

DISASTERS OF SHIMLA: A MULTIDISCIPLINARY APPROACH

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ABSTRACT

Despite recent achievements in the field of disaster management, the increase in death and damage points out that there is a need for a realistic and practical plan. Advances within single disciplines, alone, cannot solve the challenges in disaster management. As various disciplines have become increasingly diversified, a more complete understanding of the vulnerability and mechanism in which disaster happens is needed, so that adequate strategy is identified. To achieve this aim, the expertise of sciences, social sciences and language is combined. There has been recent progress in these individual disciplines, but multidisciplinary approaches must be implemented to tackle disasters in the future. The geographical location of Shimla is such that it is environmentally fragile and ecologically highly vulnerable to multiple disasters. It lies in Himalayan region located in the Zone IV and V making the region liable to experience the earthquake of intensity MSK VIII or more. In addition to it, river Satluj, Giri, Pabar rivers renders the population living on the banks of these rivers susceptible to floods. Now days due to the increasing developmental activities, the landslides are on the rise. Further the Shimla being enriched with the green cover leads to irreparable losses during summers due the incidents of forest fire. Keeping these problems in view, this paper comprises three objectives. They are: a) to record the spatial temporal incidences of disaster in the Shimla, b) to analyze the causes and impact of disasters in the Shimla and c) to suggest measures of mitigation based on multidisciplinary perspective of sciences and social sciences. The investigation leads to analysis that the disasters are on the rise. Hence, there is a need of multidisciplinary research to mitigate disasters and to prepare the community by way of capacity building to respond in a better way by adopting appropriate measures to reduce the adverse impacts. It explains why this strategy is deemed necessary and highlights the edge of moving beyond explanation emanating from one single disciplines or separate fields of study.

Keywords: Disaster management, Vulnerability, Mitigation, Multidisciplinary

INTRODUCTION

Himalaya being a nascent mountain range and due to the continuous ongoing movement of tectonic plates, the Himalaya is still rising making this region vulnerable to the earthquake. The whole area of Himachal Pradesh falls into two earthquake zones viz. Zone IV and Zone V as per the BIS Zoning map of the Himachal Pradesh. Consequently the Shimla district is also located in the Zone IV and V (about 99.62% area falls in Zone IV and 0.38% falls in Zone V) making the region liable to experience the earthquake of intensity MSK VIII or more. Consequently rendering the human lives and property situated in this district more vulnerable to the disaster. Due to climate change and human intervention with nature because of ongoing unscientific developmental activities, the flash floods, landslides, cloudbursts are on the rise. Being the fragile ecology of Himalayan region, these hazards are causing havoc on the human lives and property as well as environment. Further the thrust of the

Government to exploit its Hydro power potential has laid the road map for construction of many big, small and micro hydro power projects in district Shimla making it vulnerable to the industrial hazards also.

METHODOLOGY

The study is based on secondary data which is collected from disastrous weather events published by Indian meteorological Department. The methodology adopted includes vulnerability assessment on the basis of incidences of disaster in the study region. The research will include mapping to reflect the trends and spatial patterns simulated by using GIS technology.

The non spatial data collected on different types of disasters (data in the form of tables and literatures) has been attached with spatial attributes and then finally shown on maps. Then, this data has been analyzed both in terms of time and space variations.

The relationship between occurrences of disasters and vulnerability has been conducted reveals that there has to be multidisciplinary research to deal with multi disaster scenario.

RESULTS AND DISCUSSION

The state of Himachal Pradesh is vulnerable to 25 hazards out of 33 hazards identified by the High Powered Committee of Government of India and further district Shimla is prone to 16 such hazards. The most imminent danger is due to earthquake, landslides, flash floods, cloud bursts, hailstorms and road accidents and is vulnerable to multi-hazards.

Earthquakes quite devastating and sudden in nature, is one of the most common type of disaster that hits the study region. The District Shimla as a whole lies between mid Himalaya and greater Himalaya and due to the tectonic movements of the Indo Australian Plate and Eurasian plate the Himalaya is still rising and giving rise to tremors in the Himalayan region. Further the Jutog thrust, Kaurik thrust etc made this region more prone to the earthquake.

Table 1: Occurrences of Earthquakes in Shimla

Date	Intensity/ Magnitude	Impact
05.03.1842	VI/VII	Houses Damaged
07.04.1856	VII/VIII	Loss to Life and Property
09.07.1860	V	Loss not Reported
05.10.1869	V	Loss not Reported
28.02.1906	6.5	Killed 26 people, Injured 45 people and 73 dwellings destroyed

Besides earthquakes, landslides are the other geological hazards that are common and peculiar to the region. Landslides are simply defined as the mass movement of rock, debris or earth down a slope and have come to include a broad range of motions whereby falling, sliding and flowing under the influence of gravity dislodges earth material. They often take place in conjunction with earthquakes, floods and cloudburst. The most common type of landslides that occur is debris slide, rock slide, rock fall, slump, wedge failure and planer failure. Shimla is frequently experiencing landslides with slips and subsidence commonly occurring within overburden material and adversely affecting roads and unsoundly founded constructions. Landslide is most risk oriented hazard found in district Shimla affecting the human life and property in many ways like damages to the houses, roads, communication network agriculture etc.

There are four vulnerable sectors to landslides in the Shimla constitutes around 67 kilometers stretch. The Rampur-Leori sector on NH-22 is longest and is of 25 kilometers followed by Sungri- Narkanda Sector, Theog-Sainj Sector each 15 kilometers and Rohroo-Chirgaon sector is 12 kilometers.

Table 2: Major Landslides in Shimla

Year	Location	Causes	Damages
1993	Jhakari	Flash Flood	NH-22 washed Away
1995	Chirgaon	Flash Flood	Rohroo and Chirgaon road washed away

Flash flood is a rapidly rising and flowing surge of water that result from excessive rainfall or failure of a dam. Flash floods usually occur with little or no warning and can reach at full peak within few minutes. This phenomenon is quite common in Himachal Pradesh. Glacial melting due to global warming is another major cause of flash floods in Himachal Pradesh. The major glaciers in the higher hilltops are receding at an alarming rate, mainly due to anthropogenic activities. Deforestation, encroachment into the mountains and rapid industrialization often result in increase in temperature and subsequent frequency of flash floods. Along with this, the bursting of natural or man-made dams and cloudburst are other main causes of flash floods.

Shimla district's geographical location is such that it spreads from mid Himalaya to greater Himalaya and the river Satluj , Andhra, Pavvar,Nogali ,Ganaviand other many smaller khuds/rivulets flowing through it makes the area and the people living around these more vulnerable to the floods /flash floods.

Table 3: Occurrences of Flashfloods in Shimla

Date	Location	Causes	Impacts
08.07.1973	Nathpa	Rockfall	-Formation of Lake -Loss of Property in Lacs
24.02.1993	Jhakari	Landslide	-River Satluj was Blocked -About 1 km of NH-22 damaged -Huge loss to Public Property and Land owners
31.07.2000 to 01.08.2000	Rampur and Nearby	Heavy Rains	-At least 140 people died along with 1673 cattle and 12400 sq.km area affected -Roads and Bridges were washed away
26.06.2005	Parchu Lake	Bursting of Parchu Lake	-Washed away various roads and bridges
06.07.2005	Pabbar River	Heavy Rains	-Washed away State Highways, foot bridges, buildings and houses -Loss of Life and Property

It has been noticed that sudden heavy rains are occurring in some part of the district during the last two decades causing the situation of flashfloods .landslides resulting in devastating huge loss to the human life and property which is being attributed to the climate change caused due to the large human interference with the nature activities like deforestation, developmental activities like construction of roads, bridges, hydel projects, buildings etc.

Forest fire is a major cause of degradation of forest. While statistical data on fire loss are not well placed, it is estimated that about 90 percent of the forest fires are occurred due to human error or manmade. The forests of the Himachal Pradesh are more prone to forest fire compared to forests in other parts of India due to various biotic and geographic reasons. With increasing population pressure, the forest cover of the country is deteriorating at an alarming rate. Especially in recent past the incidences of

forest fire have increased tremendously due to human induced activities. Along with various factors, forest fires are a major Causes of forest fire are both natural and also due to human intervention. Fires occur naturally due to lightning, but most fires are caused by the local community. Approximately 90percent of the forest fires are due to human interventions, both intentional and unintentional. In states like Himachal, forest fires have a close link with livelihood. People residing within forests or nearby areas are dependent on forests for their source of income/ day to day fuel. They ignite forests for collection of forest produces or clearing land for agricultural purposes. Some fires are caused due to poor knowledge and the negligence of the people. Throwing burning cigarettes and cooking food in the forest are such causes of forest fire. The remaining 10percent of forest fires are due to natural processes such as lightning, increase in temperature during summer etc. Shimla district is under thick forest cover and the flora varies from the pine tree to oaks to cedar. However during the hot dry spell sometimes the human negligence the unattended small spark in the forest triggers forest fire which spreads to the whole forest and becomes difficult to control resulting in huge loss to the natural resources of the district i.e. flora and fauna and to the extent that some time the fire enters the nearby villages causing huge loss to human life and property.

The study region needs to develop a holistic approach to manage the entire gamut of disasters. It is not the case that there is action plan or disaster mitigation charter does not exist in the study region. Vulnerability analysis and risk assessment are essential for developing mitigation. Mitigation planning is best accomplished from a multi-hazard and multidisciplinary perspective. The reduction in the level of risk involved in one hazard may increase the level of risk from another hazard. Consequently, it is important to consider that some mitigation alternatives may not be viable given a particular set of hazard conditions. For example, constructing a house on higher reaches can be beneficial in a flood prone area, but it becomes a problem in an earthquake zone. There are various organizations at all levels involved in risk mitigation, such as National Disaster Management Authority, State Disaster Management Authority and District Disaster Management Authority. Even at state level and district level disaster mitigation, there are various departments involved in the given tasks of mitigation puts question on their roles as disaster managers. The roles and responsibilities of each department should be clearly identified. There should be coordination among these organizations working on the same plan of action to avoid overlapping or gap of work. Timely mass media communication about impending disasters can lead to appropriate individual and community action, which is the key to implementing effective prevention strategies including evacuation and survival of people. Such communications can educate, warn, inform and empower people to takepractical steps to protect themselves from natural hazards. It was felt that there is need to set up or establish a research center for disaster mitigation. This department should involve the expert not only from disaster management but experts from other relevant areas working on specific hazards, specific streams of knowledge to work under one roof. Their focus should be on conducting research on all the issues related to disasters in the region. The experts of various departments working in their own arena of research do not lead to complete understanding of reality as it is practiced at this moment. The real success of mitigation plan lies on a platform where all are geared towards one common goal.

CONCLUSION

The district of Shimla is vulnerable to different disasters. All the disasters like earthquakes, landslides, forest fire, flash flood and cloud burst has shown the increasing trend and have also become more widespread including almost all parts of the study region. Mitigation is not yet practiced to its fullest extent. So the mitigation plan is in its initial stage of development and implementation. A paradigm shift has

been recently taken place at the national level from the relief centric syndrome to holistic and integrated approach with emphasis on mitigation. The potentials exist to reduce hazard risk through the various mitigation measures. The cooperation of government departments, NGOs and local people is needed for proper implementation of the mitigation measures to reduce the risk of a disaster. Shimla is vulnerable to multi disasters and mitigation plans will be developed and adapted locally. Mitigation strategies need to ensure the higher level of community involvement and participation. In rural areas, characterized by inadequate infrastructure and poverty groups, all mitigation efforts will have to be backed up by a strong and committed programme of social development for the communities. Constant re-examination, therefore, of development Policies and programmes, leading to equity and social justice, will be pre-requisite to ensure the success of mitigation efforts that are being proposed. Hence, there is a need of multidisciplinary research to mitigate disasters and to prepare the community by way of capacity building to respond in a better way by adopting appropriate measures to reduce the adverse impacts.

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