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Summary Report
Five Days Training Programme on
Understanding The Vulnerability And Risk Associated With Urban Areas
November 23-27, 2021



National Institute of Disaster Management
 In collaboration with
 Centre for Environmental Studies and Disaster Management, Miranda House
 and
 Department of Environmental Studies
 University of Delhi

Five days Training Programme on
"UNDERSTANDING THE VULNERABILITY AND RISK ASSOCIATED WITH URBAN AREAS"

Organising Team

Patrons					
Prof. Bipayakshi Nahda Principal (Officiating) Miranda House, University of Delhi	Maj. Gen. M.K. Bisdal Executive director, National Institute of Disaster Management, Delhi	Prof. Chiranjeev Ghosh Department of Environmental Studies, University of Delhi (Convener)	Prof. Chandan Ghosh Head, Resilient Infrastructure division, NIDM, GoI (Guidance)	Dr. Gunna Aggarwal Senior Consultant Resilient Infrastructure division, NIDM, GoI (Course Co-ordinator)	
Core Committee					
Dr. Rakhi Panigrahi Department of Geography Miranda House, University of Delhi	Dr. Rakha Kumari Department of Zoology Miranda House, University of Delhi	Dr. Saloni Dohra Department of Botany Miranda House, University of Delhi	Dr. Hema Singh Department of Political Science Miranda House, University of Delhi		
Organising Committee					
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Link: <https://training.nidm.gov.in/>
23rd -27th November, 2021
Venue: Mini Auditorium (158), New Building, Miranda House, University of Delhi

JOINTLY ORGANIZED BY		
National Institute of Disaster Management, (Ministry of Home Affairs, Government of India), Plot no. 15, Pocket-3, Block-B, Sector-29, Rohini, Delhi -	Center for Environmental Studies and Disaster Management, Miranda House, University of Delhi, Delhi- 110007	Department of Environmental Studies, University of Delhi, Delhi-110007



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Resilient India - Disaster Free India



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Content

SUMMARY REPORT

Introduction and Objective	1
Agenda	2
Day-wise summary	5
November 23, 2021 - Day 1 Summary	5
November 24, 2021 - Day 2 Summary	8
November 25, 2021 - Day 3 Summary	10
November 26, 2021 - Day 4 Summary	12
November 27, 2021 - Day 5 Summary	14
Key Takeaways	16
Organizing Team	17
Gallery	18
Day 1	18
Day 2	18
Day 3	18
Day 4	19
Day 5	19
Participants List	25



सत्यमेव जयते



Introduction and Objective

The unique geo-climatic and socio-economic attributes of India has marked it as one of the highly vulnerable country to different hazards in the world map. The National Disaster Management Plan 2016 has categorized natural hazards in five groups namely, Geophysical, Hydrological, Meteorological, Climatological and Biological. Earthquakes, landslides, floods, droughts and cyclones are some of the major geo- meteorological hazards that affect the nation. In a country like ours, hazard risk prevention and mitigation is one of the keys to sustainable development and this has been the policy of Government of India which lays greater emphasis on prevention, preparation and mitigation.

Role of Educational Institutions

Educational institutions can greatly contribute by initiating training, research and engagement of youth in disaster awareness. The need of the hour is to enhance preparedness by adopting safety measures as a habit. Creating a culture of “being prepared” needs to begin early in one’s life. It is also essential to focus on various aspects of disaster mitigation and risk aversion. All this 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. Miranda House has been working to sensitize individuals and institutions and create a culture of disaster resilience for one decade. The aim is to work on community participation for disaster preparedness in and around the college campus.

Target Group

The target group for the training workshop were the university teachers, research scholars, students and non-teaching staff. The programme involved senior level resource persons, experts, professionals and functionaries who have very long and meaningful experiences with vast knowledge on the subject. During the programme, there were presentations, discussions and group exercises on planning for urban risk management. The programme provided information about topics and key important points to be considered in disaster risk reduction and resilience.

Importance of Increasing our Capacities



It was expected that the programme would serve as a milestone for further actions in enhancing our capacities to reduce disasters and their impacts as part of the national goal to make the country disaster resilient through proactive prior planning on disaster risk reduction and resilience at proper place and time.

Agenda

Day 1: Tuesday, November 23, 2021

Time	Learning Session / Theme	Key Speakers
9.30 am – 10.30 am	Registration	Managed by Miranda House
Inaugural ceremony (23.11.2021)		
10.30 am to 10.45 am	Welcome Address & Context Setting	Prof. Chirashree Ghosh, Department of Environmental Science, Delhi university/ Prof. Bijayalaxmi Nanda, Officiating Principal, Miranda House College/ Dr. Garima Aggarwal, Senior Consultant (Resilient Infrastructure Division), NIDM
10.45 am to 11.00 am	Key Note Address	Mr. Atul Bagai, United Nations Environmental Programme (UNEP) -
11.00 am to 11.10 am	Vote of thanks	Miranda House / NIDM
11.10 am to 11.45 am	Tea break	
Day 1 (23.11.2021): Hazard, Risks and Vulnerability Assessment		
11.45 am – 12.00 noon	DRM in India and Role of NIDM	Dr. Garima Aggarwal, Senior Consultant (Resilient Infrastructure), NIDM
12.00 noon– 01.15 pm	Understanding Hazard, Vulnerability and Risks- Conceptual Understanding and Vulnerability Profile of the Country	Ms. Tanushree Verma DRR Expert & Head (Research & Training). Zone 4 solutions
1.15 pm to 2.00 pm	Lunch	
2.00 pm – 3.15 pm	Basic Structural and Non-structural mitigation measures in Urban areas	Dr. Hari Kumar, Regional Coordinator, Geohazards International & Head, GHS



सत्यमेव जयते



3.15- 3.30 pm.	Tea Break	
3.30 pm – 6.00 pm	Identifying local hazards, risks and vulnerabilities, Risk Assessment and Mapping of Vulnerable Areas (With hands on training)	Interactive lecture by CISF

Day 2: Wednesday, November 24, 2021

Day 2 (24.11.2021): Disaster Risk Mitigation and Management		
10.30 am – 11.30 am	Urban Risk Mitigation Measures	Prof. Chandan Ghosh, Head, Resilient Infrastructure Division, NIDM
11.30 am – 12.00 noon	Tea break	
12.00 noon – 1.15 pm	Urban Risks, Impacts and Global framework for Disaster Risk Reduction	Dr. Sreeja Nair, DRR Expert & Consultant (Former NIDM Faculty)
1.15 pm – 2.00 pm	Lunch	
2.00pm – 3.15 pm	Earthquake Risk Mitigation Measures	Dr. Amir Ali Khan, Asst. Professor, NIDM
3.15 p.m. – 3.30 p.m.	Tea Break	
3.30 p.m. to 6.00 p.m.	Disaster Risk Management in Urban Communities	Dr. Garima Aggarwal

Day 3: Thursday, November 25, 2021

Day 3 (25.11.2021): Policy and Programmes for Disaster Management		
10.30 am – 11.45 am	Health Emergency and Disaster Management Risk	Dr. Shakuntala Kumar Director at Nulife Maternity Center and Senior Gynaecologist at Fortis Hospitals
11.45 am – 12.15 pm	Tea break	
12.15 p.m. – 1.30 pm	Sustainable Development Goals and Policy Imperatives: Opportunities and Challenges	Prof. Kaushal Kumar Sharma, Centre for the Study of Regional Development, School of Social Sciences, Jawaharlal Nehru University
1.30 pm – 2.00 pm	Lunch	



सत्यमेव जयते



2.00 pm – 3.15pm	Special Address	Maj. General M.K. Bindal, Executive Director, National Institute of Disaster Management
3.15 pm - 3.30 pm		Tea Break
3.30 p.m. -6.00 pm	Fire Risks and Mitigation practices Hands on training on First Aid and Fire Safety Training Group exercise	Delhi Fire Service

Day 4: Friday, November 26, 2021

Day 4 (26.11.2021): Contemporary Environmental Issues		
9.30 am – 11.45 am	Conserving Ecosystem Services for Managing Uncertainty and Transformation	Prof. Ranit Chatterjee Co-founder RIKA India KYOTO University, Japan
11.45 am – 12 noon		Tea break
12 noon – 1.15 pm	AI for resilient cities	Dr. Anshu Sharma Co-founder, SEEDS
1.15 pm – 2.00pm		Lunch
2.00pm – 3.15pm	Gender and Environment: Debate on Nurture and Nature	Prof. Amita Singh President, NAPSIPAG Centre for Disaster Research (NDRG) Senior Professorial Fellow ISS former Professor Jawaharlal Nehru University (Law, Governance and Disaster Management)
3.15pm to 3.30 pm		Tea break
3.30pm – 6.30 pm	The ideal perspective of climate change in present day scenario, with emphasis on prediction and coping strategies to manage urban resources	Sh. Alok Mukherji Scientific Secretary, South Asian Start Committee Centre on Global Change, National Physical Laboratory, Delhi

Day 5: Saturday, November 27, 2021

Day 5 (27.11.2021)- Workshop and Concluding Session		
9.30 am – 11.45 am	How to prepare a Disaster Management Plan for the College	NDRF
11.45 am – 12 noon		Tea break



सत्यमेव जयते



12 noon – 1.15 pm	Group activity (Identify local hazards, vulnerable groups, formation of committees and prepare an evacuation plan)	NDRF
1.15 pm – 2.00 pm	Lunch	
2.00 pm – 3.00 pm	Earthquakes and its impacts	Dr. O.P. Mishra Advisor/Scientist G & Head (SAGE), Director, National Centre for Seismology, New Delhi
3.00 pm – 6.30 pm	Valedictory session- Way forward Closure of the program Distribution of the certificates Vote of thanks	Prof. Balaram Pani, Dean, University of Delhi Prof. V.K. Sehgal, IARI (Guest) Prof. Chandan Ghosh, Head, Resilient Infrastructure Division, NIDM Prof. Bijayalaxmi Nanda, Officiating Principal, Miranda House Prof. Chirashree Ghosh, Dept. of Env. Science Dr. Garima Aggarwal, Sr. Consultant, NIDM



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Day Wise Summary November 23, 2021 – Day 1 Summary

The Five Days Training Program on “Understanding the Vulnerabilities and Risks associated with Urban Areas” was organized by National Institute of Disaster Management, Ministry of Home Affairs, Government of India in collaboration with Centre for Environmental Studies and Disaster Management, Miranda House, University of Delhi and Department of Environmental Studies, University of Delhi. The programme was organized in Miranda House. The deliberations during the training programme were done primarily in English and Hindi language. The inaugural session commenced with a warm welcome to the dignitaries and participants by the workshop conveners Prof. Chirashree Ghosh and Prof. Bijayalaxmi Nanda.

Prof. Chirashree Ghosh, Department of Environmental Studies, University of Delhi described that

- India is vulnerable to various disasters and this is why planning for management of all these hazards are of utmost importance.
- She illustrated with the examples of Bhuj earthquake and Jammu & Kashmir floods (2014) where health systems collapsed when it was needed the most which caused more casualties.
- She reminded about the guidelines prepared by the National Disaster Management Authority (NDMA) on Hospital safety and Mass casualty management and expressed her concern for resilience building.

Professor Bijayalaxmi Nanda, the officiating Principal of Miranda House welcomed all the guests.

- She announced the opening of a new centre in the college - Centre for Environmental Studies and Disaster Management.
- She appreciated the support of Prof. Kaushal Kumar Sharma, Chairperson and Governing Body Member under whose guidance the collaborative workshop was planned and successfully organized along with Professor Chirashree Ghosh who is also a Governing Body Member.



सत्यमेव जयते



- She reiterated the commitment of Miranda House as an institute of academic excellence dedicated towards achieving the goal of Sustainable Development and conduct research in the field of Disaster Management.
- She thanked the conveners, core committee members, organizers and most importantly the participants who participated in huge numbers. After the welcome address, the sessions of day one began.

Mr. Atul Bagai, Head of Country Office, United Nations Environmental Programme, India gave the keynote address.

- He explained the Vulnerability and Risk associated with urban areas in which he pointed out that 31 percent of total population in India is living in urban areas.
- Additionally, since cities are the engine of economic and social growth, the energy consumption is going to double in the next 20 years. As far as source of energy is concerned, we are still getting nearly 80% of our total electricity from coal-based power plants.
- The situation of air pollution is worrisome with nearly 75 per cent of Indian cities not making it to the standard of national air quality; the prime example of which is the severity of pollution in Delhi.
- Further, only about 37 per cent of total urban waste is treated and rest make it to the water sources, adding to the grimness of plastic and water pollution, and the challenges of provisioning clean and adequate water to the ever-growing population.
- He also discussed some solutions like involving the youth in addressing the challenge of environmental degradation and capacity building at the local level.

Dr Garima Aggarwal, Senior Consultant (Resilient Infrastructure), NIDM highlighted the role of NIDM in bridging the knowledge gap and helping people in capacity building.

- She laid stress on the problem presented by environmental degradation and urbanization, and how the level of poverty increases the scale of vulnerability.
- She further explained the significance of risk assessment and preparedness for disaster management in these challenging times.
- With increased frequency and intensity of disasters, there is a need for pro-active approach.
- She presented Delhi as a case study, with Delhi lying in Zone 4 as per earthquake zonation, and the diverse disasters the city of Delhi is exposed to, including COVID 19 pandemic. Thus, the time to act is now.



सत्यमेव जयते



Ms. Tanushree Verma, DRR Expert & Head (Research & Training) Zone Four Solutions gave an informative lecture on the topic ‘Understanding Hazard, Vulnerability and Risks: Conceptual Understanding and Vulnerability Profile of India’.

- She gave an insight into the conceptual understanding of disaster, vulnerability and its types, vulnerability profile of India to disasters, more specifically Delhi and how we can minimize the vulnerability.
- She explained the basic nuances related to the concepts of disaster management and disaster management cycle, and how climate change is accentuating the risk and vulnerability with increased frequency and severity of disasters.
- She further discussed the PM's 10-point agenda for Disaster Risk Reduction (DRR), laying stress on the importance of women’s participation and the role of Indian academic institutions and youth in addressing these challenges.
- There is a need for capacity building at different levels in the community because community is the first responder and ultimate sufferer.
- Only a community which is well prepared can stop hazard from becoming a disaster. She further discussed few solutions related to awareness, preparedness, resilience building and formation of disaster management plan.

Dr. Hari Kumar, Regional Coordinator, Geohazards International & Head, GHS held an interactive session on the significance of structural and non-structural elements and risks associated with disasters and disaster management.

- Not only the major hazards like the earthquake risk, flood hazard etc. but also local level emergencies like gas pipelines, high tension wires, etc. should be kept in mind while creating a disaster management plan.
- He gave several examples of how preparedness and response lead to reduction in loss of lives and infrastructure.
- He also addressed the various factors influencing vulnerability, including the design of buildings and violation of building code.
- Since hazards can only be partially contained, we need to work towards reducing the vulnerabilities and increasing the capacities of the communities.
- He also stressed on the requirement of a disaster management focal point and a proper plan in place along with due importance to non-structural hazards.

Ms. Ashoka Nandini Mohanty, Commandant CISF, DMRC, Delhi started her talk with an interactive exercise.



सत्यमेव जयते



- She displayed the importance of both audio and visual instructions in understanding the risks and managing the disaster, and saving lives during a disaster.
- She then explained the process of assessing the risks at a particular place using various tools like Transect Walk, Problem Tree, Chapatti Diagram and Social and Institutional Analysis.
- She also shared her experiences on threat perceptions and hazard mitigation. Having worked in Delhi metro for several years, she awared the public regarding matters which she and her team encounter on daily basis in Delhi Metro.
- She ended her talk with the importance of CISF in eliminating casualties.

The session was moderated by Ms Shipra Singh, Faculty, Department of Geography, Miranda House and Dr. Priyanka Sharma, Faculty, Department of Environmental Studies, Miranda House.

November 24, 2021 – Day 2 Summary

The second day of the training programme began with welcome note to all the participants and speakers.

Prof. Chandan Ghosh, Professor and Head, Resilient Infrastructure Division, NIDM, MHA, GOI talked in detail about the following points.

- He mentioned structural and non-structural components and their role played during an earthquake which command disaster risk reduction processes.
- He introduced vetiver grass as that grows on banks of rivers and is difficult to extract, one which was used in making cooler sheets a few years ago referred to as khus –khus at our homes. He also mentioned that vetiver grass roots can be grown as deep as the double the height of an average person into the ground and these roots can act as a great point for bio-phytoremediation.
- He stressed that if grown on the banks of Yamuna River it can crystal clear the water within a time period of two months. He described several advantages associated with the use of vetiver grass and also gave a start-up idea for youngsters where they could plant this vetiver grass in minimal area with minimal costs. He also stressed the use of vetiver grass bio-engineering measures.
- He said all we have to do is water it 15 days after sowing and leave it, after two years we can extract its roots which could be used for various purposes and hence the profit earned would be very high with bare minimum investment.



सत्यमेव जयते



- He highlighted the benefit and cost related to the above solution for disaster management.

Dr. Sreeja S. Nair, Independent consultant with Aga Khan Agency for Habitat on Environment and Social Impact assessment for National Seismic Risk Mitigation Programme of NDMA and World Bank started her session by introducing UNDRR (United Nations Disaster Risk Reduction) and explained the risks associated with urban areas.

- She stated that with climate change viruses and vector – borne diseases are going to increase along with many more epidemics. India rather maximum Asian countries are considered at higher risk of experiencing any losses due to climate change which includes human resources and financial losses.
- She said that 1970s was the landmark decade where there was awareness among the masses.
- She mentioned about various global strategies like Sendai framework for DRR, Paris Agreement, Hyogo framework and Sustainable Development Goals by UN which helped in setting agenda for the future.
- She explained the role of Disaster Management Act in the country and highlighted the importance of preparedness.
- She described the importance of response capability to disasters at the ground level and state administration giving cognizance to environmental degradation and sustainable management practices.
- She gave a detailed plan on setting a New Urban Agenda for Disaster Management.

Dr. Amir Ali Khan, Assistant Professor, National Institute of Disaster Management began his lecture with a brief introduction of basic concepts such as disasters, hazards, vulnerability, resilience and disaster risk management.

- He stressed on the fact that disasters have affected people all over the world especially with the ongoing pandemic, we need to learn the art of living with hazards.
- He explained the basics of earthquake, its origin and mechanics along with the increased vulnerability of urban setups due to expansion of habitat in risk prone areas. He brought up the fact that approximately 70 percent of Delhi's housing might be structurally weak and even in the 26 percent of the area that is considered to be standard much of it is pestered with illegal extensions.
- He emphasized the need for efficient urban governance, along with bringing disaster risk management and preparedness to dinner table discussions.



सत्यमेव जयते



- He highlighted the mitigation which includes assessment of risk, prevention, early warning and response constituting rescue, relief and rehabilitation.
- He emphasized the importance of seismic maps, micro-zonation for land use planning and structural and nonstructural retrofitting.

The day two of the workshop concluded with a brief session by **Dr. Garima Aggarwal** on “Disaster Risk Management in India & Role of National Institute of Disaster Management”. Dr. Aggarwal explained the interlinking of development and disasters along with sustainable development and its role in reducing vulnerability. She mentioned the need of institutional framework for disaster management in India focusing on the role of NIDM from its origin to its current endeavours.

The session was moderated by Ms Shipra Singh and Dr. Ruchi Sachan, Faculty, Department of Geography, Miranda House.

November 25, 2021 – Day 3 Summary

The sessions of the day began with a documentary based on Kashmir floods of 2014 highlighting the management strategies of Dr. G.N. Qasba who minimised the damage and impact of the floods. Following the video Dr. Garima Aggarwal had an interactive session with the students and research scholars regarding their personal experiences with floods and other disasters.

This was followed with an informative session by **Dr. Shakuntala Kumar, Gynecologist, Fortis Hospital, Delhi.**

- She began with her discussion revolving around the Covid-19 pandemic. She pointed out the lack of knowledge of the medical professionals regarding this novel virus and the ensuing hardships and losses brought about by the virus.
- She stated that the medical professionals were caught off guard and this also affected the treatment of patients who were suffering from other ailments. She then continued on with the Government’s response and delved into the various legislative Acts that were invoked to fight the pandemic.
- She briefly touched upon the hierarchy that was put in place for the decision making at various levels after which she enumerated on the pandemic management strategies.
- She summarised her talk by answering a question from the audience which questioned the growing trend of increasing Child births using C-Section deliveries.



सत्यमेव जयते



Prof. Kaushal Sharma, Centre for Study of Regional Development, School of Social Science, JNU spoke about the Sustainable Development Goals (SDGs).

- He enumerated the 17 sustainable development goals and 169 targets each under one of the SDGs, that are to be achieved by 2030. He stressed on the need for the collaboration among various sectors like technology, research, health, administration, logistics and transport to meet the SDG targets.
- His key pointers included international funding and collaboration through technology. He pointed out that international collaboration and transfer of technology would be pivotal for achieving the SDGs. It would lead to the growth of knowledge which would further push the cause of Sustainable Development Goals.
- He emphasised on circular economy and how resources had to be used and recycled in a way that it is sustainable to achieve Intergenerational Equity of Resources.
- While explaining how sustainable development goals can be implemented, he talked about the Addis Ababa Agenda and the progress towards achieving all the goals and targets of Sustainable Development.
- India has made steady progress in areas of health, energy and infrastructure as per NITI Aayog's latest India Index. He introduced the national programmes and initiatives aligned with SDGs and the challenges faced by India to achieve each of these goals like the: Sashakt Bharat- Sabal Bharat; Swachh Bharat- Swasth Bharat; Satat Bharat- Sanatan Bharat and Sampanna Bharat- Samridhh Bharat.

Major General M.K. Bindal, Executive Director, NIDM, Ministry of Home Affairs, Government of India addressed the audience on a variety of contemporary issues.

- First, he explained that any learning on disaster management should be multidisciplinary to be able to understand and cope up with disasters.
- Another important issue raised by him was about the need for Psycho-Social care. Sharing his experiences about the Bhuj earthquake the lack of such facility brought setback in the recovery process. Psycho - social care forms a very important part of post disaster management where people are given mental support to deal with the effects of trauma and anxiety.
- He also focused on one of the root causes of the urban vulnerability that is poor land use planning relating it to recent episodes of flooding which have occurred even after low intensity rainfall over a short period of time.
- He emphasized on the role of capacity building in academic institutes. Women leadership in disaster management can be a step forward in this direction.



सत्यमेव जयते



- He stressed on a consultative process with various stakeholders to create a conducive environment for disaster preparedness.

Delhi Fire Services elaborated the measures related to fire safety.

- They dealt in detail about Fire Risks and Mitigation Practices that needs to be given a serious thought.
- Being one of the major man-made disasters in urban areas, it is our concern as well as our responsibility to raise awareness on this hazard.
- They also gave Hands on Training on First Aid and Fire services. Usage of fire extinguishers was explained to the participants in detail along with various types of extinguishers available in the market.
- They interacted with the audience and responded to all their queries very patiently.

The session was moderated by Ms Shipra Singh, Faculty, Department of Geography, Miranda House and Dr. Priyanka Sharma, Faculty, Department of Environmental Studies, Miranda House.

November 26, 2021 – Day 4 Summary

The fourth day of the training programme started with the moderators welcoming all the participants. **Dr. Ranit Chatterjee, PhD, Kyoto University** was the first speaker of the day.

- Dr. Chatterjee first introduced his topic “Conserving Ecosystem Service for Managing Uncertainty and Transformation”. He then explained the importance of mangrove forests as one of the world's most productive and biologically diverse ecosystems.
- He further discussed the adaptation strategies related to climate change. The process of adjusting to current or expected climate change and its effects (IPCC, 2014) will be a major topic of concern.
- Giving example of the Sundarbans, which has 4,200 sq km forest area and 5,400 sq km of non-forest area and is inhabited by 4.5 million population where their livelihood is at stake. Highly dependent on rain-fed monocrop, fishing, seed, timber and honey collection, more than 50,000 people will be affected.
- He then went on to explain the Bonobibi’s customary regulations which are focused on protection, provisioning and regulating services which have been a part of the traditional system of these people.



सत्यमेव जयते



Dr Anshu Sharma, Co-founder, SEEDS, India discussed about Contemporary Environment and Risk Issues.

- He pointed out that our focus should be in building resilience when discussing contemporary environment and risk issues that is built from our past experiences. We should know our risks and develop coping mechanism. He explained the three dimensions of resilience which are; Anticipate, Absorb and Adapt.
- Furthermore, he outlined some of the organizations responsible for managing complex disasters in Sikkim such as MOEFCC, SSDMA, IIPA, SEEDS.
- He demonstrated a Dwelling-Type Risk Classification Model called Go HYPER-LOCAL that uses GIS and ground truthing for prediction of disasters.
- He explained that he keeps his air quality measuring device handy and normally checks the air quality of places he normally visits in his everyday life. To his astonishment, he discovered that indoor air pollution is a greater threat as the rise of respiratory problems have become severe in Delhi NCR compared to other states. He emphasized the need for every individual to be cautious and take the necessary steps to reduce indoor air pollution.
- He believes in sensitizing the community and the government at large on the need to find alternative technologies to curb outdoor and indoor air pollution.

Prof. Amita Singh, President, NAPSIPAG Centre for Disaster Research (NDRG), Senior Professorial Fellow ISS, former Professor Jawaharlal Nehru University (Law, Governance and Disaster Management) discussed about the gender roles in context of environment.

- She mentioned that the human race has developed arrogance which has made us greedy to the point that we change every part of the environmental landscape to make it suitable as per our needs. A classic example is the Himalayas where a lot of mangroves have been lost due to development which has led to an accelerated soil erosion.
- Prof. Singh further explained that in every environmental degradation, women are the first to feel the effects of that disaster. She then presented the agricultural statistics of India giving examples from Punjab where the overuse of chemicals has found its way into food, water and soil which has a devastating impact on women.
- Several scientists who are women have done research over the years and published books to raise awareness to the public on how much damage we are inflicting to our environment which causes ecosystem breakdowns.
- Rachel Carson, the founder of U.S Environmental Movement published the book titled Silent Spring which was aimed to sensitize the public on the effects of use of chemicals



सत्यमेव जयते



in farming. Furthermore, the Soil not Oil book by Vandana Shiva sought to induce environmental justice in an age of climate crisis.

- Women are suffering the effects of being under-represented in government debates and issues affecting the society.
- She concluded her presentation by listing the solutions to this issue of gender and environment. She reminded the audience of the UN's sustainable development goals that will help us forge a platform to achieve equality and also save the environment.

Dr. Alok Mukherjee, Scientific Secretary, South Asian Start Committee Centre on Global Change, National Physical Laboratory, Delhi held the final session which was crisp, compact and energy filled.

- He spoke about the central idea of integration of knowledge and data for overcoming disasters. He elucidated on the urban risks and on how to mitigate and reduce them.
- He emphasized that there are different problems for different areas and the risk reduction efforts must be tailored for the particular needs of the areas.
- Continuing with the concept of building resilient urban areas he spoke about the Monocentric, Polycentric and Linear models in urban planning.
- Moving on from the concept of urban planning he focused on the need for Information Sharing and Data Generation in order to better predict the calamities, create new knowledge for preparedness and mitigation measures and in general for the cause of making a safer society to live in.
- He gave few ideas that could go a long way in achieving our goals for protecting the environment.

The session was moderated by Ms Shipra Singh, Faculty, Department of Geography, Miranda House and Dr. Vimla Singh, Faculty, Department of Environmental Studies, Miranda House.

November 27, 2021 – Day 5 Summary

The final day of the five days training program started with a theoretical session as well as practical demonstration by the team from **National Disaster Relief Force**. The message from the Director General of NDRF was read out to the audience as he could not make it to the event.

The theory session was conducted by **Mr. Aditya Pratap Singh, the Deputy Commandant of NDRF** who explained the vulnerability profile of India, outlining the fact that there is no inherently 'safe' place in the country pointing out to the different risk profile maps.



सत्यमेव जयते



- He explained the emergence of the response forces in the country. He gave an introduction of the NDRF, a specialist force with a three-tier pattern at National, State and District level.
- Out of the 16 battalions (initially 8 battalions), 12 are functional. The distribution of these battalions is based on the vulnerability profile of India. He then continued the session with the central motto that “Disasters are no longer a surprise.”
- This session was then followed by a live demonstration of various first aid and other rescue procedures in cases of disasters by **Inspector Jitendra Kumar Yadav**. He spoke about the first three things to be done when attending to an injured person rescued from disaster site.
- The NDRF gave a demonstration of different techniques used to scale buildings and evacuate people from dangerous conditions using rappels, ropes and pulleys. They displayed their valour and dedication in rescuing the victims and trying to reduce the loss of human lives.

Dr. O P Mishra, Scientist and Head (SAGE), Director, National Centre for Seismology, New Delhi began his lecture by discussing the basics of a disaster, hazard and vulnerability.

- The main highlight of his lecture was the discussion on earthquakes and the subduction tectonic zones. He highlighted the problems caused by severe earthquakes leading to loss of land and property.
- As a solution he said that the Disaster management cycle should be followed to reduce the earthquake risk but there would always be certainties when it comes to pre-disaster steps and the precautionary measures.
- He explained the disastrous effect caused by liquefaction which leads to the inadequate resistance to horizontal shaking, soil amplification, permanent displacement and fire following rupture of utilities, lack of detailing or construction materials.
- He ended his discussion with Trans building assessment to know more about it and be well prepared and said that consequences of urbanization should be analyzed properly so that a safer system can be generated.

The five days programme ended with the valedictory address by **Dr. Balram Pani (Dean of Colleges of University of Delhi and Director SOL, Delhi University)** who showed his enthusiasm towards this endeavor. He congratulated the entire team responsible for organizing the face-to-face event after the pandemic and lauded Miranda House for hosting the event. He also shared his valuable insight on disaster management while thanking all the speakers and experts who lent their time, effort and expertise for the cause of the workshop. The valedictory ceremony was also graced with the solemn presence of **Prof. Chandan Ghosh** and **Dr. V.K.**



सत्यमेव जयते



Sehgal who were very happy with the success of the workshop. This was followed by the address from the Principal of Miranda House, **Prof. Bijayalaxmi Nanda**, **Prof. Chirashree Ghosh**, the Convener, and **Dr. Garima Aggarwal**, who summarized the proceedings of the workshop. The floor was opened to the audience to share their experiences and this was met with enthusiastic replies from the participants who spoke about their experiences. The five - day saga ended with the heartfelt vote of thanks from **Dr. Rakhi Parijat (Core Committee Member and Associate Professor, Department of Geography, Miranda House)**. She thanked the participants and the organisers along with the eminent speakers for making the event successful. She also welcomed the initiative of NIDM along with Miranda House and Department of Environmental Studies for organising the event in an offline mode.

The session was moderated by Dr. Ruchi Sachan, Faculty, Department of Geography, Miranda House and Dr. Priyanka Sharma, Faculty, Department of Environmental Studies, Miranda House.

Key Takeaways

- The workshop provided the participants a training ground for capacity building and sensitize individuals and the college community to understand their risk and vulnerabilities.
- This programme also marked the first physical activity of the newly launched Centre for Environmental Studies and Disaster Management of Miranda House.
- The college has decided to formulate a Disaster Management Plan based on a multi-disciplinary approach. It plans to take help from experts from NIDM and other institutes engaged in disaster planning.
- The college will also invest in resource mapping and preparation of evacuation maps.
- All risk prone areas or hot-spots will be identified and a detailed inventory of the structural safety within the college premises will be undertaken. Vulnerability mapping can be done for identifying the population and areas at risk.
- The college will not only engage the students and teachers but also the non-teaching staff to be part of its resilience building activities. It will organise skill development programmes from time to time on various topics like- fire safety, first aid, road safety, handling hazardous substances in the lab and conduct evacuation mock drills.
- The college under the centre will develop teaching learning material and design short-term certificate programmes on environment and disaster management.



सत्यमेव जयते



- Short-to-medium term and long-term response plans will be prepared based on suitable feedbacks in a phased manner.
- The centre also aims to involve the students and teachers in community outreach programmes related to disaster preparedness.
- The centre will use innovative tools like audio/visual shows, making and screening of documentaries, dissemination workshops and street plays for raising awareness among common people.
- The centre will acquire and use various instruments to generate meaningful data for environment and disaster analysis
- The college intends to focus on publication of the research data on diverse topics covering the theme of environment and disaster management for greater good of the scientific community.
- The most important takeaway would be to have a multi-disciplinary and holistic approach for conducting extensive research in fields related to environment and disaster management.



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Gallery





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Day one photographs





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Day two photographs:





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Day three photographs:

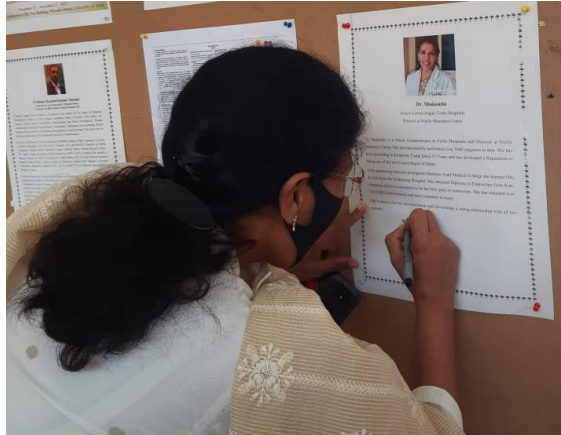




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Day four photographs





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Day five Photographs





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