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Climate variability of the Greater Himalayas – implications for impacts and adaptation

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Impacts assessments on physical and societal systems from climate change and variability in high-mountain areas are often limited due to the scarcity of reliable long-term observations. However, these regions and the adjacent downstream areas are often highly affected by climatic variations and/or related extremes. Furthermore, societies there are typically highly vulnerable to such variations and extreme events, and have low adaptive capacities. Knowledge on climate variability and possible changes in a changing climate is thus of great importance in order to support preparing and planning with adequate adaptation measures.

Here, we present an assessment of climate variability patterns across the Greater Himalayan area. Our approach is based on high-elevation observations (air temperature and precipitation) and we combine these observations with selected gridded observations and Reanalysis data in order to get a most realistic picture of historical variability of two relevant climate variables. Future climate variations are assessed based on the comparison of past simulation of CMIP5-models with measurements and appropriate statistical methods.

Our results are interpreted with focus on specific regions and events in the past, including disaster events or droughts; and we outline possible implications for the future for societal relevant aspects like disaster preparedness, implications for cropping seasons or impacts on the cryospheric system and related fresh water availability.