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DEVELOPMENT IN HIMALAYA'S AND LANDSLIDE DISASTER MANAGEMENT: A SPECIAL REFERENCE OF HIMACHAL PRADESH

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ABSTRACT

Landslides is a major risk in India that presents a risk to human lives, livelihood and property. The level of destruction caused by them is unimaginable. Therefore, it is very necessary to do proper management of such risks. Also, development is very necessary for region's overall growth. But in major instances, these developmental projects and activities are the major causes of such hazards. Therefore, this paper highlights the developmental projects and their contribution in Himachal Pradesh as well the extent to which they hamper the ongoing development of Himachal Pradesh by increasing the frequency and magnitude of risks like landslides. Also, this paper suggests some mitigation strategies of landslide disaster management as given in State Disaster Management Plan. Also, some of the key initiatives are also discussed which can be included in accordance with disaster management.

Keywords: Landslide, Disaster Management, Growth, State Disaster Management Plan

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1. INTRODUCTION

Regional Development is an umbrella term which is used to denote the efforts in the form of schemes, policies and activities undertaken by the government, private and community at their end to minimize the disparities that are present in the region. (OECD, 2013) It also ensures the quality each region has in the present and what will it look like in the future in the terms of economic growth, social advancement, dynamic polity and environmental scenario. Each region varies in its own sense therefore the methods and efforts of its development also varies. Some region needs more emphasis on employment whereas some focus on other societal problems. (Chandana, R.C., 2014) But now-a- days, the problem of unemployment is rampant and therefore, each level be it government, private or even community is working to generate more income sources to create economic equality in their respective regions. Talking about regional development from the lens of geography, it offers a mix of physical, economic and social spheres of society which has an equal weightage in region development. (Chandana, R.C., 2014)

But as the world is changing every moment and need of the man is rising and taking control over its surrounding. Therefore, it is a time to take a reform in approaches of regional development. It is very necessary to shift to Modern Approaches of Regional Development like Sustainable Development Goals which was put forward by United Nations in 2015 and adopted by United Nations Member States. The goals envision the effort every country has to do in the future to ensure peace and prosperity for its citizens as well as our planet. They are aware that policies that improve health and education, reduce inequality, foster economic growth, fight climate change, and defend our forests and oceans are all necessary to battle poverty and other types of deprivation (United Nations Report, 2015).

2. REGIONAL DEVELOPMENT IN INDIA- PAST AND PRESENT

India is a diverse country with different cultures, languages, social beliefs, religions and traditions. Therefore, it is very necessary to adopt such type of approach that is capable to address various types of problems according to region and brings out solutions to those problems. In India, the government institution which focuses on planning of every region is NITI Aayog (National Institution for Transforming India). Earlier the responsibility of regional planning was endowed with Planning Commission. But with the changing needs of the region and the need for a new approach for development, On January 1, 2015, the Planning Commission was replaced by NITI Aayog. NITI Aayog follows 'Bottom-Up Approach' i.e. initiating development from the grassroot level with major focus on Maximum Governance with Minimum Government. (NITI Aayog, 2022).

During 1940 and 50s, i.e., at the time of Partition, the first and foremost goal and need of our country was to rebuild the economy and therefore, the need of proper planning arose. Thus, several industrialists jointly made a proposal for developing the economy in a developed manner. In history, this proposal is known as BOMBAY PLAN. Following this plan, India launched a series of Five-Year Plans specially for rebuilding our economy and developing the country in every sphere. The entire responsibility of these five-year plans was bestowed with Planning Commission. The first five-year plan came out in 1951 and the last i.e. 12th Five – Year Plan came in 2012 and continued till 2017. (National Portal of India, 2022)

3. CORRELATION BETWEEN DISASTERS AND DEVELOPMENT

In the race of making our country more developed in every sense be it economy, lifestyle, infrastructure, health or education, we, humans are compromising with our ecosystem and environment, which is of utmost importance. As already discussed that every region is unique in its own sense and what makes it unique is its geography, history, needs and aspirations of the people living there. Therefore, it is very difficult to follow 'one size fits all' approach and continue with the developmental activities. In this way, only our environment is getting degraded and eventually human beings and other living organisms will be at risk like increasing frequency of natural and man-made disasters, new types of diseases, global warming and climate change.

As human is becoming focus of fascination and laying out its predominance over climate, the recurrence and force of catastrophes have expanded. Man is zeroing in additional on formative exercises outperforming or breaking every one of the cutoff points presented commonly. Hence, it is apparent that new weaknesses have been emerging in the general public prompting weighty monetary, physical and social misfortunes. There is cause-impact connection among debacles and advancement. There is no space for natural worries and morals in formative exercises. For example, it is seen that uncontrolled utilization of substance pesticides and manures have prompted salinization of water in Punjab. Likewise, dislodging of native networks because of production of dams in sloping areas of India and making that locale more inclined to seismic exercises and avalanches. (India Disasters Report, 2005)

Coherently talking, in the event that catastrophes have human association to wide degree, the answer for this issue must be found by people as it were. The strategies should be reduced so fiascos and improvement can undoubtedly remain inseparable like long haul arranging with a perspective on recurrence, degree, potential and force of debacles. (IRCRS, World Disasters Report, 2002)

4. STUDY AREA- HIMACHAL PRADESH

Himachal Pradesh is northern state in India, which is located in between 30°22′N and 33°12′N latitude and 75°47′E′ and 79°04′E longitude, where it covers an area of 55,673 square kilo metres. It is one of the 13th mountain states of India with lofty snow-covered peaks and river systems. The state shares border with different states like UT of Jammu and Kashmir and Ladakh in the north, Punjab in the west, Haryana state in the south west, Uttarakhand state in the south

east and some stretch of Himachal Pradesh shares boundary with Uttar Pradesh in the southern direction. Tibet Autonomous Region touches a global border with the state. People refer the region as Dev Bhoomi (Land of God) and Veer Bhoomi (Land of Brave). Before independence, Himachal Pradesh was not a separate state rather it was a part of Punjab in British empire. Following independence, much of the hilly and undulating terrain regions were formed as Himachal Pradesh. The steepy portions of the surrounding state of Punjab were amalgamated into Himachal in 1966, and the state was finally given full sovereignty in 1971. (District Census Handbook, 2011)

The vast Himalayan range extends across the eastern and northern portions of the state, while the lesser Himalayan Dhaula dhar and Pir Panjal ranges, along with their valleys, make up the majority of the state's core regions. The mountain range located in northeastern direction is known as Zaskar range. Western and southern Himachal Pradesh are formed by the outside Himalayas, often known as the Shiwalik range. The topmost point in the state is known as Reo Purgyil which has a height of 6,816 metres. The state is intersected by valleys that are traversed by several perennial rivers. (Government of Himchal Pradesh, 2022)

Himachal Pradesh is bifurcated into 12 districts, those are then subdivided into Shimla, Kangra, and Mandi divisions. These administrative divisions are further narrowed down into 172 Tehsils, 73 subdivisions, and 78 blocks. (Government of Himchal Pradesh, 2022)

The state has a total population of 6,864,602 people out of which 3,481,873 are males and the remaining 3,382,729 are females. The Koli caste is dominant in the state which holds 30% of total population of the state. The state has 25.19% scheduled caste and 5.71% scheduled tribes. The male- female distribution is 972 women per 1000 men which is a better figure from 2001 Census. The state has shown an increase in life expectancy at birth from 52.6 years to 72 years. The state has shown an advancement as far as education by enlisting proficiency pace of 83.78% in Census 2011.

Hindi is majorly spoken by masses and thus regarded as the only official language of the region. Moreover, Sanskrit language is in addition official language to Hindi language. Most of the population still use Western Pahari languages including Bilaspuri, Gaddi, Kangri, Kullu, Churahi, Bhattiyali, Mahasu Pahari, Mandeali, which are the sub-groups of Indo-Aryan languages. Hinduism is the major religion that is practiced by around 95% of the population. Minority religions are Islam, Sikh, Buddhism and Christianity.

The rural portions of the state are home to about 90% of the population. The state's economy heavily relies on hydropower, tourism, horticulture, agriculture, and horticulture. With 99.5% of human settlements having electricity as of data of 2016, the hilly state is virtually entirely electrified. In 2016, the region was regarded as the 2ndopen-defecation-free state in the country. Himachal Pradesh is the least corrupt state in the country, according to the CMS-India Corruption Study 2017.

Fig- Districts of Himachal Pradesh

5. ECONOMY OF HIMACHAL PRADESH

The state is second best performing state in India in terms of human development. The major initiative of government to fight against joblessness is NREGA (National Rural Employment Guarantee Act, in which the state has shown positive outcomes. The women participation has outnumbered the men participation in this scheme. Therefore, the state has joined the category of high women participation where a total of 46% females participated in NREGA.

Agriculture is the major sector through which residents earn their income. Almost 90% of the population depend upon agriculture and allied sector for their livelihood. The prominent crops grown are wheat, maize, rice, barley, pulses, fruits, vegetables and oilseeds. Initiatives that support agriculture, such as the Himachal Pradesh Reforestation Project and the Mid-Himalayan Watershed Development Project, have been successfully implemented by the government. This initiative

has helped in gaining agricultural productivity and was reason to increase income for rural households. The state is famous for its cash crop which is Apple, which is majorly grown in the districts of Shimla, Sirmaur, Kinnaur, Chamba, Lahaul and Spiti, Kullu and Mandi. It is grown in 49% of the total area of the state and approximate economy of Rs. 3500 crores.

Hydropower is another source of income and livelihood in the state. The state has great availability of water because of perennial river systems, thus the hydropower is the major income generation source. The electricity generated from these hydropower plants is also given to other states in exchange of money like Uttar Pradesh, West Bengal, Delhi and Punjab. The amount produced from selling the electricity is given back to consumers of the state as subsidy. The hydropower has helped in making the state's households electrified upto 94.8%.

Tourism is an important sector in creating income for the state's expenditure. People from other states as well as from other countries come to the state for visiting hill stations and experiencing scenic beauty all around the year. Famous tourist spots are Shimla, Manali, Dalhousie, Kullu, Kasauli, Chamba, Dharamsala and Khajjiar. Also, the state is home to various pilgrimage sites like Shri Chamunda Devi Mandir, Naina Devi temple, Jwala Ji temple, Jakhoo temple, Bijli Mahadev temple, Chintpurni temple. The state also has several Buddhist monasteries which attracts tourists for experiencing peace and serenity. Tourists also come here for adventure sports like skating, paragliding, rafting, skiing, boating, trekking, horse-riding and fishing.

6. RISK PROFILE OF INDIA

India is a country wealthy in assets like more than adequate measure of water, rich biodiversity, different sorts of minerals. In spite of these, India is likewise a country which is included in top 10 fiasco inclined nations of the world. There can be a few purposes behind it like lack of foresight of purpose of assets, not focusing towards shielding climate, including the youthful age to zero in additional on formative exercises like mining. The nation is inclined to different regular and man-made risks. In normal risks, it is inclined to tremors, avalanches, torrential slides and woods fires. It is assessed that around 58% is defenseless to quakes, around 12% land is powerless to floods though 68% of body of land is inclined to dry season dangers. Bumpy pieces of the nation are confronting the issue of avalanche and torrential slide risks (Country Profile, NIDM).

There are 13 mountain states in the country because of presence of lofty Himalayas which are also young fold mountains. Geologically, these mountains are unstable as they are still young and their height is still increasing. Therefore, these mountains are prone to various natural calamities. Moreover, the developmental activities like building roads by blasting, making dams on rivers, creating infrastructure like building houses that are not resilient to earthquakes and various other natural hazards and also, making houses and buildings on vulnerable places which are prone to disasters is very danger and is a major cause of these disasters like earthquakes and landslides. (HPSDMA, 2018)

7. RISK PROFILE OF HIMACHAL PRADESH

Himachal Pradesh is vulnerable to many risks, both natural and man-made. The main risks include things like earthquakes, landslides, flash floods, snowstorms and avalanches, severe droughts, dam failures, domestic and wild fires, accidents on the road, rail, and air, stampedes, boat capsizes, and hazardous chemicals among others. However, the earthquake risk is the danger that poses the greatest threat to the State. (HPSDMA, 2018)

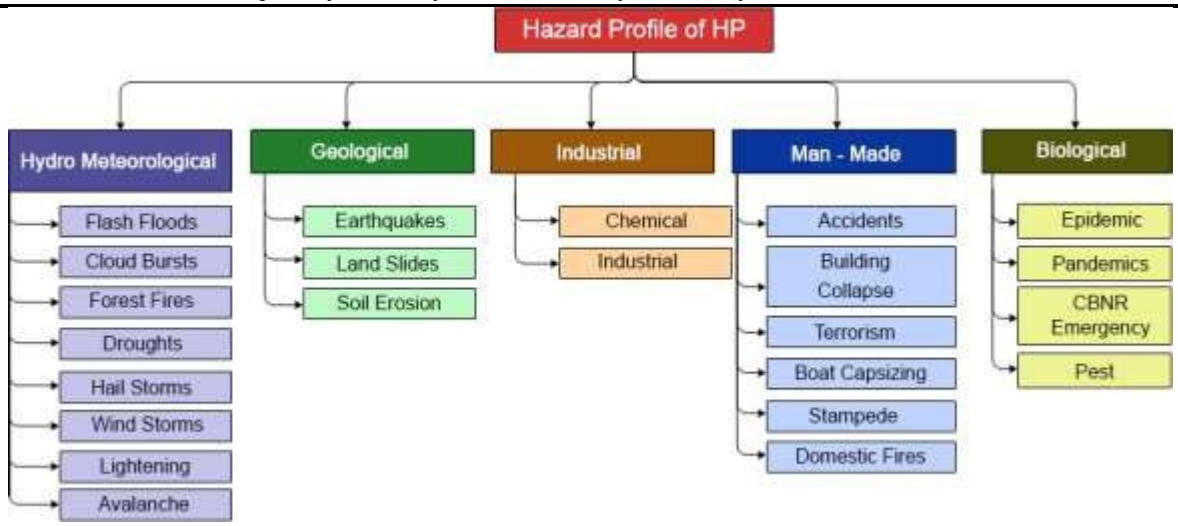

Fig – Hazard Profile of Himachal Pradesh
(Source- Himachal Pradesh State Disaster Management Authority)

8. LANDSLIDE HAZARDS IN HIMACHAL PRADESH- CAUSES

In hilly areas, landslides usually occur during or after heavy rainstorms, resulting in fatalities and damage to the natural environment and/or the built environment. (Fuchu and Chack, 2002). A landslide may be started by earthquakes, torrential rain, volcanic eruptions, etc. (Kessarkar et al., 2011). Landslides, which occur frequently in the state, are another type of natural danger. Himachal Pradesh's highlands and hills are vulnerable to landslides both during and after strong earthquakes. Over the past ten years, the vulnerability of the geologically immature and not so stable high inclined slopes in several ranges of Himalayan parts has increased rapidly due to inappropriate human activities like road cutting, terracing, deforestation, and changes in agricultural crops that require more intense watering, among others.The slopes of Himachal Pradesh are prone to landslides due to several factors like geological, meteorological and anthropogenic factors. The state has seen a devastating effect due to occurrence of frequent landslides. The interplay of these factors together makes the place fragile that causes the landslide to occur. Talking about the human causal factors like deforestation and anthropogenic activities that leads to wiping off the vegetation cover and overloading of slopes makes the area more prone to these hazards. Also, the irregular and unplanned construction activities like roads, tunnels, dams and further multipurpose projects on large scale on these steep slopes makes the situation bad for the state Himachal Pradesh. The destruction and devastation caused by striking of landslides is unimaginable as people suffers a lot. The major devastation includes loss of lives, complete or partial damage to buildings, disturbance in vegetation and ecosystem, destruction to bridges, communication setup and hydropower infrastructure.

Here are some of the major landslides that have occurred in the past and caused huge destruction in the state: - (HPSDMA, 2022)

1. Maling 1968- The landslide happened was able to cause destruction in a range of 1km on NH- 22.
2. Kinnaur December 1982- The landslide caused a major destruction and led to the collapse of 3 bridges at Sholding Nallah. Also, a road stretch of 1.5 km was completely damaged.
3. Jhakri March 1989- This event was responsible for causing destruction at Nathpa where around 500m of road was vanished.
4. Luggar bhati September 1995- This landslide was responsible in taking lives of local residents.
5. Beas Valley landslides at Marhi, Bhang, Chhyal and Mandu.

There are some specific districts that are more susceptible to landslide hazards. SDMA has categorized districts as High, Moderate and Low Vulnerability on the basis of their current status of vulnerability. Firstly, High Vulnerability districts includes Chamba, Kullu, Kinnaur, some part of Kangra and Shimla. Secondly, the districts which has moderate level of vulnerability are Kangra, Mandi, Bilaspur, Shimla, Sirmaur and Lahaul and Spiti. Some districts fall in the low vulnerability zone which includes Una, Hamirpur and Solan.

To tackle the landslides and various other hazards in the state, State Disaster Management Authority (SDMA) has the entire responsibility to manage the situation as per the command of Chief Minister. The constitution of SDMA is done after the implementation of Disaster Management Act 2005 nationwide. The National Disaster Management Authority (NDMA) would be the highest authority after this, followed by the State Disaster Management Authority (SDMA) in each state and the District Disaster Management Authority (DDMA), which is chaired by the District Magistrate in each district. In Himachal Pradesh, as per High Powered Committee of August 1997, disasters are categorized under five sub-divisions in which landslides are included in Sub Group 2 which deals only with Geologically Related Hazards. (Ministry of Home Affairs, 2005)

9. IMPACT OF LANDSLIDES ON RESOURCES (Landslide Risk Mitigation Report; HPSDMA, 2018)

1. Hydel Power Stations – The state has rich hydel resources and thus there are 118 hydel power stations located all around the state. But in disastrous times, these units are at risk. It was seen that majority of hydel power stations i.e., 67 are prone to landslide hazard. Moreover, 10 Mega Hydropower stations are located in medium and high-risk area. The importance of these hydel power stations is very crucial for fulfilling the needs of power in industries, agriculture and electricity supply.
2. Settlements – Population is the first unit that gets affected in every sense after the disaster strike. In a state like Himachal Pradesh where total built up area is 866.14 sq.km, the human settlements are at high vulnerability.
3. Roadways – The state is well connected by the means of roadways as there are eight National Highways passes through the state. The total road length is 1628.337 kms of National Highways and out of which 993.29 km lie in high vulnerable zones, 516.46 km stretch is under moderate vulnerable zone and the remaining 10.96 km is found under extreme vulnerable zones. Also, Himachal Pradesh state has an extreme network of state highways and other village roads which has a total length of 2178.988 kms. The network of state highways lies under high vulnerable zone which is about 1111.552 kms of this stretch. The left over stretch of about 873.24 kms is included under moderate vulnerable zones. Moreover, the major and famous tourist spots in the state are accessible through roads only which includes Shimla, Manali, Dharamsala etc. These roads face the wrath of disasters and create a drowning effect on the economy of the state as the state is well flourished by tourism sector.

10. MAINSTREAMING DISASTER RISK REDUCTION INTO DEVELOPMENT (HimachalPradesh State Disaster Management Plan, 2017)

Mainstreaming DRR signifies that examining each and every scheme/policy/initiative closely through the lens of existing risks as well as potential risks that can turn into disasters and cause heavy loss to life and property. Therefore, it comes with fulfilment of two objectives: -

1. Development should not slow down because of past and future risks
2. Also, development should be done in such a way that is not capable to foster new risks

There are various acts that has been laid down in Disaster Management Act that has compulsion to jointly do disaster management in developmental plans and programmes.

1. Section 23 (4) (c) – State Disaster Management Plan has the mandate to include disaster mitigation with developmental plans and projects in the state.
2. Section 39 (c) – responsibility shall be endowed with every department of State government to accord the developmental projects in disaster prevention and mitigation.
3. Section 40 (1) (a) (ii) –every department of State government should prepare its own disaster management plan which should be included with developmental plans and programmes.

State Disaster Management Plan of 2012 had opined some basic entry points for including DRR in some programmes that are sponsored by Central government. These programmes have huge opportunities for including DRR in developmental projects.

1. Pradhan Mantri Gramin Awas Yojna– The department which has the authority to mainstream DRR activities is Rural Development department. It has the responsibility to select hazard safe zones for building and application of hazard resilient housing.
2. Mahatma Gandhi National Rural Employment Guarantee Scheme – Rural Development department has the mandate to create entry points in the scheme to include DRR activities as well. The first role is to properly use MGNREGS funds in mitigation of risks posed by natural hazards. Additionally, prioritizing the works should be done and those works

should be done first that can reduce the vulnerabilities. Lastly, new projects should be identified that can help in creating more employment in disastrous events.

3. Pradhan Mantri Gram Sadak Yojna – The whole responsibility is with Public Works department to add DRR activities. The road network should be developed in such a way that it should be capable of addressing DRR issues and concerns and join the vulnerable areas. Also, structural measures such as slope stabilization, cross drainage and protection works should be done.
4. Sarva Shiksha Abhiyan – Education department has the responsibility to add DRR activities in developmental projects. It also ensures school safety and making schools hazards resilient and safe that can withstand in different hazards.
5. Smart Cities Mission and Atal Mission for Rejuvenation and Urban Transformation – This is the responsibility which is endowed with Urban Development department. Firstly, adding various DRR measures that can make infrastructures safe in different natures of hazards. Also, emphasis is given on audit after every stage of construction. Also, stress is given on adding disaster resistant features in infrastructures.
6. Pradhan Mantri AwasYojna – The whole responsibility to introduce DRR activities in this scheme is with Urban Development department. The first thing is to ensure housing plans of villages should include DRR concerns. It also emphasizes training of ASHA workers in preparedness and response mechanisms. Also, training of doctors and hospital staff should be done to ensure proper implementation of DRR activities.

11. CONCLUSION AND WAY FORWARD

There are various strategies suggested by Himachal Pradesh State Disaster Management Authority to mitigate the landslide hazards before time. Some of those strategies are: -(Himachal Pradesh State Disaster Management Plan, 2017)

1. Reviewing, revising and updating town and area planning laws of land use.
2. Training of volunteers both in professional as well as in technical terms with the help of such professional institutions.
3. Involvement of young talent in disaster management process like engineers and geologist for mapping vulnerable areas for each hazard.
4. Creating awareness among masses so that they are well aware of both do's and don'ts during landslide disasters.
5. Creating inventory of landslide hazard prone areas on categorical basis like high, moderate and low and adopting strategies on the basis of their vulnerability.
6. Regular assessment of vulnerability and risk in and around human settlements.
7. Creating disaster management plans at every village by involving communities in mock drills on regular basis.

The disasters are dynamic in nature and are threat to existence of human beings and their well-being. The development projects are necessary for overall growth of the region but they are also a significant contributor in increasing the frequency of disasters by depleting the resources and environment and making the area more vulnerable to extreme events like landslides. It is a high time that human beings should act in accordance with nature and mend their ways. Also, more schemes and initiatives must be introduced by the government both at Centre and State so that development and disaster management can smoothly go hand in hand. Also, emphasis should be paid on involving communities in the process of disaster management. The communities can ease the process of managing disasters at initial level and can help the disasters experts in having minute knowledge of the region which can help in taking decisions easily about the area. In a nut shell, communities have wider knowledge bank which can help government agencies to plan their actions well in advance.

CONFLICT OF INTERESTS

None.

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None.

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