

INTERNATIONAL MOUNTAIN CONFERENCE

#IMC22

SEPTEMBER 11 - 15 2022

>> SYNTHESIZE MOUNTAINS OF KNOWLEDGE <<

Submitted Abstract

ID IMC22-FSAbstr- 323

First Author First Name Last Name	Anubha (1) Aggarwal
Submitting Author First Name Last Name	Anubha Aggarwal
Correspondence	agrawal.anubha@gmail.com
Co-Authors >> E-Mails will be not listed	Frey, Holger (2); Mcdowell, Graham (2,3); Drenkhan, Fabian (2,4,5); Nüsser, Marcus (6); Racoviteanu, Adina (7); Hoelzle, Martin (8)
Organisations >> for readability limited to 6 >> full list can be found online	 Department of Civil Engineering, Delhi Technological University, India Department of Geography, University of Zurich, Zurich, Switzerland Canadian Mountain Assessment, University of Calgary, Calgary, Canada Department of Civil and Environmental Engineering, Imperial College London, London, UK Departamento de Humanidades, Pontificia Universidad Católica del Perú, Lima, Peru South Asia Institute, Department of Geography, Heidelberg University, Heidelberg, Germany
Country	India
Region	Asia
Title	Adaptation To Climate Change Induced Water Stress In Major Glacierized Mountain Regions.
Keywords	Mountains, Water Stress, Cryosphere, Adaptation, Limitation
Туре	List Of Focus Session
Focus Session ID	37



INTERNATIONAL MOUNTAIN CONFERENCE



SEPTEMBER 11 - 15 2022

>> SYNTHESIZE MOUNTAINS OF KNOWLEDGE <<

Abstract

Mountains are a critical source of water. Cryospheric and hydrological changes in combination with socio-economic development are threatening downstream water security triggering the need for effective adaptation responses. In this study, a systematic review at global scale was carried out to understand the adaptations implemented in mountainous regions to cope up with local hydrological changes. A full text analysis of 83 documents revealed that glacier area change, changes in snow fall amount and pattern, less precipitation and unpredictability of precipitation are the most common cryospheric and hydrological changes in the different regions, Globally, agriculture (42%), tourism (12%), hydropower (8%) and health and safety (4%) are among the main sectors affected by hydrological and cryospheric changes. Locals are forced to implement various methods of improved water use and conservation, diversify their means of income, migrate for jobs, modify agricultural practices and promote tourism beyond snow and ice. To cope with these stresses and in order to minimise the damage potential, a number of adaptation measures are being implemented all over the world in mountainous regions. The majority of adaptation practices are implemented in the agriculture sector in South America and Asia, in the tourism sector in Europe and Australia, in the transport and water infrastructure building sectors in North America and in the agriculture and forestry sectors in Africa. In South America, Asia and Europe adaptation measures are also being implemented in water storage infrastructure and disaster risk management sectors. We find that globally the most commonly used adaptation practices correspond to the improvement of water storage infrastructure (13%), green infrastructure (9.5%), agricultural practices (17%), water governance and policies (21%), disaster risk reduction (9.5%) and economic diversification (10%). However, successful implementation of adaptation measures is limited by a diverse set of factors. This includes reduced capacities and resources in infrastructure maintenance, mismanagement, conflicts and mistrust in government together with lack of funding and insufficient collaboration between stakeholders as well as delayed implementation of laws and mountain development programmes.

In sum, this work identified a wide diversity of adaptations in response to climate-related hydrological changes across mountain geographies. These adaptations are driven by a wide variety of climatic and social stimuli and have multifaced effects on the well-being of mountain people. Resilience is often improved, but unintended consequences and maladaptation are also prevalent. Also, social and environment limits to adaptation threaten to deepen the vulnerability of mountain people to hydrological changes.

Research Area Mountain Regions Innrain 52f 6020 Innsbruck Austria WWW.IMC2022.INFO

imc2022@uibk.ac.at +43 512 507 54442