PREFACE

In any programme of disaster prevention, mitigation and preparedness, the first and the foremost task is to identify the vulnerable areas where the impact of natural disasters namely, earthquakes, cyclones, floods and landslides could reach disastrous intensity for the affected communities. Equally important is to identify the man-made buildings and structures and infrastructures which will be exposed to the hazards, to assess the vulnerability of these exposures and determine the disaster risk to the communities. In the preparation of the Vulnerability Atlas of India (2019), the Peer Group attempts to fulfil these requirements. Relevant information regarding the Atlas is given here below:

Hazard Maps - The monitoring of hazards is being carried out by the following most important organizations in the country: Seismic occurrence and cyclone hazard monitoring by India Meteorological Department (IMD) and flood monitoring by the Central Water Commission. In addition, noteworthy contributions are made by Geological Survey of India in mapping of Seismic Hazard & collation of landslide incidences and the Department of Earthquake Engineering, University of Roorkee (now Indian Institute of Technology, Roorkee) on all aspects of engineering concerning seismic risk. It is noted that the Bureau of Indian Standards Committees on Earthquake Engineering and Wind Engineering have already prepared a Seismic Zoning Map and the Wind Velocity Map including cyclonic winds for the country, and the Central Water Commission has prepared a Flood Atlas of India.

The Group has used these hazard maps to prepare 1:2 million scale maps by superposing the above available data on Survey of India map of this scale as the base map. The earthquake, wind storm and flood hazard maps are drawn for each State and Union Territory separately in which the various district boundaries are clearly shown for easy identification of the hazard risk prone areas. The landslide incidence maps and thunderstorm incidence maps are also presented in the Atlas from data provided by the nodal agencies i.e. Geological Survey of India (GSI) and Indian Meteorological Department (IMD), respectively. The seismic zones of India based on intensities of earthquakes on MSK scale and intensity of the wind hazard related with wind speed are shown on the maps clearly identifying the various intensity zones. Flood prone areas were earlier categorized in terms of unprotected and protected areas in 1997 Atlas. However, the division using protected areas were removed since when the protection fails under a large flood, the devastation in the ‘so called protected’ area becomes even more severe since people have a false sense of protection about the calamity they may face. No information is available on low lying areas in urban centres, which are liable to inundation during heavy rains, hence such areas could not be identified. Landslide Incidence Map besides giving landslide incidences also provide information on Annual State Rainfall Normals. Thunderstorm Incidence Map shows number of thunderstorm at a station during 1981-2010.

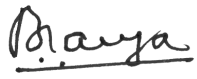
Vulnerability and Risk Assessment - It is noted that preliminary effort towards vulnerability assessment of buildings under seismic and cyclone intensities has been made by the Deptt. of Earthquake Engineering, Indian Institute of Technology, Roorkee and Structural Engineering Research Centre, Chennai, respectively. Taking guidance from that work, the types of housing as existing in each district has been taken from the Census of India, 2011 and categorised from vulnerability consideration. The vulnerability of these types to various intensities of the hazards including floods was estimated by the Peer Group based on knowledge gained in past disaster damage surveys, and the damage risk present in each district is presented accordingly in a separate table for each district wherein the area of the district prone to various hazard intensities has also been shown. All buildings are likely

to suffer severe damage if impacted by landslides, hence separate vulnerability levels to different building types could not be assigned.

The Vulnerability Atlas of India (2019) gives State-wise hazard maps and district wise damage risk tables for the country as a whole. The information and data given in the Atlas can be utilised by the Institutions and Disaster Management organizations for preparing damage scenarios in individual recurrence of hazards and for developing methodologies for mitigation and prevention.

It has been observed since the release of the first Atlas, that the Atlas has helped the planning agencies, the state and district administrations and the communities at panchayat levels in raising the level of awareness about the disaster proneness of the identified areas and the need for disaster preparedness and mitigation on a scientific and realistic basis.

It is hoped that the present Atlas, which is now also available in fully digitized format, will be more conveniently used for various disaster risk management planning, preparedness and mitigation.



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