

# **Project Brief**

## **Multi State Earthquake Preparedness Awareness Campaign**

### **And Mock Drill**

**Implementing Partner: National Disaster Management Authority, IIT Bombay,  
IIT Madras and GeoHazards Society India**

#### **1. Background:**

In our context it is impossible to predict and prevent earthquakes, but we have to be prepared for in a diligent manner to save lives and livelihoods. According to the latest seismic zoning map of India about 58% of India's landmass is vulnerable to moderate or severe seismic hazards i.e. prone to shaking of MSK intensity VII and above. During the period 1990 to 2006 India has experienced 6 major earthquakes that has resulted in over 23,000 deaths and caused enormous damage to property and infrastructure. The entire Himalayan region is considered to be vulnerable to high intensity shaking and in a relatively short span of 50 years five such earthquakes have occurred:

- i. Shillong 1897 (M 8.7)
- ii. Kangra 1905 (M 8.0)
- iii. Bihar- Nepal 1934 (M 8.3)
- iv. Assam-Tibet 1950 (M 8.6)

The latest earthquake to cause loss of time and money is the Sikkim earthquake of Magnitude 6.9.

NDMA has been very conscious of this hazard right from its inception. A number of mock drills have been carried out at the grassroots level to generate awareness amongst the stakeholders and also help them identify gaps in their planning process. Since this disaster cannot be localised and will cover large area we conducted a mega mock exercise on 15<sup>th</sup> Feb 2012 in the National Capital Region in partnership with Government of Delhi. In this exercise more than 15,000 officials and observers including His Excellency The Governor of Delhi took part in this exercise which was conducted at 400 places which included high rise buildings, malls, all the schools, hospitals, metro stations, airport and the like. In the run-up to this exercise workshops were conducted for Hon'ble members of the Legislative Assembly, Hon'ble Judges of the State High Court, lawyers and residents of welfare associations. An extensive media campaign was launched by the State Government including SMS campaign. The participation in this exercise was most encouraging. Few of the important lessons which have been learnt during this exercise are:

- i. Survey of vulnerable buildings
- ii. Standardisation of SOPs and various Emergency Support Functions
- iii. Training and awareness of stakeholders
- iv. State of Art Emergency Operation Center
- v. Compatible communications with all the agencies
- vi. Raising an training of response forces

- vii. Purchase of basic equipment for search and rescue

Now in our effort to depict a realistic scenario we have chosen to replicate the Kangra Earthquake of 1905 in the North-West and the Shillong Earthquake of 1897 in the North-East. The Kangra earthquake of 1905 took 20,000 lives and many more were injured. District towns of Kangra and Dharamshala including Mcleodganj were completely devastated. Extensive damage also occurred in Lahore, Gurdaspur, Pathankot, Jalandhar, Ludhiana, Ambala and Shimla. Dehradun was also badly affected with landslides; tremors were felt in Delhi and as far as Calcutta.

The simulation on '*Possible Effects of a Major Earthquake in Kangra Region of Himachal Pradesh*' by Prof A S Arya, National Seismic Advisor, projects that if a similar earthquake of 1905 repeats itself in the region major losses cannot be avoided. It estimates that a Magnitude 8 earthquake could cause complete collapse of 145000 houses and partial collapse of 268000 houses in the area of 7900 km<sup>2</sup>. The loss of life could range from 88999 to 344000 depending on the time of the day and season when it occurs.

To generate awareness and face such a calamity NDMA in partnership with the States, is conducting exercises on multi-state scenario for a hypothetical earthquake of **Magnitude 8** with its epicentre at **Sundernagar Town** in Mandi District which has been scientifically developed with the group of experts from IITs and Geological science. It will prepare the States to face any such event and enhance the response mechanism of not only the States but also the region.

## **2. The main objectives of the project are:**

- a) To generate awareness amongst the stakeholders of an earthquake of such a high magnitude covering a large number of states.
- b) To evaluate the response mechanism and functioning of various stakeholders to identify gaps.
- c) To facilitate preparation of response plans at various levels.
- d) To facilitate coordination between DDMA's, SDMA's and NDMA.
- e) To understand the direct and indirect consequences of the earthquake in the affected area.
- f) To provide a template for development of earthquake scenario elsewhere in the country.

## **3. Hypothetical Scenario:**

- a) Simulation results have predicted strong shaking in the states of Himachal Pradesh, Haryana, Punjab, Uttarakhand and Jammu & Kashmir and Union Territory of Chandigarh.
- b) Intensity IX and above is felt over most parts of Himachal Pradesh, Punjab and in some parts of Haryana, Uttarakhand and Uttar Pradesh.
- c) Such a Scenario will also impact the States of Jammu & Kashmir, Uttarakhand and Uttar Pradesh. However, for administrative reasons the mock exercises are being planned for Himachal Pradesh, Haryana, Punjab and Union Territory of Chandigarh.

The district-wise intensity of the hypothetical earthquake is tabulated below: -

State	Intensity	Districts
<b>Chandigarh</b>	IX - X	Chandigarh
<b>Haryana</b> (13 out of 22 districts)	IX - X	Panchakula , Ambala, Yamunanagar, Kurukshetra, Karnal,
	VIII - IX	Kaithal, Jind, Panipat
	VII - VIII	Hisar, Sonipat, Rohtak, Bhiwani, Jhajjar
<b>Himachal Pradesh</b> (12 districts)	IX - X	Chamba, Lahul and Spiti, Kangra, Kullu, Mandi, Hamirpur, Una, Shimla, Bilaspur, Solan, Sirmaur
	VIII - IX	Kinnaur
<b>Punjab</b> (20 districts)	IX - X	Gurudaspur, Hoshiarpur, Jalandhar, Rupnagar , SBS Nagar, Ludhiana, SAS Nagar, Fatehgarh Sahib, Patiala
	VIII - IX	Amritsar, Kapurtala, Tarn Taran, Moga, Faridkot, Sangrur, Barnala, Bhatinda, Mansa
	VII - VIII	Muktsar

#### 4. Scenario Development Team

The earthquake scenario development team is being led by the NDMA and consists of scientific experts in the field of earthquake engineering (from IIT Bombay and IIT Madras) and representatives of Himachal Pradesh, Haryana, Punjab, State governments and Chandigarh UT. The team also includes representatives of organizations involved in earthquake monitoring, hazard assessment, and managing major infrastructure or facilities in the affected region. The team also includes a Coordination Agency GeoHazards Society India to facilitate the coordination between the various stakeholders, particularly at the state level. The team has been diligently working to jointly develop the consequences of the scenario earthquake.

#### 5. Project Outcome

- i. To understand likely impact of a large earthquake
- ii. To assess and understand likely impact on functioning and responsibility of various stakeholders
- iii. To facilitate state governments and other stakeholders in their preparation of earthquake disaster management plans
- iv. To facilitate state governments and stakeholders in their preparation of action plans to implement Disaster Management Plans.
- v. To facilitate evaluation of intra-agency coordination capability
- vi. To facilitate evaluation of inter-agency coordination capability
- vii. To facilitate evaluation of impact on defence establishment
- viii. To provide a template for development of other damage scenarios in the region

- ix. To provide a template for development of earthquake and other damage scenarios in other parts of the country

**6. State level participation.**

- i. State Disaster Management Authority and District Disaster Management Authority to own and drive the project.
- ii. Participating States needs to organize a multi-disciplinary team to oversee the smooth running of the scenario.
- iii. States to project the number of departments and districts which are likely to participate

**7. Responsibilities of training.**

- a. In joint collaboration with NDMA and IIT.
- b. Three major trainings of trainers to be conducted: -
  - i. Incident Response System.
  - ii. Conduct of TableTop Exercise.
  - iii. Vulnerability Assessment.
- c. Minor training at the departmental and district level for amendment of plans and gap identification.

**8. Regional Response Plan.**

This will be prepared jointly by NDMA and SDMA.

**9. Awareness Campaign.**

Awareness campaign would be launched jointly by NDMA and SDMA.

**10. Table Top Exercise.**

- a. Intra departmental to check the resource availability and requirement along with SOPs.
- b. Inter departmental to check the coordination and linkages.

**11. Mega Mock Exercise at Chandigarh.**

On the same lines as Delhi Mega Mock Drill of Feb 2012.

**12. NDMA to provide: -**

- a. One State Coordination Officer for each state.
- b. Assistance for workshop.
- c. Assistance toward Table Top Exercise and Mock Exercise.

**13. States to provide: -**

- a. Team leader for various activities like: -
  - i. State Nodal officer for overall coordination.
  - ii. Senior level Engineer for Vulnerability assessment.
  - iii. Departmental nodal officers to represent the departments and lead the task of resource mapping.
- b. For the representative from NDMA a suitable work area and infrastructure.