









# Online Training Programme

# Disaster Resilient Built-up Infrastructure of the Institutions: Focus on Earthquake & Fire

14th - 16th June, 2022 | Time - 2:00 to 4:00 PM



## JOINTLY ORGANIZED BY

Centre for Environmental Studies and Disaster Management, Miranda House, University of Delhi, Delhi-110007

and

National Institute of Disaster Management,
(Ministry of Home Affairs, Government of India),
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#### 1. CONCEPT NOTE

Risks arising from unidentified structural hazards in institutions can create a stressful and unsafe environment for students and staff. However, taking timely precautions can reduce this risk significantly. Thorough hazard identification and risk analysis is the core element in designing safe institutional spaces. The need of the hour is to address the institutional risk assessment and mitigation to enhance preparedness by adopting safety measures, and thus, understanding vulnerability is essential to moving towards risk identification, reduction and preparedness. Creating a culture of "being prepared" needs to begin early in one's life. All these needs careful application of theoretical and field knowledge that can come from in-depth study. Also, disaster information and education need to be disseminated through the outreach programmes.

The three main risk questions to be addressed are: Hazard – What can go wrong? Consequences – How bad could it be? and Likelihood of its occurrence – How often it might happen? Taking steps to either eliminate or reduce risks by introducing control measures should be done in a phased manner to address these questions. Mitigation measures for reducing risks, especially in response to earthquake and fire hazards in campuses, can be beneficial in preventing the potential threats arising from structural vulnerabilities. They are unprecedented events that cause much damage to the institutional infrastructure. We all remember the blazing fire in a coaching centre in Surat in 2019 which claimed many innocent lives. Thus, to improve existing risk assessments, institutions need to define their roles and responsibilities as academic stakeholders.

### Aims and Objectives

In these changing times of global environmental emergencies, it is extremely important to sensitize individuals and societies about the risk and vulnerabilities that affect us economically and culturally. Miranda House is committed to creating safe institutional spaces. Keeping the vision of the institution, Centre for Environmental Studies and Disaster Management, in collaboration with National Institute of Disaster Management, organised a three-day online training programme with the primary aim of the programme is to identify various risks and vulnerabilities in and around Miranda House and plan for its preparedness and mitigation.

The objectives of the three days training programme may be redefined and further enlarged as follows:

• Assessing Institutional Hazards: *Structural hazards* result when the material is stressed beyond its strength limit, causing excessive deformation or fracture. A building can be prone to earthquakes, building collapse, electrical fire and lab accidents.

## Indoor air pollution hazards

"Indoor air quality" refers to the quality of the air in a home, college, school, office, or another building environment. The indoor environment is a hub of various pollutants like SO<sub>2</sub>, NO<sub>2</sub>, Particulate matter, VOCs, etc. which are released from various sources such as combustion during cooking and environmental tobacco smoke, mold in an indoor environment, pesticides, paints, and furnishing solvents. Indoor air pollution is a potent silent killer which needs to be recognized.

- **Risk Assessment and Mapping:** The identification and mapping of structural disasters, due to unprecedented events like earthquakes and fire, is significant in preventing future damage. It also helps in preparedness and formulating mitigation plans for these types of disasters. Classification of infrastructural facilities into different risk categories would be beneficial.
- Structural and Non-Structural Mitigation: Mitigation is a risk management technique that involves a prior investment of time and resources in planning. It is an important step of preparedness

to reduce the damage caused by any calamity. Within an institution, mitigation can be done by retrofitting and strengthening the structures and mapping the structural inadequacies. Besides addressing the structural issues, it can also involve non-structural measures like preparedness in the handling of fire extinguishers, providing first-aid training, designing active evacuation plans and conducting mock drills. Furthermore, it may also include capacity building for disaster preparedness.

• Emergency Response Plan: Since emergencies normally occur without warning, plans and procedures should be designed to provide sufficient flexibility to accommodate contingencies of assorted types and magnitudes. Campuses should have a system in place that assigns and trains people by conducting regular mock drills to develop specific responses to emergencies like fire and earthquake. The institutional emergency management plan must be reviewed and revised on a regular basis.

## **Targeted Audience:**

The three days training is designed for deepening the knowledge of the undergraduate and post-graduate students, interested research scholars along with teaching and non-teaching staff of Miranda House.

## 2. Flyer for the training programme



#### 3. About the partnering organizations

## 3.1 Miranda House, University of Delhi

Miranda House, College for Women at University of Delhi, is amongst the premier institutions in the country. It was awarded All India Rank One amongst colleges under the National

Institutional Ranking Framework (NIRF) 2017, 2018, 2019, 2020, and 2021. The National Assessment and Accreditation Council (NAAC) has accredited the college with Grade A+. Department of Biotechnology, Government of India, has given it the Star College status. Established on 07 March 1948 by the then Vice-Chancellor of University of Delhi Sir Maurice Gwyer, it chronicles the history of women's education in India. Since its inception, it has carved a unique niche for itself as a globally recognized premier institution of higher learning. Miranda House has a rich legacy. The extremely distinguished list of alumnae imparts a sense of confidence and pride in students.

As a college, we are committed to the philosophy and goals of embedded learning. In this light, the college instituted Centre for Environmental Studies and Disaster Management (CESDM) in November 2021 as a center for learning and research. The centre includes faculty members and students committed to developing an understanding on assessing vulnerability and risk in the urban spaces related to disaster and environmental management.

### 3.2 National Institute of Disaster Management, Ministry of Home Affairs, Govt. of India

The National Institute of Disaster Management (NIDM) was constituted under an Act of Parliament with a vision to play the role of a premier institute for capacity development in India and the region. The efforts in this direction that began with the formation of the National Centre for Disaster Management (NCDM) in 1995 gained impetus with its resignation as the National Institute of Disaster Management (NIDM) for training and capacity development. Under the Disaster Management Act 2005, NIDM has been assigned nodal responsibilities for human resource development, capacity building, training, research, documentation and policy advocacy in the field of disaster management. Both as a national Centre and then as the national Institute, NIDM has performed a crucial role in bringing disaster risk reduction to the forefront of the national agenda. The Institute believes that disaster risk reduction is possible only through the promotion of a "Culture of Prevention" involving all stakeholders. The Institute works through strategic partnerships with various ministries and departments of the central, state and local governments, academic, research and technical organizations in India and abroad and other bi-lateral and multi-lateral international agencies. The Institute's vision is to create a Disaster Resilient India by building the capacity for disaster prevention and preparedness at all levels.

## 4. PROGRAMME SCHEDULE

Day 1 (14-06-2022)			
Time	Learning Session / Theme	Speakers/Panelists	
2:00 – 2:30 pm	Inaugural Session Welcome Address & Context Setting	Prof. Bijayalaxmi Nanda Principal, Miranda House University of Delhi Prof. Chirashree Ghosh Dept. of Environmental Studies University of Delhi Prof. Chandan Ghosh Head,RI Division, NIDM, MHA, GoI Dr. Garima Aggarwal Sr. Consultant, NIDM, MHA, GoI	
2:30 – 3:00 pm	Special address on Disaster Resilience Infrastructure of the Institution	Mr. Aslam Perwaiz Deputy Executive Director Asian Disaster Preparedness Center Bangkok	
3:00 - 3:50 pm	Indoor Air Pollution – Issues, Challenges, and Measures	Prof. Chirashree Ghosh Department of Environmental Studies University of Delhi	
3:50 – 4:00 pm	Discussion/Question & Answer	Dr. Ruchi Sachan Assistant Professor, Miranda House Dr. Priyanka Sharma Assistant Professor, Miranda House	
	Day 2 (15-06-2022)		
2:00 – 2:10 pm	Welcome Address and Recapitulation of Day One	Dr. Ankita Medhi Assistant Professor, Miranda House Mr. Shaad Warsi YP, RI Division, NIDM, MHA, GoI	
2:10 – 3:00 pm	Risk Assessment and Mapping	<b>Dr. Rakesh Arya</b> Centre for the Study of Regional Development, JNU, New Delhi	
3:00 – 3:50 pm	Components of a Disaster Management Plan in an Educational Institution	<b>Dr. Hari Kumar</b> Regional Coordinator South Asia GeoHazards International	
3:50 – 4:00 pm	Discussion/Question & Answer	<b>Dr. Vimala Singh</b> Assistant Professor, Miranda House	

Day 3 (16-06-2022)			
2:00 – 2:10 pm	Welcome Address and Recapitulation of Day Two	Ms. Shipra Singh Assistant Professor, Miranda House	
2:10 – 2:40 pm	Building Health Assessment and Structural Mitigation Measures with respect to fire and earthquakes	Mr. Shounak Mitra and Mr. Arvind Seismic Academy & Fire Stop Academy/Hilti India	
2:40 – 3:40 pm	Panel Discussion Disaster Resilient Built-up Infrastructure of the Institutions	Prof. Chandan Ghosh Head, RI Division, NIDM, MHA, GoI Dr. Pankaj Kumar (Chair) Associate Prof., Dept. of Geography, Delhi School of Economics, University of Delhi Mr. Aditya Pratap Singh Deputy Commandant, NDRF Prof. Jaishri Jethwaney Senior ICSSR Research Fellow, ISID Dr. Amod Saroj (MBBS M.D) Senior Resident -2 Laboratory medicine Dr. Garima Aggarwal (Co-chair) Sr. Consultant, NIDM, MHA, GoI	
3:40 – 3:50 pm	Discussion/Question & Answer	<b>Dr. Surabhi</b> Assistant Professor, Miranda House	
3:50 – 4:00 pm	Vote of thanks	Dr. Rakhi Parijat Associate Professor, Miranda House Mr. Shaad Warsi YP, RI Division, NIDM, MHA, GoI	

#### 5. DAY-WISE PROCEEDINGS OF THE TRAINING PROGRAMME

#### 5.1 **DAY 1**

## 5.1.1 **Inaugural Session**

The three-day Online Training Programme was started with a welcome address by the Principal of Miranda House, **Prof (Dr) Bijayalaxmi Nanda**. Prof. Nanda welcomed all honorable resource persons, students and research scholars, teaching and the non-teaching staff who joined this training programme. Highlighting the importance of management and risk resilience, she welcomed everyone for giving their valuable time to this programme and hope that the information disseminated will help us in the future to prepare an emergency response plan for the institution. Following this, **Prof Chandan Ghosh**, Professor and Head of Resilient Infrastructure Division, NIDM, MHA, Government of India, appreciated Centre for Environmental Studies and Disaster Management, Miranda House efforts in working towards making of a sustainable and disaster-resilient society. He further spoke about the creation of simulation models to check the safety and strength of our buildings to understand the nature of vulnerability in the Delhi NCR region, and find solutions to strengthen them.

**Prof Chirashree Ghosh** from Department of Environmental Studies, Delhi University, also graced the occasion and motivated the participants to work towards bridging the gap between scientists, academic community and people in understanding the risk and building resilience. She remarked upon the lack of environmental literacy as a challenge to future.

#### 5.1.2 **Session 1**

Dr. Ruchi Sachan (Assistant Professor, Department of Geography, Miranda House) introduced the first resource person, Dr. **Aslam Perwaiz**. Dr. Perwaiz is the Deputy Executive Director of Asian Disaster Preparedness Center (ADPC), Bangkok, Thailand.

Dr. Aslam Perwaiz delivered his special address on *Disaster Resilience Infrastructure of the institutions*. He talked about the resilience being a critical challenge in the developing nations of Asia, including India, where more than 2.1 billion people have been affected by different types of disasters, since 2004. He highlighted the significant role that infrastructural development can play in supporting resilience and therefore, there is a need to quantify disaster risk and prioritise investments in infrastructure. We should also be able to create an enabling environment by setting an integrated system-wide approach and scaling up financing. Thus, he laid emphasis on developing composite risk matrices for vulnerable population and identifying their capacities, to achieve the overall plan of achieving stronger, faster and inclusive disaster resilient infrastructure.

#### 5.1.3 **Session 2**

**Prof. Chirashree Ghosh** delivered her keynote address on *Air Pollution*. Prof. Chirashree Ghosh is a professor at the Department of Environmental Studies, and with her academic and non-academic ventures, she has always tried to mobilize the community on environmental issues.

She talked about the indoor air-pollution and its challenges, especially due to lack of guidelines on indoor air pollution. In addition, she also emphasised on the level of exposure to the inhabitants and the various health challenges such as COPD, Bronchial problems, cancer, etc and therefore the need to develop guidelines on the basis of diverse socio-economic classes. Her study in the University of Delhi and its surroundings shows the level of exposure in different socio-economic households and its effects. She also discussed the lack of monitoring of PM1 under the CPCB which is quite alarming in the city. Her discussion on Sick Building Syndrome provided us with valuable input for our infrastructure design and resilience. She gave valid suggestions related to change in lifestyle pattern, green consumerism and awareness about well-ventilated housing design, while constructing and renting such spaces. Besides, she talked about bio-remedies to reduce the effect of indoor and outdoor pollution.

The first day sessions ended with thought-provoking discussion to the pertinent questions to our eminent speakers. The moderators, Dr. Ruchi Sachan and Dr. Priyanka Sharma (Assistant Professor, Miranda House), gave a briefing of the day, noting interesting observations.

#### 5.2 DAY 2

#### **5.2.1 Session 1**

As the first resource person on the second day, **Dr. Rakesh Arya** gave an interesting lecture on "*Risk Assessment and Mapping: An Overview on eForest Fire*". Dr. Rakesh Arya is the In-charge of the Map Library at the Centre for the Study of Regional Development, School of Social Sciences, JNU.

He briefed us about the need for literacy on programming and use of open-source GIS mapping. His project on eForest fire, which was awarded the National Award for e-governance 2020, was based on the study of forest fire in Uttarakhand. Since forest fire is a major threat worldwide, an early warning system should be developed for real time data monitoring. He indicated about the lack of public participation and late reporting regarding forest fires. Thus, identification of vulnerable zones/hotspots are needed for immediate action.

He has created a mobile application- **eForest Fire** based on the various parameters to reduce the losses to biodiversity as well as people in the surrounding area. This predictive model helps in tackling cases of forest fire and averting disastrous situation. He also demonstrated the use of the mobile application to reduce the incidences of forest fire in Arunachal Pradesh. He also emphasized on the use of different open-source software and web portals to develop mobile applications. He summarized his lecture by informing the audience to integrate the theoretical and research knowledge along with technological solutions.

#### 5.2.2 **Session 2**

**Dr. Hari Kumar** presented his special lecture on "Disaster Preparedness in an Educational Institutions". Dr. Hari Kumar is the Regional Coordinator- South Asia for GeoHazards International.

He reemphasized on the need for safer spaces in the institutions through training and preparedness. He discussed, both earthquake and fire hazards, in great detail along with the planning for structural mitigation. He gave an elaborate plan for the institutions starting from disaster planning – basic disaster awareness, preparedness, drills and hazards occurring from falling objects. He explained how the college needs to create a committee comprising of students, teachers and non-teaching staff who can be trained on various aspects of disaster preparedness. This can start with development of an evacuation plan based on location of safe areas for assembly, safer passages and exit plans. He further stressed on regular mock drills and revision of the plan to avoid any unnecessary consequences due to fear, panic, disorder, confusion and lack of proper response.

At the end of day two of the training programme, Prof. Chandan Ghosh gave his invaluable suggestions on preparation of evacuation plan for the college. The session ended with briefing by moderators and discussion on thoughtful questions and observations with our eminent speakers.

## 5.3 **DAY 3**

## 5.3.1 **Session 1**

Ms. Shipra Singh introduced the speakers for the first session on 3<sup>rd</sup> day of the training programme, Mr. Shounak Mitra and Mr. Aravind. Mr. Shounak Mitra and Mr. Aravind are associated with Seismic Academy and Fire Stop Academy, Hilti India and delivered their lecture on "Assessing health assessments and structural mitigation measures".

Firstly, Mr. Shounak Mitra briefed us about seismic safety of non-structural components. He talked about the Vulnerability Atlas of India which shows the high level of susceptibility to various hazards. Both structural and non-structural components should be considered as part of the design principle to minimize hazards. Failure to comply with non-structural component can lead to hazardous impact. Following this, Mr. Aravind introduced the national building codes of India and elaborated its applications. He enlightened the audience about fire safety triangle that includes detection, suppression and containment. He also informed, as part of the auditing system, Fire Protection System needs to be well documented and all the required protocols should be in proper place.

## 5.3.2 **Session 2**

The final session of the training programme was a *Panel Discussion* on "**Disaster Resilient Built-Up Infrastructure of the Institutions**". The discussion was chaired by Dr. Pankaj Kumar, Associate professor, Department of Geography, Delhi School of Economics, University of Delhi. The key discussants were Prof. Chandan Ghosh (NIDM), Mr. Aditya Pratap Singh (Deputy Commandant, NDRF), Prof. Jaishri Jethwaney (Senior ICSSR Research Fellow, ISID) and Dr. Amod Saroj (Senior Resident-2, Laboratory Medicine, AIIMS).

**Dr. Pankaj Kumar** set the stage for the panelists, with an introduction to the topic and its relevance in contemporary times. Citing UNESCO 2022 Report, he talked about an Indonesian community which has become tsunami resilient. Such good practices can be initiated in India on pilot basis. Discussing about his experiences in mountainous areas of India, he stressed on the holistic planning which can be achieved through coordinated research with various stakeholders. He introduced the concept of PUB (Prediction of Ungauged Basin) which is synonymous with challenges in Himachal Himalayas which requires high precision data to deal with this.

**Mr. Aditya Pratap Singh**, from NDRF, emphasized on the need for community training as first responders. An evacuation plan should be developed by the institutions as well as at the family level for which designated spaces for evacuation and assembly should be clearly demarcated. From his vast practical experiences, he reinforced the importance of training in fire safety, civil defence and first aid.

**Prof. Jaishri Jethwaney** presented her thoughts on importance of media reportage in disaster management. Media and disaster management has always been a topic of critical analysis as the trust level towards media is lowest during disasters. In India, people are avid consumer of news, both print and electronic media; Thus, it is important to create a synergy between media and all stakeholders. There is a lack of substantive media policy, which has consequences for proper regulation for those responsible for reporting during disasters. Transparency Efficiency and Accountability (TEA) should be the aim of media.

**Prof. Chandan Ghosh** discussed in length about the introduction of innovative fire protection equipment's, involving materials, building designs and technology. He spoke about various types of fire extinguishers and other tools for multi-purpose fire protection. He also demonstrated alternate low-cost material for minimization of dust particles coming out of air coolers. He concluded his lecture by showcasing his innovative technique of reducing outdoor air pollutants.

**Dr. Amod Saroj** gave his insights on managing medical emergencies during the time of disasters. Through colour-coding system, based on different type of emergencies, nearest hospital can be made disaster ready, which would prove much beneficial in times of need.

The session ended with briefing by moderators (Dr Surabhi & Ms. Shipra Singh) and presenting interesting observations and thoughtful questions to our eminent speakers.

### 6. Way forward and Vote of thanks

In the three days of Online Training Programme, the speakers discussed and made recommendations for a safer, disaster-resilient infrastructure, especially in institutions. More than 250 participants joined the programme through Google meet platform. Live streaming on YouTube also received much attention. We look forward to having such knowledgeable and technical training programme with NIDM, that empowered our students and staff.

**Dr. Rakhi Parijat**, Associate Professor, Department of Geography, Miranda House, summed up the successful training programme and presented a formal vote of thanks, specifically to Mr Taj Hassan, ED-NIDM, Prof. Chandan Ghosh, Head- Disaster Resilient Division, NIDM, Dr. Garima Aggarwal, Online Training Programme Convener, and Mr. Shaad Warsi, Young Professional-NIDM. Heartfelt thanks were also extended to Prof (Dr) Bijayalaxmi Nanda, Principal, Miranda House and Prof. Chirashree Ghosh, Department of Environment Studies, for their consistent support and motivation. The efforts of the speakers, the panelists, the participants and the organizers were also appreciated.

## 7. Key takeaways

The three-day training programme was a great learning experience for all and gave a direction and strengthened our commitment to work towards disaster resilient society and institutions.

- Disaster resilient infrastructure is key in reduction of loss of life and property. To reduce the damages, we must include real time data, community participation and traditional knowledge.
- Institutional preparedness and recommendations for a safer & more resilient infrastructure, especially in case of fire and earthquake, needs to be defined in the institutional set-up.
- Tackling the complex challenges and opportunities related to infrastructure resilience and maintenance requires a multidimensional approach, considering a range of factors and stakeholders.
- Communities should work in tandem with local agencies in building capacities for disaster risk reduction.
- Assessment of risk and vulnerability, and effective information systems can enable an institution's safety standards.
- Institutional guidelines for disaster preparedness plan needs to be formulated for timely action and response.

#### 8. Annexures

## a. Annexure 1- Participant List

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116	Jiya Antony	jiya.2021.360@mirandahouse.ac.in
117	Jiya	jiya.2021.1841@mirandahouse.ac.in
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120	Jyoti Meena	jyoti.2021.1204@mirandahouse.ac.in
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122	Kamini Chaudhary	kamini.2021.1492@mirandahouse.ac.in
123	Kaminsi Chaudhary	kaminsi.2021.1492@mirandahouse.ac.in
124	Khushboo	khushboo.2021.1297@mirandahouse.ac.in
125	Khushi Debisow	khushi.2021.1267@mirandahouse.ac.in
126	Khushi Tripathi	khushi.2021.177@mirandahouse.ac.in
127	Khyati Ananya	khyati.2021.761@mirandahouse.ac.in
128	Kirti Halkai	kirtihalkai@pdaengg.com
129	Krunal Jagtap	sstclass9and10@gmail.com
130	Kshanika Thakur	kshanika.2021.24@mirandahouse.ac.in
131	Kuldeep Kumar	kuldeephindidept@gmail.com
132	Kummari Leelarani	kummari.2021.380@mirandahouse.ac.in
133	Kunsoth Soniraj	kunsoth.2021.392@mirandahouse.ac.in
134	Kunta Harshini	kunta.2021.1365@mirandahouse.ac.in
135	Kusang Choedon	kusang.2021.1796@mirandahouse.ac.in
136	Livisha	livisha.2021.176@mirandahouse.ac.in
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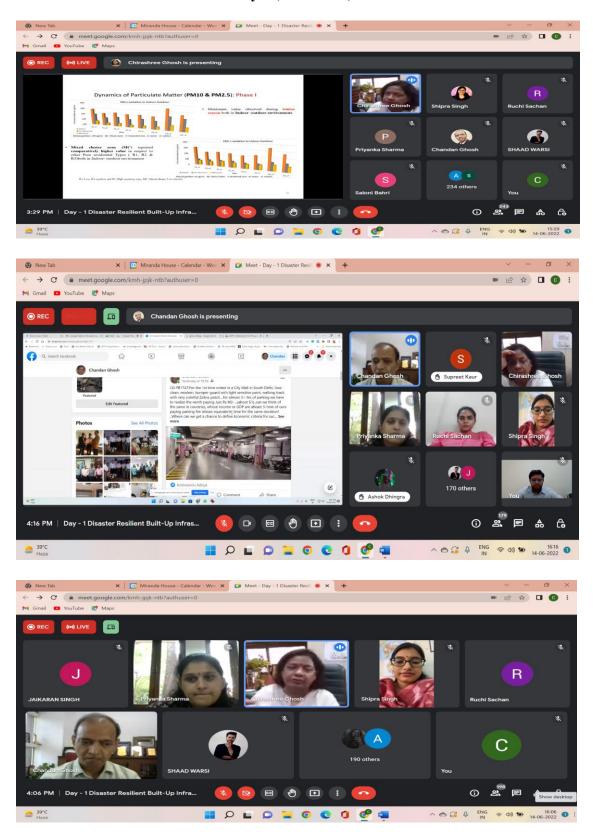
228	Rashmi Meena	rashmi.2021.985@mirandahouse.ac.in
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236	Rishita Tripathi	rishita.2021.56@mirandahouse.ac.in
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270	Shipra Singh	shipra@mirandahouse.ac.in
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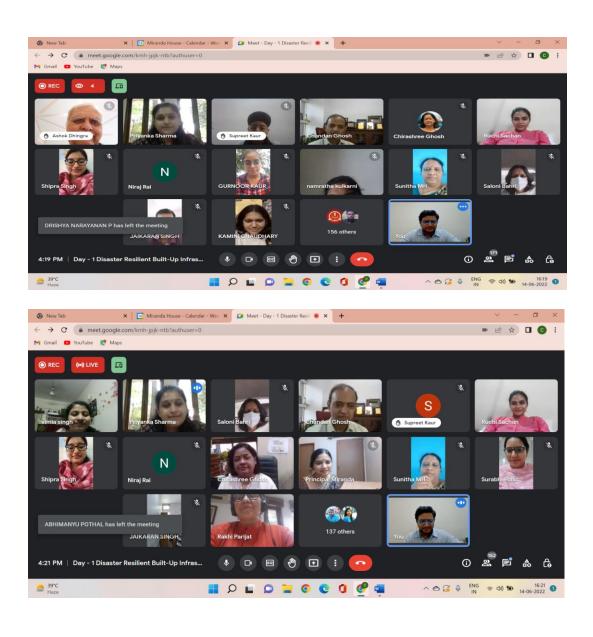
272	Shivi	shivi.2021.1111@mirandahouse.ac.in
273	Shrikant Jayprakash Bagwe	shrikant.bagwe12@gmail.com
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307	Vandana Vandana	vandana06shakya@gmail.com
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309	Vanshika	vanshika.2021.1418@mirandahouse.ac.in
310	Varju Kumari	varju.2021.1335@mirandahouse.ac.in
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316	Vyom Thaker	thakervyom.30@gmail.com
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324	Ankita Shelly	ankitashelly2016@gmail.com

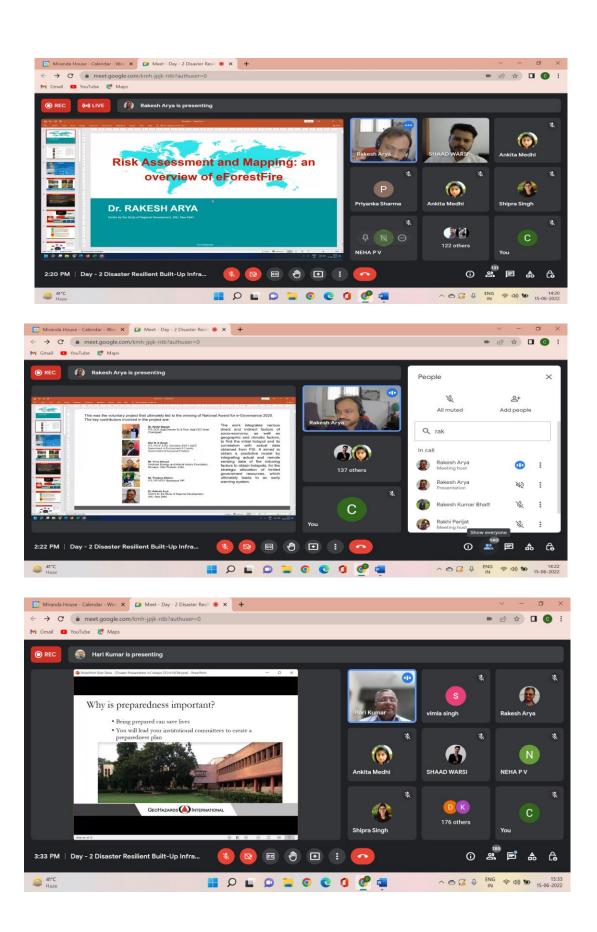
## b. Annexure 2- Photographs

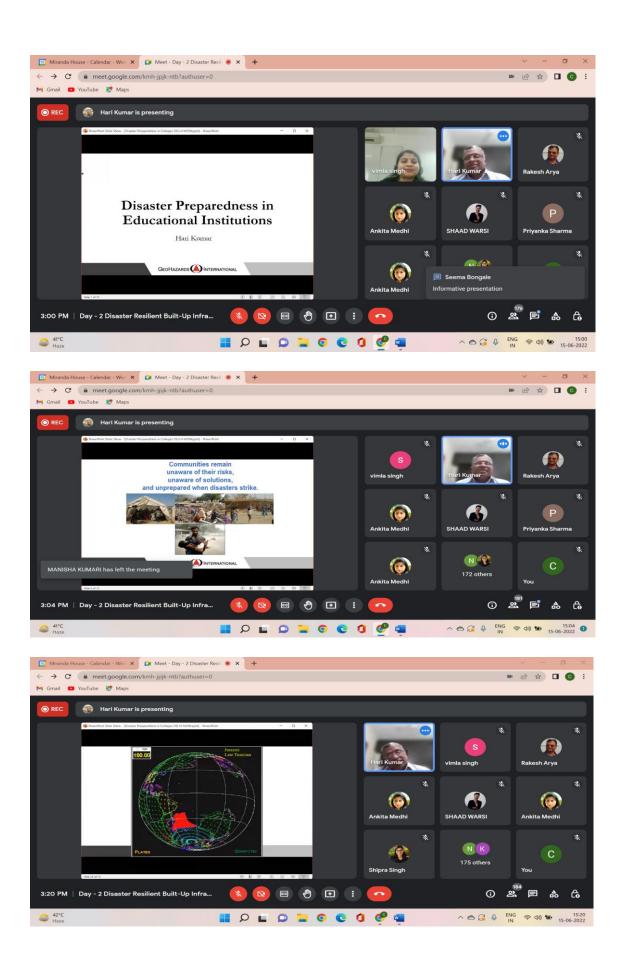
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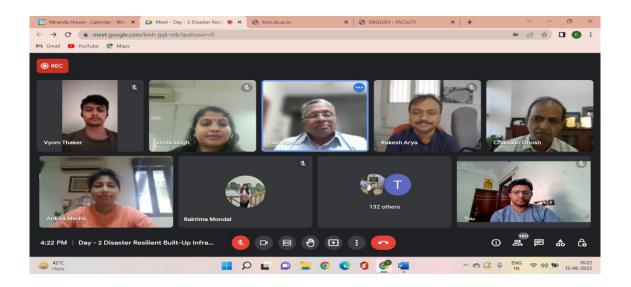




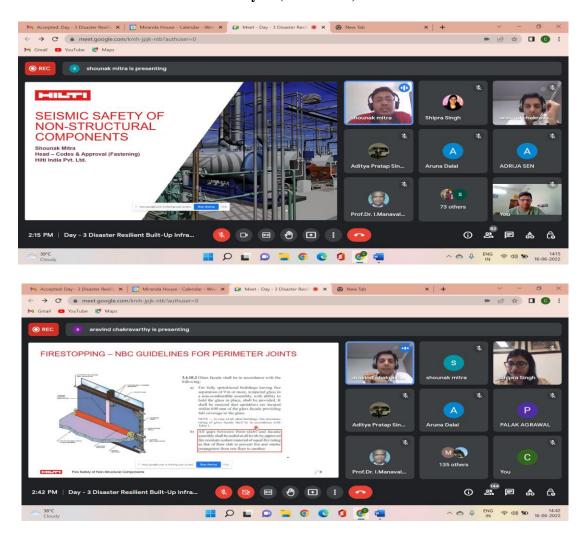
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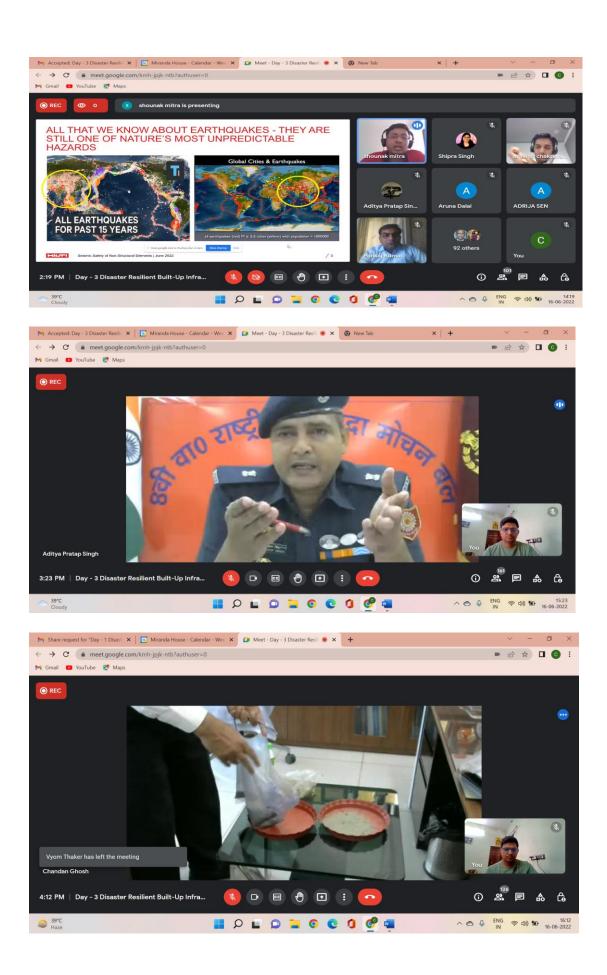


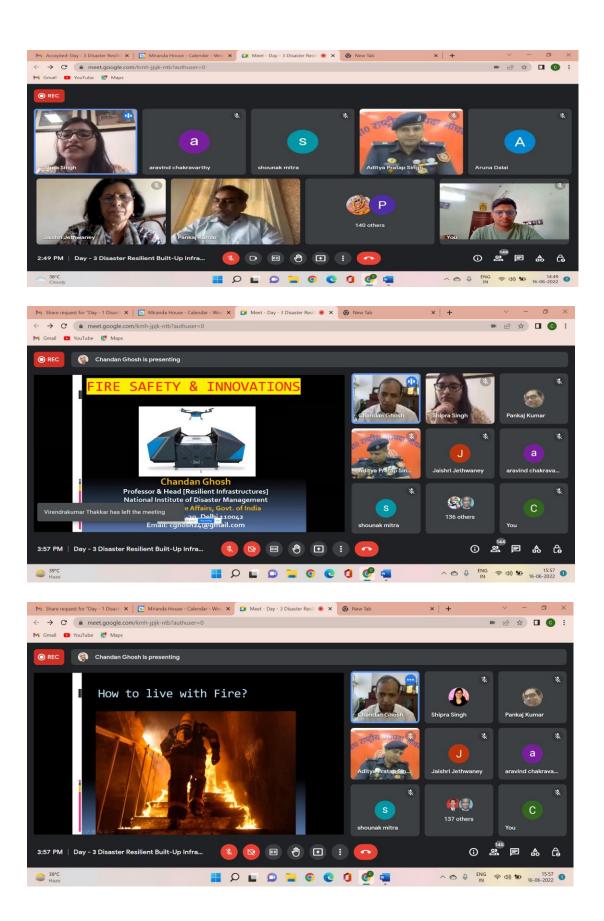


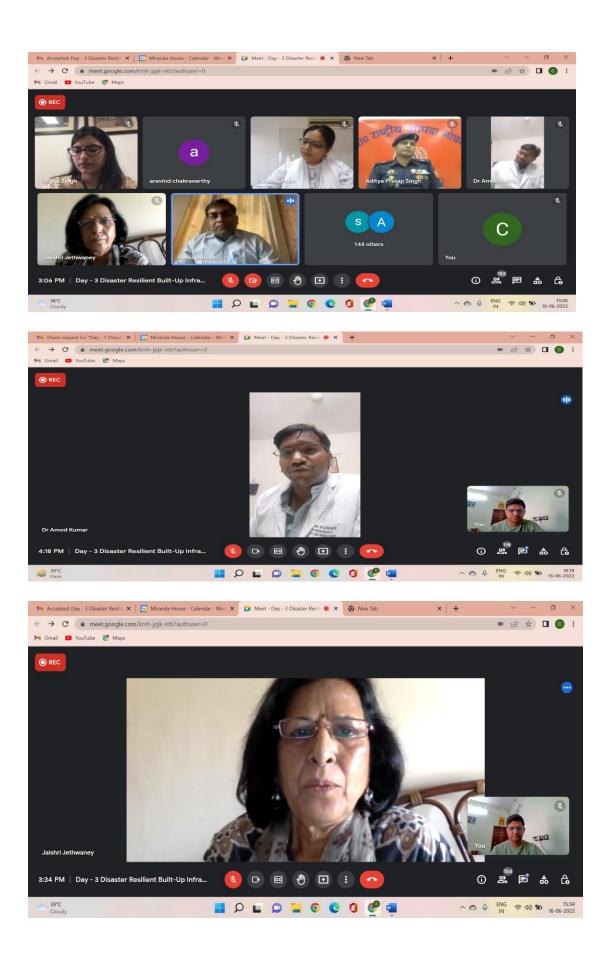


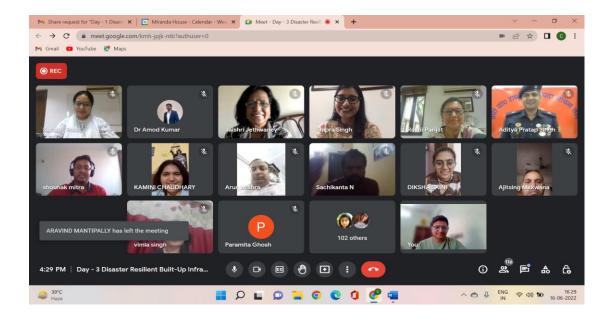
Day -3 (16-06-2022)











## c. Sample of the certificate



#### d. YouTube links

Day 1: https://www.youtube.com/watch?v=sBYuqndKNMg

Day 2: https://www.youtube.com/watch?v=NxYqWK-N65M

Day 3: https://www.youtube.com/watch?v=vSxq2RU7MM8