

Submitted Abstract

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Abstract

The Hindu Kush Himalayan (HKH) region is the expanse covered in ice and perennial snow after the polar regions; therefore, also known as the Third Pole. The cryosphere changes in the region directly and indirectly impact more than 2 billion people dependent on rivers originating in the region. A number of studies have documented physical changes in the cryosphere system; however, much less is known how these changes affect high mountain communities. Beyond impacts of a changing glacier and snow cover, the mountain communities also experience non-climatic changes viz. social, economic, and political. Using the socio-cryospheric system framework, this multi-site study analyses how cryosphere changes and non-climatic socio-economic changes in the HKH region impact life and livelihoods of mountain communities. Further, the study explores the responses of communities and institutions to these changes and identifies adaptation needs. The study was conducted in six sites across the HKH region, comprising of Pakistan, China, India, Nepal, and Bhutan.

Crop and livestock production, tourism, small business, salaried jobs, and labour migration were the major livelihood options. All the options, except salaried jobs and labour migration, were dependent on cryosphere services and influenced by cryosphere changes. Changes in snowfall pattern and glacier and permafrost degradation were of biggest concern among the respondents. Similarly, increase in physical and virtual connectivity, improving access to education and markets, changes in governance system and decline in social capital were prominent socio-economic changes. The socio-cryosphere changes had mainly resulted in shifting of traditional crop-livestock based livelihoods to other options. Emergence of new opportunities, particularly nature-based tourism and youth migration, have diversified local livelihoods in the study sites, except Nepal, where local livelihoods are already heavily skewed towards tourism. The support of governmental and non-governmental agencies was vital for livelihood diversification. Despite livelihood diversification, precarity remains high in the high mountains, because the existing livelihood options, except youth migration, are still nature-based and climate sensitive. Therefore, there is a need for climate proofing of local livelihoods or diversifying to non-nature based livelihoods in order to build local resilience.