Shiv Nadar Institution of Eminence

Co-operative planning for climate change disasters

Shiv Nadar University has been spearheading many initiatives and projects on climate change disaster planning through its capacity building efforts, training future leaders, through teaching and extra-curricular activities, groundbreaking research, providing insights for policy development, and engaging directly with affected communities. We have partnered with many academic, grassroots organizations, non-governmental organizations, and institutions across the globe to support governments within and outside the country.

Capacity building and teaching

- The university offers several courses on climate and its impact at the local and global levels to create awareness amongst students on climate change mitigation and adaptation strategies. We have integrated climate change education and displacement preparedness into the programs.
- The University has partnered with the School of Oriental and African Studies (SOAS), London for a joint Master's Program in Global Urban Sociology. Urbanization is of extraordinary significance for the regions in which SOAS and Shiv Nadar University academics focus, and globally, it is a topic that brings together many of the most pressing concerns of our times, from climate, sustainability, to mental health, pollution, illness, and issues of governance and policy.

Research in climate change

Geo-information for Disaster Monitoring and Management

Authors: **Pandey, P.C**., Kumar, R., Pandey, M., Giuliani, G., Srivastava, P.K., and Sharma, RK.

This book with contributions from Dr Prem Chandra Pandey, Assistant Professor at Shiv Nadar University provides insight into advancing remote sensing techniques dealing with floods, droughts, landslides, earthquakes, permafrost- related hazards, glacial lake outburst floods, forest fires, droughts, tropical cyclones, climate resilience, and COVID-19. It incorporates the latest technologies and techniques to illustrate disaster monitoring for acquiring information and disseminating technological results and outcomes for the betterment of society. This book published in 2024 is a ready reference for earth scientists, policymakers, and professionals working for disaster risk reduction.

Challenges and Future Implications in Monitoring and Assessment of Aquatic Ecosystems

Authors: Mohanty, S., **Pandey, P.C.**, Srivastava, P.K., Srivastava, S.K.

Aquatic ecosystems, encompassing freshwater and marine environments, are vital for global ecological balance and human well-being, emphasizing the pivotal role in supporting biodiversity, regulating climate, and providing economic services. The book chapter with contributions from Dr Prem Chandra Pandey, Assistant Professor at Shiv Nadar University published in 2024 discusses traditional and advanced monitoring techniques, including molecular-level monitoring with environmental DNA (eDNA), traditional in situ or lab-based experiments, and regional and global monitoring using geospatial technology consisting of remote sensing, GIS, and GNSS for providing data input and processing platform. Remote sensing, in particular, is highlighted for its ability to provide comprehensive and timely information over large spatial extents, enabling robust monitoring and assessment of aquatic ecosystems. Challenges associated with conventional and technological approaches to studying aquatic ecosystems are discussed, alongside recent advancements in geospatial data collection and analytics. Overall, this chapter underscores the indispensable role of remote sensing in aquatic ecosystem monitoring using derived parameters and Trophic Status Index for assessing health conditions of aquatic ecosystems. Thus, it is offering powerful tools and techniques for sustainable management and conservation efforts which is a crucial information for the regional and national governments for local climate change disaster or risk early warning and monitoring

Ecohydrological and hydrogeological dynamics of groundwater springs in Eastern Himalaya, India

Authors: Kumar, Manish, Sumit Sen, **Himanshu Kulkarni**, Shrinivas Badiger, Girish R. Varma, and Jagdish Krishnaswamy.

Groundwater springs are critical to achieving Sustainable Development Goals (SDG 6, access to clean water) in the Himalaya and remain highly vulnerable to climate change and land-use and land-cover change. In a first from Eastern Himalaya, the research analyzed the relative controls of land-use, precipitation, soil properties, and hydrogeology on the diel and seasonal variability in three representative springs using high-frequency discharge monitoring. The study with contributions from Dr Himanshu Kulkarni, Assistant Professor at Shiv Nadar University provides an integrated analytical framework for understanding Himalayan springs, which are critical for achieving SDG 6 (access to clean water) and a baseline for developing appropriate spring shed models for effective management of freshwater ecosystems (SDG 15) against future climate change impacts (SDG 13), as well as informing the water security assessment in the Himalaya. The study has been published in the journal *Groundwater for Sustainable Development* in 2024.

Regional and global linkages

The collaboration with Food and Agriculture Organization of the United Nations (FAO), Revitalization of Rainfed Agriculture Network (RRA N), Ashoka Trust for Research in Ecology and Environment (ATREE), and National Autonomous University of Mexico (UNAM) is another initiative. The collaboration has facilitated discussions on the agrobiodiversity conservation initiatives from India and Mexico and exploring opportunities for knowledge sharing between the two countries, and long-term solutions to conserve agrobiodiversity in the current scenario of climate vulnerability. This would be shaped into a multipronged transdisciplinary action research project on strengthening community capacities for landrace conservation and governance in specific landscapes/agroecological zones. The collaboration is also brainstorming on how Mexico and India can take efforts to conserving agrobiodiversity to confront and address the climate crises, through locally adapted measures.

Training future leaders

Our students were selected as UN Millennium Fellows for 2024. This fellowship is presented by the United Nations Academic Impact and MCN and supports undergraduate leadership for the UN Sustainable Development Goals. From 52,000+ applicants from 6,000+ campuses worldwide, 280+ campuses (just 5%) have been selected to host 4,000+ Millennium Fellows in 2024. The students were guided by their Professors, Dr. Paromita Goswami and Dr. Aadya Kaktikar from the School of Management and Entrepreneurship and the School of Humanities and Social Sciences. The award is a testament to the university's commitment to addressing SDGs while empowering and nurturing global leaders who will direct and shape policies, advance research, and encourage local action to protect the larger global community from future risks.

Community Outreach

The Shiv Nadar Institution of Eminence (IoE) along with the Shiv Nadar Foundation's Dadri Development Project (DDP) is spearheading many Community-University Engagement initiatives in the field of environment and sustainability for entrepreneurship and skill enhancement, education and cultural practices, health and well-being, crime and safety, nature spaces and public conservation. The project aims to create a "model sustainable rural community around Shiv Nadar University and reflects the university's commitment to inclusive development.