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International conference on mountain ecosystems: biodiversity and adaptations under climate change scenario (22–24 March 2023)

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Mountains, accounting for 24% of the global terrestrial area, occur on all continents, in all latitudinal zones, and within all of the principal biomes. As fragile ecosystems, mountains represent unique areas for detecting climate change and its impacts. Mountain ecosystems are receiving increasing attention in international debates due to their rich biodiversity and the cascading effects of a warming climate on humanity. The yearly conferences under the United Nations Framework Convention on Climate Change (UNFCCC) serve as the formal meeting of the Conference of the Parties to assess the progress in dealing with climate change.

Considering the intricate link between climate change and biodiversity loss and its impact on human well-being, an international conference entitled 'Mountain Ecosystems: Biodiversity and Adaptations under Climate Change Scenarios' was held at the Graphic Era Deemed to Be University, Dehradun, India (22–24 March 2023). The conference hosted some of the leading research groups working on remote mountain ecosystems (i.e. Himalayan, Antarctic, and Andean). The discussions focussed on the state of biodiversity under prevailing climate change scenarios, with particular reference to adaptations and applications of socio-ecological resilience, livelihood diversification, evolving development policies, and nature-based solutions for mountain ecosystems and the people residing there.

The conference involved specific discussions on three significant mountain ecosystems:

- The Himalaya, referred to as Asia's Water Tower, is well known for its heritage value enshrined in cultural diversity and sacredness. The region has been recognized as one of 36 global biodiversity hotspots. It is a discrete geographic and ecological entity that produces a distinct climate of its own and influences the climate of much of Asia.
- Antarctica represents an extreme cold environment, one of the coldest parts of the Earth. This region is highly attractive for research projects focussing on biodiversity, life strategies, and adaptation mechanisms.
- The Andes, the longest continental mountain range in the world, extends over 7000 km along the western border of South America, from Southern Chile to Venezuela, and is not well studied.

More generally, papers and posters were presented that explored trends, patterns, and impacts of climate change on mountain regions and their associated ecosystems. The major themes included:

- Biodiversity assessment and adaptations;
- Socio-economic effects on biodiversity, including sustainable food systems, managing agroecosystems and adapting to climate change;
- Application of advanced technologies, such as satellite remote sensing and geoinformatics, machine learning and artificial intelligence, and deep learning techniques, in the characterization of conservation of biodiversity and flood forecasting.

In summary, the conference provided a platform to discuss the issues that influence mountain ecosystems. The outcomes of this conference were:

- The announcement of a Centre for Mountain Studies at Graphic Era Deemed to Be University, in response to the need for a multidisciplinary approach in mountain studies;
- Formation of a network of experts across mountain ecosystem research;

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- Recognition of the age-old traditional knowledge systems practiced by the mountain communities as a lifestyle, for socio-economic purposes;
- Promotion of high-altitude plants that are economically important for people's livelihood;
- Recognition that there is a need for policy and educational curriculum development for mountainous regions.

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Dr Nakul Chettri is working as a Sr Biodiversity Specialist at ICIMOD, Nepal. He has more than 20 years of experience in biodiversity conservation, landscape management, ecosystem services, climate change impact assessment and biodiversity informatics. Dr Chettri has been assigned as focal person for Convention on Biological Diversity, Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services among others and contributed to a number of global and regional assessment reports including the Global Biodiversity Assessment of IPBES and HIMAP Report of ICIMOD. Before joining ICIMOD, Dr Chettri served as a Fellow at the Ashoka Trust for Research in Ecology and the Environment in its Eastern Himalayan Programme.

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