DEPARTMENT OF CIVIL ENGINEERING

Report on Five-Day Online Short-Term Training Programme (STTP) on "Affordable Housing in Disaster-Prone Areas"

Date:15th – 19th December 2025

Organised by the Department of Civil Engineering, KCG College of Technology, Chennai(Remote Centre)In collaboration with NITTTR, Chandigarh

The Department of Civil Engineering, KCG College of Technology, organised a Five-Day Online Short-Term Training Programme (STTP) on "Affordable Housing in Disaster-Prone Areas" from 15th to 19th December 2025. The programme was conducted as a Remote Center of the National Institute of Technical Teachers' Training & Research (NITTTR), Chandigarh, under the coordination of Dr. Amit Goyal, Department of Rural Development, NITTTR Chandigarh.

This training programme aligned with the national agenda of strengthening resilience, enhancing disaster preparedness, and promoting sustainable, affordable construction practices. It brought together leading experts from premier institutions such as IIT Roorkee, CBRI Roorkee, NITTTR Chandigarh, and industry organizations engaged in risk mitigation and infrastructure resilience. More than 100 participants including faculty members, research scholars, professionals, and postgraduate students attended the sessions online.

Programme Inauguration – 15 December 2025

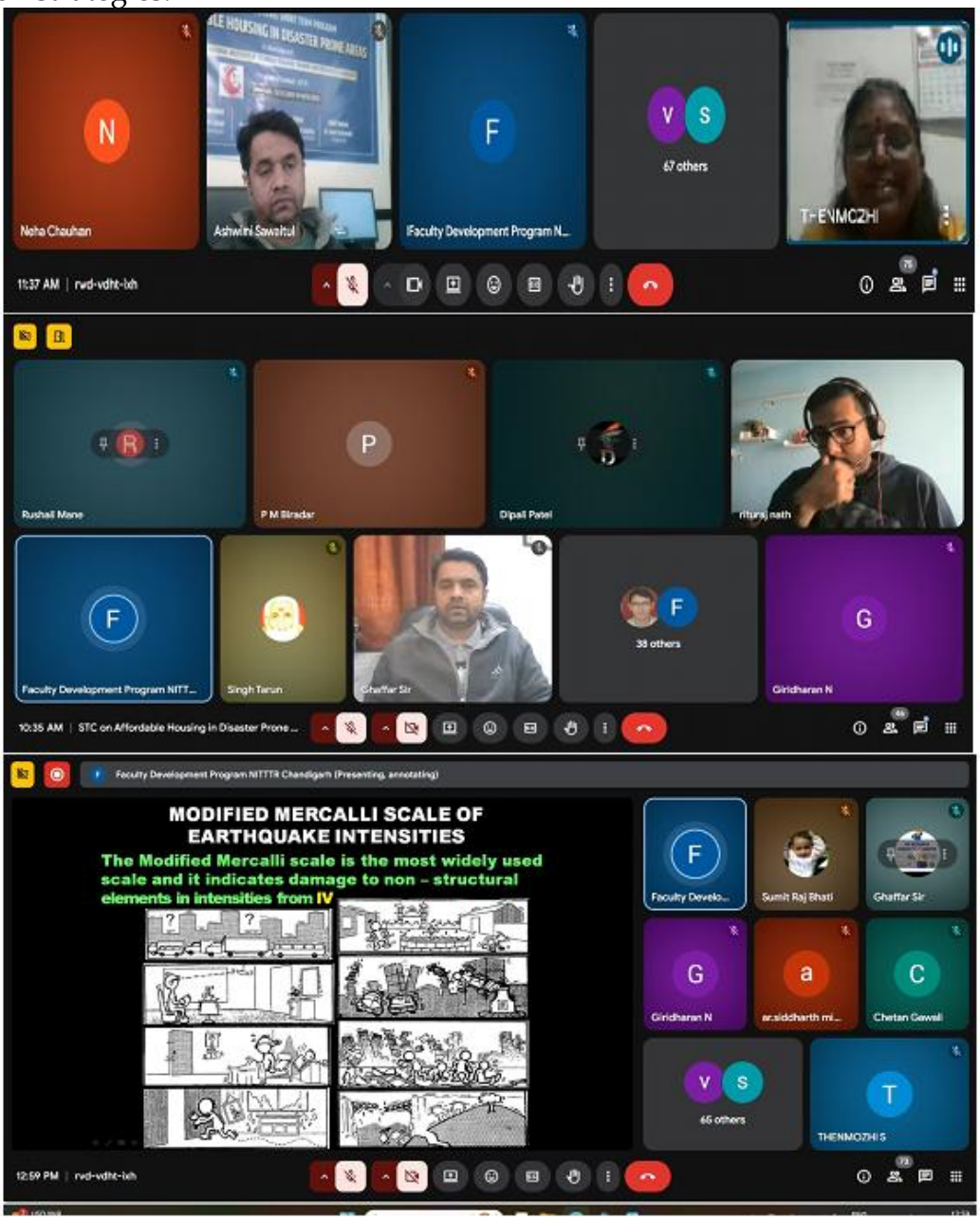
The programme commenced with an inaugural ceremony. **Dr. Amit Goyal**, Coordinator–NITTTR, delivered the introductory remarks and highlighted the pressing need for resilient infrastructure in disaster-prone regions of India. The inauguration set the context for subsequent technical sessions focused on multi-hazard risk reduction, earthquake engineering, affordable materials, and modern construction technologies.

During the inaugural programme, Dr. S. Thenmozhi, Department of Civil Engineering, KCG College of Technology, delivered a brief presentation highlighting KCG College's role as the Nodal/Remote Center for the STTP in collaboration with NITTTR Chandigarh. She outlined the institution's commitment to capacity building, technical training, and advancing resilient infrastructure education, emphasizing the college's active involvement in national-level academic initiatives and professional development programmes.

Day 1 Sessions
Session 1:*Overview of Disasters and Its Mitigation*
Resource Person:*Dr. Amit Goyal*, NITTTR Chandigarh

This session introduced the classification of natural and anthropogenic disasters, vulnerabilities in the built environment, and holistic frameworks for mitigation

planning. The speaker emphasized multi-hazard analysis and community-based mitigation strategies.



Session 2 (AN):*Seismological Investigation for Earthquake Risk Management*
Resource Person:*Dr. Bhanu Chamoli (PhD, IIT Roorkee), Director, Resilinfra Pvt Ltd., Dehradun*

The session covered seismic source characterization, ground motion prediction, and the application of geophysical investigations for earthquake-resistant design. The scientific insights provided a clear link between engineering design and seismological data interpretation.

Day 2 – 16 December 2025 (Tuesday)
Session 1:*Diagnostic Techniques for Health Monitoring of Structures*
Resource Person:*Dr. Sanjay Sharma,* Professor & Head, Civil Engineering, NITTTR Chandigarh.

This session dealt with structural health monitoring (SHM), including NDT methods, damage detection techniques, vibration-based analysis, and the significance of periodic assessment in disaster-prone areas.

Session 2:*Earthquake Resistant Construction Practices and New Techniques*
Resource Person:*Dr. Amit Goyal*, NITTTR Chandigarh.

The speaker elaborated on ductile detailing, base isolation, shear-wall systems, and emerging construction technologies that enhance seismic resilience in affordable housing.

Session 3:*Fire Protection Techniques in Affordable Housing*
Resource Person:*Mr. M. L. Sanjay Sharma,* Chief Fire Officer (Retd.), Chandigarh

This session highlighted fire-risk assessment, fire-resistant construction materials, active and passive fire protection systems, and community-level fire safety planning.

Day 3 – 17 December 2025 (Wednesday)

Session 1:*Retrofitting of Structures in Disaster-Prone Areas*
Resource Person:*Dr. R. Shiva Chidambram,* Senior Scientist, CBRI Roorkee.

The speaker discussed retrofitting methods such as jacketing, FRP strengthening, shear-wall insertion, and foundation retrofitting. Real-world case studies were shared from hilly and seismic Zones IV and V.

Session 2:*Seismic Response Control Techniques*
Resource Person:*Dr. Naveen Kumar Kothapalli,* Scientist, CBRI Roorkee.

This lecture addressed vibration control techniques, including base isolation, tuned mass dampers, and hybrid control systems for mitigating seismic forces in buildings.

Session 3:*Solar Techniques and Renewable Technologies for Affordable Housing*
Resource Person:*Dr. Poonam Syal,* Professor, NITTTR Chandigarh

The session focused on integrating solar PV systems, passive solar architecture, and low-cost renewable solutions to achieve sustainable, affordable housing models.

Day 4 – 18 December 2025 (Thursday)
Session 1:*Disaster Risk Reduction and Capacity Building*
Resource Person:*Dr. Jog Bhatia* ,Senior Consultant, MGSIPA; Former Assistant Commandant;International HAZMAT Specialist & Disaster Management Expert.

The speaker emphasized institutional preparedness, community training, emergency response planning, and hazard-specific capacity-building frameworks.

Session 2:*Seismic Test on Buildings with Traditional vs. Seismic Consideration*
Resource Person:*Dr. Amit Goyal*, NITTTR Chandigarh.

This session compared traditional construction practices with advanced seismic design principles, demonstrating performance differences through experimental data.

Session 3:*Prefabricated Structures in Disaster-Prone Areas*
Resource Person:*Dr. Ajay Chourasia,* Chief Scientist, CSIR–CBRI Roorkee.

The session presented prefabrication technologies, modular structural systems, and their application in post-disaster rehabilitation and affordable mass housing.

Day 5 – 19 December 2025 (Friday)
Session 1:*Protection from Landslides*
Resource Person:*Dr. Rituraj (PhD IIT Roorkee),* Engineer, Risk Management Solutions India, Noida.

This lecture covered landslide hazard zonation, slope stabilization, erosion control, and monitoring systems for hilly terrains.

Session 2:*Role of Affordable Dampers in Retrofitting of Housing*
Resource Person:*Dr. Amit Goyal*, NITTTR Chandigarh.

The session explained damper mechanisms, energy dissipation concepts, and cost-effective damper systems suitable for retrofitting low-rise housing.

Session 3:*Group Discussion, Presentations, and Valedictory Session*
Participants presented key takeaways and discussed the applicability of learned techniques to real-world housing challenges. The valedictory session formally concluded the training programme.

Outcomes of the Programme

The STTP achieved the following outcomes:

- Enhanced understanding of **multi-hazard risk assessment** and **disaster-resilient housing strategies**.
- Exposure to **cutting-edge technologies** including SHM, seismic isolation, prefabrication, and renewable integration.
- Strengthened academic–industry–research collaboration with IIT Roorkee, CBRI Roorkee, NITTTR Chandigarh, and risk-management firms.
- Improved participant competency in **designing, assessing, and retrofitting** structures in disaster-prone regions.
- Reinforced the role of **sustainable, affordable housing frameworks** aligned with national disaster management and infrastructure development goals.

SDG MAPPING:

This Five-Day STTP on "Affordable Housing in Disaster-Prone Areas" strongly aligns with **SDG 9, SDG 11, and SDG 13** by promoting resilient infrastructure, sustainable communities, and climate-responsive construction practices.

Through sessions on innovative structural systems, retrofitting, prefabrication, seismic response control, and renewable energy integration, the programme directly supported

SDG 9 by advancing modern engineering solutions and strengthening technical capacity for robust infrastructure.

Its emphasis on safe, affordable, and disaster-resilient housing addressed **SDG 11,** equipping participants to create sustainable urban environments and reduce vulnerability in hazard-prone regions.

By highlighting climate-related risks such as earthquakes, landslides, and fires, and by discussing mitigation, adaptation strategies, and capacity building, the event also contributed to **SDG 13,** enabling professionals to incorporate climate action into planning and designing resilient, future-ready housing systems.

Conclusion

The Five-Day Online STTP on **"Affordable Housing in Disaster-Prone Areas"** was highly impactful and comprehensive, addressing pressing issues in disaster resilience and affordable urban development. The Department of Civil Engineering, KCG College of Technology, successfully facilitated high-quality knowledge dissemination as a Remote Center of NITTTR Chandigarh. The expert-driven sessions significantly enriched the technical competence of participants and underscored the importance of resilient, sustainable, and economically viable housing systems for vulnerable regions.