire alerts in the State of HP and developing a geospatial query system resulting in an enterprise image server (ESI) working as a virtual GIS laboratory providing wide access to spatial data including high resolution imagery and GIS tools with an emphasis on analysis, processing of spatial data. The alert system is a part of the Bhuvan-HP Forests web portal established jointly by the National Remote Sensing Centre, Hyderabad and Himachal Pradesh forest department. The NRSC is providing fire alert through its web portal Bhuvan-Himachal Pradesh

6. DISASTER RESPONSE AND RELIEF

6.1 RESPONSE PLAN

The response plan of the Department includes design of actions based on Standard Operating Procedures and tested through mock drills and exercises that would be initiated on a trigger mechanism based upon the impending or actual occurrence of an event of disaster

6.1.1 INSTITUTIONAL ARRANGEMENT WITHIN THE DEPARTMENT

- The nodal officer for disaster management in the department shall be responsible for coordination with EOC, ESF nodal and support agencies and other departments. Appoint additional staff to support him as required for the situation.
- Develop periodic situation report and share with EOC and SDMA.
- Call for a coordination meeting of the key officer to take stock of the situation, the impact of the disaster on department capacity, immediate actions for a response like need and damage assessments, coordination with ESF and Incident response system / EOC, coordination with community-level committees and other key stakeholders.
- Divide work among the current staff to take care of normal time work and emergency work. In particular, do not compromise preventive and preparedness actions in non-emergency areas.
- Organise initial assessment for damages and immediate, short term and long term needs as per the format enclosed and share it with EOC and other key stakeholders.
- In consultation with EOC and ESF nodal and support agencies, plan response actions as per immediate, short term and long-term needs.

6.1.2 EMERGENCY OPERATION CENTRE / CONTROL ROOM OF THE DEPARTMENT

- To appoint one communication officer to coordinate with the emergency control room of the disaster management department.
- To direct the officers at all levels in the department to provide support and regular help to the subdivision officers, district magistrates, disaster management agencies and other local administration.
- Informing the relevant offices and people about dos and don'ts in case the disaster happens.
- Support in the dissemination of Early Warning information once approved by SDMA.
- The first and foremost point to be ascertained by all the Departments concerned, especially the Forest Department, State Govt, Dist Administration, SDMA & NDMA is that the Forest Officers shouldn't be assigned with any duties other than fire protection during March 15th to July, 15th such as election duty, Recruitment of Forest Guards, unnecessary tours by the VIPs of the FD other than for the purpose to monitor and inspect the fire preparedness.
- Assessment and reporting are done on a daily basis and the report is sent to the Nodal Officer for Disaster Management in respect of Forest Fires cum Chief Conservator of Forests (Forest Protection & Fire Control) at Bilaspur.

6.1.3 INCIDENT RESPONSE TEAM

The department has constituted an incident response force at each range level. It consists of Range Officers, Deputy Rangers, Forest Guards, Forest Workers and other staff. The roles and responsibilities of incident response team

- To coordinate with SDMA and other concerned Government Departments.
- Visit the spot and assist Response Team at the sight
- To prepare a status report regarding the disaster.
- To facilitate execution of orders for declaring the disaster.
- Assess the staff and another logistic requirement for field operation and monitor effectiveness.
- To develop the media messages so as to update the status of response work.
- To monitor and guide all the response activities

6.1.4 RESPONSE ACTIVITIES SPECIFIC TO DISASTER

Hazards	Hazard Specific Response Plan
Forest Fire	<ul style="list-style-type: none">• Response teams to be deputed as soon as possible in the affected areas.• Backup plans should be activated after ensuring the availability of drinking water• First Aid kits for the response team
Uprooting of Tree	<ul style="list-style-type: none">• Rapid Response Teams of the Forest Department working under the control of DFO Hq, working in each circle under the control of Conservators (Territorial) should be informed immediately to reach the site and rescue the operations
Landslide	<ul style="list-style-type: none">• All Major landslide prone areas should be identified by geologists and the roads should be closed at times of heavy rains and floods for vehicular traffic• All dozers should be kept in place to reach the site at short notice• Plantation in the steep slope areas to prevent landslides.
Soil Erosion	<ul style="list-style-type: none">• Plantation in the waste / fallow land to prevent erosion of fertile surface soil to control the speed of flood eater leads to soil & moisture conservation.• Watershed management for conservation soil & water conservation should be practised.
Wild Human conflict	<ul style="list-style-type: none">• Rapid Response Teams of the Forest Department working under the control of DFO HQ, working in each circle under the control of Conservators (Territorial) should be informed immediately to reach the site and rescue the operations
Flora Fauna Epidemics	<ul style="list-style-type: none">• The job should be entrusted to the scientists from FRI Dehradun and teams should be constituted to control the epidemics if required using epidemic control teams.

6.1.5 SYSTEM OF RECEIVING AND MANAGING ALERTS

- Field Officials form Forest Guard to DFO receives a text message of latitude and Longitude of the first location of the respective jurisdiction immediately after the passage of MODIS satellite over the

Indian Region NRSC local carries out local processing at Hyderabad and uploading the fire location to Bhuwan-HP Forest web portal mention above.

- The SMS based Forest Fire Alert System as stated above will reduce the response time considerably to enable the firefighting parties to combat the forest fire more promptly.
- Circle wise Action Plan regarding deployment / availability of human/other resources eg number of gang huts, fire watch towers, fire control room, forest fire fighting task force, firefighting equipment is prepared.

6.1.6 EVACUATION, SEARCH AND RESCUE OPERATION

- Proper arrangement should be done to control forest fires and to minimize loss to the department
- Clear the road and make a proper connectivity to affected area
- Support for search and rescue, relief programs etc. by connecting with nodal agencies for different essential support functions.
- The rescue kits are available with Forest guards and as well as in Range Offices. A telephone directory has also been prepared for the said purpose. Proper inventory has been done
- Ensuring adequate facility and monitoring force in the affected areas.

6.1.7 DEACTIVATION OF EMERGENCY RESPONSE PLAN

- Evaluate Emergency response in consultation with the community, protection committees, ESF nodal agencies, EOC and other stakeholders. Document response activities and learning.
- In consultation with EOC and other ESF nodal agencies deactivate the emergency response actions.
- Reallocate the departmental resources (Human, Materials and Financial) to normal time activities.
- Initiate planning to recover the disaster losses to the department, immediate recouping of the resources (materials and finances) used during the emergencies.
- Initiate planning for early and long-term recovery actions as per the damage assessment.

6.2 EMERGENCY SUPPORT FUNCTIONS

Primary Agency	Secondary Agency
Forest Corporation	Forest Department

6.2.1 RESPONSIBILITIES OF PRIMARY AGENCY

- Removal of fallen trees;
- To provide fuelwood for the relief camps and public;
- Have adequate storage of fuel wood and make arrangement for distribution.
- To provide fuel wood for cremation.

Activities for Response

- Arrange for timely removal of trees obstructing the movement of traffic;
- Arrange for timely removal of trees which has become dangerous;
- Make arrangement for fuelwood for the relief camps and for general public use

6.2.2 ROLE OF SECONDARY AGENCY

- To monitor, coordinate, support and supplement the efforts of the primary agency.

6.2.3 RELIEF AND REHABILITATION

- i. Norms of relief [not applicable]
- ii. Minimum Standards of relief [not applicable]

The degraded forests are rehabilitated under fire management plans, State Schemes and Centrally Sponsored Schemes pertaining to fire management and Intensification of Forest Management Scheme (IFMS).

7. DISASTER RECOVERY AND RECONSTRUCTION

7.1 DISASTER RECOVERY

- Develop a map record the burning intensity of the areas affected by the fire plan for forest rehabilitation
- Enhance surface water monitoring to evaluate the short- and long-term impacts of the fire on the aquatic environment in the forested areas and river basin
- Set recovery priorities and objectives
- Develop a recovery plan and implementation plans to operationalize it.
- Placing recovery coordinators in the communities, such Joint Forest Management Committee, Village Forest Management Committees etc.

7.2 DAMAGE AND LOSS ASSESSMENT

After any loss to department infrastructure or forest fire incident, department conduct damage loss assessment. In this regard, instructions will be issued by the Department to assess damage by forest fires.

- It has been stated that the forest fires to the extent of 3-10 hectare shall be thoroughly investigated by the Range Officers/ACFs, 10-20 hectare by the DFOs and in the case where area involved is more than 20 ha and plantation area affected by fire above 10 ha by CFs.
- An investigation report to be submitted to APCCF(Protection) at Bilaspur by 15th of every month during fire season and in all cases of fires, the FIRs are to be lodged with the police.
- The assessment is done on daily basis and report on the prescribed format is submitted to Chief Conservator of Forests (Forest Protection & Fire Control) at Bilaspur by 4.00 pm during 1st April till 15th July.
- Develop an integrated methodology using geospatial techniques to conduct proper damage assessment after forest fire

7.3 RECONSTRUCTION

- Soil erosion is the most damaging, long-term resource impact that occurs after wildfire. Hence measures can be taken to lower the probability of soil erosion and protect the land's productivity and water quality
- Plantation in the forest area or building new infrastructure
- Replacement of damaged trees

8. FINANCIAL ARRANGEMENTS

There is no provision for a separate budget for forest fire management for the department of State Disaster Response Fund or any other scheme. The state forest fire management activities are usually carried out using forest protection fund. The department is financially supported under CSS Schemes on forest fire management, however, this allocation is not sufficient to meet the challenges since the forest fire in the state recurrent and widespread.

The Department provides funds for

- Planning and monitoring of fire management programs
- Schemes related to State and CSS on fire management
- APO pertaining to Intensification of Forest Management Scheme (IFMS)
- Creation of fire database and introduction of a suitable software for effective fire management
- Some of the schemes such as MNREGA are also put to use for cleaning of the forest areas with combustible matter.

NOTES

