

'Earthquake Damage & Loss Estimation of Guwahati City for Scenario Earthquake'

After a disastrous earthquake a reasonable damage information overview is difficult to obtain during the first few hours or even for first few days. During the first days and weeks following the earthquake, overview maps that indicate relative and absolute damage distribution may be of great importance for rescuing lives and property, and for providing relief and rescue operation by the authorities.

The combination of the region's high seismic hazard situation, Guwahati's topographical and geological site conditions, the city's vulnerable building stock which has resulted from a rapid building development over the past decades, the city's large and dense population as well as the city's strategical importance, makes Guwahati a perfect candidate to develop a more advanced earthquake damage and loss information system which will be the first of its kind in India and the southeast Asian region.

Assam Engineering College (AEC) in collaboration with NORSAR, North East Institute of Science and Technology (CSIR-NEIST Jorhat), Department of Earthquake Engineering at IITRoorkee(IITR) and other regional stakeholders herewith propose to develop a *Real-time Earthquake Damage and Loss Information System* for the city of Guwahati, Assam (short: ELIAS). ELIAS will directly and indirectly contribute to disaster risk reduction and risk awareness of the region and thereby will be in line with the goals of the *2015 Sendai Framework for Disaster Risk Reduction*.

On February 26, 2016, as directed by the Chief Secretary, Assam and requested by ASDMA, AEC (Dr.Jayanta Pathak) made a presentation on *Development and Implementation of a Real-Time Earthquake Damage and Loss Information System for the city of Guwahati, Assam (ELIAS)*. On request of ASDMA, Dr.Jayanta Pathak made a presentation to GDD, GMDA, GMC, DDMA-Kamrup Metro to share the benefit of the proposal on 18th May 2016, Chaired by the Commissioner & Secretary, Government of Assam, Guwahati Development Department(GDD) and made several useful recommendations.

Based on the consultation and recommendations the present form of the proposal - **"Earthquake Damage and Loss Estimation of Guwahati City for Scenario Earthquakes"** is approved and accepted for implementation. The project was started with the inception workshop, organized by ASDMA in collaboration with Civil Engg Deptt, AEC on 10th November, 2016 at ASDMA Conference Hall. Around 55 Participants from various Govt Deptt, Knowledge Institutes, INGOs, etc. has participated in the workshop. Dr Dominik H Lang & Abdelghani Meslem from NORSAR, Prof Yogendra Singh from IIT (Roorkee) and Prof Jayanta Pathak (AEC) shared the project details along with project deliverables. Dr Atul Bora (Principal, AEC) has also attended the workshop as special guest.

The Project milestones are as follows:

M1 – Inventory database with including high-priority buildings, and calibrated Model Building Types (MBT) scheme.

- M2– Seismic performances analysis and evaluation for the existing high-priority buildings and compilation of capacity/fragility curves
- M3 – Seismic hazard assessment and identification of potential earthquake scenarios within the region of Guwahati, Assam State.
- M4 – Development of GIS-based exposure, vulnerability, socio-economic models. Results of earthquake scenarios-based risk assessment and earthquake risk models. Generate Ward-wise Information at sub-ward or Geounit level
- M5 – Results of cost-benefit analysis with respect to future seismic network installation
- M6 – Workshops and training courses for professionals/engineers and end-users/beneficiaries of the earthquake loss assessment, training course on earthquake-resistance performance for the existing building typology classes (recorded seismic deficiency in different building types and provide guidance practice for seismic response improvement).
- M7 – Workshop with planning and building control authorities aimed to enforce and adopt policy measures to make buildings seismic safe. Present results of cost benefit analysis with respect to future seismic network installation.

Present status of the project:

Presently, Civil Engineering Deptt of AEC is preparing the Inventory database including high-priority buildings, and calibrated Model Building Types (MBT) scheme and proposed to finish it by 2nd week of February, 2017 according to project timeline.