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Planning & Disaster Resilient Development: A Case Study of the Hilly Regions in Uttarakhand

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ABSTRACT: We have reached the zenith, where it is possible for human kind to shape the designs into reality. Amidst the technological advancements and the expeditious development we have chosen to ignore the nature's existence whereas the sustenance of life on earth was to be based a proportionate amalgamation of man and nature. The nature when exploited to its threshold retaliates in worst possible way and is thus termed as disaster. This paper shall primarily focus on the catastrophic results due to occurrence of natural disasters. An insight will be given into the occurrence of landslides across India with foremost focus on the landslides occurring in the hilly region of Uttarakhand and Uttar Pradesh. Thus this paper will principally highlight the causes of landslides in these areas and formulation of strategies which shall spatially channelize the development forces in the hilly regions.

I. INTRODUCTION

Disaster is a crisis situation that far exceeds the capabilities'.- *Quarentelly, 1985.*

The word *disaster* implies a sudden overwhelming and unforeseen event. At the household level, a disaster could result in a major illness, death, a substantial economic or social misfortune. At the community level, it could be a flood, a fire, a collapse of buildings in an earthquake, the destruction of livelihoods, an epidemic or displacement through conflict. When occurring at district or provincial level, a large number of people can be affected. Most disasters result in the inability of those affected to cope with outside assistance. As the limiting factor in disaster response is often the coping capacity of those affected, improving their resilience when responding to disasters is a key approach to lessening the consequence of a disaster.

A. Classifying Disasters

Natural disasters. In the minds of many, disasters are divided into those thought of as originating from forces of nature or from the effects of humans. The list of natural disasters include weather phenomena such as tropical storms, extreme heat or extreme cold, winds, floods, earthquakes, landslides and volcanic eruptions. Disasters caused by humans have included transportation accidents, industrial accidents, release of hazardous materials and the collapse of buildings. Disasters are still widely thought of as sudden onsets of cataclysmic events. However, disasters such as famine and global climate change could be considered 'slow-onset' disasters. As odd as the idea sounds, disasters can even be 'chronic' – that is: continually occurring over a protracted period of time.

Disasters caused by humans. Though weather and geologically related disasters are considered to have generated the greatest number of deaths and economic loss, disasters generated by humans are increasing in importance. In former Soviet-bloc countries, industrial systems have left the environment heavily polluted with dangerous substances in many places. Globalization is now carrying industrial production to previously agrarian societies. The risk from the unintended release of hazardous materials is becoming ever morewidespread.

B.Mitigation

Mitigation means to take actions which will lessen a disaster's consequences and subsequent hazards. Many of these actions are an integral part of the reconstruction process. An improved design should be incorporated into the reconstruction of buildings following an earthquake or a tropical storm. Housing in marginal lands or flood plains which have been destroyed by flooding should not be reconstructed.

At a time of heightened awareness following a disaster, attention should turn to other vulnerabilities and mitigation efforts should also be directed toward reducing these additional risks. Disasters expose social vulnerabilities which may predispose populations to other potential disasters: these should be addressed. Efforts at mitigation may overlap with plans to improve preparedness for the next disaster. Mitigation activities and longer term development programmes have very similar goals and can reinforce each other. Making available adequate and affordable insurance helps share risks and mitigates the potentialeffects on the economic devastation that might arise from future disasters.

C. Improving Resilience to Disasters

Many efforts have contributed to the ability to manage the consequence of disasters more effectively by building better resilience among governments and their citizens. Among these has been the UN International Decade for Natural Disaster Reduction, These have greatly advanced knowledge on effective approaches to mitigate the effects of disasters and support communities in coping with disaster consequences. The Hyogo framework focuses on building national and community resilience to disasters. It outlines three strategic goals: Introduction of disaster risk reduction into planning for sustaining development at national and local levels;Development and strengthening of institutions, mechanisms and capacities to build resilience to hazards;Systematic incorporation of risk reduction approaches into the implementation of emergency preparedness, response and recovery programmes.

II. CASE STUDY: UTTRAKHAND

Soaring Himalayan peaks and steamy lowland jungles. Revered temples and renowned ashrams. Peaceful hill stations and busy cities. Uttrakand is an enticingly diverse state with some of India's best trekking yoga schools , holiday towns and wild life watching all tucked into one little corner of the country. It is also known as the Dev bhoomi- land of the Gods. The dramatic terrain covered with holy mountains, lakes and rivers.

To reconstruct the chronology of events that culminates in the tragedy at Kedarnath on 16-17 June, 2013 as well as whole of Uttrakand between 15-18 June, 2013 was a combination of massive rainfall, glacier flow, snow melt, debris and landslides along with flash floods. In terms of seismic activities, the region is traversed by several lineaments, faults andthrusts, which are considered to be geodynamically active. The geomorphological study of the area indicates that the surface slopes consist mostly ofglacial, fluvial-glacial, or fluvial materials, which are mostly unconsolidated and loose innature.

A. Vulnerability to natural disasters

Natural disasters in Uttarakand are pronounced due to its tectonic activity, lithological, structural and ecological settings, and topography and changing landscapes owing to various natural and anthropogenic activities. Natural hazards like earthquakes, landslides, slope failures, rockfall, avalanches, cloudbursts, hailstorms, glacial lake outburst floods, floods, flash floods, lightning, forest fires etc are frequent in Uttrakand causing loss of life and property from time to time. There has been a spurt of development oriented activities following formation of the state.

B. Himalayan Tusnami- June 15-18.

In the month of June2013, the region suffered its worst disaster in its living memory with huge loss of lives and wide spread destruction. The disaster coincided with the peak tourist and pilgrimage season, considerably enhancing the number of the causalitieswithadverseimpacton rescue operations. In the entire region of the State was hit by 'heavy to very heavy rainfall, possibly due to the fusion of Westerlies with the Indian Monsoorial cloud system, resulting into flash floods and landslides over a wide area. The districts of Bageshwar, Chamoli, Pithoragarh, Rudraprayag and Uttarkashi were the worst affected. large populations in several areas were cut off across the State and suffered due to shortage of essential commodities.

The nature's fury was most pronounced in the Mandakini valley of the Rudraprayag district. Torrential rains coupled with the collapse of the Chorabari Lake led to flooding at the Kedamath Shrine and the adjacent areas of Rambara, Agastyamuni, Tilwara, and Guptkashi. Other pilgrimage centers in the region, including Gangotri, Yamunotri, and Badrinath, which are visited by thousands of devotees during the summer season, were also affected. People were stranded for days to weeks at isolated locations such as Harsil, Roopkund and Hemkund Sahib. Over one lakh people were stuck in various parts of the State owing to blockages by damaged roads, landslides, flash flood induced debris and absence of communication.

The impact of the disaster was unfathomable for the local population as well as the pilgrims. As per the report made available by the State Government on 09 May 2014, a total of 169 people died and 4,021 people were reported missing (presumed to be dead). About 4,200 villages were affected; 11,091 livestock were lost and 2,513 houses were completely damaged.

Large number of tourists and local inhabitants were stranded in the difficult mountain terrain of the upper regions of the Himalayas.

While the main cause of casualties was physical exposure to flash flood, the harsh weather conditions, i.e., Continuous rainfall, biting cold and timely non-availability (of food, potable water, shelter, warm clothes, etc.) were also responsible for the grim distress to pilgrims. There was extensive damage to housing, both in urban and rural areas, because settlements were mostly concentrated along the rivers. Damage to public buildings resulted in severe disruption of basic services such as food, shelter, health, education, women & child care, etc.

Flash floods with heavy sediment load caused intense erosion of the river banks which washed away large sections of roads and a large number of bridges at many places. Road connectivity to thousands of villages in the affected parts of the State was lost and the areas remained disconnected and isolated for weeks. A large number of vehicles were washed away, buried under debris, fell off the hills, or were stranded at cut-off locations.

The urban infrastructure in majority of the towns was seriously at risk. Thousands of households in the five worst affected districts were dependent on the tourism for their livelihood. As a result of the disaster, a large number of the petty traders, hotel & restaurant owners and bus & taxi operators lost their livelihoods. The impact of disaster in region included damage to the routes to the holy pilgrimage circuit of the Char Dham Yatra. The loss of livelihoods, particularly in the tourism sector, has also posed a threat of forced migration in the region. Wide spread damage and destruction to infra-structure and housing, and most importantly the loss of livelihoods, pronounces for long-tedious ways ahead for recovery including reconstruction, rehabilitation and future risk reduction. While the Centre and the State Governments have initiated prompt actions, documentation of the disaster and related response management actions, in an objective manner, are necessary to help introspect and analyze the causes of tragedy and for drawing lessons to improve contemporary disaster management structures.

III. PLANNING DISASTER RESSILIENT DEVELOPMENT

The disaster caused huge devastation to almost all developmental facets in the State, which needs a reconstruction strategy that takes care of high vulnerability of mountain communities and land to natural hazards in the backdrop of ecological fragility, environmental impacts, livelihood resilience and local economic sustainability issues. The elements of disaster risk reduction need to be very innovatively woven into all the development and reconstruction plans of the State at a strategic level. These could inter alia include supporting sustainable agricultural, pasture and forestry practices and integrating local environmental knowledge and community memories in disaster risk reduction strategies. The In the backdrop of region's vulnerability to heavy rainfall resulting in extensive damages along the river courses and widespread landslide incidences, there is a need to follow best practices in the landslide stabilization techniques including ecological and bio-engineering solutions. This is particularly important for development of religious tourism, aspects of environment safeguards, natural resources and long-term livelihood security. Issues related to hazard forecasting, including involvement of scientific community with adequate funding for R&D, need to be addressed on priority. It is axiomatic that the reconstruction in disaster affected Uttarakhand region will have to be a well planned, comprehensive state-led effort built upon local capacity with "build back better" approach. This needs to be well integrated with the efforts of recovering local economy, livelihood regeneration and ecosystem services resilience. It is of utmost importance that community emerges as the most vibrant stakeholder in the reconstruction plans with creation of structures empowered for objective monitoring and critical review of the execution of the plans.

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