Training Needs Assessment

of Stakeholders in Disaster Management in the State of Himachal Pradesh

State Council for Science, Technology & Environment &
Disaster Management Cell, Department of Revenue,
Government of Himachal Pradesh

Mrs. Rajwant Sandhu, I.A.S
Chief Secretary

Government of Himachal Pradesh
Shimla-171 002
Tel. : (O) 0177-2621022
Fax : 0177-2621813
E-mail : cs-hp@nic.in

MESSAGE

Himachal Pradesh by virtue of its geography and fragile ecology experiences the fury of nature every year causing loss of precious human lives and property. The state is particularly susceptible to major earthquakes on account of higher seismicity of the region. Increasing pace of population growth, urbanisation and construction are therefore throwing up challenges for which adequate planning is necessary for prevention of disasters and mitigation if these do occur. Hence, there is an urgent need to improve capacity building in this area.

As disaster management is a very specialised job, so there is a need to develop a technical and professional approach in handling disasters. In the existing scenario, there is a wide gap in the knowledge and skills of the disaster managers to cater to disaster prevention, mitigation, preparedness and response. Thus, it is important to have HRD plan supported with the strategy for training and capacity building of individuals within an organisation compatible with their roles in disaster management. I strongly believe that training need assessment is the first and foremost step in this direction.

This Training Need Assessment (TNA) Document prepared by the State Council for Science Technology & Environment and the Disaster Management Cell of the Department of Revenue in collaboration with National Institute of Disaster Management (NIDM), New Delhi is a maiden effort and I am sure would help the line departments in devising their training calendar commensurate with their roles as envisaged in the emergency support functions of each department. I hope all departments will take advantage of this assessment report and will prepare strategy for skill upgradation as per the requirement of the Disaster Management Act, 2005. I appreciate the efforts made in compiling the document as a first step to develop abilities of both the individuals and the organisations to proactively deal with various types of disasters in the state.

(Rajwant Sandhu)

अतिरिक्त मुख्य सचिव
हिमाचल प्रदेश सरकार

एलजंली,
शिमला-171 002.

PREFACE

Globally, repetitive disasters have been causing huge developmental losses. India because of its highly fragile topography and ecosystems coupled with physical and socio-economic vulnerabilities is characterized to be one of the most multi-disaster prone country in the world. As per UN estimates, as far as Indian Sub-Continent is concerned, it ranks second in the world for natural disasters after China. In 2010 India suffered 16 natural disasters in comparison to 22 disaster witnessed by China where loss of lives and destruction was several times higher where landslides, earthquakes and floods on an increasing scale was observed. Records show that disasters have been increasing both in terms of frequency and severity. Disasters are caused not only due to natural hazards but also through human interference with the environment.

Though hazards, natural or man-made, are common throughout the world, their adverse impact on the land and society is not uniform. While on one hand, the developing countries are worst affected in terms of mortality, the developed countries on other hand observe huge loss of property and infrastructure due to these catastrophes.

The State of Himachal Pradesh, which forms a part of the Western Himalaya, is environmentally fragile and ecologically vulnerable. The State being part of the Himalayas is seismically very active and is highly vulnerable since 32% of the total area of the state falls in very high damage risk zone known as zone V and zone IV. Occurrence of natural hazards emanating from the effects of climatological variations are a matter of immediate concern to the state of Himachal Pradesh, as every year the state experiences the fury of nature in various forms-like cloudburst, flash floods, landslides, snow avalanches and droughts. The fragile ecology of the mountain state coupled with large variations in physio-climatic conditions has rendered it vulnerable to vagaries of climate and natural disasters.

Various forums at the National, State and local levels need to be addressed through training, research and capacity building for an effective disaster management strategy. Sector specific training needs assessment is an important aspect of an effective disaster management cycle. These training modules for capacity building should cut across all the sectors accentuating the critical subject areas, so that planning and response are commonly addressed in a coordinated and multidisciplinary manner. The recent paradigm shift from erstwhile relief-centric response to a proactive prevention, mitigation and preparedness will help us in minimising loss of life, livelihood and property.

In order to further strengthen the preparedness level, the Government of Himachal Pradesh conducted a Training Needs Assessment workshop for the various stakeholders with the technical assistance of National Institute of Disaster Management (NIDM), (Ministry of Home Affairs) GoI, New Delhi. The outcome of the workshop helped us in assessing the capacity available with other departments to combat the threat due to natural disasters in the state and based on their feedback, the training needs of various stakeholders have been derived, which will help in having need based trainings rather than the conventional one. I hope this document would be useful for all the departments in knowing their broad needs so that sector specific capacity building could be generated in the State to prepare them to face any eventuality in the times to come.

(Sudripta Roy, IAS)
Additional Chief Secretary (Env. S&T) to the
Government of Himachal Pradesh

सचिव,
हिमाचल प्रदेश सरकार,
शिमला-171 002.

ACKNOWLEDGEMENT

Natural hazards are a matter of immediate concern for us in Himachal Pradesh, as every year the state experiences the fury of nature in various forms-like earthquakes, cloudburst, flash floods, landslides, snow avalanches, droughts etc. Notwithstanding, continuous efforts made by the Government to cope with natural hazards through relief and rehabilitation measures, the recurrence of these hazards continue to inflict widespread damages to human life as well as the property. As far as disaster management in India is concerned, there is a paradigm shift from the earlier charity approach to a professional way of handling disaster management. The Government of Himachal Pradesh also has taken various initiatives for handling the disasters at pre disaster level, so that the post disaster effects are not only minimised but also reduced to a great extent. For the better management of disasters, all departments irrespective of their roles, require sector specific trainings as per their mandates and the State Council for Science Technology & Environment was assigned the task of assessing the training needs of various stakeholder departments so that they are equipped to handle the disasters more effectively.

The State Council for Science Technology & Environment is grateful to the Executive Director, National Institute of Disaster Management (Ministry of Home Affairs, GoI) New Delhi for accepting the offer of the Council and providing all technical support for conducting the Training Needs Assessment workshop at Shimla on April 25-26, 2011. Financial support extended by the Revenue Department, Government of Himachal Pradesh is also duly acknowledged. The State Council for Science Technology & Environment is thankful to Mrs. Rajwant Sandhu, IAS, Chief Secretary, Government of Himachal Pradesh for entrusting this task to the Council, Sh Sudripta Roy, IAS, our present Additional Chief Secretary (Environment, Science & Technology) and Mrs. Sarojini Ganju Thakur, IAS, our previous Additional Chief Secretary (Env, S&T) to the Govt. of Himachal Pradesh for their efforts and guidance in this matter. The State Council for Science Technology & Environment is also thankful to the Director, Himachal Institute of Public Administration (HIPA) for extending the infrastructural support for organising the event. The Council also duly acknowledges the contributions made by Dr. Amir Ali Khan, Faculty, National Institute of Disaster Management (NIDM), New Delhi in conceptualising, organising and making the final presentation on the outcome of the workshop before the Chief Secretary, Government of Himachal Pradesh and other senior functionaries of the various departments.

(Dr. Nagin Nanda, IFS)
Secretary-cum-Director (Env.,S&T) &
Member Secretary (EC), SCSTE, Shimla

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LIST OF ABREVIATIONS USED

MMS	Modified Mercalli Scale
NIDM	National Institute of Disaster Management
WIHG	Wadia Institute of Himalayan Geology
BMTPC	Building Materials & Technology Promotion Council
MFA	Medical First Aid
SASE	Snow Avalanche Study Establishment
DRDO	Defence Research Development Organization
SDMA	State Disaster Management Authority
DDMA	District Disaster management Authority
SEC	State Executive Committee
HPC	High Powered Committee
DM	Disaster Management
NDMS	National Disaster Management Systems
NPDM	National Policy on Disaster Management
SEOC	State Emergency Operation Centre
SDRF	State Disaster Response Force
IRS	Incident Response System
ESF	Emergency Support Functions
SAR	Search and Rescue

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Prepared by

State Council for Science Technology & Environment

&

Disaster Management Cell, Department of Revenue,
Govt of Himachal Pradesh

With technical collaboration of

National Institute of Disaster Management (Ministry of Home Affairs) Govt of India, New Delhi.

TEAM MEMBERS

Dr. Amir Ali Khan

Associate Professor
National Institute of Disaster Management (NIDM)
Ministry of Home Affairs, Govt. of India
New Delhi

Dr. S. S. Randhawa

State Council for Science Technology & Environment
Shimla, Himachal Pradesh

Sh. D. C. Rana

State Project Officer (H.P.) - UNDP
Disaster Management Cell, Deptt. of Revenue,
Govt. of Himachal Pradesh

TRAINING NEEDS ASSESSMENT OF STAKEHOLDERS IN DISASTER MANAGEMENT IN THE STATE OF HIMACHAL PRADESH

1. GENERAL PROFILE OF THE STATE

Himachal Pradesh a small hilly state forms a part of the Northwestern Himalaya which are the youngest mountain chains in the world are still active and in the building phase. The environmentally fragile and ecologically vulnerable Himalayan part has rendered the state highly vulnerable and sensitive from the natural disaster point of view. Physiographically the state has been divided into three broad units viz. Lower or Outer Himalaya, Middle Himalaya and the Higher or Great Himalaya (Fig. 1.1) and each unit is susceptible to different types of hazards depending upon the lithological, soils and local climatic variations. Himachal Pradesh formed as a Union Territory in 1948, after amalgamation of 31 erstwhile princely states and attained full statehood on 25th January 1971. Administratively the State comprises of 12 Districts, 75 Tehsils and 34 Sub-Tehsil with a total geographical area of 55,673 km^2. The State also shows considerable variations in the distribution of rainfall and temperature due to the varying aspects and altitudes. Precipitation declines from west to east and south to north. The average annual rainfall is about 1111mm, varying from about 450 mm in Lahaul & Spiti to over 3400 mm in Dharamshala, the district headquarter of Kangra. About 70% of precipitation is received from July to September. Winter precipitation in the form of snow is received at elevation above 1800 m.

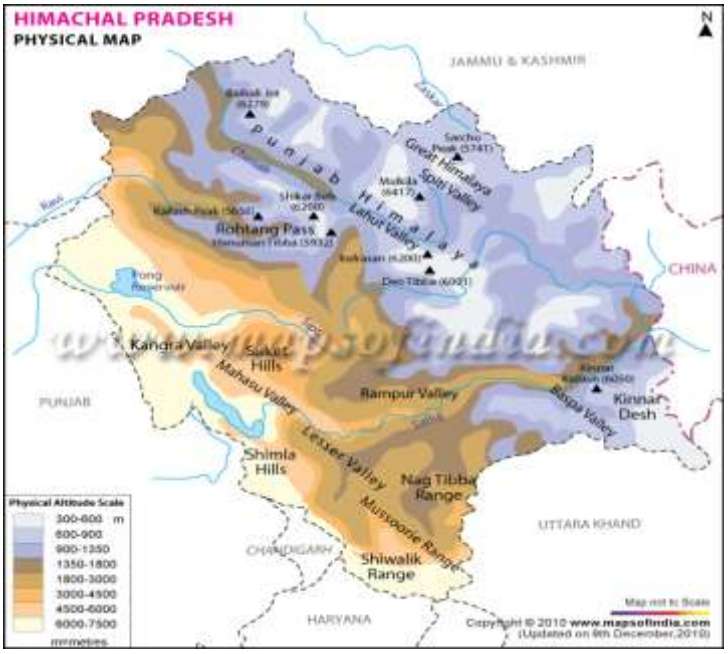


Fig.1.1: Physiographic Map of Himachal Pradesh

2. DISASTERS- A NATIONAL SCANERIO

The whole of the Indian subcontinent is susceptible to natural disasters of various kinds. It is said to be world's most disaster-prone area with 55% of the land vulnerable to earthquakes, 8% to cyclones and 5% to floods (Fig 2.1). In fact, the records over the years indicate that disasters have been on the increase both in terms of frequency and severity. Consequently there is worldwide escalation in the damages and losses attributable to natural hazards. Though the nature and type of disasters are more or less same throughout the world, yet the magnitude and intensity of the impact on the society is not the same everywhere. It is the interaction of human activity and natural processes that determine the impact on each other. The poor section of the society in developing countries is particularly vulnerable to natural disasters. The high vulnerability of such area is due to the lack of resources to avoid and deal with hazards.

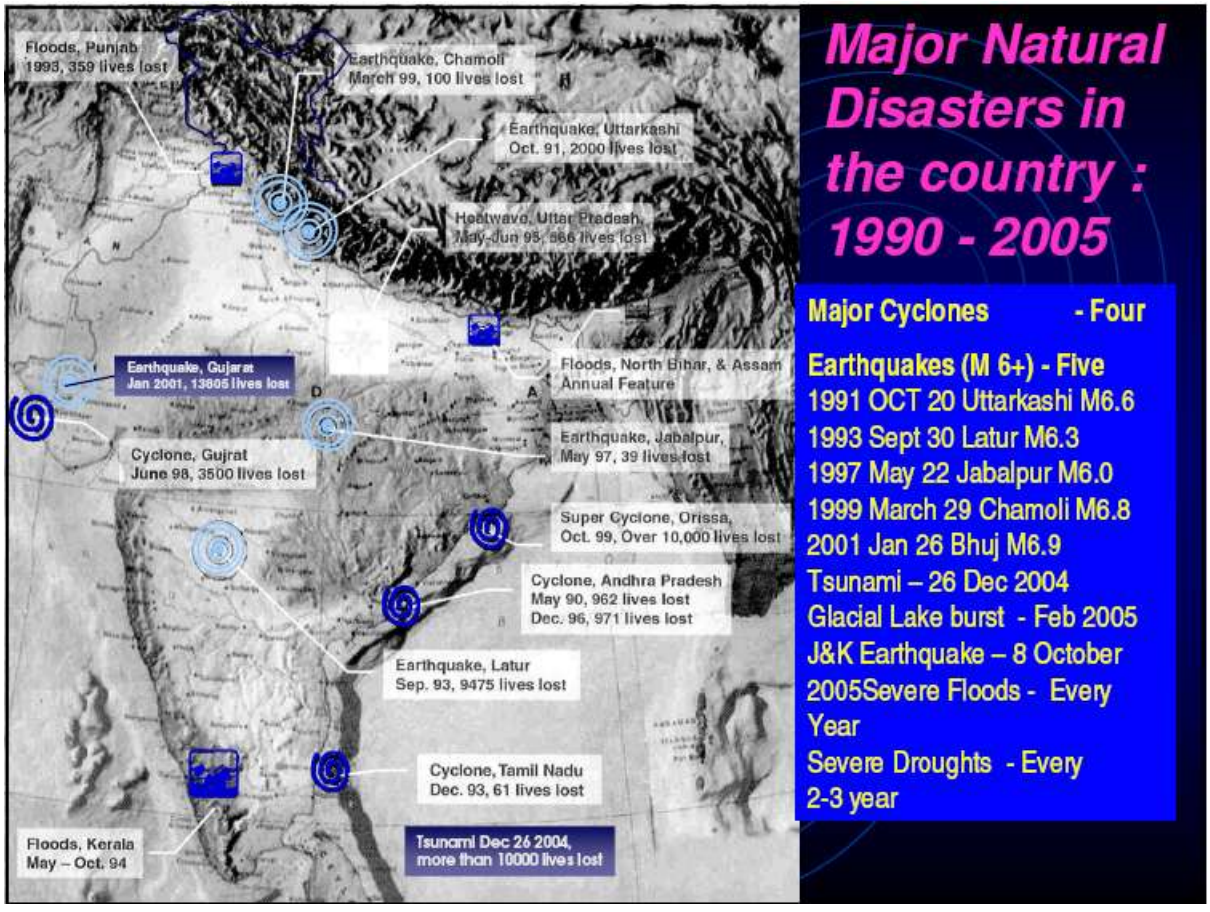


Fig.2.1: Disaster Vulnerability at the National Level

3. OVERVIEW OF DISASTERS

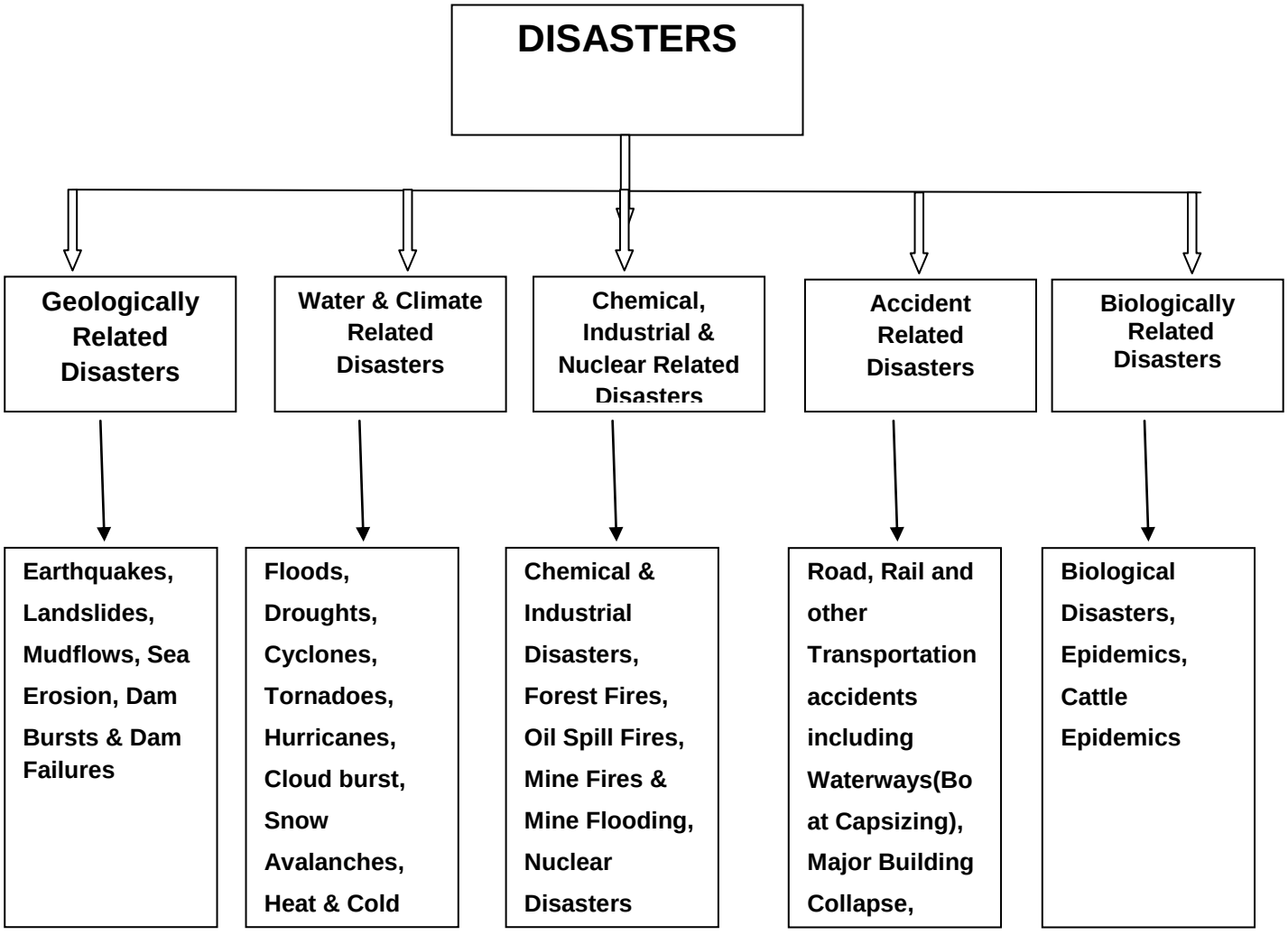
Before Independence, droughts and famines were the biggest killers in India. The situation stand somewhat altered today, wherein it is combination of factors like increased irrigation development, improved water management and food security measures have reduced the deaths caused by droughts and famines considerably. Floods, cyclones, and earthquakes, dominate (98%) the reported injuries, with ever increasing in the last ten years. The period from 1973 to 1997 has been associated with a large number of earthquakes in Asia that have a relatively high injury-to-death ratio. Floods droughts, cyclones, earthquakes, landslides and avalanches are some of the major natural disasters that repeatedly and increasingly affect India. The fast pace of growth and expansion without comprehensive understanding or preparedness has brought forth a range of issues that seek urgent attention at all levels. In the absence of such measures, the growing numbers in our population are at risk of prospective hazards such as air accidents, rail accidents, road accidents, boat capsizing, building collapse, electric fires, festival related disasters, oil spills, serial bomb blasts, and fires. The safeguards within the existing system are limited and the risk involved is high.

4. DISASTER PROFILE OF THE STATE

Mountain areas are especially vulnerable to natural disasters where development over the years has further accentuated the problem by upsetting the natural balance of various physical processes operating in the mountain eco-system. The increase pressure on the mountain environment has contributed in some measure to environmental problems such as landslides, land subsidence, removal of vegetation and soil erosion. According to one estimate, about 58.36% of the land is subjected to intense soil erosion, majority of which is located in the Himalaya. The State of Himachal Pradesh, which forms part of the Northwestern Himalaya, is environmentally fragile and ecologically vulnerable. Geologically the Himalaya is considered to be the youngest mountain chains in the world and is still in the building phase. Natural hazards are matter of immediate concern to the State of Himachal Pradesh, as every year the State experiences fury of nature in various forms like earthquakes, landslides, cloud bursts, flash floods, snow avalanches and droughts etc. The fragile ecology of the mountain state coupled with large variations in physio-climatic conditions has rendered it vulnerable to the vagaries of nature. The incidence of

cloudbursts in the last few years has baffled both the meteorologist and the common man equally. Notwithstanding, the continuous efforts made by the Government to cope with natural hazards through relief and rehabilitation measures, landslides and snow avalanches continue to inflict widespread harm and damage to human life as well as property. The roads that are the State's lifeline are repeatedly damaged, blocked or washed away by one or other acts of nature. In the circumstances, the Government has to divert the already scarce resources of the state for relief and rehabilitation measures as opposed to long term development.

The state of Himachal Pradesh as a whole is vulnerable to different kinds of disasters, natural as well as man made in the nature. Some of the identified hazards or prognostic hazards in Himachal Pradesh are as under:



5.0 SOME OF THE PROMINENT NATURAL HAZARDS IN THE STATE:

5.1 EARTHQUAKE HAZARDS:

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 (Fig.5.1). 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 and terms second in severity to zone V. It is also seen that 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 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 (Table 5.2). The housing pattern in the State and its vulnerability based on the housing census of 2001 is as per Table 5.2.

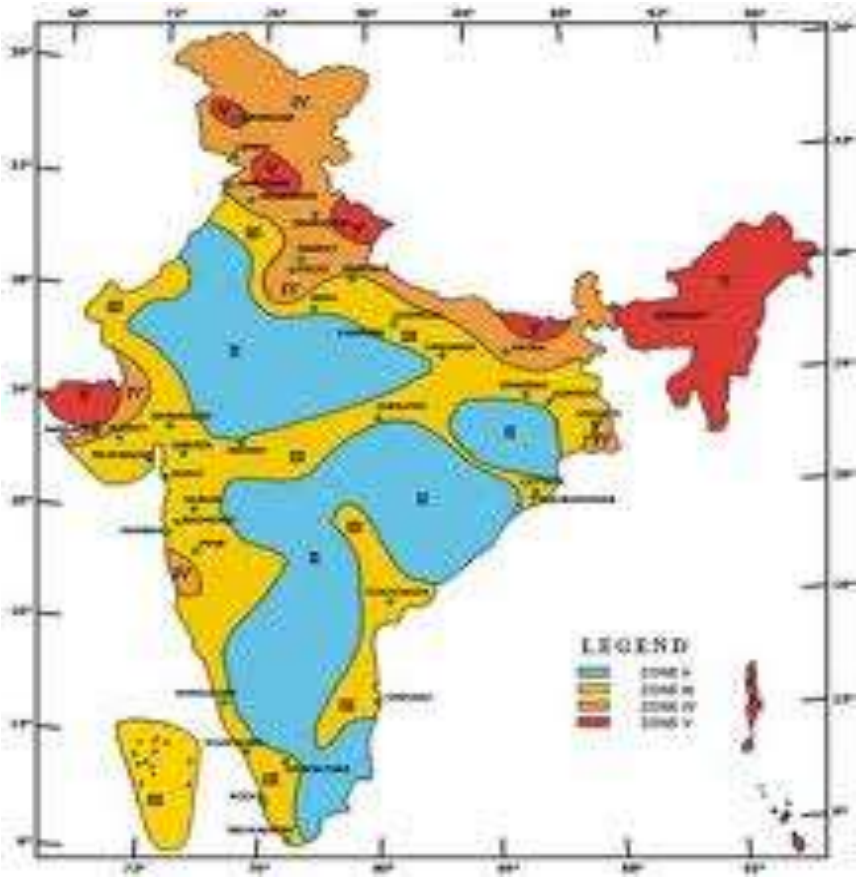


Fig 5.1: Seismic Zonation Map of India

Table 5.1: Districts with Seismic Intensities

Sr.No.	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

Source : Vulnerability Atlas of Himachal Pradesh

Table 5.2: Distribution of Houses by Predominant materials of Roof and Wall and Level of Damage of Risk

Wall/Roof	Area	Census Houses as per 2001		Level of Risk Under	
		No. of Houses	%age	V	IV
				Area in %	
Himachal Pradesh				**44.2**	**55.8**
WALL					
A1-Mud & Unburnt Brick Wall	Rural	640,847	26.6		
	Urban	20,946	0.9		
	Total	**661,793**	**27.5**	**VH**	**H**
A2-Stone Wall	Rural	982,235	40.8		
	Urban	30.368	1.3		
	Total	**1,012,603**	**42.1**	**VH**	**H**
Total Category -A		**1,674,396**	**69.5**		
B-Burnt Bricks Wall	Rural	455,886	18.9		
	Urban	168,730	7.0		
	Total	**624,616**	**25.9**	**H**	**M**

Total Category -B		**624,616**	**25.9**		
C1-Concrete Wall	Rural	10,230	0.4		
	Urban	8,193	0.3		
	Total	**18,423**	**0.7**	**M**	**L**
C2-Wood Wall	Rural	43,416	1.8		
	Urban	5,218	0.2		
	Total	**48,634**	**2.0**	**M**	**L**
Total Category -C		**67,057**	**2.8**		
X-Other Material	Rural	35,725	1.5		
	Urban	7,128	0.3		
	Total	**42,853**	**1.8**	**M**	**VL**
Total Category -x		**42,853**	**1.8**		
TOTAL BUILDINGS		**2,408,922**			
ROOF					
R1-Light Weight	Rural	534,297	22.2		
	Urban	64,512	2.7		
	Total	**598.809**	**24.9**	**M**	**M**
R2-Heavy Weight Slopping Roof	Rural	1,076,451	44.7		
	Urban	22,355	0.9		
	Total	**1,098,806**	**45.6**	**H**	**M**
R3-Flat Roof	Rural	557,591	23.1		
	Urban	153,716	6.4		
	Total	**711,307**	**29.5**	**Damage Risk as per that for the Wall supporting it**	
TOTAL BUILDINGS		**2,408,922**			

Source: Vulnerability Atlas of India 2006

Housing Category: Wall Types

Category –A: Buildings in field –stone, rural structure, unburnt brick houses, clay houses.

Category –B: Ordinary brick building, buildings of the large block & prefabricated type, half timbered structures, building in natural hewn stone.

Category-C: Reinforced building, well built wooden structures

Category-X: Other material not covered in A.B.C. These are generally light

Housing Category: Roof Types

Category –R1: Light Weight (grass, Thatch, Bamboo, Wood, Mud, Plastic, Polythene, GI Metal, Asbestos Sheets, Other Materials).

Category –R2: Heavy Weight (Tiles, Slate)

Category –R3: Flat Roof (brick, Stone, Concrete)

EQ Zone V: Very High Damage Risk Zone (MSK >IX)
EQ Zone IV: High Damage Risk Zone (MSK VIII)

Level of Risk: VH-Very High, H-High, M-Moderate, L-Low, VL-Very Low

From the perusal of Seismic Zoning Map of Himachal Pradesh, it is seen that about 32% of the total area is prone to the severest seismic risks as it falls in Very High Damage Risk Zone, Zone V (Fig 5.2). The state was subjected in 1905 to one of the most giant earthquakes of the recorded seismic history of India having a magnitude of 8.0 on Richter Scale in which 20,000 people lost their lives, 53, 000 animals perished and approximately one lakh buildings were collapsed. the towns of Kangra, Dharmshala, and the nearby areas were razed to the ground and no Government functionary was left alive to report the happening to the higher authorities. The earthquake shock was felt over an area of more than 416000 sq.km. in and around the present Himachal Pradesh. A maximum intensity X on Rossiforel Mercalli Scale, was observed in the epicentral area, which, when interpreted on the new current Modified Mercalli Scale would be between X and XI. Besides, during the last century, the state has been shaken by a number of micro as well as macro earthquakes. A number of damaging earthquakes has struck the state and the adjoining parts of Punjab, U.P. and J& K. Some of the prominent earthquakes that rocked the state are Kinnaur earthquake 1975 (M=6.7) in which 60 people lost their lives and Dharamshala earthquake 1986 (M5.7) (Table 5.3). Besides these major earthquakes, the state has been rocked by about 250 earthquakes with magnitude 4.0 and 62 earthquakes with magnitude more than 5.0. Some of the major devastating earthquakes with magnitude more 4.0 on Richter Scale that had rocked the state during the last century are given in Annexure I.

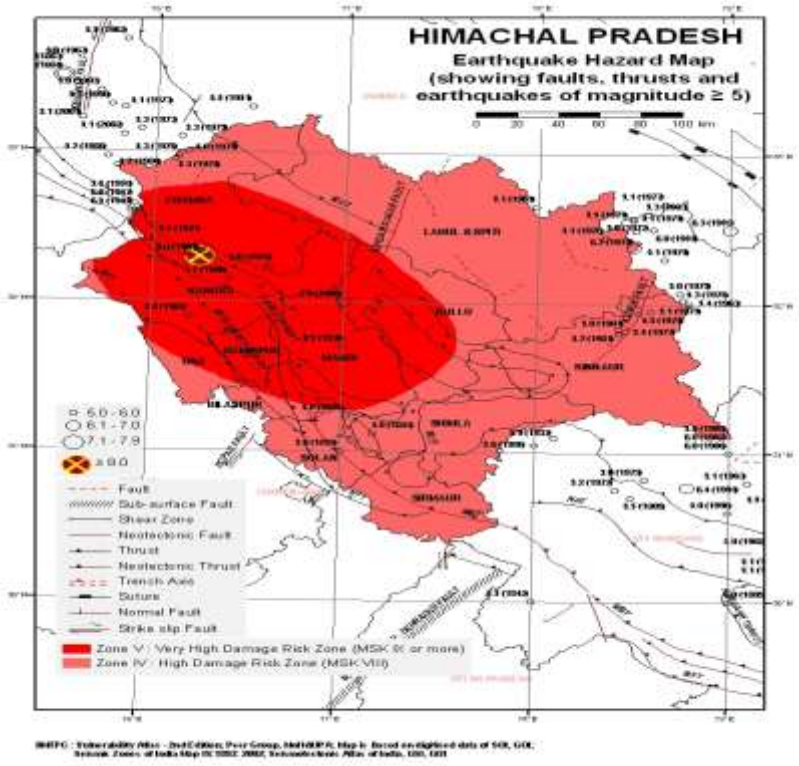


Fig.5. 2: Districts with different Seismic Zones in H.P.

TABLE 5.3: EARTHQUAKES HAVING MAGNITUDE 6 OR MORE ON RICHTER SCALE IN HIMACHAL PRADESH DURING THE LAST 200 YEARS

1	1905	4	4	8.0	$32^0$18'00" $76^0$15'00"	Karari Dal(Distt.Kangra)
2	1906	2	28	7.0	$32^0$00'00" 77^0 00'00"	Near Karshing(Distt.Kullu)
3	1945	06	22	6.5	$32^0$36'00" $75^0$54'00"	Minu (Chmaba Distt.)
4	1947	7	10	6.2	$32^0$36'00" $75^0$54'00"	Minu (Chmaba Distt.)
5	1951	09	22	6.4	32 36 76 30	East of Dhan Kanda , District Chamba
6	1975	1	19	6.7	$31^0$56'24" $78^0$31'48"	Distt. Kinnaur

(Source: India Meteorological Department Statistics).

5.1.1 Damaging Earthquakes in H.P.

Some of the damaging earthquakes in Himachal Pradesh which have history of damage in the State are as under:

Kangra Earthquake (1905)

Location - 32°15′ N, 76°15′ E
Date - 4th April, 1905
Time - 06 hrs 20 min., Indian Standard Time
Magnitude – 8.0 Richter Scale
Intensity (max.) – X on MM Intensity Scale
Causalities – 20000 persons

Kangra was then in Distt. Lahore. No government functioning was left alive even to report

Area Shaken – 416000 sq.km

The Dharamsala Township suffered severe damage amounting to total destruction at many places and casualties reached very high figure. The military and civil staff was reduced to about one-half due to large number of deaths. At Forsythganj Bazar, buildings were constructed of sun-dried bricks especially in the lower storeys and partly of wood mostly in the upper storeys and verandahs. All shops to the east of the road were ruined while on the west many of them survived total collapse. Mcleodganj Bazar was leveled to the ground with no building standing even partially. Same was the situation at Katwali Bazar. At Kangra the devastation was total. Not a single house was standing. The horror of the actual calamity was beyond imagination. There was no one left alive for directing rescue operations. All the subordinate officials were killed.

Kinnaur Earthquake (1975)

Location - 31°90′ N, 78°50′ E
Date - 19th January, 1975
Time - 08 h 12 m 9 s, Indian Standard Time
Magnitude – 5.8 Richter Scale
Intensity (max.) – VIII on MM Intensity Scale
Causalities - 60 persons and several hundred injured.

The epicentral distance was about 25 km from Kinnaur town. Sixty people died in this catastrophic event. Nearly 2000 dwellings are reported to have suffered heavy damage. Recent random rubble masonry and dressed stone masonry construction suffered extensive damage. Heavy flat roofs suffered greater damage. Buildings constructed in hollow concrete blocks or dressed stone masonry in cement-mortar developed small cracks in walls. Light structures made of corrugated iron sheets nailed to timber frames and arches did not suffer any damage. The temples (monasteries) and monuments also suffered badly.

Source: Different Reports & Publications

Dharamshala Earthquake (1986)

Location	- 32°10´ N, 76°30´ E
Date	- 26th April, 1986
Time	- 13 h 5 min. 17s, Indian Standard Time
Magnitude	– 5.7 Richter Scale
Intensity (max.)	– VII+ on MM Intensity Scale
Financial Loss	– 65 crores

The epicentre of this earthquake was very close to that of 1905 earthquake. The focal depth was shallow, about 10km. Most significant damage, requiring reconstruction of houses, was to adobe and stone house in the villages near Dharmshala, such as Narghota, Naddi, Kaned, Sukar and Khanyara. The maximum Modified Mercalli intensities in this earthquake was VII^{+}

Source: Different Reports & Publications

5.1.2 Projected Damaging Scenario in Himachal Pradesh

As per one of hypothetical studies, carried out during the decade of 90's based on census data of 1991 by Prof. A. S. Arya, Former National seismic Advisor and Professor Emiratus, IIT Roorkee, envisage that

A HYPOTHIETICAL REPEAT OF THE M 8.0 KANGRA EARTHQUAKE OF 1905 IN 1991, GAVE THE FOLLOWING LOSS SCENARIO

If all the houses were without earthquake resistant features:-

Totally collapsed Houses	1,36000
Destroyed with Partial Collapse	2,63000
Deep Large Cracks	9,16000
With Small Cracks	3,58000

The estimated loss of human lives is a staggering figure of **65,000 or more.** Economic losses may mount to **Rs. 5,000 Crores** (1995 prices) besides amount spent on relief and temporary sheltering.

If on the other hand all buildings were built with earthquake resisting features in kutcha as well as pucca houses, the damage scenario will change as;

Total collapsed houses	8300
Destroyed with partial collapse	9,5000
Deep large cracks	3,12,400
Economic loss	1960 crore

5.2 LANDSLIDES HAZARDS IN HIMACHAL PRADESH

The hills and mountains of Himachal Pradesh are liable to suffer landslides during monsoons and also in 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 decade due to inappropriate human activity like deforestation, road cutting, terracing and changes in agriculture crops requiring more intense watering etc.

As in other parts of Himalayas, the landslide activity in Himachal Pradesh can also be visualized in three distinct zones based on their characteristics depending upon altitude, geology and topography is as per Table 5.4 and some of the important landslides in Himachal Pradesh are as per Table 5.5.

Table 5.4: Landslide Distribution in Himachal Himalaya

Himalayan Zone	Characteristics	Prone to
Higher Himalaya	High relief zone of glaciations characterized by typical alpine mountain steep slopes generally devoid of vegetation and valleys are covered by glacial and periglacial deposits	Least inhabited part of the Himalaya so mass movement phenomena are not of common concern.
Lesser Himalaya	Medium relief zone consists mainly of sedimentary rocks. This zone is covered by natural vegetation. High rate of fluvial erosion and weathering processes.	Most inhabited, facing the problem of ecological and environment imbalances due to anthropogenic factors.
Outer Himalaya	Low lying hill ranges of Shiwalik sediments of soft Tertiary rocks such as sandstone, siltstone, shale and clays. These ranges are main barrier to low monsoon winds so receive maximum rainfall.	Most inhabited part prone to large scale mass movement, cloud bursts and landslides.

Source : WIHG Reports

Table 5.5: The important slides in Himachal Pradesh

Sr.No.	Landslide Area	History of Damage
1	Maling (1968).	This slide damaged 1 Km NH-22 and is still active.
2	Kinnaur (Dec.1982)	This occurred at Sholding nala collapsing 3 bridges and 1.5 of road was vanished.
3	Jhakri (March 1989)	At Nathpa about 500 m of road was damaged due to this slide and is still active
4	Luggarbhati on 12 Sept.1995	65 (39 as per official record) were buried alive during the slide
5	Prominent slides in Beas valley are at Marhi, Bhang, Chhyal, and Mandu in upper catchment of the Beas river	

Source : WIHG Reports

The devastating landslides in H.P. need more intensive scientific studies and engineering/bio-engineering measures focused on the problem of landslides. As per the first step, it will be necessary to prepare zoning maps of landslides and rock fall prone areas through geological and geo technical studies. The landslide prone areas should avoided while locating new settlement or buildings, and those, which are already occupied, should either be resettled or protective measures undertaken based on expert advice.

Based on the BMTPC Atlas on Landslides, Lahaul & Spiti District occupies maximum area of 13591 sq. km. which is liable 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. of area liable for landslides.(Table 5.6)

Table 5.6 District-wise Landslide Prone Areas of Himachal Pradesh

District	Sever 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

5.3 AVALANCHE HAZARDS IN HIMACHAL PRADESH:

An avalanche may be defined as the sudden downward motion of the snow mass which may contain rocks, soil, ice and trees. Avalanches have also the history of damage in Himachal Pradesh. The Higher Hills comprising the districts of Kinnaur, Lahaul and Spiti, Chamba, and Kullu are particularly vulnerable to the hazards of avalanches. The destruction caused as a result of avalanche in the past in Himachal Pradesh though not widespread is confined to higher reaches only. The prominent events of avalanche damage in Himachal Pradesh are as per Table 5.7 and the district wise breakup of avalanches in H.P. is given in Table 5.8.

Table 5.7: Avalanche Hazard and the damage occurred

Location	Date/Year	Damage Occurred
Lahaul and Spiti	Jan 1975	Earthquake shocks triggered the avalanche of great dimensions damaging road net work
Lahaul and Spiti	Mar 1978	About 30 people killed, road and property damaged.
	Mar 1979	About 237 people killed. Communication disrupted
Lahaul and Spiti	Mar 1991	Tinku avalanche occurs every year 4-5 times from Jan to March. Road was blocked for 40 days in 1991
	Sept.1995	Due to avalanche, huge chunk of debris came down which later changed into flood
Lahaul and Spiti	Nov.1997	Along the Rani Nala, but fortunately there was no causality
Lahaul and Spiti	March 2011	Pindri Nala, 2 laborers died

Source: SASE, DRDO, Chandigarh

Table 5.8: Districts wise Breakup of the Avalanche Accidents in Himachal Pradesh

Sr. No.	District	No. of Accidents	Persons involved	Persons killed	Persons injured
1	Chamba	12	59	53	0
2	Kinnaur	32	144	129	9
3	Kullu	6	13	9	4
4	Lahaul & Spiti	21	397	298	53
5	Shimla	2	6	1	5

Source: SASE, DRDO, Chandigarh

5.4 FLOOD HAZARDS IN HIMACHAL PRADESH:

Floods are another form of natural hazards which the state experiences every year. Due to the diverse topography of the area, the flood problem in the state is largely isolated in nature. High monsoon rains in the area of the Shiwalik and Lower and Mid Himalayan ranges causes extensive floods during the rainy season. In the upper reaches of the Beas and Satluj valley, the main problems are flash floods and bank erosion because of steep slopes of rivers and High River flows due to heavy rains. Often the flash floods caused due to cloudbursts, glacial lake outbursts and temporary blockage of the river channels have been also observed. As a result of breaches in embankments and damage to various utilities

like irrigation /flood control schemes and houses are also observed. The rivers which are prone and important from flood hazard point of view are as per the Table 5.9

Table 5.9: The Rivers of importance from flood damage angle

Sr.No.	Vulnerable Rivers	Major Tributaries
1	River Satluj	Spiti, Sangle khad, Ali khad, Gambhar khad, Sir khad, and Swan river
2	River Beas	Uhl and Suketi khads
3	River Ravi	Siul
4	River Yamuna	Pabbar, Giri and Bata

Source : Vulnerability Atlas Himachal Pradesh

Although widespread floods problems do not exist in the state because of topographical nature, continuing attention is necessary to reduce flood hazards in the state. As per the available record during the floods of 1990, 89, 88, 85,78 and 1971, considerable damage was caused to housing and infrastructure. The history of damage occurred due to floods in the State during the past is given in Annexure II.

5.5 HAILSTORMS/DROUGHT HAZARDS

Besides the major natural disasters, the state as it is characterized by diverse topography, experiences inclement weather conditions; sometimes excess rains or drought or hailstorms. During the past, losses occurred due to these hazards in the state are as per Table 5.10:

Table 5.10: Incidence of Hailstorm/Drought damage in Himachal Pradesh

S.N.	Damage Occurred
1	On 31st March 1994 extensive damage occurred to agriculture in Solan district due to hailstorms.
2	On 1st and 2nd April 1994 heavy loss took place in Phati, Nither of Tehsil Nirmand district Kullu
3	On 5th April 1994 in Jawalamukhi and adjoining areas of Dehra Sub Division in Kangra District
4	On 4th May 1994 heavy loss occurred to agriculture in Mandi district from hailstorms

Source : Department of Revenue, Govt. of Himachal Pradesh

Besides these hazards, the state also suffers a great loss of public as well as private property every year either due to excessive rains, hailstorms or drought etc. The damage occurred due to these hazards in the different sectors and the loss estimated from 1995 onwards in the state is given in Annexure III.

5.6 FOREST FIRES IN HIMACHAL PRADESH

The Forests of Himachal Pradesh known for their grandeur and majesty are like a green pearl in the Himalayan crown. This life supporting systems are presently under great stress due to impact of modern civilization, economic development and growth in human and cattle population. The forests of Himachal Pradesh are rich in vascular flora, which forms the conspicuous vegetation cover. Out of total 45,000 species of plants found in the country as many as 3,295 species (7.32%) are reported in the State. More than 95% of species are endemic to Himachal and characteristic of Western Himalayan flora, while about 5% (150 species) are exotic introduced over the last 150 years. Over the years the forest wealth of the State is being destroyed by the incidences of fire attributed to both anthropogenic and other reasons. The destruction of rich flora and fauna of the State due to forest fires will have serious repercussions on the ecological balance of the State. The rich forest wealth of the State has been subjected to the numerous fire incidences and are as per the Table 5.11.

Table 5.11: Forest Fire incidences in Himachal Pradesh

Year	No. of fire Incidences	Areas Affected (In Hectares)
1995	1669	57143
2000	1900	36887
2001-02	301	5719
2002-03	282	4204
2003-04	550	9896
2007-08	550	8393

Source : Forest Department.

5.7 ROAD ACCIDENTS IN HIMACHAL PRADESH

With the increase of road connectivity and increasing number of vehicles plying, the number of road accidents and loss of precious human lives has been increasing day by day. The data from 2001-02 to 2009-10 would show an increasing trend in the number accidents and the victims. The hilly terrain of the State and rash and negligent driving are the major cause of these accidents. The department of PWD has identified numerous back spots and the department is in the process of improving them to reduce road accidents. The details of accidents occurred during the past in H.P are given in Table 5.12:

Table 5.12: Number of Accidents in Himachal Pradesh

Sr. No.	Year	Road Accidents	Persons Killed	Injured persons
1	2001-02	2,226	804	3,798
2	2002-03	2,830	695	3,917
3	2003-04	2,607	867	4,188
4	2004-05	2758	920	4674
5	2005-06	2807	863	4833
6	2006-07	2756	886	4688
7	2007-08	2906	945	4867
8	2008-09	2846	838	4637
9	2009-10	3409	1196	5560

Source: Analysis of Different documents from Government and private source

5.8 OTHER HAZARDS

5.8.1 Stampede. The State is known as 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. Large number of devotees 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. Possibility of such instances is always there if there is any laxity on the part of the management.

5.8.2 Air Crash. The State has two airports and more than 120 helipads/helicopter landing sites in the State. Punjab Governor Shri Surendra Nath and nine members of his family were killed when the government's Super-King aircraft crashed into high mountains in bad weather on July 9, 1994 in Himachal Pradesh. Nath was then acting Himachal governor also.

It is therefore seen that the State of HP is prone to various hazards and its geographical, social and climatic features exacerbate its vulnerability.

6. VULNERABILITY PROFILE:

Vulnerability is defined as "the extent to which a community, structure, service or geographical area is likely to be damaged or disrupted by the impact of particular hazard, on account of their nature, construction and proximity to hazardous terrain or a disaster prone area." The concept of vulnerability, therefore, leads to calculation of risk. Risk management would, therefore, mean the level of social and economic ability to cope with resulting event in order to resist major disruption or loss. This susceptibility and vulnerability to each type of threat will depend on its respective differing characteristics.

6.1 VULNERABILITY PROFILE OF THE STATE:

Considering the proneness of the state towards different kinds of natural hazards, a broad district wise vulnerable status was devised for the state Vulnerability matrix was developed based on the qualitative weightage which was given on a scale of 0-5 for different hazards such as earthquakes, landslides, avalanches, industrial hazards, construction type and density of population (Table 6.1). District wise matrix was prepared by evaluating the risk severity. The evaluation also gives weightage to the density of population likely to be affected (Fig.6.1). The matrix also includes the evaluation of hazards likely to be induced on account of development of projects such as hydel projects, roads industries etc (Fig.6.2). In case of earthquake vulnerability, the district Kangra, Hamirpur and Mandi falls in very high vulnerable category on the basis of the matrix devised. The districts which falls in high earthquake vulnerability are Chamba, Kullu, Kinnaur and part of Kangra and Shimla, districts, whereas the moderate and low vulnerable districts are Una, Bilaspur , Sirmour and Solan, Shimla and Lahaul & Spiti districts respectively (Fig 6.3). The landslide vulnerability in case of Chamba, Kullu, Kinnaur and part of Kangra and Shimla districts is high followed by Kangra, Mandi, Bilaspur, Shimla,Sirmour and Lahaul & Spiti districts falling in moderate vulnerable category. The areas falling in low vulnerable category are in the

districts of Una, Hamirpur and Solan (Fig.6.4). The avalanche hazard vulnerability map suggest that the districts of Lahaul & Spiti and Kinnuar are very high vulnerable followed by Chamba, Kullu and part of Kangra and Shimla as moderate vulnerable areas where as the remaining districts falls in the category where avalanche hazard is nil (Fig.6.5). The flood hazard vulnerability map indicates that the areas falling in the districts of Chamba, Kullu , Una and Kinnaur falls in high vulnerable districts where as the Lahaul & Spiti, Mandi, Shimla, Kangra, Hamirpur, Bilaspur, Solan and Sirmour falls in moderate and low vulnerability areas (Fig 6.6). The overall vulnerability of the state on the basis of the matrix clearly suggests that the district Chamba, Kinnuar Kullu and part of Kangra and Shimla falls in very high vulnerable risk. Similarly district Kangra, Mandi, Una , Shimla and Lahaul and Spiti falls in high vulnerable risk status. The district Hamirpur, Bilaspur, Solan and Sirmour falls in moderate vulnerable risk status (Fig.6.7). The disaster management strategies and infrastructure required to be evolved by taking the above factors into consideration.

Table 6.1: District Wise Vulnerability Matrix

DISTRICT	EARTHQUAKE	LANDSLIDE	FLOODS	AVALANCHES	INDUSTRIAL	OVERALL VULNEABILITY
Kangra	VH	M	L	-----	M	H
Chamba	H	H	H	M	M	VH
Hamirpur	VH	L	L	-----	-----	M
Mandi	VH	M	M	-----	-----	H
Kullu	H	H	H	M	H	VH
Bilaspur	M	M	L	------	M	M
Una	M	L	H	------	H	H
Sirmour	M	M	L	-------	H	M
Solan	L	L	L	-------	H	M
Kinnaur	H	H	H	VH	H	VH
L&Spiti	L	M	M	VH	-------	H
Shimla	L	M	M	--------	H	H

VH: Very High, H: High, M: Moderate, L: Low

Source : State Council for Science Technology & Environment Analysis

District wise vulnerability of Himachal Pradesh

Fig.6.1: Construction Vulnerability

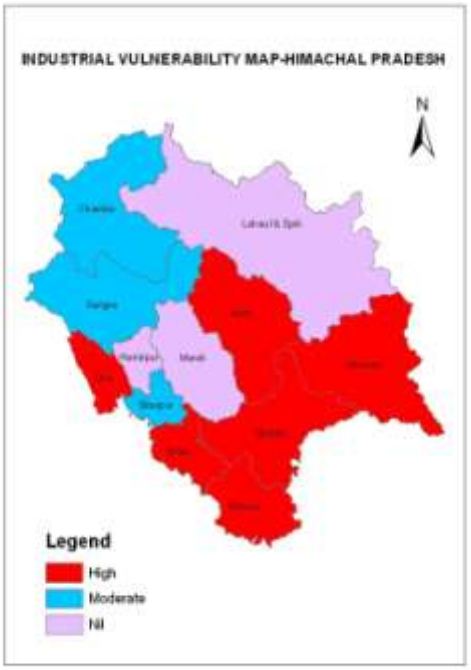


Fig.6.2: Industrial Vulnerability

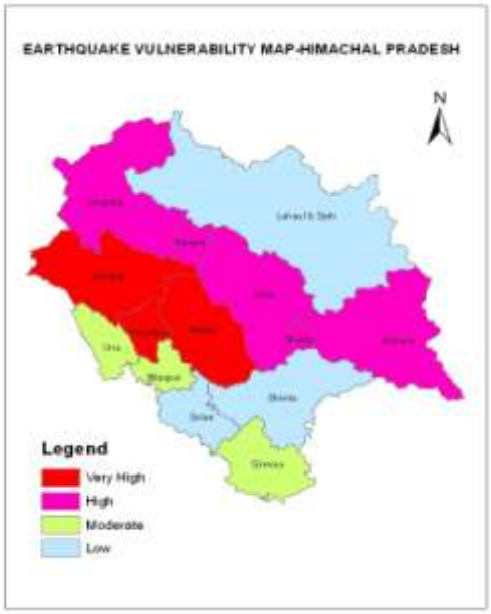


Fig.6.3: Earthquake Vulnerability

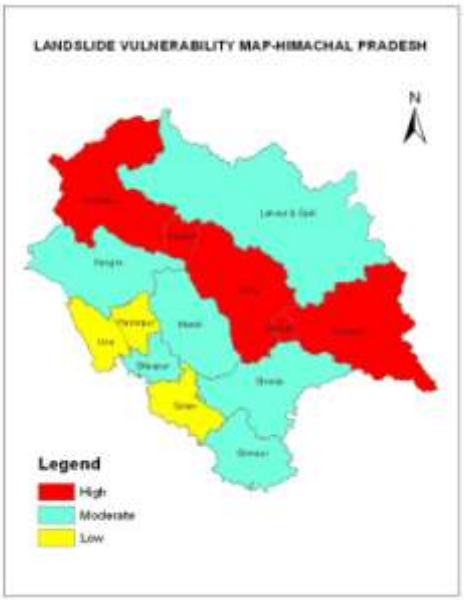


Fig.6.4: landslide Vulnerability

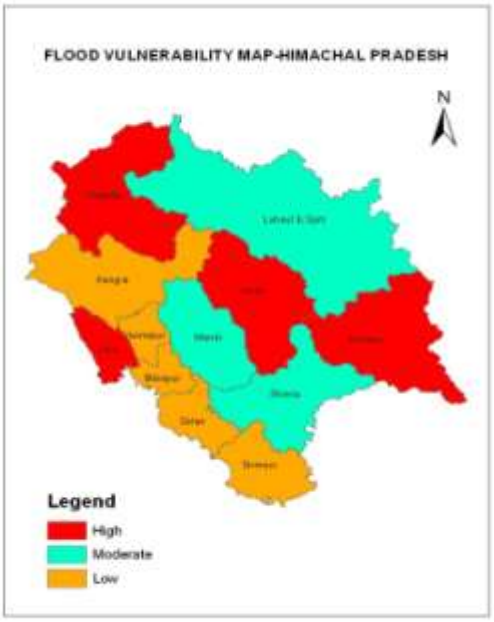


Fig.6.5: Avalanche Vulnerability

Fig.6.6: Flood Vulnerability

Fig.6.7: Overall Vulnerability of the State

Source: SCSTE Analysis

7.0 DISASTER MANAGEMENT INTIATIVES AT STATE LEVEL:

7.1 High Powered Committees (HPC):

The HPC, was constituted in October 1999 under the Chairmanship of Sh. J.C. Pant. HPC Members were drawn from the Central Ministries, State Governments, NGOs and experts from relevant fields. It was the first attempt in India towards evolving a systematic, comprehensive and holistic approach towards all disasters. The original mandate of the HPC was confined to the preparation of management plans for natural disasters only. The Terms of Reference of the HPC were subsequently enlarged to include man- made disasters also with the approval of Prime Minister of India. Representation from concerned Ministries dealing with industrial, nuclear, biological, chemical disasters were ensured by way of inclusion of experts from these Ministries.

On the similar guidelines, the Government of Himachal Pradesh formulated a State Level Disaster Management Committee under the Chairmanship of Chief Secretary to take stock of the disaster situation in the state and monitor and administer the State Disaster Management Plan in Himachal Pradesh. Government also constituted five sub-groups as per the guidelines framed by the HPC of Govt. of India.

7.2 Disaster Management- an Institutional Mechanism

On 23rd December, 2005, the Government of India took a defining step by enacting the Disaster Management Act, 2005, which envisaged creation of the National Disaster Management Authority (NDMA) headed by the Prime Minister, State Disaster Management Authorities (SDMA) headed by the Chief Ministers, and District Disaster Management Authorities (DDMA) headed by the District Magistrates or Deputy Commissioners as the case may be, to spearhead and adopt a holistic and integrated approach to disaster management (DM). According to the Act - there will be a paradigm shift, from the erstwhile relief-centric response to a proactive prevention, mitigation and preparedness-driven approach for conserving development gains and to minimize loss of life, livelihood and property.

Section 2 (e) of the Act defines disaster management as follows:-

> "Section 2(e) "disaster management" means a continuous and integrated process of planning, organizing, coordinating and implementing measures which are necessary or expedient for-
>
> (i) prevention of danger or threat of any disaster;
>
> (ii) mitigation or reduction of risk of any disaster or its severity or consequences;
>
> (iii) capacity-building;
>
> (iv) preparedness to deal with any disaster;
>
> (v) prompt response to any threatening disaster situation or disaster;
>
> (vi) assessing the severity or magnitude of effects of any disaster;
>
> (vii) evacuation, rescue and relief;
>
> (viii) rehabilitation and reconstruction;"

The definition encompasses the cycle of disaster management which has the elements of pre-disaster phase such as prevention, mitigation, preparedness and capacity building. Section 18 (d) of the Act says that the SDMA shall "lay down guidelines to be followed by the departments of the Government of the State for the purposes of integration of measures for prevention of disasters and mitigation in their development plans and projects and provide necessary technical assistance therefor..". And Section 22(i) mandates the SDMA to "…promote general education, awareness and community training in regard to the forms of disasters to which different parts of the State are vulnerable and the measures that may be taken by such community to prevent the disaster, mitigate and respond to such disaster.."

The Act also mandates the DDMAs under Section 30 (xii) to "…. organise and coordinate specialised training programmes for different levels of officers, employees and voluntary rescue workers in the district…" and under sub Section (xiii) to "…facilitate community training and awareness programmes for prevention of disaster or mitigation with the support of local authorities, governmental and non-governmental organisations..". Section 32 of the Act states that every office of the Government of India and of the State Government at the district level and the local authorities shall, subject to the supervision of the District Authority prepare a disaster management plan. The departments are also required to draw up mitigation, preparedness and response plans, capacity-building, data collection and identification and training of personnel in relation to disaster management.

Besides, as per Section 40 of Act every department of the State Government, in conformity with the guidelines laid down by the State Authority, shall draw up their own disaster management plans. Chapter VI (Section 41) of the Act prescribes the local authorities (PRIs, ULBs etc.) to ensure that its officers and employees are trained for disaster management; to ensure all construction projects under it or within its jurisdiction conform to the standards and specifications laid down for prevention of disasters and mitigation by the National Authority, State Authority and the District Authority and to carry out relief, rehabilitation and reconstruction activities in the affected area in accordance with the State Plan and the District Plan.

8.0 INSTIUTIONAL MECHANISM AT THE STATE LEVEL

The Disaster Management Act 2005 lays down a three tier institutional structure for disaster management at the National, State and District levels in the form of NDMA, SDMA, and DDMA. National Policy on Disaster Management (NPDM) has further specified the roles and responsibilities of various organisations for disaster response. To fulfil the DM Act Provisions, State Government has already constituted a State Disaster Management Authority (SDMA).

8.1 State Disaster Management Authority (SDMA) and State Executive Committee (SEC)

It will be the primary responsibility of the State Government to respond to natural disasters and provide relief to the affected people. Section 22 (2) (g) of the DM Act stipulates that the SEC under the State Chief Secretary shall 'coordinate response in the event of any threatening disaster situation or disaster'. SEC shall give directions to any Department of the State Government or any other authority or body in the State regarding actions to be taken in response to any disaster.

Disaster Response being a multi-agency function, other Departments of the State Government will provide emergency support in their relevant domains at the State/District levels.

Govt of Himachal Pradesh vide order No. Rev. D(F)4-2/2000-V dated 1-06-2007 constituted the SDMA and the Member of the State Disaster Management Authority (SDMA)

1.	Hon'ble Chief Minister	Chairperson
2.	Hon'ble Revenue Minister	Member
3.	Chief Secretary	CEO, Ex-officio
4.	Additional Chief Secretary –cum- FC (Rev)	Member
5.	Principal Secretary (Home)	Member
6.	Principal Secretary (PWD)/I&PH	Member
7.	Principal Secretary (Health)	Member
8.	Director General of Police	Member
9.	Secretary (Revenue)	Member Secretary

The Government of Himachal Pradesh in pursuance to DM Act 2005 also constituted the State Executive Committee (SEC) to assist the State Authority in the performance of its functions and to coordinate action in accordance with guidelines laid down by the State Authority and ensure the compliance of the directions issued by the State Government under the Act ibid and consists of the following members:-

1.	Chief Secretary	Chairperson
2.	Principal Secretary (Home)	Member
3.	Principal Secretary (Health)	Member
4.	Principal Secretary (PWD)	Member
5.	Principal Secretary (Revenue)	Member Secretary

8.2 District Disaster Management Authority (DDMA):

Section 30(2)(xvi) of the DM Act stipulates that DDMA under the Chair of the Collector or District Magistrate or Deputy Commissioner, as the case may be and the co-chair of the elected representative of the local authority, shall 'coordinate response to any threatening disaster situation or disaster'. The Collector/District Magistrate/Deputy Commissioner, as the head of administration at the district, shall be the focal point in the command and control for disaster response at the district level, in accordance with the policies/guidelines/instructions from the national and State levels. Depending on the nature of disaster and response, he will be the Responsible Officer for managing disasters and emergencies.

All the Department/Agencies of the Central and State Government in the District /City involved in response and relief will work in accordance with the directions of the Responsible Officer.

The lower administrative units of Districts viz. Subdivisions under the administrative control of a Sub-Divisional magistrate /officer and Block and Tehsils under the administrative control of Block Development Officer/Tehsildars will coordinate the functioning of the various departments in their respective jurisdiction.

The Incident Response Teams at Subdivision and Block levels under SDO/SDM or BDO/Tehsildar and each department level as the case be will be responsible for all response and relief works.

Besides the institutional frame work of SDMA and DDMA, the state should have the following at the state and district level.

State Emergency Operation Centre (SEOC) and District Emergency Operation Centre (DEOC) is yet to be established in the state.

8.3 State Disaster Response Force (SDRF)

Emergency Support Functions Plans, based on ESF Plan at National level, the State Government shall designate Primary and Secondary Departments/Agencies for each ESF and mandate them for making plans for providing emergency support at the State and district level.

8.4 Incident Response System (IRS)

Under IRS an incident commander and officers trained in different aspects of incident management, such as logistics, operations, planning, safety, media management etc. form a specialist incident management team to manage the disaster /emergency.

Section 23 of the DM Act 2005 provides that there shall be DM plan for every state. It outlines the broad coverage of the plan as well as the requirements of consultation in the preparation of the State Plan. It also provides for annual review and updating of the state plan, and enjoins upon the state Governments to make provisions for financing the activities to be carried out under the state plans. It provides for the department of the state Government to draw up their own plans in accordance with the State Plan. The State Plan

shall be prepared by the State Executive Committee (SEC) in conformity with the guidelines to be issued on related matters by the SDMA having regard to the guidelines laid down in this regard by the NDMA, and after such consultation with the local and district authorities and the people's representative as the SEC may deem fit. The state plan prepared by SEC shall be approved by the State Disaster Management Authority (SDMA).

Based on the institutional mechanism available at the State level, the SWOT analysis was carried out and the following inferences were made (Table 8.1)

Table 8.1: SWOT Analysis of Institutional Mechanism at the State Level:

Strengths	Weaknesses	Opportunities	Threats
State has already established SDMA, SEC and DDMA	Although the institutions have been notified but are still to become functional. No human resources are available with SDMA and DDMAs.	Strengthening the already notified institutions by taking appropriate measures and make them fully functional.	In case of a mega disaster, the State may not be in a position to respond effectively.
Established of State Emergency Operation Centre (SEOC) & DEOC	SEOC/DEOC are yet to be set up.	GIA from 13th Finance Commission has been made available to the State to set up/strengthen the EOCs. The EOCs at State and District HQs have been approved for setting up by the SEC.	If SEOC and DEOC are not established with latest communication tools and Decision Support System (DSS), it may be difficult to deal in case of a mega disaster as there may be complete collapse of communication and DSS. The response may not be coordinated and effective.
Disaster Management Cell has been created within the Revenue Department to deal with disaster related issues.	Department is more relief oriented than proactive in tackling disasters holistically in the State. Lack of capacity to deal disaster management in a holistic way.	Current UNDP Program on Disaster Risk Reduction (DRR) and Urban Risk Reduction (URR) may be helpful to strengthen the existing system in the state.	If department does not start reacting in a proactive manner, the opportunities may not result in achieving the desired results.

8.5 Recommendations in context of Institutional Mechanism:

Based on the SWOT analysis carried out in the State and at department level, the following recommendations are made:

- Disaster Management Policy of the State must be formulated.
- SDMA and SEC should be made functional by providing appropriate level and number of staff and other necessary support system.
- Disaster Management Plans of the State must be prepared.
- District Disaster Management Authority must be made fully functional and there should be proper plan at the District Level. It is also recommended that adequate staff should be provided to DDMAs as per the provision of the DM Act 2005.
- Training and orientation of all the Govt. functionaries in DM should be ensured.
- Specific steps need to be taken for enhancing capacity building of all stakeholders at all levels.
- In order to develop capacity building in Disaster Management, State level Nodal Institute to be identified and should be equipped with man and machinery The departmental training institutes of all departments should also be equipped to take up DM training with respect to the needs of their departments. Tie up with specialised training institutes such as NIT, CBRI, NIDM, NRSC etc. should be done so that training can be effectively carried in the State.
- Sector specific DM plans need to be developed which must be incorporated into DDMP and SDMP.
- Departmental Nodal Officers of all the line Departments are not only to be appointed but also appropriate training should be imparted to them.
- On the pattern of other States like Orissa, the State should constitute State Disaster Response Force (SDRF) to minimise response time.
- Hazard Vulnerability Assessment of the state needs to be carried out for having effective Disaster Management, Mitigation and Response Plans.
- New techno-legal regime in the State taking into account the hazard profile should be promulgated and the implementation and compliance mechanism should be put in place.

9.0 WHY IS TRAINING NEED ANALYSIS IMPORTANT?

Keeping in view the requirement of Act and for effective handling of disasters and building capacity at all level – Government machinery and other stakeholders - training needs to be imparted at various levels according to the needs and requirement of respective departments and other stakeholders. An analysis of training need is an essential requirement to design effective training. The purpose of training need analysis is to determine whether there is a gap between what is required for effective performance and present level of competence. As far as disaster preparedness at different levels is concerned, Training need assessment is necessary for effective implementation of disaster management plans at the state, district and block level respectively and the training needs of various departmental functionaries and other stakeholders would be determined by the roles/emergency support functions vis-à-vis various facets of DM.

9.1 Training Needs Assessment

A "Training Needs Assessment" workshop was organized by the Department of Revenue through HP State Council for Environment, Science and Technology on 25-26th April 2011. The Officers of the District Administration and the Nodal Officers appointed by various departments for disaster management participated in the workshop. The workshop was designed in such a manner that the first one and half day, the participants were made

aware about the disaster scenario of the state, various facets of Disaster Management followed by evolving action plans based on the expertise, human resource and other logistics as well as infrastructure available with their respective department exercises by assuming a disaster like situation. The information thus collected from different departments was used to derive the SWOT analysis for each department, which would be useful in assessing the expertise and strengths available for further strengthening the disaster preparedness in the state with respect to each department.

In order to evolve training needs in disaster management, all the Govt. Departments and other stakeholder were divided into different groups depending upon the nature of their work, expertise available, training gaps, role in DRR and emergency support functions (ESFs) to be performed in case of an emergency as per Table 9.1. The findings of the workshop were compiled and presented before the Chief Secretary, Secretaries and HODs by Dr. Amir Ali Khan, Associate Professor, National Institute of Disaster Management, New Delhi on the concluding day.

Clippings of the Concluding Day





Table 9.1: Broad Categorization of Departments for TNA

Sr. No.	Broad Groups	Departments to be involved
A	Policy and Planning	All MLAs, Secretaries and HODs
B	Construction/Public Works Sector	PWD, I&PH, HIMUDA, Construction wing of Education, HPSEB, Rural Development, Tourism, TCP, and UD
C	Search & Rescue, Law & order	Civil Defense & Home Guards, Police, Fire and Emergency Services
D	Social Sector	Social Justice and Empowerment, & ICDS
E	Management & Coordination Sector	Revenue & District Administration
F	Industrial Sector	Industry
G	Health Sector	Health, Ayurveda, Red Cross, Voluntary Health Organizations and Animal Husbandry
H	Livelihood Sector	Agriculture, Horticulture and Forest
I	Communication	BSNL, Police, Home Guards, Forest, Electricity
J	IEC and Media	I & PR
K	Voluntary Sector	NCC, NSS, NYKS, Women and Youth Organizations, RWAs, CSO, CBO, Market Organizations, VDMTs, Youth Services and Sports etc.
L	Service Sector	Food & Civil Supplies, Forest Corporation, Transport,
M	Public Representative Sector	Elected Representatives of PRI, and ULBs
N	Forest Sector	Department of Forest
O	Tourism & Civil Aviation Sector	Department of Tourism and Civil Aviation & HPTDC
P	Education Sector	Universities, Higher and Elementary Education

10.0 STRENGTHS, WEAKNESSES, OPPORTUNITIES AND THREAT (SWOT) ANALYSIS AND THE ROLE OF EACH STAKEHOLDER DEPARTMENT IN DISASTER MANAGEMENT:

A Training Needs Assessment Workshop was organised on April 25-26, 2011 at HIPA, Shimla. The workshop was attended by the heads/representatives and the Nodal officers for Disaster Management of all line departments working in the areas related to disaster risk reduction. Based on the TNA exercise carried out during the two days workshop the SWOT analysis was carried out for different departments. The findings of the analysis were compiled as in Table 10.1

Table 10.1: SWOT Analysis in respect of different Departments

	Name of the Department - District Administration (Revenue)				
	Major Role in Disaster Management	**Strengths**	**Weakness**	**Opportunities**	**Threats**
	Pre Disaster Level:				
	To have an overview of the state and district level administrative, institutional and techno-legal regime (including relief code) structure of DM. To have proper DM plans at different levels including regular updation and their integration with development plans. To have an effective operational EOC. To have post disaster relief and logistics management.	Large human resource at different levels in the district and is well spread up to the village level. Critical knowledge of the area. Manpower with the administration is involved in the activities related to Disaster Management.	No proper training/exposure to district officials in disaster management. Lack of coordination among different stakeholders Role and responsibilities are not clearly defined and understood also. EOC not set up.	Proper training will lead to better management of any disaster like situation Availability of proper plans will ensure not only better post disaster management but also ensure better prevention, mitigation and preparedness. The on-going programmes can be effectively implemented.	Disaster management related activities may be taken over by some other agency if not handled properly. As per experience DM has become highly unprofessional and if no improvements are made, the conditions will deteriorate further. Lack of lack of interest in DM and DRR activities at all levels.

	To have an effective emergency support functions and their coordination mechanism To have an inventory of resources and material available in the district. To have the modalities for deployment of army during extreme emergencies. To manage relief camps and camp for volunteers arriving for relief operation. To have field level coordination with various Govt. and nongovernmental agencies, community participation at various stages of DM. To have the arrangements for financing relief and reconstruction activities. To have the coordination and management of NGOs and other activities during emergencies and assigning roles to various stakeholders.	At the time of crisis these actions can lead to better coordination and response.	DDMPS not properly formulated Integration of DM not done with development plans. No prioritisation for DRR. Safety of infrastructure and buildings. Lack of EOCs and reliable communication network to manage crisis. Lack of trained staff and lack of equipment. Lack of knowhow about damage assessment. Non-availability of proper DMPs.	Time is available for community training and capacity building. The database of NGOs, CBOs can be prepared and they can be trained for emergencies. IEC activities can create public awareness and preparedness.	DM is viewed as additional and extra work. DM/DRR is not seen as an opportunity.

	Mapping & vulnerability assessment of the area Formulation and strict implementation of building by-laws. ● Construction/retrofitting of public buildings particularly schools, hospitals, community centre, panchyats bhawans etc. and publically funded buildings like IAY houses for earthquake resistance. ● Regular monitoring of structural safety of public buildings, water tanks, roads, bridges, dams and other built structures. • Mass campaigns involving community for disaster risk reduction. • Awareness and motivation of the civil society. • Identification of public shelters and equipping them with basic facilities, training of Govt. servants/volunteers in Medical First Aid (MFA) and Search and Rescue (SAR).		Improper prioritisation towards Disaster Risk Reduction (DRR) Improper disaster safety of infrastructure and buildings with the Administration Lack of EOC and improper communication network to manage any crisis Shortage of staff Lack of know how about damage assessment and compensation disbursement amongst the working staff. Non- availability of proper Disaster Management plans		

	Post Disaster Level:	The district administration has good experience in disaster response.	Disaster response mechanism is not equipped to hand big disasters. Lack of specialised SAR Teams. Inadequate SAR equipment. Inadequate preparedness. Community not trained to handle emergencies properly.	Time is available for filling up the gaps. The on-going programmes if implemented properly can lead to better response.	Non-functional DDMAs can jeopardize the opportunities available.
	• Maintenance of law and order. • Arrangements for evacuation of people. • Recovery of dead bodies and their disposal. • Restoring lines of communication and information flow. • Quick assessment of damage. • Cordoning off the area • Quick relief distribution • Restoration of minimum communication. • Restoration of basic transport facilities. • Establishment and functioning of Control Room				
Public Works Department (PWD)					
	Pre Disaster Level:				
	Hazard resistant/safe constructions. • Retrofitting of the lifeline buildings and other critically important buildings. • Identification of sites for raising temporary shelters. • Ensuring the raw material for raising temporary shelters. • Availability of tools/instruments required	Large Manpower Professional and technical organisation	Non-implementation of project specifications at site. Lack of knowhow of retrofitting and training thereof. Lack of sensitisation at lower levels – supervisory and contractors level. The department is overburdened in routine works and DM may not be a priority.	The officers and staff down the line can be trained and oriented for the job.	Retrofitting of structures a huge and costly affair. Enforcement of hazard resistant features in new constructions can add to the existing risk. The department hasn't constituted Hazard Safety Cell (an MHA directive).

	during the disaster for removals of debris etc.				
	Post Disaster Level:				
	• Debris removal • Setting up temporary shelters • Restoration of roads to their normal condition. • Repair /reconstruction of public utilities and buildings. • Designation of routes strategic to evacuation and relief should be identified and marked in close coordination with EOC.	The manpower, expertise and experience of the department.	In case of big disaster the existing capacity of the department may be inadequate to respond to the situation. The dependence the department on contractor.	Networking and tie-up with CPWD, BRO, Army etc. can be done in advance. List of equipment and machinery, manpower available in private sector can be inventoried for possible use during disasters.	Orientation and sensitisation is not adequate at this state. The department has not constituted HSC as desired by MHA.
Police Department					
	• Maintenance of law and order after any disaster event • To have search and rescue teams(district and local SAR teams of volunteers and their coordination) • To have a departmental contingency plan. • To have an emergency communication system • To have defined role for Civil Defence, Fire Services, Home Guards etc. • Appointment of one officer as "Officer-in-charge –Police at the district level. • Immediately after the disaster, dispatch officer to	Large human resource network available throughout the state with different levels of personnel. Adequate and dependable communication network throughout the state.	No earmarked battalion for disaster purpose Regular training programmes with special reference to disaster management using latest techniques & tools. Not trained in DM related activities. Police stations are not disaster resistant Inappropriate and inadequate equipments to meet out the DM challenges	All the human resources of this sector need to be given specialised training at least up to Constable level for search and rescue operations. Police control rooms can further be strengthened with some additional tools of communications which does not fail during crisis. Can manage disasters effectively if fully trained and equipped. Police control rooms may	Buildings may not be safe so they are susceptible to big disasters. The power failure may reduce the effectiveness of police wireless network.

	systematically identify and assist people and communities in the threatening situations. • Providing transport facilities to seriously injured people. • Establishment of control room in the affected area to provide accurate information • Traffic control in the event of crisis • To make security arranges in the affected area to prevent looting etc. • To provide guards at supply depots such as cooperative food stores and distribution centres. • Identification of anti social elements and take necessary precautionary measures for confidence building. • To provide security arrangements for visiting VVIPs and VIPs • In conjunction with other Departments, establish a public information centre so that authenticated information could flow to the people. • To have proper inter departmental coordination. • Monitoring the needs and welfare of people sheltered in the relief camps.		Inadequate means of communications	be developed as alternative EOC at the level of State, district or local level.	

	• Coordinate with military service personnel in the area				
Department of Health					
	• Providing efficient and quick treatment • Preventing outbreak of epidemics • Stock emergency medical equipment which may be required after a disaster. • Assess type of injuries/illnesses expected and drugs and other medical items required, and accordingly ensuring that extra supplies of medical items be obtained quickly. • To sensitise all hospital staff about the hazards and their likely damages and effects, and information about ways to protect life, equipment and property. • To establish a mobile hospital immediate in the area in a safer place, • To check emergency power arrangements to ensure that	Professional and skilled manpower Infrastructure up to village level	Structures may not be hazard resistant Lack of orientation among all stakeholders towards this sector Staff may not be adequately trained to handle such emergencies, mock drills and no protocols are there to face big crisis. Inadequacy of equipments Non-availability of mobile hospitals. No quick reaction teams for field duty. No portable medical kits Non availability of sector specific contingency plan	Tremendous opportunities not only to disaster risk reduction but also to mobilise resources for overall development through corporate social responsibility and public private partnership. Hospital safety issues and concerns can be addressed in the on-going programmes such as NHRM etc. by way of DRR integration.	Sector may be the victim of the disaster itself if sufficient measures are not taken well in time.

	it is operational and that a buffer stock of fuel exists. • To prepare an area of hospital for receiving large number of causalities. • To orient field staff with DDMAP, standards of services, procedures including tagging etc. • To have a well rehearsed Hospital Disaster management Plan • Up-gradation of Medical Infrastructure at various levels.				
	Irrigation and Public Health • Appointment of Nodal Officers for ESFs at State and District level • Restoration of water supply to the affected area. • Monitoring of flood situation • Monitor and protect irrigation infrastructure • Restore damaged infrastructure • To establish communication with EOC at State HQ, District Control Room and departmental and field officers within the Division. • To make provisions to acquire tankers and establish other	Network and trained manpower upto village level.	The infrastructure may be exposed to various hazards and may not withstand disaster shock. The lift water supply schemes may become non-functional due to damage and power failures. Drying up of water resources or excessive silt in the streams may affect water availability.	The DRR integration may be done in on-going programmes. Hazard proofing of existing infrastructure and schemes can be done. Rain water/snow harvesting can be popularised. Contingency plans can be prepared. Nodal Officers for ESFs can be appointed at various levels.	Lack of sensitisation towards DRR at various levels. The water supply schemes drawn from longer distances can take longer time for restoration.

	temporary means of distributing water on and emergency basis. • To make a plan for water distribution to all transit and relief camps, affected villages and cattle camps. • To keep a minimum level of stock for emergencies.				
Home Guards and Civil Defence					
	• Assisting Police in maintenance of law and order, crowd control etc. • Search and Rescue (SAR) • Community training SAR, MFA and public awareness.	Dedicated and trained volunteers. Well spread network	Lack of regular staff and infrastructure required the role to be performed.	Further strengthening of network by providing modern state of art, training, equipment and facilities. Large network of human resource may be utilised for taking disaster management activities at community level.	Volunteers may be affected during disaster and may not report for duty.
Department of Fire and Emergency Services					
	• Responding to all disasters • Mobilising staff and fire units • Effective management of resources by communication and mobilization of additional resources	Professionally skilled manpower and equipments to meet out emergencies created by disasters.	Lack of modern equipments for search and rescue operations. Insufficient and less manpower strength than the proposed sanctioned strength. Inadequate number of fire stations. Fires stations may not be earthquake safe.	The Fire and Emergency Services should be modernised, staffed and equipped with modern equipment. Density of fire stations should be increased.	In absence of appropriate actions, the department may not be in a position to respond effectively and timely.

Food and Civil Supplies					
	To ensure food supplies to the affected population. To ensure proper distribution of the supplies	Large network of fair price shops up to grass root level. Availability of buffer stock for relief	Godowns of HP State Civil Supplies and of FCI may not be safe from earthquake point of view. No Reserve supplies are available beyond one month at godowns level	If godowns are retrofitted for earthquakes, the supplies in case of disaster can be sustained.	Damage to the stocks in the event of disaster.
Department of Education					
	Education department can play an important role in creating awareness and preparedness up to the grass root level. To incorporate the DM in the Curriculum To have disaster specific preparedness, awareness and awareness in educational institutions	Large human resource and infrastructural support up to grass root level. Infrastructure can be used for providing temporary shelters at the time of emergency. NCC/NSS and Scouts and Guides volunteers at each level	Buildings which are generally not earthquake resistant can't withstand the tremors. Lack of training to NCC/NSS and Scouts & Guides volunteers in DM. Lack of training to teachers in disaster management.	The teachers can be trained in School Safety issues under SSA and RMSA trainings. Volunteers if given proper training can be used as important resource for carrying rescue operations. The new constructions under SSA and RMSA and other programmes should be hazard resistant. Retrofitting of weak structures. Large network of teachers can be used for imparting training upto grass root level.	Sustainability of the building structure in the event of disasters like earthquake/fire etc.

Department of Social Justice, Empowerment and Women Welfare					
	To study the impacts of disasters on women, adolescent girls and children. To understand the special needs of women, adolescent girls and children and to evolve strategies to cater special needs of this group. Training of Aanganwadi and ICDS workers in MFA and Psychological Counselling.	Huge network of Anganwari worker, Self Help Groups is available up to the village level throughout the state.	No training and capacity building of this large human resource network.	Community Based Disaster Management (CBDM) can be strengthened by utilising the Anganwari and SHG. Anganwari workers can also be trained for counselling purpose after the disaster. Quick Disaster Response Teams can also be constituted by involving Anganwari and SHG workers at the village level. Important resource for imparting immediate first aid during the crisis at the village level.	Workers itself may be vulnerable to disasters because of the structural vulnerability of the buildings.
Department of Information and Public Relations					
	To provide and collect reliable information on the status of disaster and disaster victims for effective communication of disaster. To coordinate with EOC's at the airport and railways for required information for International and national relief workers.	Good outreach to the masses with the help of medium like films, exhibitions etc. Coordination with media.	Lack of trained manpower. Lack of organisational structure for DM related issues. Lack of funds to have campaigns on disaster awareness.	DRR issues should be clubbed with other campaigns. I & PR Staff and Media should be sensitized and oriented towards DM.	Lack of direct control over media.

	To acquire accurate scientific information from the Ministry of Science & Technology on IEC of DM. To coordinate with all TV and radio networks to send news flashes for specific needs of donation To respect the socio-cultural and emotional state of the disaster victims while collecting information for dissemination.				
Department of Town and Country Planning					
	Hazard mitigation measures both in urban and rural areas. To frame and implement the development plans, land use regulations, development control regulations etc. in different parts of the State for safe and sustainable growth.	Professional manpower and expertise of the department.	Non- implementation of various tools like land use planning, zoning regulations etc. Inadequate manpower. Resistance from community to TCP.	Can sensitise community and policy makers about needs of TCP. Developmental plans be based on HRVA.	Vulnerability will keep on increasing if the present status continues.
Department of Urban Local Bodies and UD Department					
	To promulgate building bye-laws and implementation thereof. To provide shelters and food to the displaced persons. Disposal of unclaimed bodies. Removal of debris. Maintenance of sanitation and hygiene.	ULBs are run by public representatives and have community support. Good network in the cities.	Hardly any control over the construction practices. Lack of trained manpower. Inadequate resources. Improper disposal of solid waste.	Can reduce the vulnerability by having proper construction codes and practices. Availability of large human resource to be used for relief and rescue purpose. ULBs can involve community and take DRR issues to the household level.	Haphazard and illegal construction can lead to a major disaster. Lack of political will to enforce building bye-laws. Scientific disposal of solid waste.

	To coordinate with volunteers and NGO's To deal with mass disposal of carcasses. To deal with livestock and family pets. To define procedure for condemning damaged buildings.			DRR should be integrated in all the schemes. City Disaster Management Plans should be formulated clearly defining roles and responsibilities.	
Department of Transport					
	To arrange transport for SAR, victims and relief supplies. Restoration of the affected routes.	Large fleet of vehicles – Government and private.	Lack of contingency of plans and networking with private sector. Difficult terrain of the state.	The department can make transport planning and contingency plans. Inventorisation of private sector transport service providers. Procedures for hiring private transport services can be established.	Disasters like earthquakes and landslides may hamper the smooth flow of movement and affect the working of the department.
Department of Tourism and Civil Aviation					
	Involvement of industry in disaster management – tourists tracking system, building level emergency plan. Safe construction practices for hotels and tourist destination.	Huge resource base in private sector including manpower and other infrastructure and facilities.	Lack of training to handle the crisis situation. Lack of contingency plan to track the tourists in case of disasters. No emergency plan at building level.	Tremendous opportunities not only in Disaster Risk Reduction but also to mobilise resources for overall development through corporate social responsibility and public private partnership.	Sector may be the victim of the disaster itself if no preparedness measures are taken.

Department of Industries					
	Preparation of on-site and off-site emergency plans at factory level. Regular meetings of the crisis management committees. To make people aware of their vulnerability and the need for prevention, mitigation and preparedness measures. To mobilise human and financial resources as well as material for utilisation during disaster.	Huge resource base in private sector including manpower and other infrastructure and facilities	No plans to meet out the crisis situation at on-site and off-site. Poor awareness and preparedness level.	Can contribute in the early recovery. Should take steps for industrial safety. Should promote eco-friendly industry. Should promote clean development mechanism.	In the absence of proper planning , sector may be victim of a big disaster. Innocent population may be victim of industrial disaster.
Department of Rural Development and Panchyati Raj					
	To ensure hazard resistant and sustainable development in Panchayats. To have the inventory of resources for countering disasters. To maintain and operate a village level warning system. To organise village disaster management committees and village task force. To formulate village level disaster management plans and their integrating with development plans. To have emergency support functions and their coordination mechanism	Availability of functionaries up to the village level. Community based organisations. Good rapport with the public. Important role in the development of rural areas.	Lack of training to the officials about DM. Lack of awareness amongst masses. Poor construction practices. There are no rules and regulations for the rural constructions.	Community Based Disaster management (CBDM) and Community Based Disaster Reduction (CBDR) can be efficiently implemented. Mason training can revolutionise the safety culture. Schemes like MGNAREGA, IYA and other Govt schemes can very effectively utilised for vulnerability reduction.	Lack of orientation may result in disaster losses.

	To integrate rural develop programmes with disaster reduction and mitigation activities.				
Himachal Urban Development Authority (HIMUDA)					
	Promoting safe and planning housing in the State.	Skilled and professional manpower	Lack of orientation of DRR. Shortage of manpower.	Can prioritise mitigation if proper trainings are given to masons and related work force in safe construction practices.	The old housing stock in the State. Poor maintenance of infrastructures in HIMUDA colonies in the State.
Department of Agriculture					
	To have contingency crop planning. To promote crop insurance to transfer risk. To have mechanism for the damage assessment of crops and equipment.	Large infrastructure, human resource and volunteers up to the Block level.	Lack of orientation to field level staff. Inadequate irrigation facilities. Poor acceptance of crop insurance policies by the public. Non-promotion and conservation of local seed base.	Field level staff can be used to further educate the masses at the grass root level if proper trainings are given to them. Local seed should be promoted and preserved. Effort should be made to bring more and more area under assured irrigation schemes.	Loss of agriculture land and top soil. Climate change and extreme weather variability
Department of Horticulture					
	To have contingency crop planning. To promote crop insurance to transfer risk. To have mechanism for the damage assessment of crops and equipment	Trained manpower at Block level.	Lack of modern infrastructure to deal with hazards such as hailstorm. Climate change adaptation challenges are overwhelming.	Further strengthening of the department by adopting modern techniques to face meteorological disasters.	Loss of crop land. Climate change and extreme weather variability.

			Poor response to insurance schemes.	Crop quality and quantity can further be improved by adopting modern techniques. Anti-hail suppression system should be installed.	
Department of Animal Husbandry					
	To have the contingency plan for the effective disaster management in relation to the animal livestock in the event of any disaster. To make arrangements for fodder, water etc to face any crisis. To make arrangements of injured cattle. To have arrangements for the protection and care of abandoned/lost cattle. To make stock emergency medical equipment. To make arrangements for establishing cattle camps, and to ensure the medicines required for their treatment.	Huge network up to village level. Professional and trained staff.	Lack of preparedness. Lack of disaster resistant Govt. owned sheds /buildings. Lack of proper storage of medicine/vaccination etc. Lack of appropriate fodder banks. No proper carcase disposal	Doctors and other technical staff can be utilised for creating awareness at the grass root level. DRR concerns can be addressed in on-going programmes. Contingency planning can be prepared.	Improper disposal of carcase may lead to epidemic outbreak.

Department of Youth Services and Sports					
	Mobilisation of volunteers for public education, awareness, Search and Rescue.	Large human resource. Well spread network of volunteers. Young blood	Lack of training, coordination, infrastructural facilities. Lack of organisational set up. Financial crunch.	If proper training is given to these volunteers and young blood, they can be a very effective and useful human resource for emergency situations.	Volunteers may be affected by any disasters or they may report for emergencies.
Forest Department					
	• Developing departmental disaster management plans and their integration with developmental plans. • Methods /techniques of disaster mitigation and management with a special focus in forest fires, landslides, flash floods which are more prone to frequent forest fires. • Identification of areas which are vulnerable for forest fires incidence.	Good network upto Panchayat level and huge man force.	Lack of contingency planning. Lack of capacity to fight forest fires. The department has failed to mobilise and generate support.	Contingency planning based on community based disaster risk management. Integration of DRR in on-going programmes. Generating support of community and their involvement.	Huge forest area for management. Inaccessibility due to terrain and lack of modern equipment to fight fires. Climate change.

Note: SWOT analysis has been carried out for those departments only who had participated in the exercises. Those who could not participate, they can assess their own SWOT analysis

TRAINING NEEDS ASSESSMENT

11.0 Training/Orientation mandatory for all the Departments

All departments irrespective of their roles would require being trained/oriented in the following aspects of disaster risk reduction/disaster management. The training modules would be developed for different categories of employees depending upon their roles. The main areas where training inter alia would be provided are as under:-

a) Awareness about the provisions of the Disaster Management Act, 2005.
b) National and State Policy on Disaster Management
c) Guidelines issued by the National Disaster Management Authority, State Disaster Management Authority and the State Executive Committee
d) Orientation and awareness on Disaster Management and its various aspects
e) Dos and Don'ts for various hazards
f) Office preparedness for Disaster Management
g) Preparation of Disaster Management Plans (DMPs)
h) Preparation of Response Plans
i) Training to perform the Emergency Support Function (ESF) assigned to the departments
j) Training on integration of Disaster Risk Reduction into development plans and policies
k) Training on mitigation measures and plans
l) Community awareness and IEC
m) Damage and Needs Assessment
n) Conduct of mock drills
o) Training in basics of search and rescue (SAR), medical first aid (MFA) and use of fire equipment.
p) Training of all the new entrants into Government Services at the training institutes and academies itself such as HIPA, PTC Daroh, Medical Colleges, DIETs, B. Ed institutions, Revenue Training Institute, Patwar Schools and all the departmental training institutes etc.

11.1 Sector specific Trainings:

The sector specific trainings would be imparted covering all the line departments involved in different activities based on the nature and role and expertise available as per the Table 11.1

Table 11.1: Sector Specific Training Needs

Level	Category	Components	Duration of the training/orientation	Preferable Training Institute
Policy and Planning				
Level I	All the Members of the Legislative Assembly, All the Administrative Sectaries	Basic Orientation about DM, DRR and DM Act and Policies, institutional set-up etc.	Half Day	State HQ by the SDMA.
Level II	HODs and other Officers of the Secretariat	Basic Orientation about DM, DRR and DM Act and Policies, institutional set-up etc.	Half Day	State HQ by the SDMA.
Construction Sector				
Level I	Engineer-in- Chiefs, Chief Engineers, HODs of other allied departments involved in construction activities	General orientation about disaster management and earthquake risk reduction, safe construction practices related multi-hazards. NBCs, Building By-Laws, best practices at Nation and International level.	One Day	IITs, NIT,CBRI
Level II	S.E/E.E/ Senior level professionals for other allied departments.	First orientation to all of them as in **Level I** followed by training on planning/designing and execution aspect related to construction industry	3 Days	IITs/NIT/CBRI
Level III	A.E./J.E./Junior Level Professionals from other allied departments	General orientation at level I &II followed by field demonstration and execution including retrofitting etc	5 Days	NIT/HIPA or Officers trained at Level II for departmental trainings.
Level IV	Construction supervisors, Masons, Black smiths, and Wire Binders etc.	Basic and safe construction practices with hands on training	10-20 days	At Block HQs
Management and Coordination Sector (District Administration)				
Level I	Officers of the Collectorate, & SDMs	Sensitisation and orientation on DM; preparation of DMPs; Coordination; inter agency coordination, IRS; documentation of disaster/disaster events; post disaster damage and needs assessment; management of relief camps; relief and rehabilitation; crowd management; Modalities for deployment of army and NDRF during extreme emergencies and Working with armed forces during disasters.	5 Days	NIDM/LBSNAA/ HIPA

		Structure and operationalization of EOCs. ESFs and their coordination mechanism; Resource and material management; Conducting mock drills in co-ordination with different functionaries including Govt. Depts. & NGOs; Management of relief camps and camps for volunteers arriving for disaster relief. SOPs and checklists for disaster management. Information systems and decision making tools for disaster management (IDRN, IDKN etc.); Arrangement for financing relief and reconstruction activities; Coordination and management of NGO, CBOs and other's activities during emergencies and assigning roles to various stakeholders IEC in DM. Crowd Management and Conflict Resolution		
Level II	Tehsildars and Naib Tehsildars	As per Level I	5 Days	NIDM/HIPA,/RTI Jogindernagar
Level III	Kanungos, Patwaris and Official of District, Sub-Division and Tehsil	General orientation on DM, damage assessment, EWS and dissemination thereof, relief including running and management of relief camps; documentation, manning the EOCs/Control Rooms	2-3 Days	HIPA, RTI
Search & Rescue Sector				
Level I	Director Generals, IG, DIGs, SPs,	General orientation about DM and technologies/ tools available for search & rescue, general role of the department in crisis management etc.	One Day	SDMA/NDMA/ NDRF
Level II	Addl SPs, DSPs, Commandants Home Guards and Fire Officers	General orientation about DM and technologies/ tools available for search & rescue, general role of the department in crisis management etc and	1-2 Days	Civil Defence College Nagpur

		conduct of mock drills; Crowd Management and Conflict Resolution		
Level III	Inspectors, Sub Inspectors and ASIs and equivalents in HHGs and Fire Deptt.s	As in Level II + practical in SAR, First Aid and conduct of Mock drills; Crowd Management and Conflict Resolution	5 Days	Civil Defence College Nagpur to be trained as Master Trainers
Level IV	Other Ranks	General Orientation plus practical training in SAR and First Aid and mock drills; Crowd Management and Conflict Resolution	7 Days	PTC/HHGs BTCs /Civil Defence Training Institute
Social and Community Sector				
Level I	Directorate and District Level Officers of Social Justice and Empowerment and ICDS Deptt.	General orientation on DM and role of the Department	One Day	SDMA/HIPA
Level II	Aanganwadi Workers and field staff of Social Justice and Empowerment, and ICDS	Training of Anganwadi workers in SAR, First Aid, psychological counselling, shelter and relief camp management and information gathering on damage assessment; Training of SHGs formed through ICDS in SAR and First Aid; Training in IEC; Impacts of disasters on women, adolescent girls and children; Role of women, adolescent girls and children during disasters; Disaster management strategies to cater to the special needs of women adolescent girls and children	3-5 Days	At Block levels to be arranged by the Department Concerned.
Health Sector				
Level I	Principals of Medical Colleges, CMO, and MS of District Hospitals, Joint Directors, Dean of Vet. Colleges, DDs and ADs in AH Deptt. and equivalents in other officers at Directorate level	General Orientation on DM, handling CBRN emergency, dealing with dead, Minimum Standards in medical response and ESF of the department, Hospital Safety and Mass Causality Management; Evacuation plan and conduct of mock drill; Integration of health services – institutional integration and networking with other health service providers, logistics management including inventory management; Training of doctors and paramedics in various aspects of disaster management including	2 Days	NIDM/HIPA/SIH & FW etc.

		emergency health management issues in disasters; Rapid health assessment in different disasters; Post trauma care. Crowd Management and Conflict Resolution		
Level II	Senior Specialists, BMOs, MOs at district level/Senior Vet. Officers and Vet. Officers	As in Level I	3 Days	State Health and Family Welfare Training Institute at Primahal, Shimla
Level III	Paramedics /Para veterinary Staff	General Orientation on DM, Role of the Department, Mass causality management, running of mobile and temporary hospitals, hospital safety, evacuation, mock drill	3 Days	At Block Level to be organised by the Deptt.
Level IV	MPWs, FHWs etc/Animal Husbandry Attendants	As in Level III	3 Days	As Above.
Industrial Sector				
Level I	Directorate and District Level Officers	General Orientation on DM, Role of department (ESF); Survey and identification of hazardous industries; Off site and on site DM plan for all the industries, IEC.	3 Days	ATI Bhopal
Level II	Others	As in Level I	3 Days	To be arranged by the Department
Livelihood Sector				
Level I	Directorate and District Level Officers	General Orientation on DM and DRR, DRR Integration, Early Warning System, Risk Transfer and coping with Climate change etc.	2-3 Days	NIDM/HIPA/ICAR
Level II	Sub Division Level Officers	As in Level I	3-5 Days	HIPA
Level III	Field Functionaries	As in Level I	3-5 Days	At Block Level to be arranged by the Department
IEC and Media Sector				
Level I	Directorate and District Level Officers	Basic orientation and sensitisation on DM and related issues and training on handling help lines and setting up media centre; Designing and implementing effective IEC campaign; ; Documentation and reporting.	2 Days	HIPA

Level II	Field Functionaries and Mass Media	As in Level I	2 Days	HIPA
Level II	Print and Electronic Media	Basic orientation and sensitisation on DM and related issues.	1 Day	At District Level to be organised by the Deptt.
Voluntary Sector				
Level I	All Volunteers	Basic Orientation on DM, DRR and specialised training on SAR, MFA and Psychological Counselling, Management of Relief camps; Community based disaster management etc.	3-5-7 Days	HHGs BTCs, at local level to be arranged by the DDMAs
Service Sector				
Level I	Directorate and Distt. Level Officers	Basic orientation and sensitisation on DM and related issues. Role of department in DM and ESFs, management and running of relief camps and related issues.	2 Days	HIPA
Level II	Other Field Level Officers	As in Level I	2 Days	HIPA
Level III	Grassroots Level Functionaries	As in Level I	2 Days	At Block Level to be organised by the Department
Public Representative Sector				
Level I	All the PRs	Basic orientation and sensitisation on DM, DRR and related issues, CBDM and CBDR, Role of the institution, Preparation of plans, relief and relief camps.	2 Days	SIRD/HIPA/District/Block HQ
Forest Sector				
Level I	State Level Officers	Basic Orientation and Sensitisation on DM and DRR related issues. Forest fires and their management involving community; Methods/ techniques of disaster mitigation and management with a special focus on forest fires, landslides, and flash floods etc. which are more frequent in forest areas.	1-2 Days	FRI Dehradun
Level II	District Level Officers	As in Level I	3 Days	FRI/HIPA

Level III	Range Level Officers	Level I + hands on training	5 Days	Departmental Training Institute
Level IV	Others	Basic orientation and sensitisation and CBDM and hands on training	7 Days	At Range Level to be arranged by the Department
Tourism Sector				
Level I	Directorate and Distt. Level Officers	Basic orientation and sensitisation on DM and DRR, role of Department in DM Training of Hoteliers on IEC; Training of Hotel staff on Disaster Response/ Mock drills; Involvement of Private Industries into awareness generation and post disaster recovery; Training of developing information management system to track the tourists in case of disaster; training on fire safety.	2 Days	HIPA
Level II	Field Level Functionaries	As in Level I	2 Days	HIPA
Level III	Hoteliers	General orientation and sensitisation on DM and DRR related issues, safety of guest, IEC, mock drill etc.	1 Day	To be arranged by the department at local level
Education Sector				
Level I	Head of Institutions – Universities & Departments	General orientation and sensitisation on DM and DRR related issues, Safety of Institution, DM Plans. mock drills, IEC, DM in Education; Medical First Aid, Search and Rescue etc.	1 Day	In the respective Institution
Level II	College Principals and Other Teaching Faculties	As in Level I	1 Day	In the respective Institution
Level III	School Principals and Headmasters	As in Level I	1 Day	DIETS
Level IV	School Lectures and Teachers	As in Level I and practical training and Teaching of DM in School curriculum	3 Days	DIETS
Level V	Primary Teachers	As in Level I and Practical Training	3 Days	DIETS
Level VI	Others	Hands on training in handling fire equipment, Dos and Don'ts	1 Day	In Respective Schools/Clusters

ANNEXURE I

EARTHQUAKES HAVING MAGNITUDE 4 OR MORE ON RICHTER SCALE IN HIMACHAL PRADESH DURING THE LAST 200 YEARS

S.No	Year	Month	Day	Magnitude	Coordinates	Tentative location
1.	1809	-		5.5	$30^0$42’00” 78^0 30’00”	Near Labrang (Distt. Kinnaur)
2	1827	9		5.5	$32^0$30’00” $76^0$00’00”	Near Dalhousie (Chamba Distt.)
3	1856	4	7	5.0	$31^0$00’00” $77^0$00’00”	Near Ranhog (Distt.Solan)
4	1858	8	11	5.0	$31^0$7’12” $77^0$10’12”	Shimla(Distt. Shimla)
5	1865	04	11	---	Shimla region	
6	1905	4	4	8.0	$32^0$18’00” $76^0$15’00”	Karari Dal (Distt. Kangra)
7	1906	2	28	7.0	$32^0$00’00” 77^0 00’00”	Near Karshing (Distt.Kullu)
8	1930	5	11	5.5	$31^0$42’00” $77^0$00’00”	Shila Kiepr (Mandi Distt.)
9	1940	04	07	-----	31 05 77 00	Near kali Hatti , District Shimla
10	1945	06	22	6.5	$32^0$36’00” $75^0$54’00”	Minu (Chamba Distt.)
11	1947	7	10	6.2	$32^0$36’00” $75^0$54’00”	Minu (Chamba Distt.)
12	1950	8	12	5.5	$32^0$36’00” $75^0$54’00”	Minu (Chamba Distt.)
13	1951	09	22	6.4	32 36 76 30	East of Dhan Kanda ,District Chamba
14	1962	9	15	5.5	$31^0$54’00” $76^0$12’00”	Near Dehra Gopipur (Distt. Kangra)
15	1965	02	21	4.5	32 14 76 54	Near Bara Banghal, District kangra
16	1967	09	20	---	32 36 76 06	Near Rajpura, District Chamba
17	1968	05	11	4.9	32 22 76 22	Near Atrori, District Chamba
18	1969	01	23	4.0	32 14 76 03	Near Trilokpur, District Kangra
19	1970	03	05	4.9	32 24 76 29	Near Sani, District Chamba
20	1972	01	29	4.7	32 51 75 54	
21	1973	12	16	4.9	32 17 76 01	Near Mordhu, District Chamba

22	1974	11	16	4.8	32 50 76 08	Tissa, District Chamba
23	1975	10	30	5.2	32 54 76 00	Near Bhujara, District Chamba
24	1975	12	11	5.1	32 50 76 58	Near Jankar,Sumdo,Lahaul & Spiti
25	1975	12	10	5.0	32 49 76 11	Near Chhajaut, District Chamba
26	1975	1	19	6.7	$31^0$56’24” $78^0$31’48”	Distt. Kinnaur
27	1975	2	2	5.1	$32^0$33’36” $78^0$53’00”	Indo China Border
28	1975	7	19	5.1	$31^0$57’00” $78^0$35’24”	Near Chnago (Kinnaur Distt.)
29	1975	7	29	5.5	$32^0$34’12” $78^0$29’24”	Near Kanum (Distt.Kinnaur)
30	1975	2	10	5.3	$32^0$57’00” $76^0$06’ 00”	Near Janu Pass (ChambaDistt.)
31	1975	2	11	5.0	$33^0$00’00” $76^0$10’12”	Near Sathrundi (Chamba Distt.)
32	1976	1	7	5.3	$32^0$58’12” $76^0$7’12”	Dunchili Gad (Chamba Distt.)
33	1976	01	09	4.7	32 59 76 01	Along J&K Border
34	1976	02	05	5.0	$31^0$14’24” $77^0$01’48”	Near Chebri (Distt. Shimla)
35	1976	04	10	4.5	32 43 76 30	Near Balthal Got, District Chamba
36	1976	04	16	4.0	32 52 76 00	Near makkan, District Chamba
37	1976	7	6	5.1	$32^0$26’24” $78^0$21’00”	Near Raksham (Kinnaur Distt.)
38	1976	9	8	5.3	$32^0$14’08” $78^0$45’36”	Near Baspa origin(Kinnaur Distt.)
39	1977	2	19	5.4	$31^0$48’00” $78^0$25’48”	Near Rangbar Thachang (Distt. Kinnaur)
40	1977	3	27	5.1	$32^0$40’12” $78^0$39’36”	Lenchichi (Kinnaur Distt.)
41	1978	6	14	5.0	$32^0$14’24” $76^0$36’36”	Near Singhau Pass, along Kangra Border District. Chamba
42	1979	01	19	4.1	32 22 76 28	Near Chandota Pass, District Chamba
43	1980	05	29	4.2	31 33 76 33	

44	1980	09	04	4.0	32 00 76 54	Near Pajaund, District Mandi
45	1980	11	26	4.0	32 29 76 24	Near Khaddar, District Chamba
46	1981	02	14	4.0	32 35 76 37	Near Bara Kanda, District Chamba
47	1981	06	19	4.5	32 43 76 00	Near Lohari, District Chamba.
48	1981	6	13	5.0	$31^0$49’12” $78^0$27’36”	Nalpaya Thach (Distt. Kinnaur)
49	1981	5	28	5.2	$31^0$49’48” $78^0$25’48”	Barling (Kinnaur Distt.)
50	1982	05	18	4.0	32 25 76 24	Near Chagrauta , District Chamba
51	1983	2	27	5.3	$32^0$36’00” $78^0$34’12”	Khadi Thach (Distt. Kinnaur)
52	1983	04	13	4.0	32 46 76 14	Near Tikkri Khas, District Chamba
53	1985	03	11	4.8	31 15 77 00	Near Malaun,District Shimla
54	1985	12	29	4.9	32 37 76 06	Near Theru, District Chamba
55	1986	4	26	5.5	$32^0$19’00” $76^0$24’00”	Near Nag Dal (Boundary of Chamba and Kangra distt.)
56	1987	06	10	4.7	31 55 76 26	Near Daton, District Chamba
57	1987	12	26	4.3	32 07 76 41	Near Dewal Khas,DIstrict Kangra
58	1991	06	23	4.6	32 18 76 42	Near Gataunda, District Shimla
59	1992	01	26	4.5	32 16 76 24	Near Bhagsu Nath, District Kangra
60	1992	02	13	4.5	32 37 76 30	East of Dhan Kanda, District Chamba
61	1992	09	06	4.6	32 25 76 20	Near Darkund, District Chamba
62	1996	05	09	4.0	32 50 76 19	Near Kuntka Matha,DIstrict Chamba
63	1996	05	23	4.2	32 42 76 29	Near East of Kagal Dhar, District Chamba
64	1996	07	14	4.1	32 37 76 31	Near East of Dhan Kanda, DIstrict Chamba
65	1996	09	14	4.6	32 49 76 22	Near Kala Ka Bhandar,District

						Chamba
66	1997	07	29	4.7	31 33 76 48	Near Baldwara, District Mandi
67	1997	08	13	4.2	31 12 76 41	Near Jajjar, District Solan
68	1998	10	17	4.5	32 12 76 32	Near Kandha, District Kangra
69	1999	05	30	4.9	31 48 36 78 54 36	Near Miyang Lung, District Kinnaur
70	1999	01	08	4.2	31 26 24 77 18 00	Near Mehog,District Mandi
71	1999	05	30	4.9	31 48 36 78 54 36	Near Miyang Lung, District Kinnaur
72	1999	01	08	4.1	31 22 48 77 17 24	Near Karsog, District Mandi
72	2000	04	28	4.1	31 30 36 78 15 00	Near mehbar, District kinnaur
73	2000	08	28	4.5	32 01 48 78 18 00	
74	2000	09	26	4.0	30 55 12 75 39 00	
75	2000	06	17	4.3	31 48 00 78 27 00	Near Nalpaya, DIstrict Kinnaur
76	2001	06	17	4.2	32 42 36 78 26 24	
77	2001	01	22	4.0	31 04 12 77 55 48	Along Uttranchal Border
78	2001	02	23	4.0	30 55 48 78 00 00	Along Uttranchal Border
79	2001	09	18	5.1	33 13 12 75 36 36	
80	2001		14	4.7	32 31 12 76 06 00	Near Pundla, District Chamba
81	2001		23	4.6	33 07 12 75 40 12	
82	2002	01	27	5.1	33 06 36 75 49 48	
83	2002	03	17	4.1	32 46 48 75 55 48	
84	2002	02	17	4.1	33 06 00 75 40 48	

(Source: IMD: India Meteorological Department, DLDH- Oldam (1883), ISS: International Seismological Summary, PDE: Preliminary Determination of Earthquakes).

ANNEXURE II

Some of the devastating Floods, which caused heavy damages to Private, public as well as Government property

Sr. No.	Prominent Flash Floods	History of Damage Occurred
1	8 July 1973	Lake formed by the blockage of Satluj River due to nathpa rock fall damaging Sanjay Vidyut Power House causing revenue loss of Rs.45 Million.
2	In Satluj basin two blockades were observed in Spiti valley. One on Parchu River between Sundo and Kaurik during the landslide along the right bank created by 19Jan.1975 earthquake, which occurred along the Sumdo-Kaurik fault. Blockade was 60m and 150 length created temporary lake. In March this lake burst causing flash floods in Spiti valley	
	On 29th Sept. 1988 (2.30 a.m.) a flash flood occurred due to cloud burst in Soldan khad causing huge damage to property.	Caused heavy loss of life and property in the Soldang village. Washed away 2 km of NH-22 across Soldan khad Washed away the Bhabanagar water works Created landslides along the eastern slopes of Soldan khad and damage road to Ponda Lake was formed on the Satluj river near confluence Block stopped the flow of Satluj river for about 30 minutes and created a temporary lake having dimensions roughly about 6000 m long, 200-250 m wide and 25-30 m deep extending up to Wangtoo bridge Lake water entered Sanjay Vidyut Pariyojna and damaged the Power House
3	Second occurred along Maling nalla due to Maling landslide debris between 31st July and 2nd August	Cloud burst and flash flood along Soldan khad in Satluj valley Flood washed away 15 houses, 35 bigha of agriculture land and about 600 apple trees in Soldang village.

	1991.	32 persons and 35 cattle heads lost their lives. Flash flood and landslide on 2nd August 1991 along Maling Nala in Lower Spiti valley damaged 1500m road section of NH-22 and washed away agriculture land along Leo village situated downstream.
	24 Feb 1993 Satluj River blocked twice due to major landslide and rock fall near Jhakri and Nathpa damaging NH-22.	
	Another flash flood occurred in two phases along Duling khad on 4th & 5th September causing extensive damage in Tapri, district Kinnaur First flash flood occurred on 4th September 1995m at 2pm,. After cloudburst in the upper catchment of Duling and Damaged the PWD rest house.	Huge debris formed a fan along Satluj river and formed a lake by partially blocking the river. Flash flood caused a heavy damage due to change in river course of Satluj from left to right bank and increased the toe and lateral erosion at Tapri. Washed 19 houses , HRTC workshop along with 3 buses Change in course is still causing toe erosion to NH-22
	High magnitude floods have also recorded in Beas valley in 1902, 1945, 1993, and 1995 . Continuous anthropogenic pressure on existing Geo-Eco system has increased the severity and damaging impact of these flash floods.	
	4th & 5th Sept.1995 flash flood in Kullu valley	Caused damage to the tune of Rs.759.8 million. Heavy rains and flash floods caused water saturation along loose Quaternary deposits along slopes and excessive bank erosion which led to landslides in Kullu valley
	February 1993	500m road section of NH-22 washed away by Jhakri slide.Rs.10 million loss to road and forest land , a village on the upper slope was in danger
	Flash flood on the night of 31st July and Ist August 2000 in Satluj valley	Flash flood in the Satluj valley resulting in the increased water level of Satluj river upto 60feet above the normal level. The flash flood was

		termed as the one that occurs once in 61,000 years. Widespread damage in the valley right from its confluence with the with Spiti river near Khab to downstream areas. Extensive damage to 200 km of NH-22, washed away 20 bridges, 22 Jhulas and badly damaged 12 bridges. About 1000 irrigation, sewerages, flood protection and water supply schemes were badly damaged. Extensive damage to hydel projects including NJPC, 135 people and 1673 cattle lost their lives. The total estimated loss was to the tune of Rs.1466.26 Crore.
	Flash floods on the night of 22nd July 2001 in Sainj valley in district Kullu	Cloud burst in the upper reaches of Sainj valley caused flash floods in two nallahs viz. Sainj and Jeeba affecting about 40 families. 2 bridges on Sainj and Jeeba nallas and plenty of fertile land was washed away. Connecting road to Siund and Sainj was also washed away at a number of places. Two persons were washed away and 5 cattle perished. Some other areas in Kullu district were also affected due to excessive rains in July and population of 6355 was adversely affected.
	17th & 19th July 2001 floods in Mandi district	Excessive rains caused damage to 160 houses in Mandi district and destroyed 11 cattle and one person.
	Flash floods on the night of 29th and 30th July 2001 in Chhota Bhangal and Baijnath Sub Divisions of Kangra district	Caused widespread damage in the area. 12 deaths occurred due to flash floods and loss of 150 cattle was reported from the area. Bridge connecting Deol and Baijnath was also washed away. Total estimated loss was to the tune of Rs.18.27 Crore.
	Flash floods on the night of 9th August and 10th August 2001 on Moral-Danda peak in Rohru Sub-Division in Shimla District	Flash floods occurred along two streams, one along the Devidhar area and another along Darkali in Rampur Sub Division. Damage to infrastructure like roads, bridges, agriculture land, horticulture land, footbridges, village paths, residential houses, and water mills and loss of 3 lives and 390 cattle and destruction of private property. Total loss in both the Sub Divisions was 145.15 lac. In Rohru Sub Division 7 bridges, 8 village paths,8 water supply schemes, and 1 power house was damaged besides 16 houses, whereas in Rampur Sub Division, 10 bridges, 8 village paths, 1 water supply schems,1 soil conservation plant, 7 residential houses and 16 water mills were damaged.
	Flash floods on the night of 21st and 22nd August 2001,	Due to flash flood in village Badhali 2, houses in which a couple was buried alive and their two

	cloud burst in Ani Sub Division of Kullu District	children injured. In village Sarli 7 people lost their lives, 15 houses were washed away besides the loss of 12 cows, 18 oxen and 40 sheep and about 115 bighas of agriculture and horticulture land was washed away.
	Flash floods in Sihunta area and Tissa areas of Chamba district on the night of 12-1th August 2001	Washed away 9 hectare of fertile land, 2 small bridges causing a total loss to property of Rs. 2 crore.
	Flash floods due to cloudbursts in Gharsa valley on 16th July 2003 in Kullu district	Due to these flash floods 21 people lost their lives, 21 people suffered major injuries and 9 are missing
	Flash floods in Kangni nala near Solang in Kullu district on 7th August 2003	30 people lost their lives and 19 were injured and 9 people were missing.2 people lost lives due landslides in Bhang nala.
	Flash flood in Satluj river due to breach in the Parechhu lake in Tibetan catchment on 26th June 2005	Extensive damage as a result of rise in water level of Satluj river due to a breach in the Parechho lake formed in Tibetan catchment. Washed away the NH-22 at a number of places, 10 bridges, 11 ropeways washed away, 15 motorable bridges and 8 jeepable and footbridges damaged/affected.10km stretch of Nyh-22 between Wangtoo and Sumdo was washed away and various link roads were damaged. Total loss estimated to the Govt. as well as public property was to the tune of 610 crore.
	Flash floods during July 2005	Flash floods in Pabbar river in Rohru Sub Division resulted in heavy losses to roads, bridges, public buildings, residential houses, cowsheds, private land. Chirgaon block was totally cut off. On July 7,2005, flash flood in Baspa river took place causing the loss of 6 bridges and 600 mt link road to Sangla. More than 3000 cattle perished in different parts of the state leading a total loss of Rs.55980.76 Lac.
	15 August 2007,Bhavi Village, Ghanvi Shimla District	58 persons died, all roads leading to village cut off.
	7 August 2009,Dharmpur, Mandi District	2 persons died.

Source: Bhandari, 1988; Sah et al.1996,Sah & Mazari 1998;Sah and Bist 1998'Paul et al, 2000,revenue Department, Govt. of Himachal Pradesh)

ANNEXURE III

Loss to Govt. Exchequer due to hailstorm, excessive rains, flash floods droughts etc. during the past

DAMAGE DUE EXTENSIVE RAINS , LANDSLIDES ETC DURING THE YEAR 1995

Physical		
1	Human lives lost	114
	Heads of cattle perished	5,625
	Houses ,cowsheds damaged	25,183
	Agriculture cropped area affected	2.838 Lac Hac.
	Horticulture cropped area affected	0.513 Lac Hac.
	Land washed away/damaged	0.262 Lac Hac
Estimated Monitory Loss (in Lac)		
	Loss to private proper such as houses ,cowsheds etc	6,928.00
	Loss to public property	16,152.60
	Loss to agriculture crops	16,511.00
	Loss to Horticulture crops	8,085.60
	Total	**47,677.28**
DAMAGE DUE EXTENSIVE RAINS , FLASH FLOODS IN 1996		
	Human lives lost	51
	Heads of cattle perished	2250
	Houses ,cowsheds damaged	5774
	Agriculture cropped area affected	2,579 Lac Hac.
	Horticulture cropped area affected	0.409 Lac Hac.
	Land washed away/damaged	0.220 Lac Hac
Estimated Monitory Loss (in Lac)		
	Loss to private proper such as houses ,cowsheds etc	6,928.00
	Loss to public property	16,152.60
	Loss to agriculture crops	16,511.00
	Loss to Horticulture crops	8,085.60
	Total	**47,677.28**
DAMAGE DUE EXTENSIVE RAINS , CLOUD BURSTS AND FLASH FLOODS DURING THE YEAR 1997		
Physical		
	Human lives lost	223
	Heads of cattle perished	4,809
	Houses damaged (fully)	3,763
	Houses damaged (partially)	7,304
	Cow sheds damaged	8,146
	Agriculture cropped area affected	2.287 Lac Hac.
	Horticulture cropped area affected	0.249 Lac Hac.
	Land washed away/damaged	0.170 Lac Hac

Estimated Monitory Loss (in Lac)		
	Loss to private proper such as houses ,cowsheds etc	8,146.00
	Loss to agriculture crops	12,260.00
	Loss to Horticulture crops	5,064.90
	Loss in terms of land that have been washed away	17,000.00
Loss in respect of Public Property		
	Works being maintained by Deputy Commissioners	23,580.00
	Works being maintained by PWD	4,297.76
	Works being maintained by IPH	2,097.52
	Works being maintained by Forest	899.01
	National Highways being maintained by GOI	3,000.00
	Total	**37,294.29**
	Grand Total	**79,865.19**
DAMAGE DUE EXTENSIVE RAINS AND FLASH FLOODS DURING THE YEAR 1998		
Physical		
	Human lives lost	71
	Heads of cattle perished	221
	Houses damaged (fully)	3,431
	Houses damaged (partially)	1,619
	Agriculture cropped area affected	2.210 Lac Hac.
	Horticulture cropped area affected	0.139 Lac Hac.
	Land washed away/damaged	0.165 Lac Hac
Estimated Monitory Loss (in Lac)		
	Loss to private proper such as houses ,cowsheds etc	84.02
	Loss to agriculture crops	9,084.50
	Loss to Horticulture crops	1,492.00
	Loss in terms of land that have been washed away	11,550.00
Loss in respect of Public Property(in Lac)		
	Works being maintained by Deputy Commissioners	4,985.00
	Works being maintained by PWD	4,067.00
	Works being maintained by IPH	1,964.27
	Total	**11,016.27**
	Grand Total	**33,226.79**
DAMAGE DUE EXTENSIVE RAINS , FLASH FLOODS AND DROUGHT DURING THE YEAR 1999		
DROUGHT		
	Agriculture cropped area affected	2.423 Lac Ha
	Horticulture cropped area affected	0.447 Lac Ha

Estimated Monitory Loss (in Lac)		
	Agriculture loss	10928.00
	Horticulture Loss	12559.00
	Total	**23487.00**
EXCESSIVE RAINS PHYSICAL		
	Human lives lost	**30**
	Heads of cattle perished	129
	Houses damaged (fully)	649
	Houses damaged (partially)	904
	Cow sheds damaged	671
Estimated Monitory Loss (in Lac)		
	Loss to private proper such as houses ,cowsheds etc	2,730.00
Loss in respect of Public Property(in Lac)		
	Works being maintained by Deputy Commissioners	8,450.00
	Works being maintained by PWD	7,283.00
	Works being maintained by IPH	688.67
	Total	**16,421.67**
	Grand Total	**19151.67**
Damage during Drought in Himachal Pradesh during 2000-2001(Rabi Season)		
	Estimated Monitory Loss (in Crore)	360.85
Damage during Drought in Himachal Pradesh during 2002-2003(Kharif Season)		
	Estimated Monitory Loss (in Crore)	707.21
Damage during Drought in Himachal Pradesh during 2005-2006(Rabi Season)		
	Estimated Monitory Loss (in Crore)	366.00

Annexure IV

Profiles of Different Training Institutions in the Country

National Institute of Disaster Management (NIDM),New Delhi:

The National Institute of Disaster Management is one of the youngest national institutes in the country. It was constituted under the Disaster Management Act 2005 with nodal national responsibilities for human resource development, capacity building, training, research, documentation and policy advocacy in the field of disaster management.

Located centrally at the Indraprastha Estate on the Mahatma Gandhi Road, within the campus of the IIPA, the Institute has a multi-disciplinary team of professionals working on different aspects of capacity development on disaster management. It is equipped with state-of-art facilities of training and research on disaster management. It has fully air conditioned Training and Conference Halls, well stocked Library, GIS Laboratory, Computer Centre, and Video Conference Hall. The Institute also provides free of charge facilities of boarding and lodging to the participants of its programme.

The Institute has strategic partnerships with a number academic, research and technical organizations in India and around the world. It promotes networking among knowledge based institutions and encourages inter-disciplinary research on different aspects of disaster management.

The Institute supports Disaster Management Centers in the Administrative Training Institutes of the States and the Union Territories. At present there are 30 such Centers located mainly in State capitals. Six of these Centers are being developed as Centers of Excellence on different of natural and manmade hazards, such as earthquake, flood, drought, cyclone, landslide and industrial disasters. The contact details of the institution are as under:-

National Institute of Disaster Management (NIDM)
(Ministry of Home Affairs, Government of India)
5-B,IIPA Campus, IP Estate, Mahtma Gandhi Marg,
New Delhi-110 002(India)
Tel:011-23702432,23705583,23766146

National Civil Defence College, Nagpur

The First Disaster Management Training Institution of the country was founded on 29th April 1957 at Nagpur as the Central Emergency Relief Training Institute (CERTI) to support the Emergency Relief Organisation of the Government of India. This Central Institute organized advanced and specialist training for the leaders of Disaster Relief and Response operations to manage the consequences of any natural or manmade disaster.

The conflicts of 1962 and 1965 compelled the Government of India to reorient it's emergency training activities from natural disasters to those relating to protection of life and property, reducing damage and raising public morale during any war emergency. Hence, CERTI was renamed as National Civil Defence College on 1st April 1968. But the devastating Andhra Pradesh cyclone in 1978 once again vested the responsibility of training Disaster Response & Relief Officers upon the NCDC. Skill enhancing Training of Trainers in the field of search and rescue, first-aid, communications, welfare services, etc., are being organized till date.

This college is catalogued in the UNDHA centers of Disaster Relief training. It has also been identified as a premier training establishment in Chemical Disasters by the Ministry of Environment & Forests. The college has been recognized as a nodal training institute for Nuclear, Biological and Chemical Emergencies training by the Ministry of Home Affairs, in year 2002.

The Institute has been regularly training Trainers from Central Police Forces such as ITBP, CRPF, BSF, CISF, etc in order to prepare their personnel for the organisation of National Disaster Response Force. Training for developing skills to deal with terrorist threats that may comprise use of Weapons of Mass Destruction is also being conducted. The Contact details of the institution are as under:

National Civil Defence College

Temple Road, Civil Lines, Nagpur,

Maharashtra, India.

National Institute of Technology , Hamirpur

National Institute of Technology Hamirpur is one of the twenty NITs of the country, established in 1986 as Regional Engineering College, as a joint and cooperative enterprise of the Govt. of India and Govt. of Himachal Pradesh. The goals of the institute as embodied in the logo are truly remarkable in their scope of vision. The college provides Undergraduate, Postgraduate and Doctorate Education in Engineering, Sciences & Humanities; fostering the spirit of national integration among the students, a close interaction with industry and a strong emphasis on research, both basic and applied. It has been given the status of Deemed University.

The campus is situated at Anu in Hamirpur district of Himachal Pradesh and is 4 Kms from main bus stand of Hamirpur on Hamirpur – Toni Devi road. The city of Hamirpur is well connected with the rest of the country by road. The nearest broad gauge rail head is at Una (Himachal Pradesh) which is 80 Kms from Hamirpur. The campus has a picturesque surrounding facing snow clad Dhauladhar mountain ranges. Lush green pine trees surround it. The campus is well laid with roads, electric installations, water supply, underground drainage, etc. The place has healthy climate with moderate temperature ranging from 1^{o}C to 38^{o}C with an altitude of 900 meters.

The institute has been identified as the institute for imparting training to engineers etc in the field disaster management in the state. The contact details are as under:

NATIONAL INSTITUTE OF TECHNOLOGY HAMIRPUR,
HIMACHAL PRADESH
PIN 177 005
INDIA

Tel: 01975-222258

Himachal Institute of Public Administration (HIPA), Mashobra, Shimla

The Himachal Pradesh Institute of Public Administration, popularly known as HIPA, was established on January 1, 1974 at '**FAIRLAWNS'**, a place about 12 kms. from Shimla on the Mashobra road. The Institute is located in a building with a historical past. The building having serene and picturesque surroundings with well laid out spacious and luxuriant lawns was originally got constructed by Mr. R. Dixon of the foreign office of British

India. Later, it was purchased by Nawab Muzaffar Ali Khan Quizzalbash of Malerkotla. On his migration to Pakistan in 1947 the property came to the Government of Punjab State, which converted it into a Circuit House. At the time of re-organization of States in November, 1966 the property was transferred to Himachal Pradesh government, which subsequently selected it for setting up the Institute.

Over time, this Institute, which virtually began from a scratch, has bloomed into a full-fledged training institution having all the facilities that an Institute of this nature is expected to have.

Himachal Institute of Public Administration (HIPA)

Fairlawn, Mashobra, Shimla-12, Himachal Pradesh

Tel:0177-2647855

Central Building Research Institute, Roorkee

The Central Building Research Institute, Roorkee, India, has been vested with the responsibility of generating, cultivating and promoting building science and technology in the service of the country. Since its inception in 1947, the Institute has been assisting the building construction and building material industries in finding timely, appropriate and economical solutions to the problems of materials, rural and urban housing, energy conservation, efficiency, fire hazards, structural and foundation problems and disaster mitigation.

At the national level, the Institute has close interaction with BMTPC, HUDCO, DST, Ministry of Urban Development, Ministry of Rural Areas, Housing Boards and Societies of the State Governments, engineering and academic institutions, construction and building material industries.

To carry out applied and basic research in all areas of building science to solve problems confronting the country in:

- Shelter planning
- Building materials
- Structures and Foundations

- Disaster mitigation including Fire Engineering
- To develop new technologies for the promotion of building materials and systems
- To disseminate the results of results of research far and wide for the good of community
- To transfer the developed technologies to the industry for further commercialization

Contact Details:

Central Building Research Institute

IIT Campus, Roorkee,

Uttrakhand-247 667Tel:01332-272243,283393

Lal Bahadur Shastri National Academy of Administration Mussorrie, Uttrakhand

The Lal Bahadur Shastri National Academy of Administration (LBSNAA) is a research and training institute on public policy and public administration in India. Operated by India's federal Union Government, LBSNAA is located in the remote town of Mussoorie in the foothills of Himalayas. It is one of the apex training institutions in the country for senior members of the Civil Services in India.

The vision of the LBS National Academy of Administration is to promote good governance, by providing quality training for building a professional and responsive civil service in a caring, ethical and transparent framework.

The academy's main purpose is to train civil service officers of the Indian Administrative Service, Indian Foreign Service, Indian Police Service, Indian Forest Service, Indian Revenue Service, Indian Audits and Accounts Service, Indian Railway Traffic Service, and other government agencies undergo training at LBSNAA.

Contact Details:

LBS National Academy of Administration

Mussoorie-248 179, Uttrakhand, India.

Tel:0135-2632405,2632236,2632489,2632367

Indian Council of Agricultural Research (ICAR)

The Indian Council of Agricultural Research (ICAR) is an autonomous organisation under the Department of Agricultural Research and Education (DARE), Ministry of Agriculture, Government of India. Formerly known as Imperial Council of Agricultural Research, it was established on 16 July 1929 as a registered society under the Societies Registration Act, 1860 in pursuance of the report of the Royal Commission on Agriculture. The ICAR has its headquarters at New Delhi.

The Council is the apex body for co-ordinating, guiding and managing research and education in agriculture including horticulture, fisheries and animal sciences in the entire country. With 97 ICAR institutes and 47 agricultural universities spread across the country this is one of the largest national agricultural systems in the world.

Contact Details:

Indian Council for Agriculture Research (ICAR)

Krishi Bhawan, New Delhi 110 114,

Tel:-011-23382629

FRI Dehradun

Established as Imperial Forest Research Institute in 1906, Forest Research Institute (FRI) Dehradun is a premier institution under the Indian Council of Forestry Research and Education (ICFRE). Set in the sylvan surroundings of Doon Valley, the Forest Research Institute is a proud testimony to the foresight and vision of foresters and administrators of long ago. The institute caters, in particular, to the research needs of the States of Punjab, Haryana, Chandigarh, Delhi, Uttar Pradesh and Uttarakhand. This institute also has the status of University and at present offers three courses leading to M.Sc. Degree and two Post-Graduate Diploma Courses, besides awarding Ph.D. degree in Forestry.

As per the Notification no. F.9-25/89-03, Ministry of Human Resource & Development, Dept. of Education, Govt. of India Dated 6th December, 1991 the Forest Research Institute- Dehradun shall be deemed to be a University (Published in Gazette of India, Part I, Section I) .Forest Research Institute, Dehradun made a humble beginning from

the Forest School established in 1878. Initially named as Imperial Forest Research Institute, FRI came into being in 1906.

Contact Details:

Forest Research Institute,
P.O. New Forest-Dehradun (India)
Tel: 0135-2755277

Annexure-V

List of Participants

S.No.	Name of Participants (Address, E-mail, Phone No.)	Contact Details
1.	**Dr. R. K. Sood,** Director, Samiti, Deptt. Of Agriculture, Krishi Bhawan, Shimla.	9418155850 samiti_drok@yahoo.co.in
2.	**Mr. Deepak Behal** Deptt. Animal Husbandry Pashudham Bhawan, Shimla	9418047808 dd.epid@nic.in
3.	**Dr. U.S. Rana** Deptt. Of Animal Husbandry	9418484900 usrshimla@gmail.com
4.	**Mr. Anuj Tomar** Deptt. Of Home Guards & Civil Defence U.S.Club Shimla	9816028057 anujshimla@gmail.com
5.	**Mr. B.S.Mahal** Fire Services Deptt. Stokes Place, Shimla	9459144136
6.	**Dr. Davinder Sharma** Sub Fire Officer, Fire Services, Shimla	9816015505
7.	**Mr. Maan Singh,** Addl. Director Deptt. of Food, Civil Supplies & Consumer Affair, Shimla	9418003256
8.	**Mr. Som Dev Thakur,** Jt. Director Deptt. of Food, Civil Supplies & Consumer Affair, Shimla	9418047727
9.	**Mr. Avtar Singh,** IFS CCF, Bilaspur, Forest Deptt.	9418024257
10.	**Dr. S.S.Verma** Directorate of Horticulture, Navbahar, Shimla	9816140287 ssverma30@gmail.com
11.	**Dr. Anil Malhotra,** Surgery IGMC, Shimla	9816023184 anilmalhotra_igmc@rediffmail.com
12.	**Mr. S.K. Sharma,** Tehsildar Deptt., Industries	9418049329
13.	**Mr. Rakesh Kumar,** Naib Tehsildar, Deptt. of Industries	9805525792
14.	**Er. R.K.Gupta,** SE Works Deptt. of IPH.	9816224816
15.	**Er. S.K. Justa,** EE, IPH Deptt.	2652847

		sushiljusta@gmail.com
16.	**Mr. R.M. Sharma,** DIG Police Deptt.	9418024453 r_msharma@yahoo.co.in
17.	**Mr. Rajender Rajan** Deptt. of Information & Public Relation	9418020610
18.	**Mr. M. S.Thakur,** SE Works Deptt. of Public Works	9418134999 hp_shig@nic.in
19.	**Mr. Robin George** Deptt. of Rural Development	2622302 rddhimachal@gmail.com
20.	**Mr. Rakesh Bhardwaj** Social Justice & Empowerment Deptt.	9418030300
21.	**Ms. Sarita Gupta** Town & Country Planning deptt.	9418460252 01772621450
22.	**Mr. S.S. Dhiman** Urban Development Deptt.	9916983531
23.	**Mr. B.L.Raghav** Addl. Commissioner cum Secy. State Transport Authority	9418026928 raghavbl@yahoo.co.in
24.	**Dr. Manoj Chauhan** Env. Planner, H.P State Pollution Control Board	9418044033
25.	**Ms. Ekta,** UNDP	9418030611 Ekta.bartarys@undp.org
26.	**Sh. D.C. Rana** State Project Officer- UNDP GOI-UNDP DRR Programme.	9418184700 dcrana04@yahoo.co.in
27.	**Mr. Ghanshyam Mishra** HIMUDA	9318500331 G_mishra2001@yahoo.com
28.	**Mr. S.S. Chaudhary** Deptt. of IT.	9459346347 ss.chaudhary@yahoo.com ss.chaudhary@hp.gov.in
29.	**Mr. Jugal Kishore Katoch** AC to DC , Bilaspur	9418550199
30.	**Mr. Rohit Rathoor** SDM(Chamba)	9418089107
31.	**Mr. Anupam Thakur** Tehsildar, Hamirpur	9418470002 dadhwalanupam@rediffmail.com
32.	**Mr. Gian S. Negi** D.R.O. Kangra	9418400111 negigian@yahoo.com
33.	**Mr. Hirdaya Ram** ADM Kinnaur	9418981350
34.	**Mr. Ashwin Sood** DRO Kullu	9418493700
35.	**Mr. Vinod Kumar** ADM Mandi	9418458158

36.	**Mr. Vikas Sood** DRO Shimla	9418000089 karolvikas@gmail.com
37.	**Mr. Lokender S. Chauhan** ADC, Sirmaur	9418048499 01702-222410
38.	**Mr. K.C. Chaman** ADM, Solan	9418069444 01792-223705
39.	**Capt. J.M.Pathania** ADC, Una	9418467658 jmpathania@gmail.com
40.	**Dr. Santosh Banyal Chauhan** OSDCC, Deptt. of Higher Education, Shimla	9418644424
41.	**Ms. Pushpa Devi** Dy. Director, Deptt. of Higher Education, Shimla	9418821351
42.	**Mr. B.D. Bagga** AE, HPPWD Nigam Vihar, Shimla	9816170674
43.	**Er. Karan Chand** Tech. Expert, RDD, Kasumpti, Shimla	9418123863
44.	**Mr. V.S.Negi** Dy. Director (YSS)	9418439339
45.	**Ms. G.P. Kapoor** Nodal Officer, HIPA	9418014653
46.	**Mr. Surjeet Kumar** Publicity Officer, Tourism Deptt., Shimla	
47.	**Ms. Shama Rana** Sub-Editor, I & PR Deptt. Shimla	
48.	**Dr. D.P. Singh** Project Co-ordinator, Municipal Corp., Shimla	9418083977
49.	**Mr. K.T. Bodh** Deputy Controller (F & A) HIPA	
50.	**Mr. Deepak Sunan** Pricipal Secy., Revenue	
51.	**Mr. Gurcharan Singh** Dy., Director Fisheries, Bilaspur	