

Natural Hazards and Disaster Management in Himachal Pradesh: A Review

*** Dr. Ajay Kumar**

Background

Disasters and human survival has a long history of rivalry and co-existence. However, the occurrences were not as frequent and with fanatic regularity as it are now. The impact of disasters on economic well-being and human suffering has increased alarmingly. Disasters not only disrupt normal life but also play havoc on lives and livelihoods of the people. Haphazard developmental works, rapid industrialization, increase in population, lack of adequate policy measures, etc., has all contributed towards increased occurrences of disasters. Natural and man made disasters often result in loss of lives, cause injury to people, and lead to loss of livelihoods and damage and destruction of property, assets and infrastructure. Disasters worsen the risk and exposure of vulnerable communities and lead to psycho-social stress and trauma among the disaster affected communities. In the case of recurring disasters like floods, the disaster-prone communities often become victims of a crisis of confidence as their coping strategies are often overwhelmed, survival threatened and normal life adversely affected for several months repeatedly. Children infants, the elderly and the physically and mentally challenged people become more vulnerable to neglect and deprivation in the event of sudden outbreak of disasters, especially when the displaced communities are forced to stay in temporary relief camps.

Each year, natural disasters result in thousands of deaths, injuries and loss of property, infrastructure and assets causing substantial economic losses. It is estimated by the World Bank that the annual costs of damage caused by disasters vary from 2 to 15% of the Gross Domestic product (GDP) of the affected countries.

Disaster Response Mechanism and Various Stakeholders

The Central Disaster Management Act specially focuses on formulation of State Disaster Management Policy and formation of State Disaster Management Authority (SDMA). State Government plays the role of an implementing agency for central response and assistance, though it also makes its own contribution in policy and administrative relief is responsibility of the district magistrate/district collector/deputy commissioner who supervises the work of all departments. The block development officer is responsible for all disaster management activities at block level. Officers of the health department, veterinary department, water and irrigation departments, sanitation, police, fire services, national and international NGOs from a disaster management committee and help in disaster management. Local institutions like PRIs undertake disaster management through providing early warning, relief distribution, providing shelter to the victim and medical assistance etc. at village level,

* Dr. Ajay Kumar, Assistant Professor, Department of Public Administration, Govt. College Chamba, India.

the *Sarpanch* leads village disaster management committee and coordinates with different departments.

Systems and Procedures for Disaster Management

India become one of the first country to declare a national commitment to set up appropriate institutional mechanisms for more effective disaster management at the national, state and district levels. The Disaster Management Bill was unanimously adopted by both houses of Parliament and the Disaster Management Act 2005 demonstrated the national vision of a paradigm shift from post-disaster response to improving the pre-disaster disaster mitigation projects and strengthening emergency response capacities in the country. The Disaster Management Act 2005 envisaged the establishment of the National Disaster Authority (NDMA), chaired by the Hon'ble Prime Minister of India, as the apex body for disaster management in the country, the State Disaster Management Authorities (SDMAs) chaired by the respective Chief Ministers at the state level and the District Disaster Management Authorities (DDMAs) chaired by the respective District Collectors and co-chaired by the elected representative of the Zila Parishad in the respective districts. During NDMA's first meeting, the Hon'ble Prime Minister of India directed that the Union Minister for Home Affairs, Union Minister for finance Union Minister for Agriculture and the Deputy Chairman of the Planning Commission should be permanent invites for the NDMA's meetings henceforth to facilitate greater synergy in decision making and for more effective mainstreaming of disaster management in development planning.

Natural Disasters in Himachal Pradesh

Himachal Pradesh is exposed to several kinds of disasters regularly. Frequent disasters hamper development of the state. Earthquakes, landslides, cloud-bursts, floods, avalanches, forest-fires, droughts etc. caused tremendous loss to the state. Landslides and flash floods are the most common disasters in Himachal Pradesh which cause immense loss of life and property. Frequent flash floods in the last few years have baffled both meteorologists and common man equally.

Himachal Pradesh been hit by a series of massive natural calamities like the earthquake in 1905 (Kangra). 1955 (Lauhal-Spiti) & 1975 (Kinnaur), land slides in 1968 (Kaliasaur), 1982 (Solan Nala) & 1995 (Kullu) and the disastrous cloudburst in Kullu in August 2003, Prominent among the Satluj and Beas basin's calamities are massive and violent flash flood in river Satluj during the night on July 31, 2000, cloudburst and flash flood in the Beas in September, 1995, and cloudbursts that wreaked havoc in the Rohru and Wangtu areas in Kinnaur district in 1997.

Earthquake, quite devastating and sudden in nature, is one of the most common types of disasters that hit the state. Seismologists have categorised Himachal Pradesh in Seismic

Zones IV and V, highly prone to earthquakes. Statistically, more than 250 earthquake of magnitude above 4.0 on the Richter scale, including 51 with magnitude above 5.0 have rocked the state during past century. As far as geographic area of occurrence of earthquake is concerned, Chamba, Kullu and Manali fall in the highest seismic Zone i.e. Zone-V and are most prone to disastrous earthquakes. Block-wise, Kangra is most sensitive to earthquakes.

Cloudbursts are common to all hilly areas but the states of Himachal Pradesh and Uttarakhand are most affected due to topographical conditions. Most of the damages to properties, communication system and human casualties are a result of flash floods. The topography enhances the devastation.

The unplanned construction of hydel power projects, roads and large-scale mining/quarrying have put a severe strain on the delicate and fragile ecology of Himalayas gifted with lush green landscape and fascinating environment. Nathpa Jhakri Hydel project and some other projects have already experienced such events. With removal of forest and vegetative cover, the destructive action of water gets further pronounced. The barren steep rocky slopes that absorb little water facilitate quick runoff. The excavated materials disposed of carelessly on hill slopes besides damaging the green cover, trees and agricultural land, are carried down during heavy rains causing siltation and consequent reduction in the storage capacity of the reservoirs.

The detail of the incidences of Natural Disasters in Himachal Pradesh is as under:

Earthquake in Himachal Pradesh

Himachal Pradesh falls in Zone IV and V of Seismic activity and has been the epicentre of several earthquakes causing heavy damages and loss of lives.

Kangra Earthquake (1905)

A massive earthquake measuring 8 on the Richter scale has struck Kangra on 1905. The reported damage to property in Kangra is about Rs. 2000 crore and the figure of death is placed at 20,000. The earthquake has caused incalculable damage to Dharamshala which is the capital town of Kangra as all the other towns and villages of this district.

Kinnaur Earthquake (1975)

This earthquake struck in the early afternoon of 19th January 1975 causing havoc in parts of Kinnaur, Lahaul and Spiti regions. It is believed to have been caused by movements along the Kaurik fault. This quake resulted in loss of human life and property. A massive landslide was triggered off by this earthquake near Maling in the Spiti Valley. Another giant slide blocked the Parechu River near Sumdo. Many smaller occurrences of slope failure were caused by this earthquake. As a result, communications remained disrupted for several days and helicopters had to be pressed in to service to bring relief to the worst affected areas.

Kangra Earthquake (1986)

Another massive earthquake measuring 5.5 on the Richter scale has struck Kangra. This quake resulted in loss of 6 human lives and property.

Kangra Earthquake (2004)

A massive earthquake measuring 4.6 on Richter scale has struck Kangra and Chamba on 11 Nov. 2004 at 7.43 A.M. and another earthquake measuring 4.2 on Richter scale on the same day at 8.16 A.M. However no loss of life and property has been reported. Cracks in many houses also been reported from Kangra, Dharamshala and Chamba.

Heavy Rains-Monsoon

1. During the year 2000, heavy rains monsoon in Himachal Pradesh, 35 human lives lost and 1411 heads of cattle lost. The total damage due to private and public property was Rs. 1466.26 crore.
2. In the year 2001, heavy rains monsoon in Himachal Pradesh, 45 human lives lost and 915 cattle heads lost. The total damage due to private and public property was to the extent of Rs. 138.25 crore.
3. In the year 2003, excessive rains monsoon in Himachal Pradesh, 89 human lives lost and 452 cattle heads lost. The total damage to crops, houses and public utilities was Rs. 263.00 crore.
4. In the year 2005, heavy rains monsoon in Himachal Pradesh, one human life lost and 24 cattle heads lost. The total loss due to private and public property was to the extent to Rs. 800.00 crore.
5. During the year 2006, heavy rains monsoon in Himachal Pradesh, 48 human lives lost and 846 cattle heads perished. As much as 87,122 hectares of agriculture cropped area and 6718 hectares of horticultural area have been affected. The total damage to private and public property was Rs. 53,370.97 lacs.
6. In the year 2007, heavy rains monsoon in Himachal Pradesh, 98 human lives lost and 3087 cattle heads perished. As much as 1,12,982 hectares area of agricultural crops and 66,748 hectare area of horticulture have been affected. Loss in terms of money to the public and private property has been estimated at Rs 1269.00 crore.

Flash floods in Satluj River during rainy season of Year 2000

A natural calamity is of gigantic magnitude struck the Satluj Valley on the intervening night of 31st. July 2000. It led to an unprecedented rise in the water level of Satluj River from Tibetan plateau through out the entire length of about 250 km up to Govindsagar Lake. The

rise in the level of water according to eyewitnesses was reported up to 60 feet above the normal levels. The flash flood was termed as the one that occur once in 61000 years. It is almost impossible to design technical specifications for all kinds of infrastructures to cater to such a rare incidence. It is obvious that such a natural calamities would cause unprecedented loss of human life, livestock, public and private property and would also erase from the surface and existing of physical infrastructure. It has led to extensive damage to about 200 km of road length, washed away 20 bridges and 22 Jhulas and badly damaged 12 bridges. About 1,000 irrigation, sewerage, flood protection and water supply schemes have been considerably damaged and some of these have been completely destroyed. Extensive damage has taken place in the already executed Hydel Projects as also those under execution including the prestigious Nathpa Jhakri project.

According to preliminary estimates the damage has been estimated at about Rs 1466.26 crore. Macro details are as follows:

Item	Estimated loss (Rs crore)
Road Bridges and Jhulas including National Highways	261.18
Water supply, irrigation sewerage and flood protection	17.77
Power projects and transmission lines	1083.50
Forest infrastructure	0.73
Cultivated area washed away (1887.50 bighas) in Kinnaur, Kullu and Shimla Districts	31.92
Human lives lost (number)	135
Cattle heads lost (number)	1673
Private houses damaged (number)	15.82
Standing crops and fruit crops lost over an area of 41,792 hectares	53.34
Total	1466.26

Flash flood in Satluj River during rainy season of the Year 2005

A natural calamity of gigantic magnitude, due to sudden rise/breach of Parechu River in the Chinese territory struck the Satluj valley on 26.06.2005. It, led to an unprecedented rise

of water level of Satluj River from Tibetan Plateau through out the entire stretch of National Highway 22. The rise in water level was reported up to 15 meters above the normal level at some places. It led to extensive damage to about 350 hundred kilometers of road length from Samdo to Govindsagar/Bhakra Dam. Detail of damage is as under:

- 10 bridges, 11 ropeways washed away.
- 15 motorable bridges and 8 jeepable and foot bridges damaged/affected.
- 10 km. road between Wangtoo and Samdo washed away.
- 15 km. length of various patches in road between Wangtoo and Samdo has been damaged /affected.
- Various link roads originating from National Highways including certain NH/PWD roads between Sainj and Wangtoo have been damaged.
- Electrical lines including poles and towers, OFC Network, water supply schemes, sewerage system have also suffered serious damages.
- Generation in power projects has also been affected. The details of the washed away/damaged bridges is as under:

Shilkhari, Leo, Khab, Akpa, Khari, Karcham, Jagatkhana, Bazir Bauri, Nathpa and Bhabanagar.

Apart from the above, the foundation and abutments and approaches of number of other bridges have been damaged, extensive damage has also been caused to National Highway-22 which have been damaged at the following places:

Kali Mitti, Nogli, Cholling and Ralli, Poari, Pooh, Khari, Khab, Shilkar and Sambho. State Highway at Saij and Luhari has also been damaged and at several places foundation/base of National/State Highway has also been damaged. The major part of district Kinnaur i.e. from Wangtoo to Samdho is completely cut off from rest of the world and intra district communication is also affected due to breach of roads and bridges at various points in this stretch. Similarly, Spiti valley of Lahaul and Spiti District, which is also mainly dependent on this road, has also suffered connectivity problem. Flood has not only caused extensive damages along the rivers Parechu, Satluj and Spiti but has also affected the population living in the entire area of Kinnaur District between Wangtoo to Samdho and Spiti Sub-Division of Lahaul Spiti District as they have no access to transportation and not in a position to sell their cash crops/export surplus farm produce in the market services like health, education, electricity and supplies of essential commodities have also been affected. This has also adversely affected movement of local people, employees and security forces especially students/patients. In the year 2005, the total damages to crops, houses and public utilities have been estimated Rs 68604.48 lacs say 686 crore.

Cloudburst in Himachal Pradesh

Himachal Pradesh has been facing widespread and extensive damages almost every year because of hazards and natural disaster. Cloudburst is one of the natural disasters which causes huge damages to the lives and property of the state. Cloudburst is a unique weather phenomenon which last for a short time in particular area which results in loss of lives of human being and animal as well as property and infrastructure of the state in that particular area.

Major cloudbursts up to 2006 in different regions of Himachal Pradesh

Sr. No.	Date of incident	Place of incident	District	Detail of loss
1.	29.09.1988	Soldan Stream	Kinnaur	32 people, 15 houses, an orchard, 25 km road bridge.
2.	08.07.1993	Nathpa Jhakri	Shimla	Loss to NJPC & NH 226 km long formed.
3.	August 1994-95	Mani Mahesh	Chamba	50 died, 62 km road, 2000 injured.
4.	Sept. 1995	Beas River & southern slope of Rohtang	Lahaut Spiti & Mandi	Loss in several private and govt. establishments
5.	11.08.1997	Andhra Khad, Chirgaon	Shimla	300 people died and loss to private & govt. establishment.
6.	22.07.2001	Sainj & Jeeba Nallah	Kullu	40 farms, 2 bridges damaged.
7.	16.07.2003	Pullia Nallah	Kullu	90 people killed, loss to property
8.	08.08.2003	Kangli Nallah	Kullu	36 people killed, loss to property.
9.	08.07.2003	Rai Khad, Rampur	Shimla	Loss to crops & cattle.
10.	13.07.2003	Chunahan	Mandi	Loss to crops & real estate, cattle's
11.	20.07.2003	Balh Valley Gaggal	Mandi	Loss to crops & property.
12.	24.07.2003	Bahang	Kullu	2 people, house property.
13.	26.07.2003	Jhakri area	Shimla	Loss to NJPC, buried dead, a few went missing.
14.	27.07.2003	Dansa (Rampur)	Shimla	Damage to crops, apple orchards & land.
15.	02.08.2003	Lulani (Bajjnath)	Kangra	5 killed, 18 families marooned.
16.	03.08.2003	Shilara (Rampur)	Shimla	Landslides.
17.	03.08.2003	Bhagsunath	Kangra	1 died, 2 injured.
18.	06.08.2003	Balh Valley	Mandi	Loss to crops and fertile land.
19.	07.08.2003	Kangni Nallah	Kullu	36 dead 20 stall reported missing.
20.	07.08.2003	Kotkhai	Shimla	Transport bus with passenger washed away, 15 had miracle escape.
21.	29.07.2004	Kothi Khokhan	Kullu	Loss to property.
22.	01.08.2004	Kothi Gulabh	Kullu	Killed, damage to Manali & Leh Highway.
23.	09.08.2004	Bassani	Kullu	22 labourer trapped, loss to Parvati Project.
24.	11.07.2005	Chopal	Shimla	40 cattle lost, valuable land washed away.

25.	18.08.2005	Bahan Godhiman, Karsog	Mandi	25 families affected & valuable land washed away.
26.	09.07.2006	Rampur, Sangla	Shimla, Kinnaur	Landslides.
27.	23.07.2006	Chopal	Shimla	Flash flood, bridge partially damaged.
28.	25.06.2006	Haripur	Chamba	Five mules & scooter washed away, landslides.

As many as 187 people lost their lives and four persons have gone missing due to natural disasters and accidents in Himachal Pradesh with a monetary loss of 401 crore reported in the state till 27 June, 2021. A total of 381 animals have also died during the period.

Initiatives in Himachal Pradesh- Situational Analysis

Several initiatives have been taken in the state towards minimizing the risks and losses due to disasters. These include several measures for conservation and preservation of natural greens. In order to promote sustainable use of the natural resources, few very effective and traditional methods have been retained, revived and few newer proactive forms framed.

The state government of Himachal Pradesh has its own relief code which deals with the contingency planning and budgeting for Disaster management. Himachal Pradesh has initiated the process of establishing the State Disaster Management Authority (SDMA). However, dialogue and consultation with the larger civil society is essential for developing and effective plan and for establishment of the Authority.

Several local regulatory mechanisms are in process for minimal interference with natural processes. The government has also initiated dialogue for preparation of district disaster management plan. The establishment of 1077 code in the District Head Quarters has been done. The government has initiated uploading of data in the IDRN website. The district disaster management committee have been constituted. The TCP Act and MC Act in effect so as to promote constructions that minimize the risks. However, several other institutional and policy framework is yet to take shape so as to strengthen the process of disaster mitigation measures.

Critical issues:

1. lack of Preparedness & Awareness for Disaster Mitigation & Management

The level of awareness about the actions that results in frequent disaster occurrences, preparedness to cope with disastrous situations, immediate response to disasters and recovery of damage can be seen across sections of the population. The losses due to disasters are indirectly proportional to the level of preparedness among the people.

2. Lack of Well-framed Disaster Management Policy

The high level of damage due to disasters in recent times endorses that it can be effectively controlled and better-managed only if the state has an integral and well-defined Disaster Management Policy.

3. Lack of co-ordination in Rescue & Relief Efforts

Poor coordination during rescue & relief work results in delayed provision of material and improper utilization of all resources. Human lives and socio-economic losses increase manifold due to extended response time. Hence, pre-planned strategy to co-ordinate the immediate rescue, relief & recovery operations holds the key to minimizing the losses and the extent of further work.

4. Over-Exploitation of Natural Resources

Over-Exploitation of Natural Resources, pose severe threats to the Himalayan region. Moreover, the haphazard development and the heavy deforestation and inadequate afforestation in the region due to development activities like dam, hydel power, road, industry projects and urbanization cause soil erosion, land slides and several geo-ecological problems have increased disaster risk in the region.

5. Sensitive & Difficult Geo-Physical Situation

Extremely rough terrain of the Himalayan region becomes hindrance for all post disaster activities. The pressure of unplanned urbanization is rapidly exceeding the carrying capacity of the mountains and therefore the region is getting more and more prone to disasters due to heavy imbalance in the ecological and geo-physical systems.

6. Inadequate Information & Communication Infrastructure

Recent natural calamities in Himachal Pradesh & Uttarakhand have caused widespread devastation due to the lack of proper communication systems i.e. connecting roads, telephone lines & information dissemination systems. It was learned that had there been better information and communication systems in the disaster-hit areas, there would have been lesser levels of damage. Rescue & Relief operations took much longer to reach the affected places as there were no connecting roads to the villages that suffered massively due to the disasters.

Suggestions and Policy implications

Disaster Mitigation demands much more than just focusing on aspects which are directly related to the crisis management during or after disaster. With our poor socio-economic status a holistic disaster management plan must include the recognition of 'rights-based' approach, which focuses on protection issues, community mobilization empowerment. Key objective is not only to provide material assistance but also to help affected people to access services and entitlements. The media has a vital role in education

the public about disasters, disseminating information about affected areas and facilitating discussions about reducing vulnerabilities to future disasters. Following are the few immediate and long-term measures that need to be soon accomplished:

Immediate measure

- ❖ Restructuring the Department of Relief into Department of Disaster mitigation
- ❖ Implementation of Disaster Management Act
- ❖ Panchayat/Ward level disaster management teams and plans should be prepared
- ❖ Clear defining of roles and delegation of responsibilities
- ❖ Conducting mock drills
- ❖ Training of rural masons, engineers & architects
- ❖ Retrofitting of lifeline buildings
- ❖ Promotion of General Insurance for housing and household articles (awareness thereof)
- ❖ Establishment of control rooms & equipment of the same
- ❖ State/District Emergency Communication Network
- ❖ Early warning system
- ❖ Creation of Disaster Mitigation Corpus

Long Term Measures

- ❖ Incorporation of disaster education in the school syllabus
 - ❖ Incorporation of BIS codes in the building bye-laws
 - ❖ Implementation of TCP Act in rural areas through PRIs
 - ❖ Land use regulation and zoning
 - ❖ Incorporation of Disaster management in training curriculum of premier services of state
 - ❖ Strengthening of fire services at the Sub-Division level and provision of life tenders
 - ❖ Enactment of State Disaster Management Act
 - ❖ Disaster Management code has to be in place
 - ❖ Specialist response teams-GIS based State Disaster Resource Network (SDRN)
 - ❖ Incorporation of Disaster Mitigation into all other development processes
-

References

1. Bhaskar News, 11 Nov. 2004, Dainik Bhaskar, Chandigarh, 12 Nov. 2004.
2. Govt of H.P. Revenue Department, Memorandum on damage due to excessive rains, flash floods, H.P. Govt. Press, 2000.
3. Govt of H.P. Revenue Department, Memorandum on damage due to excessive rains, flash floods, H.P. Govt. Press, 2001.
4. Govt of H.P. Revenue Department, Memorandum on damage due to excessive rains, flash floods, H.P. Govt. Press, 2003.
5. Govt of H.P. Revenue Department, Memorandum on damage due to excessive rains, flash floods, H.P. Govt. Press, 2005.
6. Govt of H.P. Revenue Department, Memorandum on damage due to excessive rains, flash floods, H.P. Govt. Press, 2006.
7. Govt of H.P. Revenue Department, Memorandum on damage due to excessive rains, flash floods, H.P. Govt. Press, 2007.
8. Hindustan Times, 21 January, 2007.
9. Indian express, 1st July, 2006.
10. Manual on National Disaster Management in India, IIPA, New Delhi, 2009.
11. Memorandum on damage due to Flash Flood and Heavy Rain Monsoon, Govt. of H.P., Revenue Department, H.P. Govt. Press, 2000.
12. Memorandum on damage due to flash floods and heavy rains monsoons, Govt, of H. P. Revenue Dept., H. P. Govt. press, 2005.
13. Negi S. S., Cold Desserts of India, Indus Publishing Company, New Delhi, 2004.
14. Report on Disaster and Governance, Mountain Form of Himalayas, Himachal Pradesh.
15. Yojna, A Development Monthly, Managing Disasters, How Prepared Are We? Vol. 53, June, 2009.