

Shiv Nadar Institution of Eminence

Inform and support government

Shiv Nadar University has been actively contributing to informing and supporting the regional and national governments in local climate change disaster or risk early warning and monitoring. Many of our researchers have been successful in studying the factors impacting climate change that are important to assess and mitigate climate change disaster or similar risks.

Some of these studies by **Shiv Nadar University faculty members** are:

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.

Future-proofing a naturally ventilated log house: A case study of adaptive thermal comfort under climate change impact

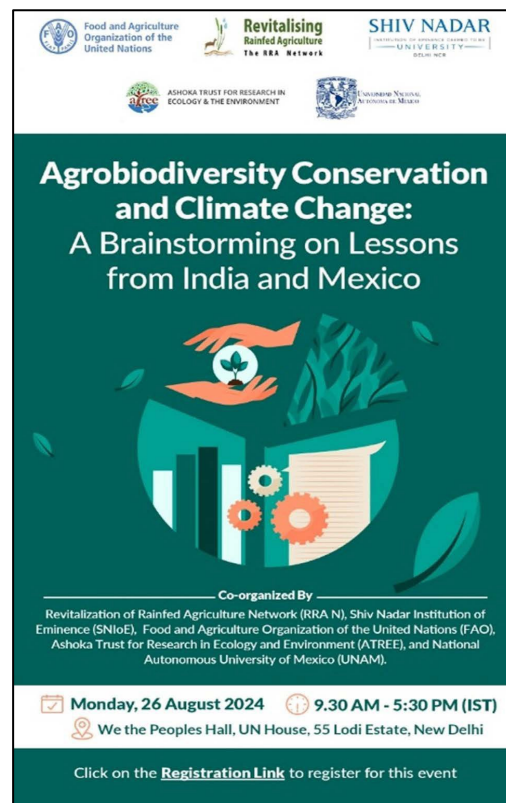
Authors: Pajek, L., Možina, M., Nadarajah, P.D., **Singh, M.K.**, Košir, M.

This study with contributions from Dr Manoj Kumar Singh, Assistant Professor at Shiv Nadar University aimed to identify the most effective passive design measures to prevent overheating in a *log house* in a temperate climate. The study was conducted with a calibrated *thermal* model under a future climate projection (SRES A2 scenario) utilising an EN 16798–1 *adaptive comfort* model for the building operated under free-run mode during summer. The effects of six building-related and three organisational measures on the projected future *thermal comfort* in the studied *log house* were evaluated. By outlining the potential effectiveness of specific measures in preventing overheating discomfort under climate change conditions, the findings significantly contribute to climate change adaptation of *log houses* and buildings in general. These findings can be used as design guidelines for future buildings and to formulate future building regulations as well as a decision-making support for policy-makers at local, regional and national level.

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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.



Brainstorming event organized in New Delhi