Innovation and Global Cooperation for Sustainability
12-14 March, 2024

Collaborative Indo-German project on estimating and predicting natural hazards in the Himalayan region

Jürgen Mey[1], Axel Bronstert[1], Ankit Agarwal[2], Roopam Shukla[3]
[1]Institute of Environmental Science and Geography, University of Potsdam, Germany
[2]Department of Hydrology, IIT Roorkee
[3]Centre of Excellence for Disaster Mitigation and Management, IIT Roorkee

Co-PREPARE

Highlights:

- 16 long-term student exchanges (Msc. + PhD)
- Joint field schools in the Himalayas
- High public visibility and scientific output

1. Introduction

The project deals with natural hazards in the Himalayas. In this region the challenges of environmental change accumulate. On the one hand, the retreat of glaciers and permafrost will have a medium-term impact on water availability in the dry season. On the other hand, the warming of the atmosphere means that extreme weather events such as flash floods and landslides occur more frequently. This collides with rapid economic development and the associated expansion of transportation and energy infrastructure.

Fig. 1 | The Tapovan hydropower project was hit by the Chamoli ice and rock avalanche in 2021 (Shugar et al., 2021).

2. Objectives

We are pursuing three goals: firstly, to strengthen the internationalization of both institutions, secondly the joint investigation of extreme hydrometeorological events and their impact on the population and thirdly, the transfer of knowledge between the partners and to the public.

Fig. 2 | Teaching on an alluvial plain behind an ancient landslide during the Himalaya field school 2023.

3. Activities

Co-PREPARE facilitates exchanges of Msc. and PhD students, mutual visits of research staff and members of the international relations departments. We've offered disciplinary training courses and soft-skills workshops, which were held online during the pandemic and in presence thereafter. We organize an annual Indo-German Himalaya field school with a subsequent symposium. We survey households in Uttarakhand that have been exposed to natural disasters and conduct disaster awareness training courses on the village level.

Fig. 3 | Visit at the Tapovan HPP in 2023.

4. Results

- MoU between UP and IITR
- Msc. exchange: 9 IITR → UP; 5 UP → IITR (2 more in 2024)
- PhD exchange : 2 IITR → UP (1 year)
- Many short-term visits for e.g. the Potsdam Summer School, conferences in Potsdam and Roorkee.
- Three personal meetings of the president of UP and the director of IITR.
- Co-PREPARE has been mentioned in several press releases and newspaper articles.
- 27 journal articles including a Special issue in the Copernicus journal "Natural Hazards and Earth System Sciences" (NHESS)
- 30 recorded lectures from internationally renowned colleagues on natural hazards in the Himalayas →

5. Lessons learned

Finding an affordable accommodation remains an issue for students from IITR visiting UP, who are not eligible for a place in the subsidized dormitories (i.e. PhD students or those who are older than 30 years). On the other hand, students from UP visiting IITR have more than sufficient financial support. We recognize this as an imbalance regarding equal opportunities.

6. Outlook

With the support of both universities, the core team of Co-PREPARE has initiated the preparation of a joint German - Indian, DFG/DST funded, proposal for an International Research Training Group (IRTG), which is currently under review. In case we succeed, this would provide the foundation for continued intense collaboration in research and higher education for the next 5 – 10 years.

References:

Shugar, D. H., Jacquemart, M., Shean, D., Bhushan, S., Upadhyay, K., Sattar, A., ... & Westoby, M. J. (2021). A massive rock and ice avalanche caused the 2021 disaster at Chamoli, Indian Himalaya. *Science*, *373*(6552), 300-306.