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Resilient India - Disaster Free India

25 Years of Risk to Resilience

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International Year of Cooperatives 2025
Cooperatives Build a Better World

NATIONAL WORKSHOP ON

CAPACITY BUILDING FOR EARTHQUAKE RISK MITIGATION:

EXPERIENCES AND INITIATIVES

08- 10 September, 2025

NIDM, DELHI

Key topics of the workshop –

- Earthquake Risk Mitigation
- Seismotectonics of Himalayan Region
- Gaps in Urban and Critical Infrastructure
- Lessons Learned from Past Earthquake Events
- Global Best Practices for Earthquake Resistant Design

Organized by

National Institute of Disaster Management (NIDM)

Ministry of Home Affairs, Government of India

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NATIONAL INSTITUTE OF DISASTER MANAGEMENT
Ministry of Home Affairs, Govt. of India

National Workshop on
Capacity Building for Earthquake Risk Mitigation: Experiences and Initiatives

Venue: NIDM Rohini, Delhi
Date: 08-10 September 2025

CONCEPT NOTE

India, owing to its position on the seismically active Indian plate, has a long history of destructive earthquakes. These have had devastating effects on human life, infrastructure, economy, and the environment in India. Being a seismically active country, especially in the Himalayan region, India has faced several destructive earthquakes that have left deep and lasting impacts. One of the most immediate and tragic effects of earthquakes is the loss of human lives. The Indian plate is slowly moving northward, colliding with the Eurasian plate and forming the Himalayan Mountain range, making northern and northeastern India particularly earthquake-prone. However, other regions, including central and western India, have also experienced significant seismic activity. One of the earliest recorded earthquakes was the 1819 Rann of Kutch earthquake (M ~7.7), which caused massive damage and altered the landscape by creating a geological feature known as the "Allah Bund". The 1897 Assam earthquake (M 8.0) and the 1905 Kangra earthquake (M 7.8) devastated large areas of northeast and north India, claiming thousands of lives. The 1934 Bihar-Nepal earthquake (M 8.0) was one of the deadliest, killing over 10,000 people. In 1950, the Assam-Tibet earthquake (M 8.6) became one of the world's strongest recorded quakes on land, with widespread destruction in Arunachal Pradesh and Assam. Peninsular India, considered relatively stable, though, was shaken by the 1993 Latur earthquake in Maharashtra (M 6.4), which killed nearly 10,000 people. The 2001 Bhuj earthquake in Gujarat (M 7.7) was another major disaster, resulting in around 20,000 deaths and widespread infrastructure damage. In recent years, India felt the impact of the 2015 Nepal earthquake (M 7.8), especially in Bihar and Uttar Pradesh, underscoring the continued vulnerability of the region.

The Bhuj earthquake in 2001 flattened entire towns and villages, leaving thousands homeless. Weak construction practices and non-compliance with building codes increase the vulnerability of structures, especially in rural and semi-urban areas. Earthquakes impose a heavy economic burden. The cost of rebuilding damaged infrastructure, homes, and public facilities runs into billions of rupees. Economic activity often comes to a halt in affected areas, affecting livelihoods and trade. Many people are forced to live in temporary

shelters, often for long durations. Overcrowded relief camps lack basic amenities, leading to poor living conditions and health issues. Survivors often experience trauma, anxiety, and depression. The fear of aftershocks, loss of loved ones, and uncertain future cause long-term mental health challenges. Earthquakes severely disrupt essential services like healthcare, education, transportation, and communication. Hospitals may become non-functional, and schools are often used as shelters, halting education. Earthquakes in mountainous areas often trigger landslides and rockfalls, further endangering life and blocking transport routes. Ground deformation and changes in groundwater levels also occur. These effects underline the critical importance of earthquake preparedness, resilient infrastructure, and community awareness in India.

Earthquakes emphasize the need for seismic hazard assessments, earthquake-resistant infrastructure, retrofitting of susceptible buildings, and building capacity for effective relief and post-earthquake operations. To meet the Hon'ble Prime Minister's vision "Viksit Bharat 2047", it is need of the hour to assess our progress, advancements, and ongoing challenges in the disaster management, especially earthquakes. Keeping this in agenda, NIDM has planned to conduct a three days' workshop with specific focus on lessons learned from the past earthquakes, change in construction practices and advancement done so far. This workshop will provide a platform for stakeholders to review building codes, explore vernacular practices, identify gaps in contemporary practices, and challenges in implementing building codes during construction along with the examine strategies for developing resilient infrastructure.

OBJECTIVES –

- Highlighting Gaps and Challenges present in the States/UTs in implementing Earthquake Resilience Initiatives, especially in urban infrastructure, critical infrastructure (health, power, telecommunication, and educational infrastructure), and recovery and reconstruction programmes.
- To identify the initiatives and activities taken by the governments and mapping of activities particularly related to earthquake risk reduction.
- Document vernacular construction practices from the past and behavioural changes in the enforcement of contemporary building codes.
- Update training material based on the identified gaps to improve outcomes of upcoming training programmes.

WORKSHOP STRUCTURE –

INAUGURAL SESSION

The inaugural session will unite all stakeholders on a common platform, where they will be briefed on the earthquake risk reduction programmes currently being implemented in their respective States/UTs. The session will provide an overview of past earthquake events and the subsequent operations, reflecting on lessons learned and improvements made. Key topics will include revisiting the aftermath of significant earthquake events and evaluating the effectiveness of past responses. Additionally, the session will outline the tentative objectives and plan for future earthquake risk reduction efforts, focusing on collaborative strategies and regional approaches to enhance preparedness and resilience.

TECHNICAL SESSION (1-6): EXPERT LECTURES

The expert lectures will be delivered by eminent practitioners and professors who are experts in mitigating earthquake hazards and improving infrastructure resilience. These professionals have extensive experience working on disaster management and risk reduction strategies. They will share valuable insights drawn from their work in addressing the specific challenges faced in the different part of India. The lectures will focus on the unique seismic risks in the region and explore innovative solutions for strengthening infrastructure. By sharing their experiences, the experts would aim to enhance the knowledge base of participants and provide practical approaches to earthquake risk reduction and resilience building.

PRESENTATION BY PARTICIPATING STATES AND UTs – ON EARTHQUAKE RESILIENCE INITIATIVES

The presentation by the SDMAs of States and UTs will focus on identifying and addressing the gaps and challenges in implementing earthquake resilience initiatives. It will highlight the unique seismic risks faced by these states, existing gaps in disaster preparedness and infrastructure resilience, and difficulties encountered in enforcing building codes and safety measures. The presentation aims to foster a deeper understanding of regional challenges, share lessons learned, and promote collaborative approaches for improving earthquake resilience in different states. It will also explore potential solutions to enhance disaster risk reduction strategies.

GROUP ACTIVITY 1 - IDENTIFYING GAPS/CHALLENGES IN THE SELECTED AREAS

The participating states will be divided into three groups based on their respective working areas. Each group will focus on key challenges and identify gaps in essential sectors. These discussions will inform the development of tailored training programmes aimed at building capacity and enhancing the effectiveness of local efforts. The primary topics for discussion will include gaps in urban infrastructure, critical infrastructure (such as health, power, telecommunications, and education), and challenges in recovery and reconstruction. The insights gained will guide the creation of targeted training programmes to address area-specific needs and improve overall disaster response and resilience. Groups will give presentations on the key outcomes and expectations. The main goal is to consolidate the findings, identify common and area-specific gaps, and determine the requirements necessary for addressing those gaps across the different regions.

GROUP ACTIVITY 2 - STRATEGIES FOR ACTION PLAN FORMULATION AND ROADMAP DEVELOPMENT

All the participants will be grouped into three groups. An earthquake scenario will be given to them to prepare a plan to respond that earthquake by considering the Action Plan Formulation, State-wise roadmap development, Resource mobilization strategies, and Monitoring & evaluation of framework. The developed plan will be presented by each group and if any gap is found in the plan, will be addressed by the experts.

GROUP-WISE PRESENTATIONS AND OPEN HOUSE DISCUSSIONS

The open house discussion will provide a platform for participants, experts, and representatives from the all the States/UTs to engage in meaningful dialogue on the issues raised during the presentations. Participants will have the opportunity to share insights, raise concerns, and suggest practical solutions related to earthquake resilience and

disaster risk reduction. This interactive session aims to encourage knowledge exchange and collaborative thinking.

VALEDICTORY SESSION: CONCLUDING REMARKS AND WAY FORWARD

This three days' workshop on theme **Capacity Building for Earthquake Risk Mitigation: Experiences and Initiatives** will uncover the gaps and highlights of the progress made in earthquake risk reduction and practical implementation of related measures. This workshop aims to identify key gaps in existing approaches and strategies for earthquake resilience.

The concluding remarks will summarize key takeaways, acknowledge the contributions of all stakeholders, and outline the way forward. Emphasis will be placed on strengthening regional cooperation and enhancing implementation strategies for building resilient infrastructure in all States/UTs in India.

Based on the insights gained from expert lectures, state presentations, and open discussions, a Capacity Building Programme for Earthquake Risk Reduction at the National Level will be developed. This program will be structured to specifically address the gaps identified during the workshop, ensuring a more effective and regionally tailored approach to earthquake risk reduction across India. It will contribute significantly to strengthen resilience and preparedness at the both regional and national level.

Region-wise Group Formation

Group No.	Group Name	Participating States and UTs
Group I	North Eastern Region (NE)	Arunachal Pradesh, Nagaland, Manipur, Mizoram, Tripura, Assam, Meghalaya, Sikkim, West Bengal, Jharkhand, Bihar
Group II	Western Himalayan Region (WH)	Jammu and Kashmir, Ladakh, Himachal Pradesh, Uttarakhand, Delhi, Haryana, Punjab, Chandigarh, Uttar Pradesh
Group III	Rest of India (RoI)	Gujarat, Rajasthan, Madhya Pradesh, Maharashtra, Chhattisgarh, Dadra & Nagar Haveli and Daman & Diu, Odisha, Karnataka, Goa, Andhra Pradesh, Tamil Nadu, Lakshadweep, Kerala, Pondicherry, Andaman & Nicobar Islands, Telangana

Organizing Team

Patron	Shri Safi Ahsan Rizvi, IPS, Executive Director, NIDM
Coordinator	Dr. Amir Ali Khan, Associate Professor and HoD, Resilient Infrastructure Division (RID), NIDM (amir.nidm@nidm.gov.in)
Co-coordinator	Dr. Pankaj Kumar, Assistant Professor, NIDM (pankajkumar.nidm@nic.in)
	Dr. Garima Aggarwal, Senior Consultant, RID (garima.nidm@nic.in)
Programme Team	Mr. Prateek Roshan, Consultant, RID (prateek.nidm@nic.in ; +91-9818393590)
	Mr. Sandeep Kumar Singh, Junior Consultant, RID (sandeepsingh.nidm@nic.in ; +91-9234049954)
	Ms. Avipsha Mohanty, Junior Consultant, RID
	Ms. Geeta Sharma, Training Assistant, GIDRR
	Mr. Dev Kumar, DEO, RID

Suggestive Reading Material

- https://seismo.gov.in/sites/default/files/seismoglossary.pdf
- https://seismo.gov.in/dos-and-donts
- https://ndmindia.mha.gov.in/ndmi/images/The%20Disaster%20Management%20Act,%202005.pdf
- https://ndma.gov.in/sites/default/files/PDF/Guidelines/earthquakes.pdf
- https://nidm.gov.in/PDF/pubs/EQ%20North%20East.pdf
- https://nidm.gov.in/PDF/safety/earthquake/link17.pdf
- https://bmtpc.org/DataFiles/CMS/file/Publication/EQ_TIPS_2015.pdf
- https://vai.bmtpc.org/
- https://www.undrr.org/media/48528/download?startDownload=20250501
- https://hpsdma.nic.in//admnis/admin/showimg.aspx?ID=347
- https://bmtpc.org/DataFiles/CMS/file/Publication/Seismic_Retrofitting_Book_102017.pdf

- http://www.gsdma.org/uploads/Assets/iec/earthquakerr06172017024901390.pdf
- https://ndma.gov.in/sites/default/files/PDF/Reports/EDRI_Report_final.pdf
- https://mohua.gov.in/upload/uploadfiles/files/MBBL.pdf
- https://ndma.gov.in/sites/default/files/PDF/Guidelines/sdmp.pdf
- https://ndma.gov.in/sites/default/files/PDF/Guidelines/retrofitting-guidelines.pdf
- https://nidm.gov.in/PDF/IEC/eq%20guide.pdf
- https://nidm.gov.in/PDF/pubs/SikkimEQ_ReconstuctionStrategy2011.pdf
- https://nidm.gov.in/PDF/pubs/SikkimEQ_ARoadmapforRecurection2011.pdf
- https://nidm.gov.in/PDF/pubs/MEQ_NIDM2022.pdf
- http://www.gsdma.org/uploads/Assets/other/earthquakemanagementplanvol10607201704500692 8.pdf
- http://www.gsdma.org/uploads/Assets/other/earthquakemanagementplanvol20607201704502136 1.pdf
- http://www.gsdma.org/uploads/Assets/key-projects/earthquakebehaviour06172017025353283.pdf
- https://www.iitk.ac.in/nicee/IITK-GSDMA/NSE_002_31May2013.pdf
- https://cbri.res.in/wp-content/uploads/2021/09/Simplified-Guidelines-1244-1_FINAL.pdf
- https://seismo.gov.in/sites/default/files/publication/Delhi_microzonation_report-2015.pdf
- https://www.bmtpc.org/DataFiles/CMS/file/PDF_Files/Compendium_Emerging_Technologies_Fourth_Edition.pdf
- https://hpsdma.nic.in/WriteReadData/LINKS/2db09eead-7944-4fed-ac7b-2f8e8ee22082.pdf
- https://tcp.hp.gov.in/Application/uploadDocuments/news/News20190706_161751.pdf
- https://www.bmtpc.org/DataFiles/CMS/file/PDF_Files/BMTPC_CBRI_Compendium_Building_Technology_2021S.pdf
- https://www.bmtpc.org/DataFiles/CMS/file/PDF_Files/ET_Pocket_Book_Oct2021_Final_S.pdf

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NATIONAL INSTITUTE OF DISASTER MANAGEMENT
Ministry of Home Affairs, Govt. of India

National Workshop on
Capacity Building for Earthquake Risk Mitigation: Experiences and Initiatives

Venue: NIDM Rohini, Delhi
Date: 08-10 September 2025

Programme Schedule

Day 1 (8 September 2025, Monday)		
Time	**Topic/Session**	**Dignitaries/Panelists**
09:30 – 10:00 AM	**Registration**	
10:00 – 11:00 AM	**Inaugural Session**	
	Welcome & Context Setting	Dr. Amir Ali Khan, HoD, RID, NIDM
	Special Address	TBC
	Keynote Address	TBC
	Inaugural Address	ED NIDM
	Vote of Thanks	JD NIDM/Sr. Advisor NIDM
11:00 – 11:30 AM	Group Photograph + High Tea	
11:30 – 12:10 PM	**Technical Session 1:** Multi-pronged approach Mitigating Seismic Risk in India	Prof. Ramancharla Pradeep Kumar Director, CSIR- (CBRI), Roorkee • 30 min (lecture) • 10 min(discussion)
12:10 – 12:50 PM	**Technical Session 2:** Seismotectonics of the Himalayan Region and its Implications for Seismic Risk Mitigation	Prof. Ambrish Kumar Mahajan Head, Department of Geology Central University of Himachal Pradesh • 30 min (lecture) • 10 min(discussion)

12:50 – 01:50 PM	Lunch	
01:50 – 02:30 PM	**Technical Session 3:** Gujarat (2001 Bhuj) Earthquake: Lessons from Post-Earthquake Studies and Reconstruction Programme	Prof. Mahesh G. Thakkar Director, Birbal Sahni Institute of Palaeosciences, Lucknow • 30 min (lecture) • 10 min(discussion)
02:30 – 03:10 PM	**Technical Session 4:** Integrating Global Best Practices for Designing Earthquake- safe building environment	Dr. Shailesh Kumar Agrawal Executive Director, BMTPC • 30 min (lecture) • 10 min(discussion)
03:10– 03:30 PM	High Tea	
03:30– 04:10 PM	**Technical Session 5:** Urban Earthquake Risk Mitigation at National Level- Initiatives and Experiences	Dr. O.P. Mishra (TBC) Director, National Center for Seismology • 30 min (lecture) • 10 min(discussion)
04:10– 04:50 PM	**Technical Session 6:** Earthquake-induced Landslides in the Hilly Regions of India- NESAC Expert	Expert Name (TBC) • 30 min (lecture) • 10 min(discussion)
04:50– 05:00 PM	Summing-up Day 1	
Day 2 (9 September 2025, Tuesday)		
Time	**Topic/Session**	**Dignitaries/Panelists**
09:30 – 09:40 AM	Recapitulation of Day 1	
09:40 – 03:30 PM	**Presentations on Earthquake Resilience Initiatives–** *(10 min each for participating States and UTs)* ***Chair-*** *Dr. Shailesh Kumar Agrawal* ***Co-chair-*** *Prof. Devesh Walia*	
09:40 – 11:10 AM	Group I: North Eastern Region (NE)	**Coordinator –** Mr. Prateek Roshan (NIDM)
11:10 – 11:30 AM	High Tea	
11:30 – 01:00 PM	Group II: Western Himalayan Region (WH)	**Coordinator –** Ms. Azra Mahwash (NIDM)
01:00 – 02:00 PM	Lunch	

02:00 – 03:30 PM	Group III: Rest of India (RoI)	**Coordinator –** Mr. Shreyash Dwivedi (NIDM)
03:30 – 03:45 PM	High Tea	
03:45 – 04:45 PM	**Group Activity 1:** *Identifying Gaps/Challenges w.r.t. Urban Resilience, Critical Infrastructure, Recovery & Reconstruction, Policy Implementation and Community Engagement (Parallel Session)* ***Chair-*** *Dr. Shailesh Kumar Agrawal* ***Co-chair-*** *Prof. Devesh Walia*	
	Group I: North Eastern Region (NE)	**Coordinator/Moderator** Dr. Amir Ali Khan (NIDM) Ms. Ranu Chauhan (NDMA) Mr. Prateek Roshan (NIDM)
	Group II- Western Himalayan Region (WH)	**Coordinator/Moderator** Dr. Pankaj Kumar (NIDM) Ms. Azra Mahwash (NIDM) Ms. Avipsha Mohanty (NIDM)
	Group III- Rest of India (RoI)	**Coordinator/Moderator** Dr. Garima Aggarwal (NIDM) Mr. Vijay Lokesh (NDMA) Mr. Shreyash Dwivedi (NIDM) Mr. Sandeep Kumar Singh (NIDM)
04:45– 05:00 PM	Summing-up Day 2	
Day 3 (10 September 2025, Wednesday)		
Time	**Topic/Session**	**Dignitaries/Panelists**
09:30 – 10:00 AM	Recapitulation of Day 2	
10:00 – 11: 30 AM	**Group Activity 2:** *Strategies for Action Plan Formulation and Roadmap Development (Parallel Session)* ***Chair-*** *Prof. Sasankasekhar Mandal* ***Co-chair-*** *Sh. M. Somorjit Singh*	
	Group I: North Eastern Region (NE)	**Coordinator/Moderator** Dr. Amir Ali Khan (NIDM) Ms. Ranu Chauhan (NDMA) Mr. Prateek Roshan
	Group II- Western Himalayan Region (WH)	**Coordinator/Moderator** Dr. Pankaj Kumar (NIDM) Ms. Azra Mahwash Ms. Avipsha Mohanty

	Group III- Rest of India (RoI)	**Coordinator/Moderator** Dr. Garima Aggarwal (NIDM) Mr. Vijay Lokesh (NDMA) Mr. Shreyash Dwivedi Mr. Sandeep Kumar Singh
11:30 – 11:50 AM	High Tea	
11:50 – 1:15 PM	Group-wise Presentations and Open House Discussions	**Coordinator/Moderator** Dr. Amir Ali Khan (NIDM), Dr. Pankaj Kumar (NIDM), Dr. Garima Aggarwal (NIDM), Mr. Shreyash Dwivedi, Mr. Sandeep Kumar Singh
1:15 – 02:00 PM	**Valedictory Session**	
1:15 – 01:25 PM	Workshop Report/ Concluding Remarks	Dr. Amir Ali Khan
1:25 – 01:55 PM	Way Forward and Distribution of Certificates	Shri Safi Ahsan Rizvi, IPS, ED, NIDM/ Member NDMA
1:55 – 02:00 PM	Vote of Thanks	Col. Manoram Yadav, JD, NIDM
02:00 – 03:00 PM	Lunch	

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Group III	Rest of India (RoI)	Gujarat, Rajasthan, Madhya Pradesh, Maharashtra, Chhattisgarh, Dadra & Nagar Haveli and Daman & Diu, Odisha, Karnataka, Goa, Andhra Pradesh, Tamil Nadu, Lakshadweep, Kerala, Pondicherry, Andaman & Nicobar Islands, Telangana

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