सत्यमेव जयते

Report on
Three Day online Course
"Capacity Building on Ecosystem Restoration and Disaster Management"

On 05th-07th July 2022 (14:00-16:30)

nidm
Resilient India - Disaster Free India

Society for Environment and Development (India)
Steps Towards Sustainability
Non government nonprofit organization

श्री वेंकटेश्वर कॉलेज
SRI VENKATESWARA COLLEGE
NEW DELHI

Submitted by

Dr Abhishek Chandra,
Course Coordinator &
Assistant Professor
Department of Environmental Sciences
Sri Venkateswara College, University of Delhi
New Delhi 110021

Contents

1.1 About Sri Venkateswara College, University of Delhi:

Sri Venkateswara College is a constituent college of the University of Delhi established in 1961 in New Delhi, India. It is managed by Tirumala Tirupati Devasthanams & UGC and awards degrees under the purview of the University of Delhi. The college offers courses both at the undergraduate level and the postgraduate level. Vocational courses and short-term add-on courses that serve as significant supplement to the academic profiles of the students are offered by the college. Admissions are done purely based on merit and as per the Delhi University norms. It was ranked by NIRF at 11th rank in the college category in 2021.

1.2 About Us Department of Environmental Sciences, SVC, DU

The Department of Environmental Sciences is a newly constituted department at Sri Venkateswara College, University of Delhi. The Department was established to teach one semester interdisciplinary compulsory course on Environmental Studies after the University of Delhi's mandate in 2014-15. After the introduction of Choice Based Credit System in 2015-16 this paper became a four credit, AECC (Ability Enhancement Compulsory Course) for students. Students enrolled at the University are required to study and appear for this paper either in the first or second semester of their academic year.

Environmental Studies course at Sri Venkateswara College aims to provide students with the extent of understanding environmental issues. It is done through integrated, problem-oriented study with fieldwork. It is an interdisciplinary compulsory course with an objective to create environmental awareness among students of all disciplines. Sri Venkateswara college faculties with wide-ranging expertise and background in the subject teach the course.

The Department of Environmental Studies develops interests among students in a number of areas; including ecology, energy resources, biodiversity, conservation, pollution, waste management, environmental policy and practices, human communities and environment and global climate change. The Department of Environmental Science is also associated with many field experts who have contributed significantly in the field. Students are also offered internship opportunities within the department and the department also promotes field-based research, participation in conferences, workshops and seminars.

1.3 About the NIDM

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 redesignation 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 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.

NIDM is proud to have a multi-disciplinary core team of professionals working in various aspects of disaster management. In its endeavour to facilitate training and capacity development, the Institute has state-of-the-art facilities like class rooms, seminar hall and video-conferencing facilities etc. The Institute has a well-stocked library exclusively on the theme of disaster management and mitigation. The Institute provides training in face-to-face, on-line and self-learning mode as well as satellite-based training. In-house and off-campus face-to-face training to the officials of the state governments is provided free of charge including modest boarding and lodging facilities.

NIDM provides Capacity Building support to various National and State level agencies in the field of Disaster Management & Disaster Risk Reduction. The Institute's vision is to create a Disaster Resilient India by building the capacity at all levels for disaster prevention and preparedness.

1.4About the SED India

Society for Environment and Development (India) popularly known as **"SEDINDIA"** was founded as a non-government, non-profit, consultancy and research organization. The **SEDINDIA** is an interdisciplinary research organization and it's dedicated for environmental, social and developmental issues. As scientists and social scientists, economists and engineers all play a significant role to find sustainable solutions for environmental issues and socio-economic development. **SEDINDIA** has succeeded in establishing a platform for interdisciplinary research.

2. Programme Poster

3.About the Program

The increasing incidence and severity of disasters such as hurricanes, floods and landslides are leaving more people vulnerable each year, particularly the poor and marginalized. Climate change is increasing the frequency and intensity of these climate-related hazards, leading to a higher number of deaths and injuries as well as increased property and economic losses. Human vulnerability to natural hazards is further exacerbated by ongoing environmental degradation, high population densities in exposed areas, increased frequency of extreme weather events and lacking or ineffective government policies. Environmental degradation reduces the capacity of these ecosystems to provide important services to communities like food, firewood, medicines and protection from natural hazards. It also greatly reduces a landscape's ability to sequester carbon - a crucial element in climate change mitigation. On the other hand, healthy ecosystems have important roles to play in reducing the risks of disasters through multiple ways. Healthy ecosystems such as wetlands, forests and coastal areas, including mangroves and sand dunes can not only reduce vulnerability to hazards by supporting livelihoods but also act as physical barriers that reduce the impact of hazard events. The most vulnerable are often those who are most dependent on natural resources for their livelihoods. Ecosystem health is interconnected with both physical and mental human health. Ecosystem restoration is important to regulate the climate, prevent disease and provide natural spaces in which to exercise and lower stress levels. On the other hand, disaster leads to severe alterations in the normal functioning of an ecosystem or a society due to hazardous physical events interacting with vulnerable social conditions, leading to widespread adverse human, material, economic, or environmental effects that require immediate emergency response to satisfy critical human needs and that may require external support for recovery. Although the relationship between biodiversity and infectious disease is complex, the risk of infection rises as land-use change and greater use of wildlife bring people and animals into closer contact. Ecosystem restoration is the process of halting ecosystem degradation and disaster management, resulting in improved ecosystem services and recovered biodiversity. Ecosystem restoration encompasses a wide continuum of practices, depending on local conditions and societal choice. Depending on objectives, restored ecosystems can follow different trajectories: • from degraded natural to more intact natural ecosystems (often by assisting natural regeneration) • from degraded, modified ecosystems to more functional modified ecosystems (e.g., restoration of urban areas and farmlands) • from modified ecosystems towards more natural ecosystems, providing that the rights and needs of people who depend on that ecosystem are not compromised.

Ecosystem restoration and Disaster management of natural resources can therefore play a critical role in people's ability to prevent, cope with and recover from disasters.

Training programme will allow the participant to gain knowledge regarding the mitigation and technological process available for resilient steps for the different forms of natural disaster hampering the human population, ecology and environment. It will also provide real time interactions with experts and professionals from the field of disaster management.

3.1 Aim of the programme:

The main outcome of this programme will be sensitizing people with the knowledge of importance of ecosystem restoration and its linkages with disaster risk reduction.

3.2 OBJECTIVES:

- Understanding basics of ecosystem and its restoration.
- Relationship of ecosystem restoration with disaster risk reduction.
- Ecosystem restoration as a tool for livelihood sustenance.

3.3 COURSE CONTENT:

1. Basics of ecosystem degradation and restoration.
2. Climate change and its effect on triggering natural disasters.
3. Creating awareness about disaster management.
4. Participatory approach for disaster management.
5. Impact of recent disasters on agriculture.

PARTICIPANTS:

The Target Audience for this programme would be Faculties, Researchers, Students of University of Delhi and Sri Venkateswara College.

MODE OF APPLICATION:

The interested candidates can register online at http://training.nidm.gov.in on or before 4th July, 2022 up to 17.00 hrs. There is no registration fee for participation.

VENUE: Online ZOOM platform

IMPORTANT DATES:

Last date of Registration: 4th July, 2022 up to 17.00 hrs.

Training schedule: From 14:00 Hours to 16:30 hours during 5th-7th July, 2022 (3 days)

4.**Programme Schedule:**

Time	Speaker
Day 1 (5 July 2022) Tuesday	
1400-1430 Inaugural session	Welcome Address by Dr Abhishek Chandra, Assistant Professor, Department of Environmental Sciences, SVC, University of Delhi Program Initiation: Dr Sweta Baidya, Consultant, ECDRM, NIDM Inaugural Speech by **Prof. C Sheela Reddy**, Principal, Sri Venkateswara College, University of Delhi, New Delhi Keynote Address by **Shri Taj Hassan, IPS, Executive Director, NIDM** **Chief guest Address: Prof KRS Sambasiva Rao, Hon'ble Vice Chancellor, Mizoram University** Context Setting and Opening Remarks: **Prof. (Dr) Anil K Gupta, Head,** ECDRM Division, NIDM, MHA, GoI Remark from **Prof. C Rajsekaran**, President SED India/VIT Vallore Vote of Thanks: by Dr Abhishek Chandra, SVC

1430-1515	Prof T. Pullaiah, Department of Botany, Sri Krishnadevaraya University, Anantapur 515003, A.P.	Biodiversity, Threats and Conservation
1515-1600	Dr. Sweta Baidya, Consultant, NIDM	Climate Resilient Livelihood and Ecosystem Based DRR
1600-1620	Moderator of the session	Dr Kavita Singh, University of Delhi, New Delhi
Day 2 (6 July 2022) Wednesday		
1400-1440	Prof Joseph Selvin, Head, Department of Microbiology, School of Life Sciences, Pondicherry University	Exploration-Exploitation-Extinction
1440-1520	Prof. J K Garg, Director Tribhuvan College of Environment and Development Sciences, Nalanda University Centre, Neemrana. Retd. Professor, USEM, GGS Indraprastha University, New Delhi	Wetlands restoration and Disasters
1520-1610	Ms. Fatima Binte Amin, Young Professional, NIDM	Eco system and Community based Disaster management
1610-1640	Mr. Harshit Sharma, Young Professional, NIDM	Climate Change Impact on Ecosystem and Initiatives Taken Towards DRR
1640-1645	Moderator of the session	Dr Abhishek Chandra, Asst. Prof., SVC
Day 3 (7 July 2022) Thursday		
1400-1440	Dr. L S Rawat, GB Pant 'National Institute of Himalayan Environment'(NIHE), Srinagar, Garhwal	Restoration of Degraded Land for Biodiversity Conservation and Societal Development in the centre Himalayas
1440-1520	Dr. Kavita Singh, Mata Sundri College for Women, University of Delhi, New Delhi	Mapping of Restoration of Wetlands in India
1520-1600	Mr. Himanshu, Centre for Rural Development and Technology, IIT Delhi	Sustainability through Sacred Groves: Understanding the role of Sacred ecosystems
1600-1605	Moderator of the session	Prof. C. Rajsekaran, VIT Valore
1605-1620	Concluding Remarks Dr Sweta Baidya, Consultant, NIDM Valedictory Address Prof. K.S. Rao, Dean, Faculty of Technology and Sr Professor, Department of Botany, University of Delhi Valedictory Remarks Prof. C. Rajsekaran, VIT Valore Vote of thanks Dr Abhishek Chandra	

Course Co-ordinators: Dr Abhishek Chandra, Assistant Professor, Department of Environmental Sciences, SVC, University of Delhi and Dr Sweta Baidya, Consultant, ECDRM, NIDM

Student coordinators: Chetna Sharma, Nimmi Verma, Saachi Ahuja, Arushi Thapliyal, Megha Mahesh, Radhika, Ananya, Anshita, Nishita.

5. Highlight of events

Day 1 (05th July 2022) Tuesday

Welcome Address by Dr. Abhishek Chandra, Coordinator & Assistant professor, Department of Environmental Science, sri Venkateswara college, University of Delhi.

He gave a broad description about three days capacity development online program on "Ecosystem Restoration and Disaster Management" Jointly organised by National Institute of Disaster Management (NIDM), New Delhi, & Society for Environment and Development (SED India) , New Delhi, Department of Environmental Science, Sri Venkateswara College, University of Delhi, New Delhi from 5-7 July 2022. He explained that these dates are selected to celebrate four festivals (i) Van Mahotsav or Forest Festival is an annual tree-planting festival celebrated in the month of July in which thousands of trees are planted all over the country. Van Mahotsav week is celebrated from 1 July to 7 July to spread awareness of forest conservation and to save the environment. (ii) Azadi Ka Amrit Mahotsav is an initiative of the Government of India to celebrate 75 years of independence and the glorious history of it's people, culture and achievements. (iii) Century year of University of Delhi 2022 because DU Act came into force on May 1, 1922, with Viceroy Lord Reading as the first Chancellor and Hari Singh Gour as the first Vice-Chancellor and (iv) Sri Venkateswara College is in its 60th year of its existence. As you all are well aware that SVC are celebrating Diamond Jubilee Year from 20th August, 2021 to 20th August, 2022, in a befitting manner showcasing the academic and extra-curricular activities of the college. In view of the prevailing Covid-19 pandemic, the event is being planned through virtual platform. He also give a brief idea and concept of three day program structure

Chief guest Address: Prof KRS Sambasiva Rao, Hon'ble Vice Chancellor, Mizoram University

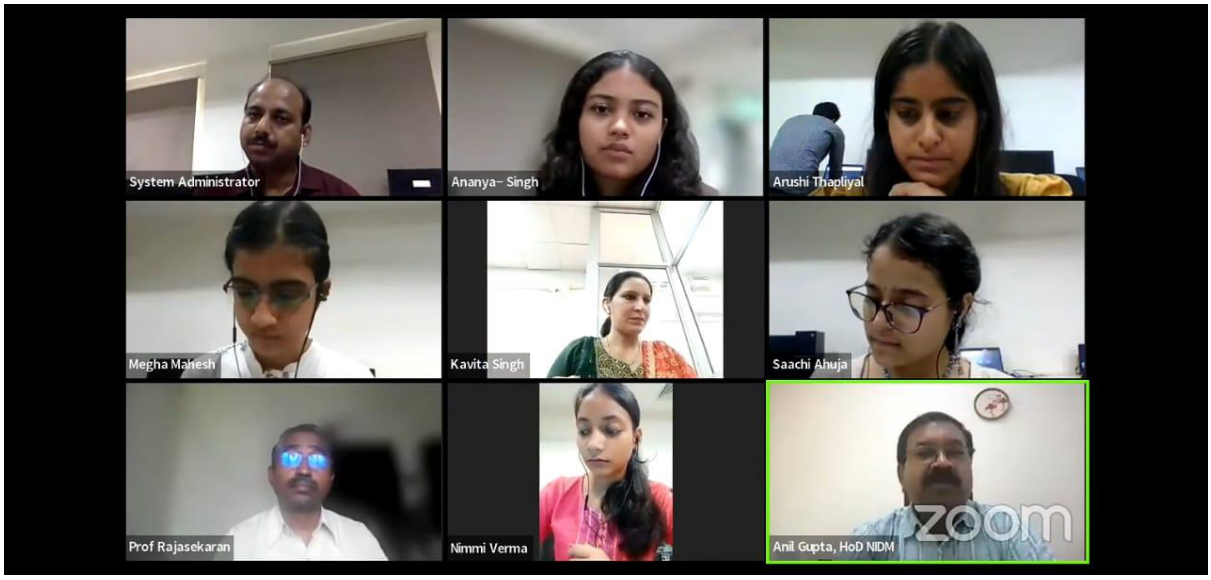
Prof. KRS Sambasiva Rao addressed the participants about how this 3-day webinar will spread awareness among youth regarding environmental issues and its present-day scenarios, environmental and physical calamity. He also briefed us about disaster management, wild life extinction due to deforestation and Mizoram water logging case.

Key points highlighted:

- Ecosystem degradation and its reasons.
- Exploitation of ecosystem and management of ecosystem.
- Disaster management and restoration.
- Talked about Northeast region of India for disaster management.
- Tremendous significance of knowledge in ecosystem restoration and disaster management.

Opening Remarks: Prof. (Dr) Anil K Gupta, Head, ECDRM Division, NIDM, MHA, GoI

Prof. Gupta highlighted Leadership based disaster management, which applies to conservation also when promoting ecosystem-based approaches. He quoted the 'UN Decade for eco-restoration', and highlighted importance of ecosystem restoration. He quoted that the year 2023 will be the International Year of Millets (IYOM) and India's cultural and traditional significance towards nature. In July 2019, India hosted the 14th Conference of parties of UN Convention on Combatting Desertification (UNCCD), in which land restoration by releasing it was discussed. Future sustainability and critical challenges faced by ecosystem and biodiversity resources.



Opening Remarks: Prof. C Rajsekaran, President SED India/VIT Vallore

He highlighted Leadership based disaster management, which applies to conservation also when promoting ecosystem-based approaches. He quoted the 'UN Decade for eco-restoration', and highlighted importance of ecosystem restoration. He quoted that the year 2023 will be the International Year of Millets (IYOM) and India's cultural and traditional significance towards nature. In July 2019, India hosted the 14th Conference of parties of UN Convention on Combatting Desertification (UNCCD), in which land restoration by releasing it was discussed.Future sustainability and critical challenges faced by ecosystem and biodiversity resources.

Speaker 1 - Prof T. Pullaiah, Department of Botany, Sri Krishnadevaraya University, Anantapur 515003, A.P.

Topic: Biodiversity, Threats and Conservation

Prof T. Pulliah talked about the convention of biodiversity and global environmental facility and explained in brief about few new species discovered in 2021, and highlighted more about angiosperms species, wild relatives of crops in India, domesticated animal breeds. He discussed a little bit about his various books on flora of different regions in India. He gave us a detailed information of different Indian environmental laws, biodiversity and its conservation strategies.

Key points highlighted

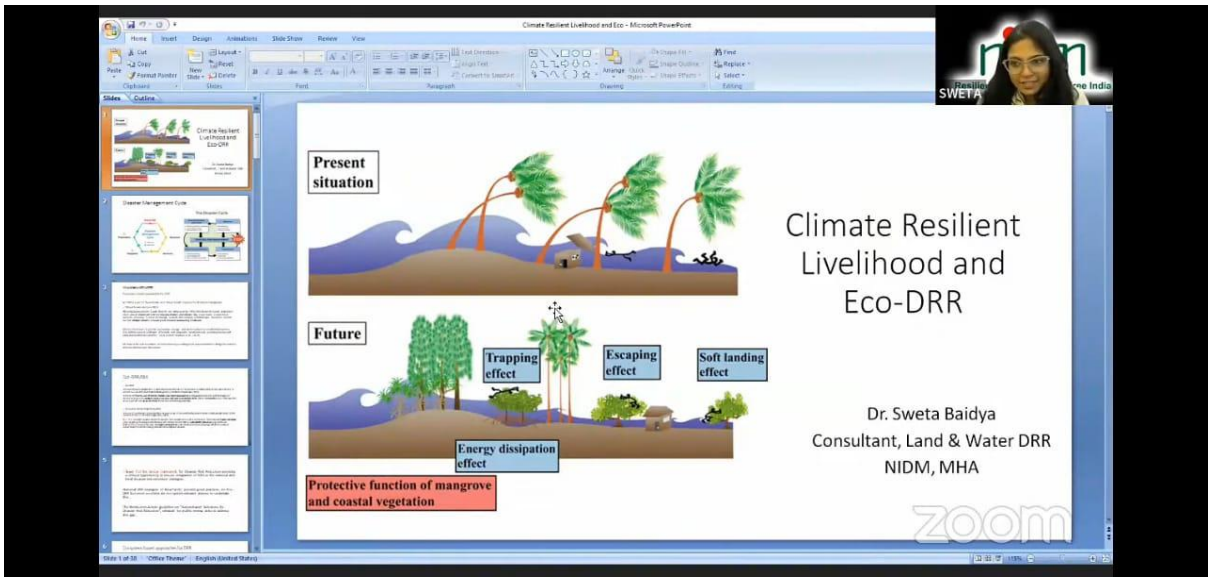
- List of new species of plants discovered in 2021.
- Angiospermous species in different countries.
- Comparative statement or record of plants and animals' species in India and the world.
- Wild relative of crops.
- Overview of different plants and trees like Rosy periwinkle, *Azadirachta indica* (Neem), *Caralluma adscendens.*
- Hotspots in the world.

Speaker 2 - Dr Sweta Baidya, Consultant, NIDM

Topic: Climate Resilient Livelihood and Ecosystem Based DRR

Dr Sweta Baidya in her session on climate resilient livelihood and ecosystem-based DDR, explained the disaster management cycle, ecosystem-based disaster risk reduction techniques, its importance and benefits. She also elaborated upon Ecosystem Based

Adaptation (EBA), ocean acidification and its effect on organisms living in ocean. At the end, she suggested few steps for preparing for preparing disaster and climate resilient livelihood, highlighting on building of flood resilient houses.



Key points highlighted

- Disaster management cycle
- Importance and benefits of Eco - DRR or ecosystem-based approaches for disaster risk reduction.
- Ecosystem based adaptation (EBA).
- Ocean acidification.
- Steps for preparing disaster and climate resilient livelihood like flood resilient houses.

Day 2 (6th July 2022) Wednesday

Speaker 1- Prof Joseph Selvin, Head, Department of Microbiology, School of Life Sciences, Pondicherry University

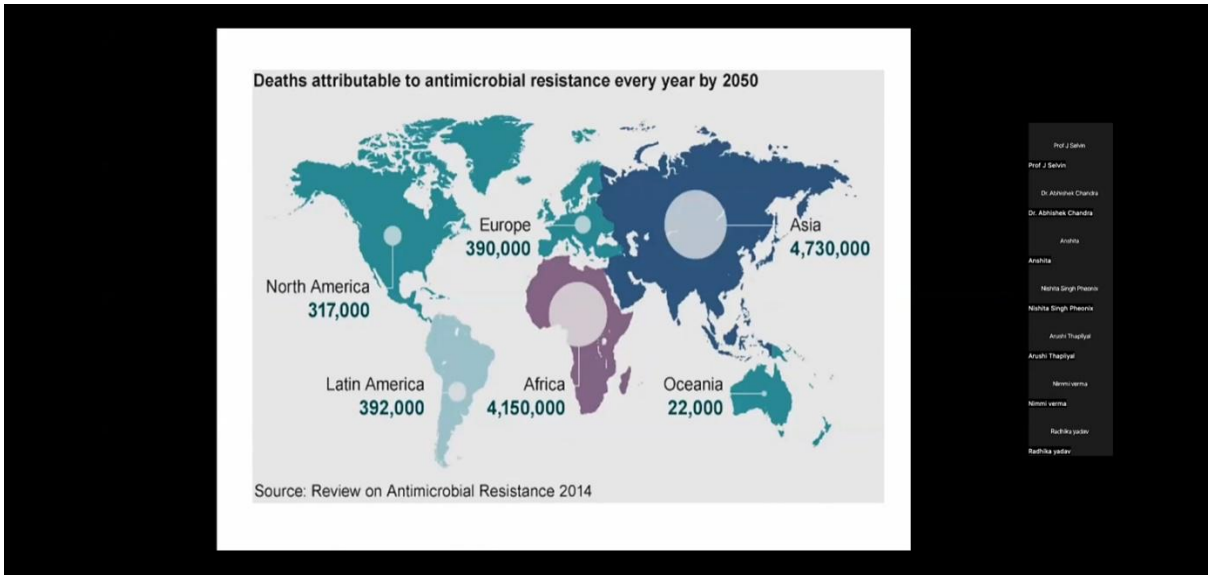
Topic: Exploration-Exploitation-Extinction

Professor Joseph Selvin talked about the concept of global warming and its effect on present generation, outbreak of new diseases due to mutation of microbes. He also explained about theories related to evolution like Darwin's theory of evolution, Stephen Hawking theory of aliens and hologenome theory of co-existence.

Key points highlighted:

- Global warming and effect of climate change on spread of antibiotic resistance.
- Zika virus outbreak in America.
- Darwin's theory of evolution and natural selection.

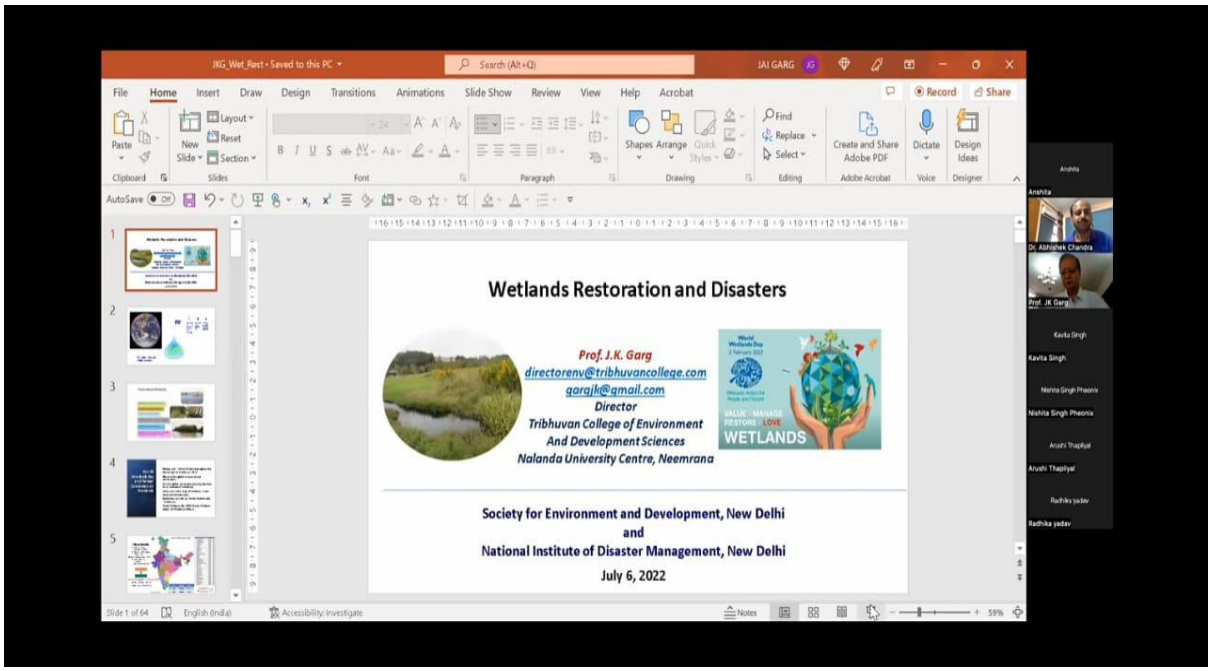
- Stephen Hawking's theory of aliens.
- Hologenome theory of Co-existence and the potential of Metagenomics.



Speaker 2- Prof J K Garg, Director Tribhuvan College of Environment and Development Sciences, Nalanda University Centre, Neemrana.

Topic: Wetlands restoration and Disasters

Prof J K Garg explained about wetlands and their importance, Ramsar convention on wetlands and also talked about major threats faced by wetland ecosystem, loss of urban wetlands and wetland for disaster reduction in India. He also highlighted rehabilitation and restoration of wetlands, restoration. He concluded with water quality index, various process of rehabilitation and restoration of wetlands.



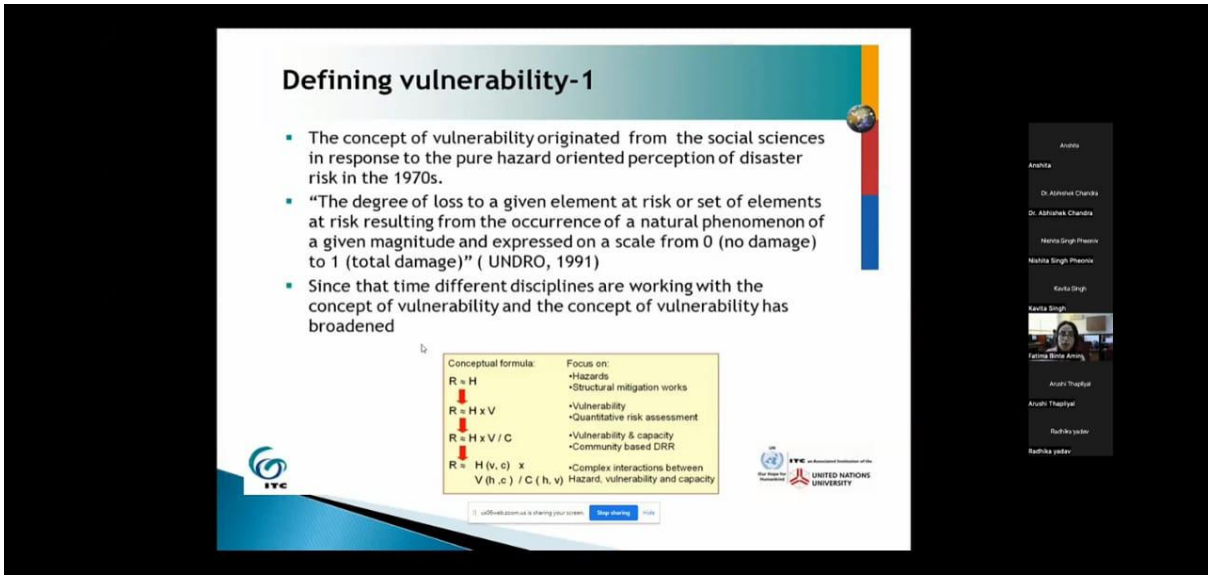
Key points highlighted:

- Facts about wetlands: RAMSAR convention on wetlands.
- Major threats faced by wetland ecosystem in India.
- Methods and tools for wetlands restoration: conventional approach and landscape approach.
- Wetland health/condition assessment: river health assessment and water quality index.
- Process of rehabilitation and restoration of wetlands: wetland structural components, catchment characterization and area of influence.

Speaker 3- Ms. Fatima Binte Amin, Young Professional, NIDM

Topic: Ecosystem and community-based disaster management

Ms. Fatima Binte Amin in her talk briefed us about the concept of vulnerability and how climate change and degradation of our ecosystem causes communities to become vulnerable. She elaborated disaster management and the various steps that are involved in disaster management and along with it she also explained how vulnerability assessment can help in developing various strategies for disaster management.



Key points highlighted:

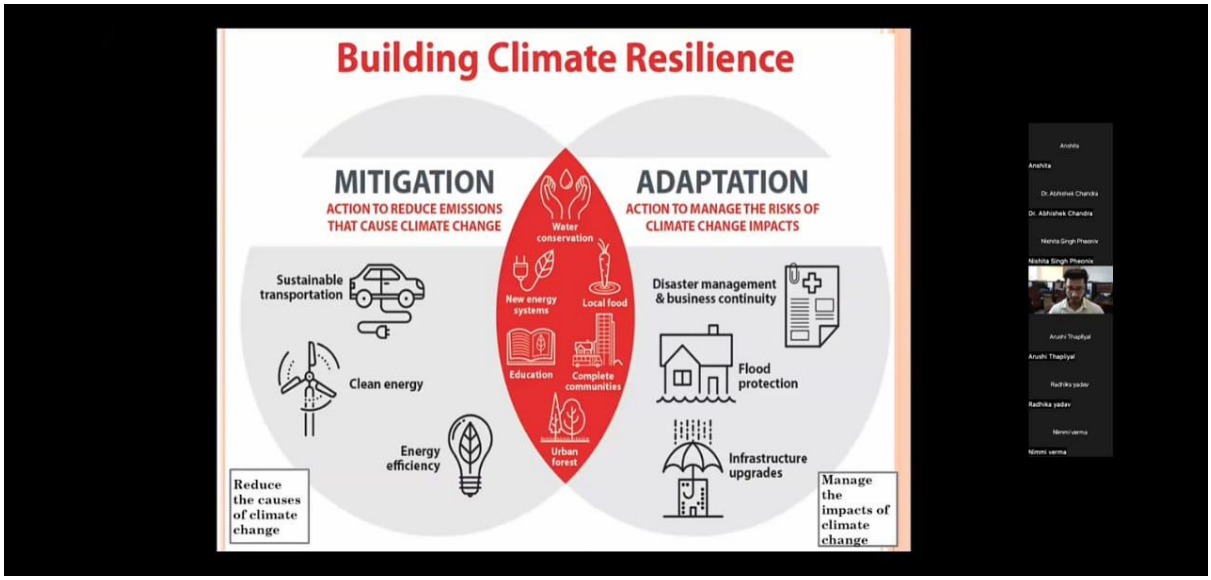
- Concept of vulnerability.
- Climate change and ecosystem degradation cause communities to become vulnerable.
- Vulnerability assessment help in developing strategies for management.
- Disaster management.
- Various steps involved in disaster management.

Speaker -4 Mr Harshit Sharma, Young Professional, NIDM

Topic: Climate Change Impact on Ecosystem and Initiatives Taken Towards DRR

Mr. Harshit Sharma spoke about climate change and its impact on the ecosystem, migration and adaptation of organisms. During his talk he also gave few solutions and approaches to climate change mitigation and elaborated on aur roles and responsibilities in

disaster management. Lastly, he talked about government initiatives and Prime Minister's agenda for Disaster Risk Reduction (DRR).



Key points highlighted:

- Mitigation and adaptation.
- Solution and approaches to climate change mitigation.
- Our roles and responsibilities in disaster management.
- Government initiatives.
- Prime Minister's agenda for Disaster Risk Reduction (DRR).

Day 3 (7th July 2021) Saturday

Speaker-1 Dr L S Rawat, GB Pant 'National Institute of Himalayan Environment'(NIHE), Srinagar, Garhwal

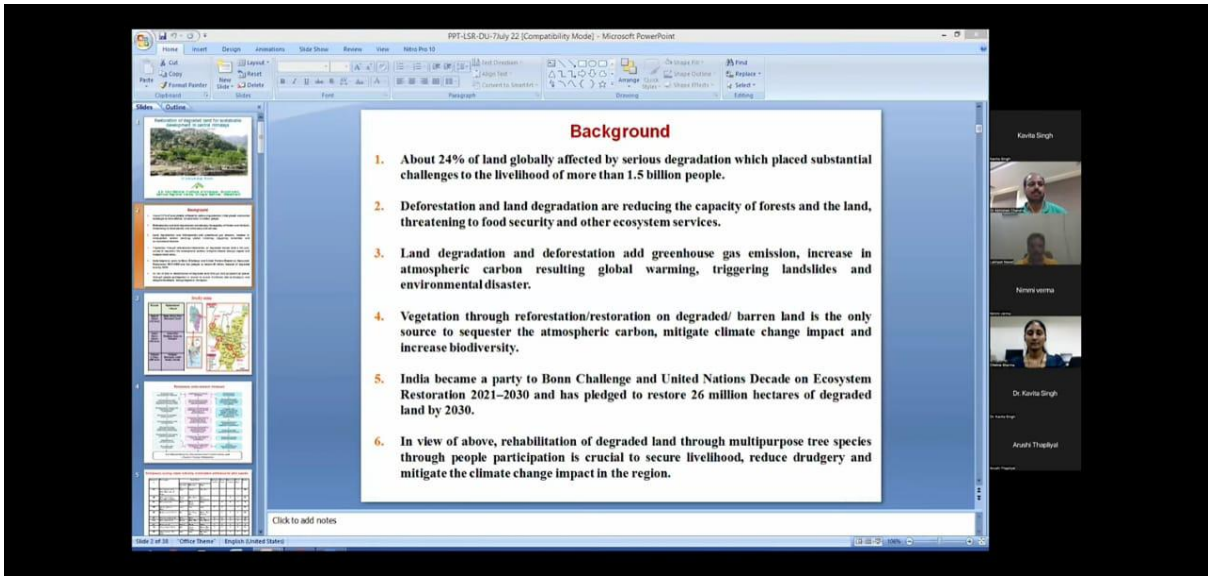
Topic: Restoration of Degraded Land for Biodiversity Conservation and Societal Development in the centre Himalayas.

Dr Rawat gave an informative session about biodiversity conservation and relative development in the Himalayan regions. He talked about specific tree plantation, horticulture and construction of water harvesting tanks. He expressed his views on organised exposure visit for progressive farmers elaborating on stem circumference, plant height and above ground biomass. Lastly, he explained models on degraded land rehabilitation.

Key points highlighted:

- Selection of degraded land and tree species for plantation.
- Horticulture species and Implementation of rehabilitation activities in the field.
- 3.Construction of Water harvesting Tank and Plantation activities in the field.
- Fruit yield and monetary equivalent of Horticultural species and Fodder yield and Monetary equivalent.
- Bansbara Rehabilitation Model- Case study.

- Carbon stock accumulated by the plants after twenty years of plantation at both sites AAL and HDFL**.**



Speaker 2- Dr Kavita Singh, Assistant Professor, Department of Environmental Studies Mata Sundri College for Women, University of Delhi, New Delhi

Topic: Mapping of Restoration of Wetlands in India

Dr Kavita Singh briefed us about the wetland ecosystem, its major types and their importance. She showed state-wise distribution of wetlands in India. She also focused on global wetlands outlooks, including the megatrends of degradation. She showed the present status of wetland degradation in India along with urbanization and land use changes. She also highlighted the role of climate change, along with role of wetlands in achieving SDG's.

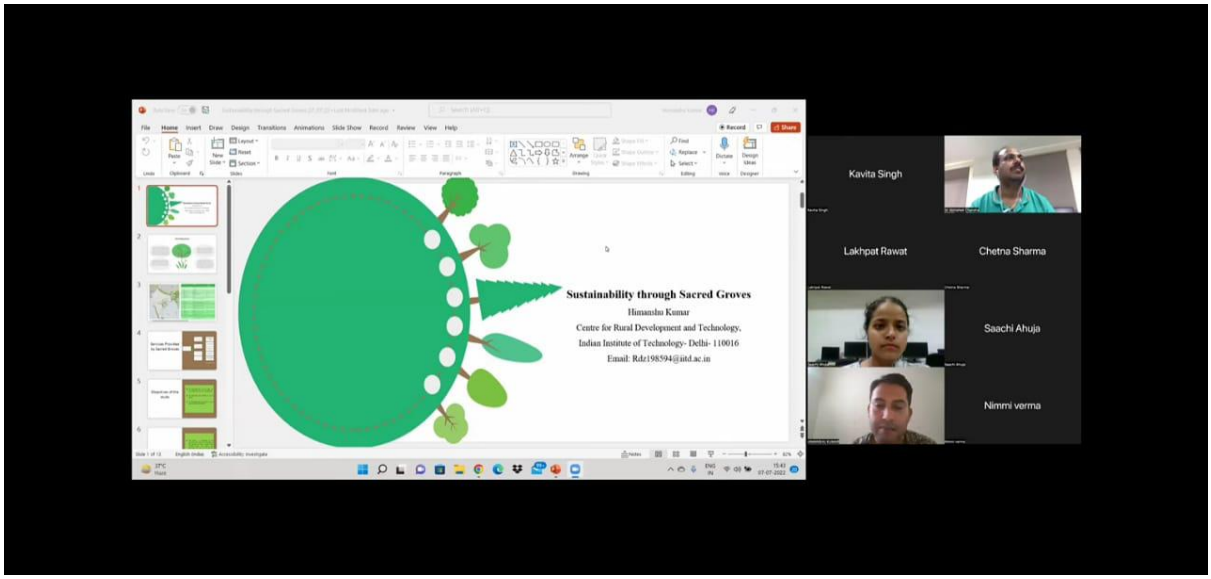
Key points highlighted:

- Introduction about wetland ecosystem, its major kinds and significance.
- Wetlands in India and Ramsar sites.
- Wetland degradation and its causes in India.
- Impacts of Degrading wetlands and wetland management.
- Mapping of Restoration guiding principles and the principles in management strategies.
- SDG's and Integration of wetlands in policies.

Speaker 3- Mr Himanshu, Centre for Rural Development and Technology, IIT Delhi

Topic: Sustainability through Sacred Groves: Understanding the role of Sacred ecosystems

Mr Himanshu in his session explained how sacred grooves can help us achieve sustainable goals and emphasized on why it is important to protect our ecosystem. He talked about services provided by sacred grooves and the Nature Based Solution context and also presented his research work on the same topic.



Key points highlighted:

- Services provided by sacred grooves.
- How sacred grooves can help us achieve sustainability goals.
- The Nature Based Solution (NBS) context.
- The Brundtland Report.
- Importance to protect ecosystems and nexus of forest.

Chief Guest of Valedictory session - Prof K.S Rao Dean, Faculty of Technology and Senior Professor, Department of Botany, University of Delhi.

His address on the socio-economic dimension of ecological restoration covering balancing the book of environment assets. He clarified why restoration is important and what is being restored

Outcomes:

This report is on a three-day online course on "Capacity Building on Ecosystem Restoration and Disaster Management" held between 5th-7th July, 2022. The event was jointly organized by National Institute of Disaster Management (NIDM), New Delhi; Society for Environmental Development (SED, India); Delhi Department of Environmental Science and Sri Venkateswara College, University of Delhi, New Delhi. The course coordinator was Dr Abhishek C. Srivastava, along with his nine student coordinators. The objective was to create an understanding of the basics of ecosystem and its restoration; the relationship of ecosystem restoration with disaster risk reduction, and knowing about ecosystem restoration as a tool for livelihood sustenance.

The three-day course started on the 5th of July, 2022 with the chief guest address of Professor K. R. S. Sambasiva Rao (Honourable Vice Chancellor, Mizoram University). He talked about the reasons of ecosystem degradation, its exploitation and management. This was followed up by the opening remarks of Professor (Dr) Anil K. Gupta, Head, ECDRM, Division, NIDM, MHA, GoI, who highlighted leadership-based disaster management and talked on future sustainability; and by Professor C. Rajsekran, President SED India/VIT Vellore, who addressed ecosystem balancing and the roles of young minds in ecosystem restoration and conservation.

The first speaker of the first day (5th July) was Professor T. Pulliah (Department of Botany, Sri Krishnadevaraya University, Anantapur). His topic was 'Biodiversity Threats and Conservation'. He talked about convention of biodiversity and global environmental facility. The second speaker was Dr Sweta Baidya, Consultant, NIDM. Her topic was 'Climate Resilient Livelihood and Ecosystem based DRR'. She explained the disaster management cycle, ecosystem-based disaster risk reduction techniques, its importance and the benefits.

The second day (6th July) started with the session of Professor Joseph Selvin, Head, Department of Microbiology, School of Life Sciences, Pondicherry University. His topic was 'Exploration-Exploitation-Extinction'. He talked about the concept of global warming and its effect on the present generation, and outbreak of new diseases due to mutation of microbes. The second speaker was Professor J. K. Garg, Director Tribhuvan College of Environment and Development Sciences, Nalanda University Centre, Neemrana. His topic was 'Wetlands Restoration and Disasters'. He explained about wetlands and their importance, Ramsar convention on wetlands, major threats faced by wetland ecosystem, and rehabilitation and restoration of wetlands. The third speaker was Ms Fatima Binte Amin, Young Professional, NIDM. Her topic was 'Ecosystem and Community-based Disaster Management'. She briefed us about the concept of vulnerability. She elaborated disaster management and its steps. The fourth speaker of the second day was Mr Harshit Sharma, Young Professional, NIDM. His topic was 'Climate Change Impact on Ecosystem and Initiatives Taken Towards DRR'. He spoke about climate change and its impact on the ecosystem, migration and adaptation of organisms.

The third day (7th July) started with the session of Dr L. S. Rawat, GB Pant 'National Institute of Himalayan Environment' (NIHE), Srinagar, Garhwal. His topic was 'Restoration of Degraded Land for Biodiversity Conservation and Societal Development in the Centre Himalayas'. He gave an informative session on biodiversity conservation and relative development in the Himalayan regions. He expressed his views on organised exposure visit for progressive farmers. The second speaker was Dr Kavita Singh, Assistant Professor,

Department of Environmental Studies, Mata Sundri College for Women, University of Delhi, New Delhi. Her topic was 'Mapping of Restoration of Wetlands in India'. She briefed us on the wetland ecosystem, its major types and importance. The final speaker of the last day was Mr Himanshu, Centre for Rural Development and Technology, IIT Delhi. His topic was 'Sustainability through Sacred Groves: Understanding the role of Sacred ecosystems'. He explained how sacred grooves can help us achieve sustainable goals and emphasized on its importance to protect our ecosystem.

The Chief Guest of Valedictory session - Professor K.S. Rao, Dean, Faculty of Technology and Senior Professor, Department of Botany, University of Delhi concluded the three-day event with is address on the socio-economic dimension of ecological restoration. Vote of thanks was delivered by Dr. Abhishek Chandra.

Short Introduction of Experts

Prof KRS Sambasiva Rao - Prof KRS Sambasiva Rao, Hon'ble Vice Chancellor, Mizoram University and former rector for Acharya Nagarjuna University. Sir has over 40 years of Research Experience with 255 published research papers in the fields of Environmental Toxicology & Physiology, Aquaculture Biotechnology, Fermentation Technology. He has 32 years of Teaching Experience. He is also General Secretary, Association of Biotechnology and Pharmacy (Since 2007). Vice-President of Indian Society of Comparative Physiology.

Prof. (Dr) Anil K Gupta - Prof. Gupta is professor and head of Environment and Climate Disaster Risk Management department NIDM. Sir is a sustainability-risk management strategist working in the area of disaster management, environment and climate resilience for more than 25 years with national, sub-national and business administrations. He is looking after various international and national projects of policy research-planning and capacity building.

Prof. C Rajsekaran - Professor C Rajasekaran is currently working as a professor Department of biotechnology School of biosciences and technology, Vellore Institute of technology, Vellore. He has an experience of 25 years in the field of research and 19 years in teaching. His PhD topic was changes in the action of enzyme of ammonia assimilation in plants along an altitudinal gradient. He has won many awards & honours and fellowships like JRF 1995 SRF 1988. Also, he is the member in various professional bodies like the linnean Society of London, Royal Society of biology, Ethino botanical Society of Nepal, Himalayan research foundation, Indian society for plant physiology, He is also the president of Society for Environment and Development (India), New Delhi popularly known as SED India. He has published around 106 publications, and has presented 120 papers in various seminars.

Prof T. Pullaiah - Prof. T. Pullaiah obtained his M.Sc. (1973) and Ph.D. (1976) degrees in Botany from Andhra University. He was a Post-Doctoral Fellow at Moscow State University, Russia during 1976-78. He travelled widely in Europe and USA and visited Universities and Botanical Gardens in about 17 countries. Professor Pullaiah joined Sri Krishnadevaraya University as Lecturer in 1979 and became Professor in 1993. He held several positions in the University.
He retired from active service on 31st May 2011. He was selected by UGC as UGC-BSR Faculty Fellow and is working in Sri Krishnadevaraya University. Prof. Pullaiah has published 62 books, 305 research papers and 35 popular articles. He is the Principal

Investigator of 20 major Research Projects totalling more than a Crore of Rupees funded by DBT, DST, CSIR, UGC, BSI, WWF, GCC etc.

Dr Sweta Baidya - Dr Sweta Baidya, has done her PhD in Oceanography from CSIR-National Institute of Oceanography. She has worked extensively on the Paleo-climate, especially the paleo-monsoon shift from Last Glacial Maximum to Holocene. Later she has worked on Desertification and Land degradation in Jawaharlal Nehru University. She also has an experience of working on Glaciology in Ministry of Earth Sciences. She was a faculty of Disaster Management in Jamia Millia Islamia University. At present she is working as the Consultant in National Institute of Disaster Management.

Prof Joseph Selvin - Professor Joseph Selvin is currently working as professor and HOD at department of Microbiology School of life sciences at Pondicherry University. He holds a specialisation in microbial genomics and bioprospecting. In his research career he has published 116 papers in international journals. He has guided 13 PhDs. And mentored 3 post-doctoral fellows. He has won many awards in research some of them are Jawaharlal Nehru award by ICAR, Indian National Science Academy young scientist medal, UNESCO- team grant and NPG award in GRC in marine microbes and more.

Prof J K Garg -Prof J K Garg is Director of Tribhuvan College of Environment and Development Sciences, Nalanda University Centre, Neemrana, Rajasthan. He has retired from the post of Professor, USEM, GGS Indraprastha University, New Delhi. He has Professional Experience of more than 40 years in the broad area of remote sensing and GIS for ecosystem assessment & analysis, climate change, wetland ecology, environmental hazard zonation (landslides, forest fire etc.), resource use, biodiversity conservation, wildlife habitat suitability analysis etc. He has carried out 14 major projects on ecology and environment. He holds specialisation in Geospatial technology for environment management and biodiversity conservation.

Ms. Fatima Binte Amin- Ms. Fatima Binte Amin is presently a Young professional the at National Institute of Disaster Management, Ministry of Home Affairs, New Delhi. She has done Masters in Disaster Management from the University of Kashmir Srinagar, J&K. She is working on different papers and participated in national and international training /webinars and conferences. She is an experienced professional skilled in Emergency Management, Public Speaking, Cyberlaw, and Leadership.

Mr Harshit Sharma- Mr Harshit Sharma is currently working as a Young Professional in National Institute of Disaster Management, Ministry of Home Affairs, GoI, New Delhi and has a vast experience in the field of administration. He has held various important administrative positions earlier in NIDM, and has worked in the Vigilance Department of Indian Oil Corporation Limited (IOCL). He was an integral part of the WHO Project and UNICEF Project in Nationwide Quality of Care Network (NQOCN India).

Dr L S Rawat - Dr LS Rawat has done his Ph.D. in Botany from H.N.B. Garhwal University, Srinagar, and is an expert in biological weed management for sustainable agriculture, degraded land restoration, and sustainable rural development. His area of specialization includes Socio-Economic Development, Biological weed management and many more. He is an awardee of DST-Young Scientist. He has work experience in various research projects and a keen interest in ecology, restoration ecology, and rural landscape.

Dr Kavita Singh- Dr Kavita Singh is passionate about learning, innovating, and putting the first two passions together. She holds a Ph.D. in Environmental Studies, as well as two Masters degrees along with years of teaching experience. Plant Physiology and Biochemistry, Environmental Biotechnology, and Bioremediation are her fields of expertise. She teaches all undergraduate students Ecosystem, Biodiversity, Pollution, Waste Management, Environmental Impact Assessment, and Natural Resources. In 2012, she was named the UGC Net Topper in Environmental Studies. She is also the recipient of the Young Researcher Award. She has twelve international and national publications with a high impact factor, as well as five conference papers along with multiple book chapters. She is granted with two patents. Dr Singh has been involved in a variety of administrative roles.

Mr Himanshu Kumar - Mr. Himanshu Kumar has an M.Phil. in Natural Resource Management with a specialization in Climate Change. He has been continuously working on assessing the vulnerability potential of various natural ecosystems in the country. Currently he is pursuing his Ph.D. from Centre for Rural Development and Technology, IIT Delhi.

Prof K.S Rao – Prof. K.S. Rao mainly investigates Agroforestry, Agriculture, Ecology, Land use and Subsistence agriculture. The study incorporates disciplines such as Agricultural productivity, Medicinal plants, Natural resource management, Crop diversity and Food security in addition to Agroforestry. His agricultural productivity research is multidisciplinary, incorporating elements of Natural resource and Ecosystem services. His research integrates issues of Protected area and Crop in his study of Agriculture. The Environmental degradation, Deforestation and Agricultural land research. He works mostly in the field of Subsistence agriculture, limiting it down to topics relating to Forest management and, in certain cases, Nature reserve.

Dr. Abhishek Chandra -Dr. Abhishek Chandra, presently working as Assistant Professor, Department of Environmental Sciences, Sri Venkateswara College, University of Delhi and founder convener and subject expert of an Add-on course on Climate Change: Issue, Concerns and Strategies at Sri Venkateswara college from the academic year 2018-19. He is Accredited Functional Area Expert (FAE) for Ecology and Biodiversity by National Accreditation Board for Education and Training (NABET), Quality Control of India (QCI), Govt of India. His research dimensions include i) Components of biodiversity that support ecosystem services; ii) Socio-economic and cultural dimensions; iii) Impact of Climate change on Agroecosystem sustainability; iv) Carbon sequestration and v) Traditional Agrobiodiversity Management Under changing climate and disaster. He research is focus on Climate Change and soil biodiversity, ecosystem function and traditional agroecosystem management. He has published more than 40 research papers in various reputed national and international journals, edited books and conference proceedings

Key Takeaway

1. The Nature Based Solution can help reduce the cascading Disasters.
2. Need to identify the conflict in forestry and promote forest conservation.
3. Need to create awareness regarding the importance of restoration and its entrypoints.
4. We need to identify Reference ecosystem for following and these reference should be dynamic reference in nature.

5. Forest community structure in shifting into cultivation fallows.
6. Need to identify pathways for social development in order to ensure DRR.
7. Leadership-based disaster management is required for future sustainability.

List of Participants

Sr. No	**Full Name**	**Email**
1	A. K. M. THOHIDUL ALAM KHAN	thohidul.ce@gmail.com
2	Aakanksha Chak	aakankshachak29@gmail.com
3	Aakanksha Gautam	gautamaakanksha146@gmail.com
4	Aayush Raj Aryan	aayushraj132003@gmail.com
5	Abhay Gupta	abhayuic@gmail.com
6	Abhay Kushwaha	abhayaskushwaha101@gmail.com
7	Abhijith L Kotian	abhijithlkotian@gmail.com
8	Abhinandan Kumar	singhabhinandan805@gmail.com
9	Abhishek Chandra	ac@svc.ac.in
10	Adarsh Raj	adarsh9862raj9862@gmail.com
11	Akash Kumar	akyadav19849@gmail.com
12	Akash Reji	rejiakash02@gmail.com
13	Akash Tripathi	at819011@gmail.com
14	Aman Choudhary	amanchoudhary785ms@gmail.com
15	Amita Sharma	amita.sharma3181@gmail.com
16	Amrit Kumar	amritkumar2823@gmail.com
17	Ananya Singh	Ananyasinghsfs5@gmail.com
18	Anisha Gulati	anishagulati100@gmail.com
19	Ankita Chakraborty	ankitachak6000@gmail.com
20	Anoushka Amar	amar.anoushka@gmail.com
21	Anoushka Dhar	anoushka.dhar@gmail.com
22	Anshita Anshita	anshitavij2002@gmail.com
23	Anupam Vaishnava	son.vaishnava.55@gmail.com
24	Anurag Maurya	anuragmaurya2719@gmail.com
25	Anusha K	a8184470@gmail.com
26	Anushka Gupta	anushka0tanu@gmail.com
27	Arun kumar Mishra	arunmisra.14@gmail.com
28	Arushi Thapliyal	arushithapliyal3@gmail.com
29	Aryan Panwar	aryan2003panwar@gmail.com
30	Ashish kumar Bhardwaj	19001001014ashish@dcrustm.org
31	Ashish Meena	ashishmeena98874@gmail.com

32	Ashmi Yadav	yadavashmi77@gmail.com
33	Ashutosh Raj	rajashutosh19615@gmail.com
34	Ashutosh Gupta	ashutoshmahadev2209@gmail.com
35	Ashwani kumar Rawat	ashwani.7309@gmail.com
36	Ayan Arun K S	ayanarunks@gmail.com
37	Ayush Sambher	ayush.sambher239@nmims.edu.in
38	Bhawna Verma	vermabhawna98371@gmail.com
39	Bikram Singh Pawar	bikramsinghpawar3@gmail.com
40	Chetna Sharma	sharma.chetnaa711@gmail.com
41	Deepa kumari	kumari21deepa96@gmail.com
42	Deepa Kumari	Vijay9810792488@gmail.com
43	DEEPAK KUMAR DUBEY	deepak.dubey97@gmail.com
44	Deepali Shinde	deepa.s.shinde@gmail.com
45	Deepankshi Shah	shahdeepankshi@gmail.com
46	Deepti Rana	ranadeepti975@gmail.com
47	Dhruv Bhatti	dhruvbhatti166@gmail.com
48	Diksha F	dikshafarswan45@gmail.com
49	DINESH KUMAR	dineshkumar15385@gmail.com
50	DINESH R	dineshabi97@gmail.com
51	Dipankar Bagchi	dipankarbagchi32@gmail.com
52	Disha Dash	dishadash2002@gmail.com
53	DR MOHAMMED OSAMA	osama4447@gmail.com
54	Dr. Dinesh Pandit	dpandit@hotmail.com
55	Dr. J L Gautam	jl.gautam@imd.gov.in
56	Dr. Kannan A	kannanbard16@gmail.com
57	Ekta Rana	03ekta.22@gmail.com
58	G Madhusudan	madhusudhan@tkrcet.com
59	Gagan Deep Singh	gagan.gds1803@gmail.com
60	Garg Sakshi	sg8556058@gmail.com
61	Gaurav Sharma	rcbgopsa@gmail.com
62	Gaytri Pottlia	gaytripottlia@gmail.com
63	GOPAL BANSAL	gopalbansalgzb@gmail.com
64	HARISH SHARMA	harishbhudev42@gmail.com
65	Hemakshi .	hemakshirakheja2003@gmail.com
66	Himanshu Mishra	himanshumishra78270@gmail.com
67	Hiteshkumar r. Barot	barothitesh13188@gmail.com
68	Huoy UK	uk.huoy@gmail.com
69	irfan shah	irfanshah1439@gmail.com
70	Jaivir Singh	sjaivir21@gmail.com
71	Jaya Bharti	jayapanwal@gmail.com
72	Jessica Singh	08.jessicasingh@gmail.com
73	Jitesh Rahi	mr.rahijitesh.official@gmail.com

74	JYOTI BIKASH DATTA	jyotibikashblg@gmail.com
75	Jyotsna Sharma	jyotsna2909@gmail.com
76	Kaarimah Naqash	kaarimahnaqash46@gmail.com
77	Kanchi Gupta	kanchi1038@gmail.com
78	Karan Bhagat	karanbhagat14321@gmail.com
79	Keerthana Sunil	sunilkeerthana3@gmail.com
80	kewal joshi	Kewaljoshi2002@gmail.com
81	Khushi Tyagi	Khushi15tyagi@gmail.com
82	KOMMANA Sai Sankar Satvik	kommanasatvik@gmail.com
83	Kunal Tomar	tomarkunal2004@gmail.com
84	Kushagra Sanwal	kushsanwal05@gmail.com
85	Lavish Rathi	Rathilalit099@gmail.com
86	Lokesh Agrawal	lokeshagrawal4403@gmail.com
87	Lovish Punia	Punialovish2@gmail.com
88	MAKWANA AJITKUMAR	ajitsingmakwana@ymail.com
89	Mamta Jain	mamta13in@gmail.com
90	Manju Manju	mansisingh1472@gmail.com
91	Manjunath R	vu3cjm@gmail.com
92	Manoj Kumar Jha	manoj61367@gmail.com
93	Mayank Bharti	richhd12345@gmail.com
94	Meenakshi .	meenakshi2005suhag@gmail.com
95	Megha Mahesh	megha18mahesh@gmail.com
96	Mihika Lohia	imihikalohia212003@gmail.com
97	Mili Aggarwal	miliaggarwal03@gmail.com
98	Mittal Shikha	ranisuman9416@gmail.com
99	Mohammad Numair	numair14444@gmail.com
100	MOHAMMAD MUKHEEM BASHA	mdmukheembasha@jnafau.ac.in
101	MOHD MUMTAJ	mumtajali82341@gmail.com
102	Mohd. Sahil	sirajsahil73@gmail.com
103	Mohit Bhardwaj	mohitbhardwaj6196@gmail.com
104	Nandini Agarwal	agrawalnandini0711@gmail.com
105	Neetu Singh	goldy.neetusingh@gmail.com
106	NEHA MISHRA	neha.neha.mishra13@gmail.com
107	Neha Sangwan	1.engineerneha@gmail.com
108	Niharika Garg	niharikagarg0711@gmail.com
109	Nikita Agrawal	agrawalnikita2003@gmail.com
110	Nimmi Verma	nimverma84@gmail.com
111	Nirmal Paul	nirmalpaul.741404@gmail.com
112	Nishant Gupta	nishantgupta200314@gmail.com
113	Nishita Singh	nishitasingh2001@gmail.com
114	Nitesh Rout	niteshrout12@gmail.com
115	Nitesh Yadav	yadavnitesh11133@gmail.com

116	Osama Abu-Libda	abulibda.o@gmail.com
117	P Naveen	roynaveen70@gmail.com
118	Pankaj Kumar	pankajkumar9871960625@gmail.com
119	Pankaj Kumar Bansal	pankajkumarbansalgzb@gmail.com
120	Parameswari E	parameswari.e@tnau.ac.in
121	Poonam Sharma	poonamsharma182003@gmail.com
122	Prabha Shankar Shukla	pssenv@hotmail.com
123	Pradyumna Borphukon	pradyumnaborphukon@gmail.com
124	Pratibha Verma	ar.pratibha2019@gmail.com
125	Priti Kumari	pritikumari207016@gmail.com
126	Priya Kumari	psa23032004@gmail.com
127	Priya Sharma	priyasadotra2003@gmail.com
128	Priyanka Datta	priyankadatta1404@gmail.com
129	Priyansh Padmakar	priyanshpadmakar@gmail.com
130	Priyanshu Raj	priyanshuraj82857@gmail.com
131	Prof. Prem Raj Pushpakaran	drpremrajp@nitc.ac.in
132	Purobi Nath	purobinath@gmail.com
133	Pushp Attri	pushpsharma778@gmail.com
134	Radhika Yadav	yadavradhika0312@gmail.com
135	Rainy Chakma	rainychakma41@gmail.com
136	Rajvardhan .	rvs17022002@gmail.com
137	RAKHOHORI BAG	rakhohoribag1992@gmail.com
138	Raman Singh	ramanbrarrb06@gmail.com
139	Ramya Singh Bhadoriya	ramyasinghbhadoriya1@gmail.com
140	RANJAN KUMAR	mrrnjn98@gmail.com
141	Ridam Kapoor	ridamkapoor2003@gmail.com
142	RISHIPARNA GUHA	Rishiparna.guha@gmail.com
143	Ritika Madankar	ritikamadankar99@gmail.com
144	Ritu Yadav	yadavritu07ggn@gmail.com
145	RIYA KATIYAR	riya.katiyar20010@gmail.com
146	Rohini Susgohar	rohinisusgohar377@gmail.com
147	Rohit Kaibrat	kaibratrohit256@gmail.com
148	Saachi Ahuja	saachibelle@gmail.com
149	Sahil Gothwal	gothwalsahil70@gmail.com
150	Sajal Shukla	sajalshukla332@gmail.com
151	Sakshi Kumari	jhasakshi1611@gmail.com
152	Salman Chouhan	architectsalman@yahoo.com
153	Sampath Kumar Viswanathan	svsjpr@gmail.com
154	SAMRAT MANDAL	sm767984@gmail.com
155	Sandeep Kumar Mishra	archsandeepgca@yahoo.co.in
156	Saniya Begam	saniyabegam129@gmail.com
157	Sanjay Apar	language.3@billimoriahighschool.com

158	Sanjeev Gupta	fdpsanjeevpreeti@gmail.com
159	Sanjh Solanki	evesolanki01@gmail.com
160	Sankalp Srivastav	sankalpsri41@gmail.com
161	SASWATI PANDIT	sasjnu@yahoo.com
162	Saumya Gupta	saumya.gupta011.2002@gmail.com
163	Saurav Kumar Singh	sauravkr.singh@gov.in
164	Shivam Chandra	chandrashivam175@gmail.com
165	Shivam Ahuja	shivaahuja502@gmail.com
166	Shivam Sen	shiivam992@gmail.com
167	Shriya Sinha	shriyasinha26@gmail.com
168	Shruti Singh	shrutikhushi1912@gmail.com
169	Shubham Kaintura	Shubhamjuly2002@gmail.com
170	Sivaranjan P	sivaranjanmsc@gmail.com
171	Smriti Sharma	ismrati30903@gmail.com
172	Soham Sharma	sharmasoham22@gmail.com
173	Sonal Meena	meenasonal09@gmail.com
174	Sonia Yadav	smsv9876@gmail.com
175	Sourav Kumar	souravpandey703@gmail.com
176	Srishti Kaushik	srishtikaushik237@gmail.com
177	SUBHAJIT SARKAR	dsubhajit1112@gmail.com
178	Sudip Subedi	sudipsubedi6699@gmail.com
179	Sujoy Banerjee	sujoybanerjee09@gmail.com
180	SUSHIL KUMAR TRIPATHI	suseeldeos@gmail.com
181	Swapnil Tyagi	swapniltyagi08@gmail.com
182	TANMAY GUPTA	tanmay.gupta@juitsolan.in
183	Tanmoy Kumar Roy	tanmoy.23715@lpu.co.in
184	Tanu Sahu	sahu.tanu134@gmail.com
185	Tarun Yadav	yadavtarun6459@gmail.com
186	Tejas Parsendiya	tejaspars@gmail.com
187	Unnati 27	unnatimed1234@gmail.com
188	VANDANA VANDANA	vandana06shakya@gmail.com
189	Vanshika Sirohi	vanshikasirohi39@gmail.com
190	Vardaan .	vkvardaan120304@gmail.com
191	Varshika Wahi	varshwahi@gmail.com
192	Vibhav Vatsa	vibhavvatsa@gmail.com
193	VIRENDRAKUMAR THAKKAR	virendrakumarthakkar@gmail.com
194	Vishal Kumar	Satyavishu2004@gmail.com
195	Vyapti Jha	vyaptijha@gmail.com
196	Y K Agrawal	yka@spacindia.com
197	Yash Vats	yashvats200@gmail.com
198	Zahoor Ul Islam	zahoor.amu@gmail.com

Students coordination's (Sri Venkateswara College):

1. Ms. Nimmi Verma, B.Sc. (P) Life Science
2. Ms. Saachi Ahuja, B.Sc. (P) Life Science
3. Ms. Arushi Thapliyal, B.Sc. (P) Life Science
4. Ms. Megha Mahesh, B.Sc. (P) Life Science
5. Ms. Radhika, B.Sc. (P) Life Science
6. Ms. Ananya, B.Sc. (P) Life Science
7. Ms. Anshita, B.Sc.(H) Zoology
8. Ms. Nishita, B.Sc.(H) Zoology
9. Ms. Chetna Sharma B.Sc.(H) Zoology

COURSE COORDINATOR (Sri Venkateswara College):

Dr. Abhishek Chandra
Assistant Professor,
Department of Environmental Sciences,
Sri Venkateswara College,
University of Delhi, New Delhi

COURSE DIRECTOR (NIDM):

Prof. (Dr) Anil K. Gupta
Head, Division of Environment & Disaster Risk Management,
NIDM, New Delhi.

COURSE COORDINATORS (NIDM):

Dr. Sweta Baidya
Consultant
NIDM, New Delhi