

Earthquake Disaster Mitigation Scenario of North East India

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ABSTRACT :

Geomorphologic ally, North East India is located in an earthquake prone zone (zone v) of the Indian subcontinent. In this region earthquake comes with land sliding flood and along with series of smaller magnitude earthquakes. Here earthquakes of up to MM intensity IX can be expected. According to a hazard map produced by the **Global Seismic Hazard Assessment Programmed**, the North East India can expect to have a **peak ground acceleration (PGA) of 0.24g to 0.48g**. Therefore we should prepare ourselves to meet the eventuality.

KEYWORDS:

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ORIGIN OF PROPOSAL :

Both instrumented and **non instrumented** events of earthquake may be listed as: earthquakes during **non instrumental period** were : 1548,1596,1601,1642,1663,1696 1756,1772,1838 and 1841 and earthquakes during **instrumental period** were:1869,1897,1923,1930,1943,1947,1950,1985,1984 and 1988. The region which has been experiencing major earthquakes and two great earthquakes of 1897 and 1950 have occurred in this region. It means that frequent and major earthquakes, in the long term basis prediction, is likely to occur in this region.

DEFINITION OF THE PROBLEM :

North East India was not experienced by major earthquakes since 1950 earthquake, so it may occur at any time in future. These earthquakes were so large that even topographical changes of levels etc took place but loss of life was not so great since in 1897 the population was not so large and the 1950 earthquake occurred in rather unpopulated region. But even more so because the Assam type construction using bamboo posts and *ikra* walling was light as well as strong which remained undamaged during these earthquakes. But present situation is vastly different since population has increased tremendously and non-engineered masonry and concrete constructions are

replacing the Assam type construction. Hence danger to life and property in future earthquakes is on increase with passing year. Normally earthquake disaster is caused due to man made structures , lack of awareness and preparedness. Earthquake as a natural hazard can become a disaster to a community if the man- made objectives i.e.: structure and systems-buildings, bridges ,dams, power plants, communication lines, highways and tunnels, water and sewer lines and plants, gas pipe lines, industrial structures, tanks and chimneys etc. are poor in concept and design and weak in construction. If improperly designed and badly constructed ,they become highly vulnerable to damage even under low intensity earthquake ground motions. In this context it may be said that whereas ‘earthquake hazard is natural, the earthquake - disaster is man-made’. Besides the structural vulnerability, the disaster can be made much worse due to the vulnerability of the community itself. The factors that make a community more vulnerable to disasters are economic backwardness or poverty ,ignorance and illiteracy, the social fabric and living habits etc., since these conditions lead to poorer constructions with little or no maintenance, very low level of awareness about natural disasters and practically no mental or physical preparedness to meet them when they occur.

REVIEW OF STATUS OF RESEARCH & DEVELOPMENT (R&D)

I. INTERNATIONAL STATUS:

Federal Emergency Management Agency(FEMA),Applied Technical Council(ATC),Earthquake Engineering Research Institute (EERI),Environmental Science Research Institute(ESRI),Pacific Earthquake Engineering Research(PEER),University of Barkley; USA, International Association of Earthquake Engineering(IAEE), Asian Centre for Disaster Management(ACDM),Asian Institute of Technology (AIT),Thailand, Japan International Cooperation Agency(JICA), Japan; NORSAR, Norway ; United Nations Development Programmed (UNDP),etc. and many others have done pioneering works in the field of earthquake disaster mitigation globally.

II. NATIONAL STATUS :

Department of Earthquake Engineering, Indian Institute of Technology Roorkee; Indian Society of Earthquake Technology(ISET),Ministry of Science and Technology, National Disaster Management Agency(NDMA),Ministry of Home Affairs; Government of India and many other Government as well as Non Government Organizations have done many cutting edge research works in this field.

METHODOLOGY :

HAZUS, a software program developed by Federal Emergency Management Agency(FEMA) which requires a GIS application and another software SELINA developed by NORSAR of Norway, which requires MATLAB, would be applied for estimation of loss using primary as well as secondary data on building stock, utility services ,demographic, social, economic information ,geological , geotechnical ,transportation data, etc which would be collected from various Government and Non Government Organizations taking *Dispur area of Guwahati city in the state of Assam , North East India, as a case study area.*

Appropriate preparedness and mitigation strategies can be adopted to reduce the impact of natural disaster .Earthquake disaster mitigation components are: pre-earthquake phase of preventive and preparedness activities ,phase of precursory phenomenon and earthquake occurrence, post earthquake emergency phase ,post earthquake reconstruction and rehabilitation phase. Pre-disaster preventive and preparedness activities are : hazard zoning, earthquake prediction and warning ,earthquake codes, laws, bye laws , retrofitting of existing structures, educational training ,emergency preparedness. Post disaster activities are of two types : short range activities viz seismological and geophysical studies, engineering and technological studies. Long range activities are repair ,restoration and seismic strengthening of damaged buildings, pulling down unsafe, unrepeatable structures and removal of debris, reconstruction of new buildings at old sites, relocation of whole villages or township with new planning and designing, creation of job opportunities for the affected people and their economic rehabilitation.

IMPORTANCE & UTILISATION OF THE RESEARCH IN THE CONTEXT OF CURRENT STATUS :

Such a scenario which would be developed through this research study, is widely used to better understanding and help plan for the future. A successful scenario would tell the story of a defined earthquake and its impacts. It would draw familiar aspects of community that they could readily recognize. It would also help decision makers to visualize specific impacts that were based on currently accepted scientific and engineering knowledge by providing a wide variety of information about the projected earthquake.

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