DISASTER MANAGEMENT PLAN

PUBLIC WORKS DEPARTMENT

GOVERNMENT OF HIMACHAL PRADESH

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1. INTRODUCTION

1.1 OVERVIEW OF THE DEPARTMENT

Himachal Pradesh Public Works Department, commonly abbreviated as HPPWD, is a department of *Government of Himachal Pradesh* entrusted with the responsibility of planning, construction and maintenance of roads, bridges, ropeways and government buildings in *Himachal Pradesh* state. The prime objective and aim of the department are to provide connectivity to all the habitations in the state. It also is the statutory authority for designing, planning, construction and maintenance of major infrastructural projects in the state. For administrative and functional considerations, the department has been divided into four zones namely Mandi Zone headquarter at Mandi, Hamirpur Zone at Hamirpur, Shimla Zone at Shimla and Kangra Zone at Dharamshala. All the four zones are headed by Chief Engineers.

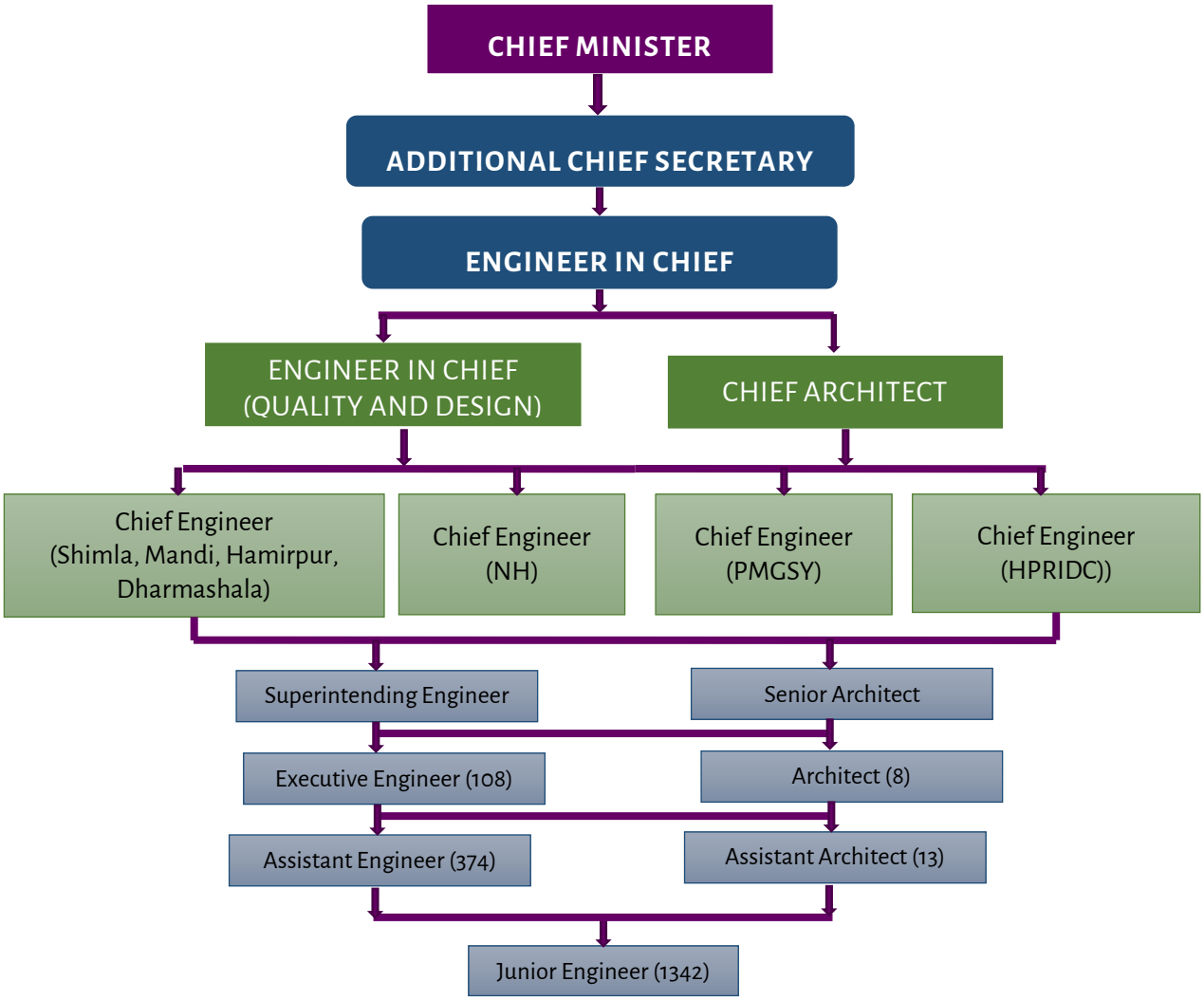
Functions of the department:

- To controls the Planning and Execution of works of National Highways.
- To control Planning, Construction & Monitoring, Inter-State connectivity for the entire State
- To standardize the Designs and Drawings for Buildings and Bridges
- To control the execution works of bridges
- To control the construction and maintenance of public building
- To act as State Level Quality Coordinator to maintain quality parameters during departmental works in the State
- To coordinate the works of PMGSY and PMGSY (World Bank) funded projects through National Rural Road Development Agency (NRRDA).
- To deals with all Architectural planning for buildings
- To executes engineering work on behalf of Local Bodies, Public Undertakings, Boards & other Institution

1.2 ORGANIZATIONAL STRUCTURE

The Public Work Department of the state is under the overall charge of Chief Minister. All policy matters and major administrative decisions of the department are generally taken by Chief Minister who is assisted by an Addl. Chief Secretary (PW). The Department is headed by the Engineer-in-Chief with Headquarters at Shimla. He controls works and matters regarding codes, specifications, planning & monitoring, inter-State connectivity for the entire state and also the entire establishments of PWD. Moreover, each wing of the department is under the administrative control of a Chief Engineers, Engineer-in- Chiefs, Chief Architect. The Chief Engineer (National Highways) with headquarters at Shimla controls the Planning and Execution of works of National Highways. The Engineer-in-Chief (Quality & Design) is acting as State Level Quality Coordinator to maintain quality parameters during departmental works in the State. Chief Engineer (PMGSY) is doing monitoring, planning and having day-to-day interaction with Govt. of India (MoRD) for the works of PMGSY and PMGSY (World Bank) funded projects through National Rural Road Development Agency (NRRDA). Chief Architect is heading Architectural Wing deals with all Architectural planning for buildings undertaken by PWD under North, South and Central Zones.

Organizational structure of the department



1.3 PURPOSE OF THE PLAN

The basic purpose of departmental DM plan is to provide guidance to all the agencies within the department to manage the risks of disasters before, during, and after disasters. The overall purpose of this plan is to make the public infrastructures in the state a resilient one as well as enough to deal with anticipated disaster risk. The plan will also provide guidance to subordinate offices as well as other stakeholders within the Public Works Department to manage the risks raised at various phases including before, during and after the disasters.

Thus, the main objectives of the plan to facilitate department plan are:

1. Assessment of multi-hazard risk of the various infrastructures such as roads, bridges, public building in the state.
2. Identifying mitigation measures of existing risk and prevention measures of anticipated risk.
3. Mounting prompt and coordinated response at various levels.
4. Assigning role and responsibilities for various tasks to be performed by the department in accordance with the State DM Policy and State DM Plan.
5. Undertaking measures proposed for strengthening capacity-building and preparedness of various stakeholders attached to infrastructure in the state

1.4 SCOPE OF THE PLAN

Some of the key areas of the disaster management plan of Public Works Department are as follows:

- Measures to strengthen the disaster resilience of states infrastructure in the state
- Identify major infrastructures in the State including roads, bridges and major public building which are vulnerable to different forms of disasters
- Measures for prevention and multi-hazards mitigation by the Departments at state level as well as local level
- The capacity-building and preparedness measures required to be taken by the Department at state level and the district level to respond to any threatening disaster situation or disaster
- The response plans and procedures of the department providing for - allocation of responsibilities at the State and District Level, procurement of essential resources; establishment of communication links and dissemination of information to the public.

1.5 AUTHORITIES, CODES, POLICIES:

Functioning of the Public Works Department in Disaster Risk Management is in accordance with the State Disaster Management Plan and Policy. Apart from these, Department of Public Works will be guided by:

1. Himachal Pradesh Public Works Department Specification 1990 (CIVIL WORKS)
2. Himachal Pradesh Public Works Department Specifications 1996 (ELECTRICAL WORKS)
3. Public Works Department Manual of Orders
4. Public Works Department. Manual and code, Punjab manual and code.
5. Himachal Pradesh Land Control Act 1968
6. Himachal Pradesh Road Infrastructure Protection Act, 2002
7. Himachal Pradesh Road Infrastructure Protection rules, 2004
8. Himachal Pradesh Aerial Rope Way Act, 1968
9. Himachal Pradesh Road Construction Policy
10. Manual on Flood Forecasting
11. Code & specification of State PWD
12. Procedure of Pradhan Mantri Gram Sadak Yojana (PMGSY), NABARD, and other Centrally sponsored scheme & projects
13. Codes and specification of BI-S related to the fields of infrastructure etc.
14. Himachal Pradesh Public Works Department Schedule of rates 1999
15. Himachal Pradesh Public Works Department Schedule of rate 1996

Department discharges its role and responsibilities on the basis of the existing specific provisions:

1. Land use hazard zoning technique used for planning for new buildings/ bridges &roads
2. Quality standards & guidelines for hazard-resistant construction of buildings/bridges
3. Retrofitting policy for disaster-resistant strengthening of existing buildings/bridges
4. Retrofitting policy for Non-structural building components (falling hazards)
5. Education & training on disaster risk management for the staff in HPPWD
6. Conduct disaster preparedness programmers (e.g. mock drills, first aid, search and rescue training)
7. Safety norms are followed in construction of buildings
8. Risk assessment is done, site- selection and construction of new infrastructures
9. Retrofitting of existing buildings

1.6 INSTITUTIONAL ARRANGEMENTS FOR DISASTER MANAGEMENT:

Public Works Department has a well structured institutional arrangement within the departments. The Departments will serve as a support agency at the various phases of disaster management.

1.6.1 NODAL OFFICERS

The nodal officer of the Public Works Department at the state will be the Superintending Engineer (Works) O/o E-in-C HPPWD Shimla who Act as the focal point for disaster management activities of the department and will be supported by Deputy Controller (Finance) and S.E. (P&M). Also, the concerned Superintending Engineer will be the nodal officer at the Circle level to perform emergency support functions.

Roles and responsibilities of the nodal officers

- Accountable to any communication / actions related to disaster management of the department.
- Take lead to prepare the department disaster management plan, Emergency Support Function (ESF) plan and Standard Operating Procedure (SOP).
- Constitute the Incident Response Team (IRT) in the department as per the need and organize training for members.
- Help the department to procure the equipment necessary for search and rescue, first aid kits and disburse the same to IRTs and for the department if required.
- Provide regular information on disaster or task assigned to him to SEOC / Revenue Department during and after disasters in consultation with the department head.
- Attend Disaster management meeting, training, workshops or any related programme on behalf of the department.
- 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 and 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.
- 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.

1.6.2 INCIDENT RESPONSE TEAMS (IRTS)

The department constituted Incident Response Teams (IRTs) at all levels with the provision of a delegation of authority in accordance with the National and State Disaster Management plans. Incident Response Teams (IRTs) will be constituted at State, Circle & Division level and Division level to deal with any disaster. State level IRT for Department of HPPWD has 10 member body which is headed by Engineer in Chief as the Chairman and IRT at State level shall meet at least twice in a year. Every year 1st meeting will be held in the 1st week of April and 2nd meeting in the 1st week of October. For circle level IRT members having 6-member body headed by the Chairman which mainly coordinated activities with the District Disaster Management Authority. At grassroots level, Divisional level IRT is constituted by 3-member body Executive Engineer as the Chairperson. The constitution of State Level Incident Response Teams for Department of HPPWD are:

#	Designation	Role
1	E-in-C	Chairman
2	CE(SZ) Member	Member
3	CE (HZ))	Member
4	CE (MZ)	Member
5	CE (KZ)	Member
6	CE (NH)	Member
7	SE (Works)	Convener-cum- Nodal officer
8	SE (Mech.)	Member
9	SE (Electrical)	Member
10	Supdt.	Member

The Circle Level Incident Response Teams for Department is as follows:

#	Designation	Role
1	SE	Chairman
2	EE(Design)	Convener-cum-Nodal Officer
3	All field Ex. Engineers	Member
4	AE (Mech.)	Member
5	AE(Elect)	Member
6	Supdts	Member

The divisional level Incident Response Teams:

#	Designation	Role
1	Executive Engineer	Chairperson cum Nodal officer
2	All AE's	Members
3	Supdts	Members

1.7 PLAN MANAGEMENT (MONITORING, REVIEW AND REVISION):

The Departmental Disaster Management Plan is a live document which is subjected to periodic up gradation and revision. The plan shall be updated by the office of the Engineer in Chief at least once in a year or as and when felt necessary as per the direction of State Disaster Management Authority. In order to update the document, all information from the various stakeholders and agencies within the department is to be collected and updated. Appropriate consultation with the various stakeholders and line agencies shall also be conducted to get views of the stakeholders. Any new data and finding of the hazard risk vulnerability studies shall be incorporated as and when it is available, which is relevant and applicable to the department. After incorporating appropriate suggestion the modified document is then submitted to the State Disaster Management Authority for the final approval. The approved plan shall be uploaded to the departmental website for wide publicity.

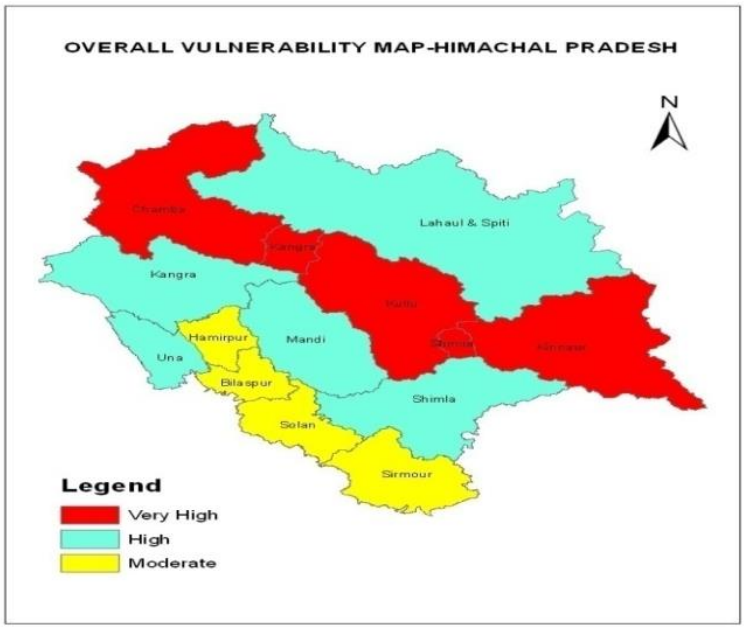
Besides the above procedures of the updating of the plan, a regular data collection system shall be set up at the main office and the data shall be verified and uploaded under the supervision of Department. The document shall be made with proper attention keeping in view the disaster risk management measures.

State level nodal officer in the department will be responsible for overall successful implemental of the plan by coordinating with all stakeholders and agencies within the department. Timely progress of the plan implementation also will be disseminated to the Himachal Pradesh District Management Authority

2. HAZARD, RISK, VULNERABILITY AND CAPACITY ANALYSIS

2.1 POTENTIAL HAZARD IN THE STATE:

In recent time, a large number of natural disaster incidence reported in the state. As Himachal is situated in the North-West Himalaya it faces a large number of natural as well as man-made disaster. So, hazards both natural and manmade are of immediate concern to the State as the immense loss was reported every year. The fragile ecology and geology of the State coupled with large variations in Physio-climate conditions increases vulnerability to hydro metrological hazards. Also, Himachal is spread along the Main Boundary Thrust (MBT) and Central Boundary thrust imposes the thread of Earthquake in the State.



Frequency of hazards in districts of H.P

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

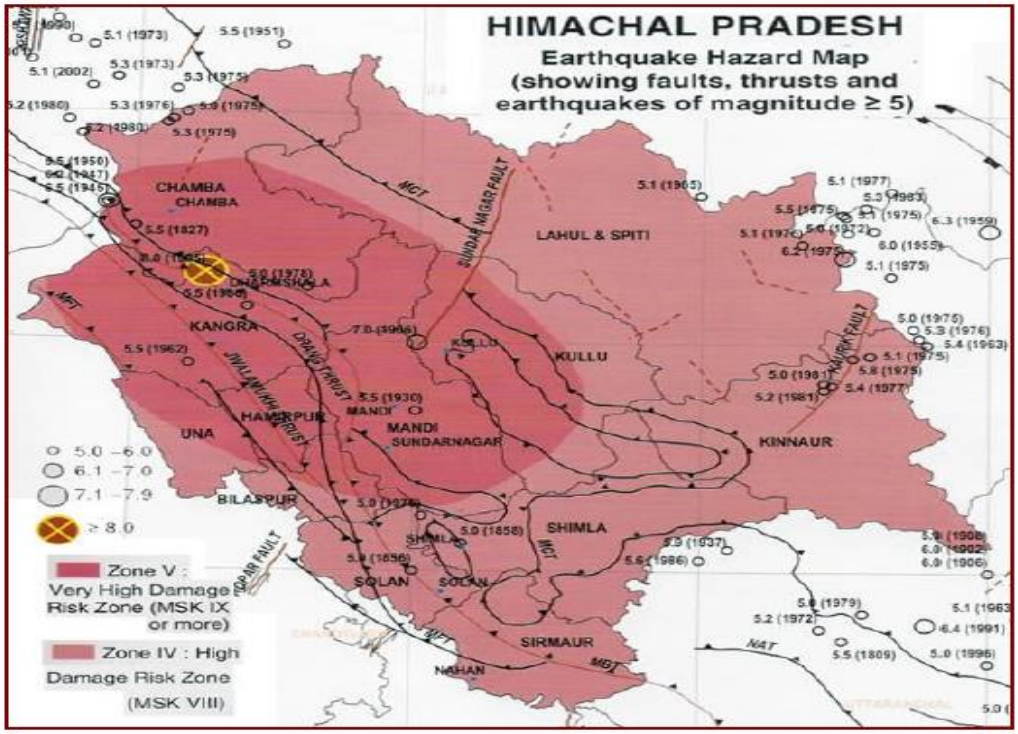
2.1.1 EARTHQUAKE

Lying in the sensitive Himalayan belt, at the juncture of two active tectonic plates, the region is prone to severe seismic activity. From the seismicity point of view, the state of Himachal Pradesh is considered to be very sensitive as it falls in Zone V and IV as per the Seismic Map of India.

- Zone V covers the areas which are liable to seismic intensity IX and above in Modified Mercalli Scale (MMS) and is most severe seismic zone referred to as the Very High Damage Risk Zone.
- Zone IV covers the areas which are liable to seismic intensity VIII

According to the Seismic Map of India, five districts viz. Chamba (53.2%),Hamirpur(90.9%), Kangra (98.6%), Kullu (53.1%) and Mandi (97.4%) have 53 to 98.6 percent of the area liable to the severest designed intensity of MSK IX or more, the remaining area of these districts being liable to the next severe intensity VIII. Two districts, Bilaspur (25.3%) and Una (37.0%) also have a substantial area in MSK IX and the rest in MSK VIII. The remaining districts Shimla, Lahaul & Spiti, Sirmour, Kinnuar, and Solan are liable to intensity VIII

The past record of seismic activity in the state and the tectonic profile, probability of a high impact earthquake, can be expected in Himachal Pradesh (Prof. Roger Bilham).



The Earthquake Hazard map, BMTPC, 2006 shows that Himachal Pradesh falls in one of the highest risk zone areas of the state (Zone IV & V).
(Source: Department of Environment, Science and Technology Govt. of HP)

#	Name of District	Seismic Zones	Intensity MSK IX or more % Area	MSK VIII % area
1	Kangra	V/IV	98.6	1.4
2	Mandi	V/IV	97.4	2.6
3	Hamirpur	V/IV	90.9	9.1
4	Chamba	V/IV	63.2	36.8
5	Kullu	V/IV	53.1	46.9
6	Una	V/IV	37.0	63.0
7	Bilaspur	V/IV	25.3	74.7
8	Solan	V/IV	2.4	97.6
9	Lahaul&Spiti	V/IV	1.1	98.9
10	Kinnaur	V/IV	---	100
11	Shimla	V/IV	---	100
12	Sirmour	V/IV	----	100

Past Earthquakes which have occurred in H.P

#	Year	Magnitude	Lat/Long	Tentative Location of the epicentre
1	1905	7.8	32°18'00" 76°15'00"	KarariDal(Distt.Kangra)
2	1906	7.0	32°00'00" 77° 00'00"	Near Karshing(Distt.Kullu)
3	1945	6.5	32°36'00" 75°54'00"	Minu (ChmabaDistt.)
4	1947	6.2	32°36'00" 75°54'00"	Minu (ChmabaDistt.)
5	1951	6.4	32 36 76 30	East of DhanKanda ,DistrictChamba
6	1975	6.7	31°56'24" 78°31'48"	Distt.Kinnaur

2.1.2 LANDSLIDES

Landslides are one of the key hazards in the mountain regions particularly in the state of Himachal Pradesh which causes damage to infrastructure and loss of life, livelihood and environment. The hills and mountains of Himachal Pradesh are liable to suffer landslides during monsoons and also as a result of high-intensity earthquakes. According to the Landslide Hazard Zonation Atlas of India published by BMPTC more than 8% of the entire area of the state is under High Hazard Risk zone but according to revised methodology, it indicates that around 3.20% and 5.65% area respectively under High Landslide Hazard Risk. Most of the past landslides were along the roads / highways and along the pilgrimage routes as observed in NRSC Atlas.

This clearly indicates that the slides are triggered mainly due to anthropogenic factors. This result calls for taking immediate measures to check the unplanned development along the high hazard areas. Visual interpretation and GIS analysis indicate that most of the built-up area comes under the high-risk zone. On further analysis, it was found that around 10 Mega Hydropower projects of Himachal Pradesh are under maximum threat of landslide followed by large hydropower projects which fall under medium landslide hazard risk. 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 to landslides in the district. Una being in Shiwalik system occupies about 1500 sq.km. of the area, prone to landslide.

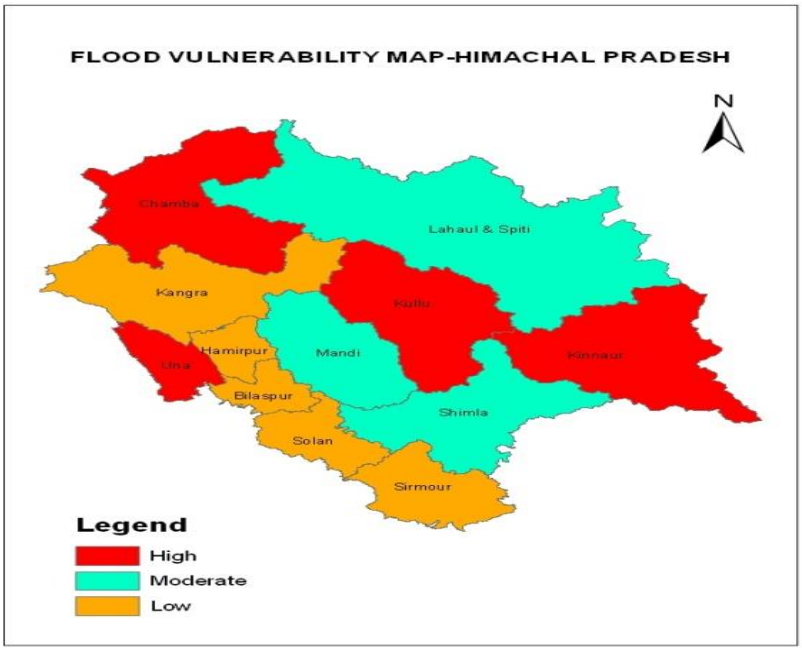
District	Severe to Very High	High	Moderate to Low	Unlikely	Total Area (Sq.Km.)
Bilaspur	216	842	83	1	1142
Chamba	2120	3829	351	70	6370
Hamirpur	0	851	204	45	1100
Kangra	123	3698	1233	557	5611
Kinnaur	868	4956	498	0	6322
Kullu	1820	3512	65	3	5401
Lahaul&Spiti	127	11637	1825	2	13591
Mandi	968	1978	826	98	3870
Shimla	893	3345	767	14	5019
Sirmaur	95	1805	614	228	2742
Solan	556	1118	157	79	1910
Una	2	678	517	311	1508

Source: Landslide Hazard Zonation Atlas of India, BMTPC

Landslide Area	History of Damage
Maling (1968)	Damaged 1 Km of NH-22 and is still active.
Kinnaur (Dec.1982)	Occurred at Sholdingnala collapsing 3 bridges and 1.5 of road vanished.
Jhakri (March 1989)	At Nathpa about 500 m road was damaged due to this slide and is still active
Luggarbhati on 12 Sept.1995	39 people were buried alive during the slide
Prominent slides in Beas valley are at Marhi, Bhang, Chhyal, and Manduin upper catchment of the Beas river	

2.1.3 FLOOD / FLASH FLOODS

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.



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.

A large number of river and their tributaries are originated from Himachal. The infrastructure build along the Banks of rivers and their tributaries are vulnerable to floods / flash floods

Table: Showing the name of major rivers and their tributaries vulnerable to floods

Rivers	Major Tributaries
River Satluj	Spiti, Sanglekhad, Alikhad,Gambharkhad,Sirkhad, and Swan river
River Beas	Uhl and Suketikhads
River Ravi	Siul
River Yamuna	Pabbar, Giri and Bata

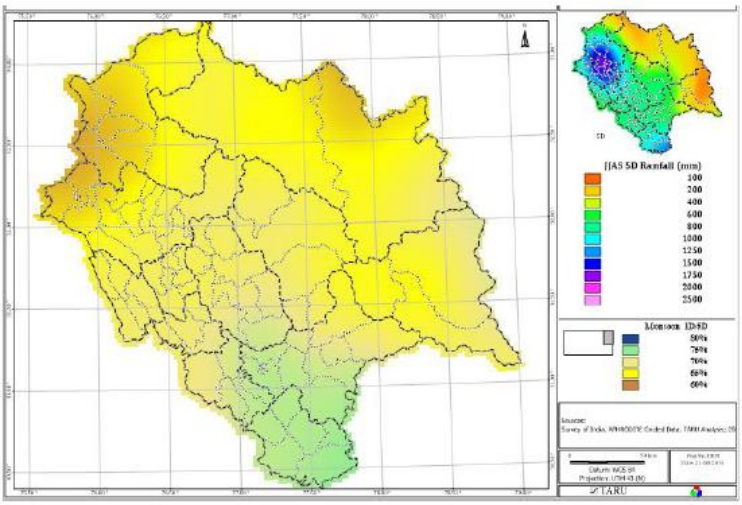
Over 40 incidents of flash flood and cloudbursts occurred in Himachal Pradesh in the last 12 years and over 35 were feared dead. In August 1994, the Manimahesh cloudburst and a flash flood washed away almost the entire length of Chamba-Bharmour road (62 km), over 50 people feared dead, and 2000 injured.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

2.1.4 DROUGHT

The climate in Himachal Pradesh shows a diverse range from tropical in the lower attitudes to the cold desert climate in the Trans Himalayan region. The western and north-western part gets the highest annual rainfall of more than 2220 mm, while the eastern cold desert region gets the lowest annual precipitation, mostly as snow (<400 mm). The maximum rainfall is contributed by monsoon about (80%) in the western region. The rainfall pattern shows high variability across years and location across the state. In any year, one or the more districts face drought as indicated by last decade's rainfall pattern.

As per the new classification of Himachal Pradesh Agricultural University, Palampur, (HP), the state has been divided into eight agro-climatic zones. This zonation is mainly based on rainfall pattern and altitudinal ranges. Nearly half the state lies in cold desert zone with low population densities. As per Land use statistics, only 12 percent of the geographical area is classified as "Net sown area", while about 39% of the land area is classified as "*Other uncultivated / Fallow land*. In high altitude districts, cultivable land is less than 2%. The cultivable land is low in the state due to topographical, altitudinal and soil erosion constraints.

The map indicates that almost all parts of the state except region around Shimla face medium to high drought risks in monsoon rainfall. Parts of Chamba and Kangra, as well as Lahaul & Spiti, show lowest ratios indicating highest risk of droughts. The Shiwalik region has medium risk while parts of Kinnaur also has medium risks.

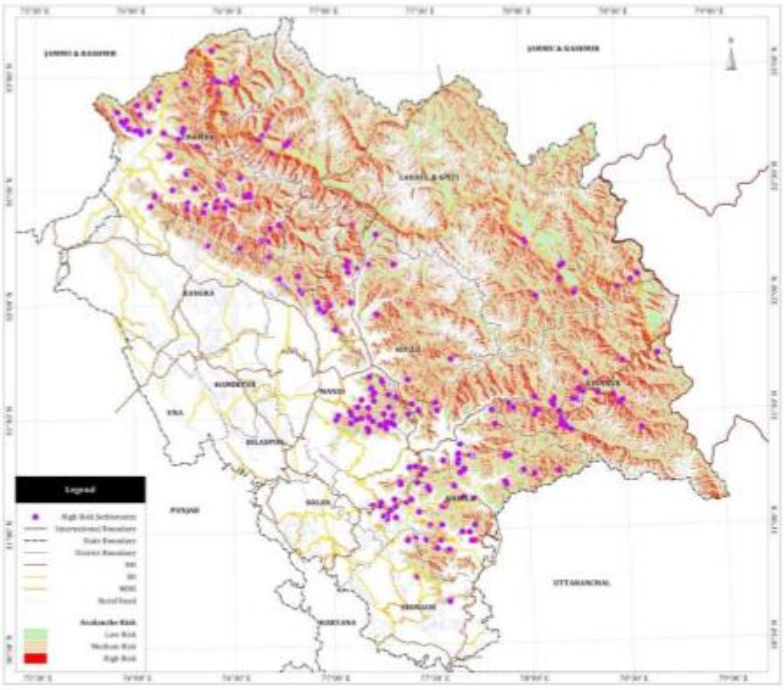


Source: Aphrodite Gridded data (1951-2007)

Shiwalik region of Hamirpur faces summer water shortages due to lack of any perennial sources. In the high-risk zone, the once in 10-year drought may be nearly two-third of the median monsoon rainfall, which can cause severe distress to the rainfed agriculture.

2.1.5 AVALANCHE

Snow avalanches in the higher Himachal Himalaya are recurrent high- frequency low magnitude process where slope, aspect, relief and surface gradient are conducive for initiation of failure. Shallow avalanches are prevalent during winter months at higher altitudes, feeding to glacier mass balance. Depending on the length of run-out distance and catchment area, these avalanches may be catastrophic.



Source: TARU 2013

Himachal Pradesh-Avalanche Probability Zones

Based on an analysis done by TARU, almost 1.2% area of Himachal Pradesh falls under the category of high avalanche probability zone. Moderately probable avalanches occur in about 15% of the geographical area. Even though the extent of the area is large the low population density around these areas does minimize the extent of the risk. Rests of the region (i.e. 84.3%) have low to nil snow avalanche probability. The extent of developmental activities including roads and bridges around the avalanche-prone areas have increased in the recent past which might lead to increased economic vulnerability. Therefore, there is a need to develop a mechanism to artificially trigger avalanches in the event of single snowfall spell in excess of 2 feet or more to avoid large-scale damage. Since the regional government is in the process of infrastructural investments by constructing all-weather roads dedicated action-force may be constituted to artificially trigger avalanches in avalanche risk-prone areas.

Snow Avalanche Probability Zone

Probability Category	Probability Type	Area (sq. km)
0	Nil Probability	8,068
1	Low	21,385
2	Medium	5,076
3	High	424
Note: Values calculated above 2000 meters. Due to tolerance Limit, variations in total area are ±2.16 percent.		

2.1.6 ROAD ACCIDENT

Amongst the man-induced disasters, road accidents are a major killer. Road accidents involve all kinds of vehicles leading to death and injuries. The topography of the state of HP is such that accidents can happen anywhere without any warning. The table below indicates the magnitude of the problem in the state.

Year-wise Road Accidents in Himachal Pradesh

Year	Cases Occurred	Persons Killed	Persons injured	Vehicles involved
2003-04	2,794	843	4,293	3,195
2004-05	2,758	920	4,674	3,423
2005-06	2,868	861	4,755	2,868
2006-07	2,737	929	4,886	2,917
2007-08	2,953	921	5,272	3,756
2008-09	2,840	898	4,837	3,583
2009-10	3,023	1,173	5,630	3,705
2010-11	3,104	1,105	5,350	3,810

2.1.7 STAMPEDE

The State is known as the land of Gods. Many famous temples are located in the State such as Sri Naina Devi, Baba Balak Nath, Ma Chintpurni, Ma Jawalaji, Ma Braheswari and Sri Chamunda Nandikeshwari Dham to name a few. A large number of devotee's throng these places every year. A human stampede at the temple of Naina Devi occurred on 3 August 2008. 162 people died when they were crushed, trampled, or forced over the side of a ravine by the movement of a large panicking crowd. The possibility of such instances is always there if there is any laxity on the part of the management.

2.2 ASSESSMENT OF CAPACITY GAPS AND NEEDS

HPPWD has a vital pool of resources located in the entire State for construction and maintenance of roads, bridges, buildings etc. The services of various units of the Department can be utilized during Disasters. E-in-C office located in Shimla has a separate IT cell with one Nodal Officer posted there. All the offices right from E-in-C office down to Division office are equipped with telephone, fax, photocopier and internet facility. These offices can be used as control rooms. Human resources of the department need training on management and mitigation of different type of disasters including relief, rescue and rehabilitation. Department also needs to establish a monitoring mechanism at Circle level to check the Circle level Disaster management plans. For this, a pool of resource persons is needed in each Circle to help in the preparation of safety plans. It will also be helpful in the auditing of these plans at grass root level to ensure the implementation of the concerns of risk reduction. Adequate financial powers are needed to be vested with the Circle level and Divisional officers to manage the crisis situation. There remains a lot of vacancies at various level, yet to be filled up as per sanctioned strength & especially with technical / skilled posts.

Number of Kacha house damaged in rural areas due to various disasters

#	District	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
1	BILASPUR	788	824	258	456	437	316	258	295
2	CHAMBA	578	500	1050	654	842	149	0	176
3	HAMIRPUR	729	687	283	329	51	366	605	581
4	KANGRA	2023	1396	683	759	601	1099	0	1023
5	KINNAUR	463	885	1107	1301	143	732	1068	521
6	KULLU	652	556	205	50	1181	216	0	242
7	L&S	220	367	824	241	483	105	86	116
8	MANDI	1177	583	375	702	304	910	858	821
9	SHIMLA	991	4308	2087	861	38	265	724	447
10	SIRMOUR	717	2160	683	1467	313	561	116	159
11	SOLAN	732	1948	296	451	1585	31	39	130
12	UNA	307	1603	507	249	293	98	0	260
HP		**9377**	**15817**	**8358**	**7520**	**6271**	**4848**	**3854**	**4771**

Road Length (in Kilometer) Damaged

#	District	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
1	BILASPUR	478	129	39	743	691	575	337	506
2	CHAMBA	0	5	0	0	0	0	50	1116

3	HAMIRPUR	361	410	567	998	916	1324	382	290
4	KANGRA	0	0	0	0	0	3706	1823	262
5	KINNAUR	247	156	79	52	18	444	351	495
6	KULLU	252	214	6	9	540	804	538	412
7	L&S	451	362	469	473	0	171	181	136
8	MANDI	0	0	0	0	93	2722	1230	1552
9	SHIMLA	2	3	4	4	45	400	63	6
10	SIRMOUR	0	0	0	0	0	0	0	0
11	SOLAN	731	1105	724	871	426	105	649	2
12	UNA	18	22	0	0	0	2318	193	363
HP		2540	2406	1888	3150	2729	12569	5797	5140

Assistance (Rs. in Lakh) provided for repair / restoration of damaged road and bridges

#	District	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
1	BILASPUR	287	220	215	802	0	12	0	93
2	CHAMBA	0	0	0	0	0	0	0	0
3	HAMIRPUR	33	45	1921	831	0	2	994	3946
4	KANGRA	86	116	685	1464	0	125	0	2385
5	KINNAUR	6	0	0	0	0	692	0	0
6	KULLU	0	0	2952	3537	0	0	0	0
7	L&S	17	29	16	18	0	550	175	0
8	MANDI	500	400	0	57	0	4490	0	121
9	SHIMLA	2	8	63	81	0	0	0	0
10	SIRMOUR	0	0	0	0	0	0	0	0
11	SOLAN	60	0	0	0	0	0	5	5
12	UNA	1	8	0	0	0	0	149	25
HP		992	825	5852	6788	0	5872	1323	6575

The data in the above tables show that the effect on the functions of the department due to disasters has been tremendous. Thousands of kilometres of roads have been lost due to disasters, hundreds of houses are lost every year and the assistance provided in reconstruction is in crores. All these are major functions of the PWD departments, therefore, the department needs to be prepared to mitigate this risk which it is prone to every year.

3. RISK PREVENTION AND MITIGATION

3.1 RISK PREVENTION

- To conduct Hazard, Risk Vulnerability and Capacity Analysis (HRVCA) of departmental infrastructure considering multi-hazard approach i.e. Risk of infrastructure to Earthquake, Landslide and fire.
- Mapping of areas those are vulnerable to a landslide.
- Construction of new infrastructure on the recommendation of Hazard, Risk Vulnerability and Capacity Analysis (HRVCA) and conducting Land Suitability Study before developing infrastructure.
- To ensure that the completed structures such as infrastructure installations have structural alternatives added on to ensure resilience, to specific disasters to which the concerned locations are vulnerable

3.2 RISK MITIGATION

- On the Recommendation of HRVCA study, preparation of non-structural mitigation plans for the departmental buildings and infrastructure.
- Undertaking mandatory technical audits of structural designs of Old and New major building/projects by the respective competent authorities to infrastructure projects
- Carrying out structural safety audits of all critical lifeline structures

3.3 STRATEGIES FOR RISK PREVENTION AND MITIGATION

Hazard	Structural Measures	Non Structural measures
Earth Quake	• Public utility buildings must be constructed in the stable areas • Developing seismic strengthening and retrofitting standards and guidelines for existing structures • Strengthening earthquake safety research and development in professional and technical institutions. • Undertaking mandatory safety audits on structural designs of Old and New major building/projects by the respective competent authorities related to all Govt. & Pvt. Buildings	• Earthquake risk assessment shall be done for site-selection for new infrastructural projects • Revision and adoption of Earthquake Resistant building bye-laws for construction, both in urban and rural areas in association with TCP & Municipal bodies • Awareness Program for dissemination of earthquake-resistant building codes, the National Building Code 2005, and other safety codes & construction practices in public • Demonstration projects to disseminate the earthquake-resistant techniques • Training of trainers in every HPPWD Division for professional & technical expertise.

		• Carrying out the vulnerability assessment of earthquake-prone areas and creating an inventory of resources for effective response. • Wide dissemination of earthquake-resistant building codes, the National Building Code 2005, and other safety codes
Landslide	• Buildings designed in locations to withstand the impact forces of landslides and to provide safe dwellings for people, and escape routes • Promotion of Eco-Disaster measure for Landslide measures. • Avoid building houses at the base of slopes that are prone to landslides • Construction protection walls for landslide mitigation at vulnerable spots	• Preparing an inventory of existing active and past landslide location. • Conduct land suability studies on GIS and Remote Sensing plate form before constructing an infrastructure. • Landslide risk assessment shall be done for site-selection for new infrastructural projects • Awareness campaign on landslide and risk reduction, and sanitizing all stakeholders on landslide hazard mitigation. Also promotion of modern land use practices in hill areas for different developmental activities. • Establishing appropriate mechanisms for compliance reviews of all land use of Govt. premises as per bye-laws in hilly areas.
Flood	• A network of rain / snow gauges would be strengthened in the information. • Flood-resistant structural measures shall be adopted for all infrastructural projects in the flood-prone areas • Careful location of new facilities, particularly community facilities such as schools, hospitals and other important infrastructure away from flood-prone areas. • Construction of strong, wind safe public buildings which can be used for community shelter in settlements	• Tie-up with weather reports, IMD would be strengthened so that EWS can be effectively communicated to the vulnerable areas.
Man Made Disaster (road accidents, stampede, fire breakout etc)	• Fire extinguishers to be installed in all the office buildings. Also, the staff to be trained on how to operate a fire extinguisher. • Construction of road safety structure	• Preparing DM plans with specific reference to the management of landslide • Awareness campaign on various manmade disaster which state mainly prone to and risk reduction, and sensitizing all stakeholders

4. MAINSTREAMING DISASTER RISK REDUCTION IN DEVELOPMENT

Mainstreaming Disaster Risk Reduction into Development is an important mandate of the Disaster Management Act 2005. Already there is an emerging consensus that the key to achieving a sustained reduction in disaster loses lies in factoring risk considerations into development activities. The Himachal Pradesh Disaster Management Plan has proposed strategies for integration and mainstreaming DRR into a few flagship national programmes in the sectors. The public works department shall identify key sectors that receive priorities for promoting DRR into all development programmes and into mainstream DRR into the departmental Plans and policies. Risk-sensitive land-use planning, building regulations with provisions for structural safety against natural hazards, construction of hazard-resistant infrastructures etc. could reduce future disaster risks. Some of the key areas, along with some illustrative activities under each sector may be as under:

Department development activities / projects	Mainstreaming
• The department constructs the govt. • buildings, museums, house allotment work of Government Building etc. and provides the architectural support in the construction	• Ensure all construction is earthquake resilient. • Museums and govt. buildings must be Earthquake resistant.
• The department provides all necessary • services and facilities to the govt. buildings, site evaluation and assessment, structural • assessment and renovation options	• Adoption of Modern technology suitable to the local geographic condition. • Land use hazard zoning technique used for planning for new public building
• Planning and designing building network to provide optimized connectivity to residential and non-residential govt. buildings of different departments	• Constructing new buildings on a high plinth in the flood-prone areas and earthquake resistant. • Developing disaster resistant Land Use Plans and Building Codes • Enforcing zoning and building regulations
• Construction, renovation, up gradation and maintenance of residential and nonresidential govt. buildings of different • departments	• Retrofitting to the govt. buildings at the block level, panchayat level and district level • Ensuring that all existing infrastructure establishments are retrofitted for future disasters
• Construction of new road and maintenance of roads	• Build landslide protection structure and crash barriers to avoid road accidents • Promote Eco DRR activities for landslide mitigation along the roads. • Ensuring that all new roads compulsorily comply with the safety standards of disaster reduction • Ensuring that all existing roads are retrofitted from future disasters to the extent possible
• Development of new infrastructure projects	• Conduct Disaster Impact Assessment (DIA) of all new development projects • Land use hazard zoning technique used for planning for all new infrastructural projects

	• Ensuring that all new critical infrastructure compulsorily comply with the safety standards of disaster reduction • Incorporating Disaster risk reduction measures into development programmes involving construction of buildings etc., such as Sarva Shiksha Abhiyan, Indira Awas Yojana, Jawaharlal Nehru National Urban Renewal Mission, Rajiv Awas Yojana etc

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. (DM act, 2005) Himachal Pradesh is very much seismicity active and most of the areas of the states lies in Seismic Zone IV and in Zone V. Build an environment in the state are not earthquake resistant which will lead to a large number of injuries, loss of life, and damage to infrastructure. In recent time due to unplanned development in the state leading to landslide incidents which can cause loss to infrastructure and damage to the road networks.

Strategic Action plan for Disaster Preparedness

- Identify potential emergency situations in which department may have a crucial role
- Clean the area beneath bridges before the monsoon so that flood waters can flow more freely.
- Maintain all the highways and access roads, which are critical from the point of view of the emergency situation.
- Increase the size of bridges, if necessary, so as to prevent a breach of roads and Bundhs. Smaller bridges prevent the flow of water.
- All equipment's i.e. Bulldozers, Crane, Truck etc. must be checked and keep in readiness for use during disaster
- Ensuring there is sufficient stock of construction material in disaster-prone areas.
- Identification of the safe building (govt.) at panchayat and block levels. The safe places must be identified as per the disasters (earthquake, landslide, floods).
- The executive engineer must ensure the temporary construction work has taken place before the disaster forecast (flood, heavy snowfall etc.).
- Identifying the buildings those are vulnerable to flood, earthquake, water logging and developing the plan to avoid any damage to the building.
- Stockpile and preposition other necessary repairing material at a safe place for the immediate repairs. Keep the equipment's, 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.
- Installation of adequate firefighting equipment & testing of the already installed equipment
- Installation of Evacuation routes & Maps and other tools to help people navigate easily in an exigency. Such signboards are to be installed in corridors and pathways. Apart from above, ladders, ropes and first aid boxes are to be arranged.
- 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.
- Adequate numbers of buildings or open space shall be identified where relief camps can be set up during an emergency.
- Demolition of unsafe buildings
- Erection of temporary bridges
- Provision of protective materials, maintenance and repair to Government buildings

5.1.1 CAPACITY BUILDING

As part of preparedness, it is required build sufficient capacities within the department staff and other stakeholders to be able to better perform the roles and responsibilities for disaster risk reduction and emergency response and achieving desired objectives. Action 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.

5.1.2 FORECASTING AND EARLY WARNING SYSTEMS

- A network of rain / snow gauges would be strengthened in the information.
- The tie-up with weather reports, IMD would be strengthened so that EWS can be effectively communicated to the vulnerable areas.
- Modern media would be utilized to communicate the EWS.
- Tie-up for sharing of information would be done with the other institutions.
- ICT tools need to be used for data receptions, forecasting and timely dissemination

5.1.3 COMMUNICATIONS AND INFORMATION TECHNOLOGY SUPPORT

The digital mapping of resources would be done and the same would be hosted in web-based portals for easy access and retrieval. These tools can be used in the following areas:

- Creating decision support system for the policy makers, disaster managers and responsible officers at all levels.
- Real-time dissemination of early warning to the all the stakeholders etc.
- Information and broadcasting mediums such as television, radios, FM stations etc. can be used keeping in view their geographical reach and availability.

- Emergency communication system during disasters.
- Collecting information on damage and needs assessment.

5.1.4 SETTING UP AND STRENGTHENING OF EMERGENCY OPERATIONS CENTRE

- Set up of an emergency control room within in the department and timely dissemination of information with State Emergency operation Centre attached with the State Disaster Management Authorities and District control rooms

5.1.5 TRAINING, SIMULATION AND MOCK DRILLS

- 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.
- Awareness Program for road safety and safe construction should be conducted time to time.

5.1.6 COMMUNITY-BASED DISASTER PREPAREDNESS

- Resilience, sustainability and mitigation are incorporated as part of the design for infrastructure systems and as part of the community's capital planning process.
- The capacity of all infrastructure systems is adequately matched to the community's current and projected demand on its built and virtual environment
- Assist in the possible identification of suitable buildings, within their scope of authority, other than the school which may be used as alternative emergency shelters.

6. DISASTER RESPONSE AND RELIEF

6.1 RESPONSE PLAN

The response plan of the department includes the design of action 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 a disaster.

6.1.1 INSTITUTIONAL ARRANGEMENT

In an emergency situation, the nodal officer within the department will be initiated for activating response plan, disseminate the information to all staff, key stakeholders etc.

Roles and responsibility of the nodal officer during disaster response are:

- The nodal officer for disaster management in the department shall be responsible for coordination with EOC, ESF nodal and support agencies and other departments
- 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.
- To direct the officers of all levels in the department, for high-level response to ensure the safety of buildings of all govt. departments and other assets
- 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.
- Organize 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.
- To direct the officers of all level in the department to provide support and regular help to the subdivision officers, district magistrate, disaster management agencies and other local administration.
- In consultation with EOC and ESF nodal and support agencies, plan response actions as per immediate, short term and long term needs.

Moreover, Superintending Engineer PWD of the vulnerable Districts will explain the detailed response plan at District level meeting of District Disaster Management Authority constituted in every district in conformity with GOI guidelines for planning, coordinating and implementing various activities. In case of severe nature of calamity, the Superintending Engineer of the concerned Circle should get in touch with the Engineer-in-Chief. Same time, Engineer-in-Chief will brief the SDMA about the nature of the natural calamity and the action which he has already taken and further assistance required by him. This should be done without any loss of time.

6.1.2 EMERGENCY OPERATION CENTRE/ CONTROL ROOMS

The department set up a circle control room which will be round the clock functioning. As information received for any emergency event or early warning for any upcoming emergency the control rooms have a responsibility to discriminate the information. This cell should immediately appraise the circle headquarters of the calamity and the action which has already been taken. If there is a disruption in

telecommunication facilities, the special messenger should be sent to communicate with circle headquarters.

- Dissemination of Information regarding status of the disaster and submission of report to HPPWD Head office
- Coordinate with the emergency control room of the disaster management department.
- Informing the relevant offices and people about do's and don'ts in case the disaster happens.
- Support in the dissemination of Early Warning information once approved by SDMA.

6.1.3 INCIDENT RESPONSE TEAM OF THE DEPARTMENT

Incident Response Teams (IRTs) will be constituted state level, circle level, and divisional level.

Role and Responsibility of the State Incident Response Team is:-

- To coordinate with SDMA, NDMA, and other concerned Government Departments.
- Visit the spot and assist the Circle level Response Team for immediate response
- To prepare a status report regarding the disaster.
- To deploy adequate staff for the response and monitor its effectiveness.
- 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 disaster 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.
- During a disaster, the IRT shall coordinate with District control room/ EOCs.
- To help and monitor the working of different teams engaged in relief operation during an emergency in the Division.
- Mobilizing relief and external support in case of necessity for those who have taken shelter in the departmental buildings/ space.
- Identify separate shelter places for the public in case necessary.

6.1.4 CLASSIFICATION OF DISASTER TYPE AND RESPONSE ACTIVITIES SPECIFIC TO DISASTER

Types of Disaster	Major response activities to be done by the department
Earth quake	Clear roads blockages Construction of temporary access roads to relief camps Provision of temporary shelters in open spaces
Landslide	Repair of roads & construction of temporary access roads. Clear and maintained all damaged roads and make a proper connectivity to affected area through alternative routes, Provide provision of temporary shelters
Avalanche	Repair of roads & construction of temporary access roads.

Flood / Cloud Burst	Provision of temporary shelters in open spaces construction of temporary roads to relief camps Clear and maintained all damaged road and make a proper connectivity to affected area through alternative routes
Manmade disasters	Immediate opening of road Identification and diversion of alternate routes

6.1.5 SYSTEM OF RECEIVING AND MANAGING ALERTS

- As soon as alerts have been received department shall be fully activated
- Issuing disaster / incident-specific information and instructions specific to all concerned
- Activate department administrative machinery to respond to the situation with available man power and resources
- Followed-up by subsequent warnings and De-warning in order to keep the people informed of the latest situation

6.1.6 EVACUATION, SEARCH AND RESCUE OPERATION

- Department take necessary steps to pool the resources for evacuation, search and rescue
- Support for search and rescue, relief programs etc. by connecting with nodal agencies for different essential support functions.
- Provide departmental resources to remove debris and re-establish access for emergency workers who need to rescue or evacuate residents
- Immediate steps to restore damaged essential services so that rescue & relief operations are conducted smoothly.
- Requisition of services / assistance
- Coordinate with another department for the rapid damage assessment immediately after the disaster
- Check if all the immediate life-saving measures are in place and there is no further risk to life, property and environment due to infrastructure and responsibilities of building department. Give status report to EOC and ESF nodal agencies

6.1.7 EMERGENCY RESTORATION OF CRITICAL FACILITIES

Critical Facilities	Action required
Roads	Repair and restoration of damaged roads Construction of temporary access roads to the affected area
Life line Building	Repair of damaged buildings like hospitals, banks and schools etc. Maintenance of other public building
Infrastructure	Repair and maintenance of important infrastructure like bridges, overhead water tanks etc.
Shelter	Construct adequate number of shelter to the evacuated people The design of the shelter should be in accordance with safe building practices

6.1.8 RESPONSE PLAN FOR RESPONDING EFFECTIVELY AND PROMPTLY

To implement the plans for immediate, short term and long term response needs key actions which are as:

- Coordinate with respective GP disaster management committee, shelter and search and rescue committee to shift office equipment, documents and people to the safe structure.
- Provide temporary shelters at block and panchayat level.
- Clear and maintained all damaged road and make a proper connectivity to affected area through alternative routes.
- Support for search and rescue, relief programs etc. by connecting with nodal agencies for different essential support functions.
- Ensuring adequate facility and monitoring force in the affected areas.

6.1.9 DEACTIVATION OF EMERGENCY RESPONSE PLAN

Action required are:

- Check if all the immediate life-saving measures are in place and there is no further risk to life, property and environment due to infrastructure and responsibilities of building department. Give status report to EOC and ESF nodal agencies.
- Ensure the maintenance of buildings has been owned by govt. departments and community level committees and adequate monitoring mechanisms are in place.
- Ensure the maintenance of damaged roads and alternate connectivity to affected areas
- Evaluate Emergency response in consultation with the community, health committee, ESF nodal agencies, EOC and other stakeholders. Document response activities and leanings.
- Reallocate the departmental resources (Human, Materials and Financial) to normal time activities.
- Initiate planning to recover the disaster loses to the department, immediate recouping the resources (materials and finances) used during the emergencies.
- Initiate planning for early and long-term recovery actions as per the damage assessment.

6.1.10 EMERGENCY SUPPORT FUNCTIONS

Primary Agency: Himachal Pradesh Public Works Department (HPPWD)

Secondary Agency: Centre Public Works Department

Responsibilities of Primary Agency

- Provide a work team carrying emergency tool kits, depending on the nature of disaster, essential equipment such as Towing vehicles, Earth moving equipment's and Cranes
- Construct temporary roads
- Keep national and other main highways clear from disaster effects such as debris from landslide or avalanche
- Networking with private services providers for the supply of earth moving equipment and other essential equipment.

Activities for Response

- Establish a priority list of roads which will be opened first
- Constructing major temporary shelters;
- Connecting locations of transit/relief camps;
- Adequate road signs should be installed to guide and assist the relief work;
- Clearing the roads connecting helipads and airports;
- Restoring the helipads and making them functional;
- Rope in the services of private service providers and secondary services if the department is unable to bear the load of work.

Role of Secondary Agency:

Making machinery and manpower available to the PWD and to keep national highways and other facilities in functional conditions

6.2 RELIEF AND REHABILITATION

Relief measures will vary with the nature and degree of natural calamity. Information on the amount of damage done will help in deciding the extent of relief, reconstruction or rehabilitation. The detailed loss of life and property will be assessed immediately after the completion of relief and rescue operations. The following measures may require being taken in the event of a calamity: -The losses to the buildings, roads & bridges will be reported in the prescribed formats as per guidelines. This should be followed up with a detailed report containing a description of the event, damage/loss details, causes, pictures etc.

6.2.1 MINIMUM STANDARD OF RELIEF

In case of a severe earthquake or another natural calamity, the homes of people and other infrastructure may be destroyed at the mass level in the State. Temporary approach roads to relief camps & helipads shall be constructed for starting rescue &search operation.

6.2.2 REHABILITATION PLAN

A very important task before the SDMC or CDMC is to create access to relief camps, hospitals without any loss of time. HPPWD will mobilize all labour, material &machineries owned by the Dept. / Contractors for immediate repair, retrofitting &restoration of roads, bridges & critical buildings. The HPPWD management will provide all the human and material resources till the rehabilitation of affected areas in association with DDMA, SDMA and NDMA. Maintain a warm relationship between department and community actions till the restoration of basic and alternative means of shelter and mobility is achieved.

7. DISASTER RECOVERY AND RECONSTRUCTION

7.1 DISASTER RECOVERY

The Disaster Recovery generally refers to the process of returning essential services to normal, the repair of infrastructure, work to help restore systems to the community. It includes repair or reconstruction of infrastructure; damaged public facilities and infrastructure; facilitation of the restoration structures.

To implement recovery plans, certain points are to be considered:

- Ensure the departmental resources like equipment's, construction material, building resource material, finances etc. used for the emergency purpose are accounted and recouped as soon as possible.
- Support recovery and rehabilitation efforts to help communities recover from the disaster impact and in build back better.
- Incorporate lessons learnt into future planning and preparedness actions.
- Mainstream DRR into new development programs and refer to DRR actions to minimize future risks.

7.2 DAMAGE AND LOSS ASSESSMENT

One important function that Departments are required to function is to assess the damage and losses in respect of the sector it represents

- Conduct damage assessment as appropriate to ensure infrastructural consideration integrate into the post-disaster planning process
- Develop appropriate methodologies for assessing departmental loss and damage after a disaster

7.3 DISASTER RECONSTRUCTION

- Set a firm schedule and sequenced time structure for future infrastructure recovery initiatives
- Preparation disaster specific reconstruction action plan after each disaster
- Promotes rebuilding infrastructure in a manner which will reduce vulnerability to future disaster impacts
- Maintain robust coordination throughout the recovery process with other partners to ensure successful completion of rehabilitation projects

8. FINANCIAL ARRANGEMENTS

It is very difficult to estimate the budget requirement for relief and rehabilitation phase of disinterment phase of disaster management. Funds required for this head will depend upon nature and intensity of natural calamity. Generally funds for disaster response, relief and rehabilitation are provided in State Disaster Response Fund (SDRF) which the departments can access without any problem. In case such funds are not adequate the additional demands can be projected by the State Government which can be met from the National Disaster Response Fund (NDRF). Normally funds required for risk assessment and disaster preparedness must be provided in the budgets of every concerned department. Moreover, the Public Work department can be directly incurring funds for various infrastructural projects in which a portion can be mainstreamed for Disaster Risk Reduction. As per the guidelines issued by the Ministry of Finance, Government of India vide Memo No.55(5)/PF-II/2011 dated 06/01/2014 for 10% flexi-funds within the Centrally Sponsored Schemes (CSS) to be utilized, inter-alia, for disaster mitigation, restoration and innovation activities in the event of natural disasters.

Thus central grants can be utilized for disaster risk mitigation which can help to some extent in reducing the risk/vulnerability due to natural disasters to which the state of Himachal Pradesh is highly prone to. It is very much required to create a disaster risk reduction fund other than normal annual budget allocation of the Department for disaster management initiatives so that the entire process can be institutionalized.

NOTES