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THIRD POLE'S CLIMATE CHANGE : IMPLICATIONS FOR REGIONAL PERSPECTIVES**Jairam Singh Yadav***Wadia Institute of Himalayan Geology, India*

The Himalayan meteorology is critical for understanding cryospheric-hydrological processes and climate change forecasts. Meteorological observations in the Indian Himalayan Region (IHR) are limited, particularly in glacierized catchments. Therefore, the current study aims to demonstrate a comprehensive investigation of past and present meteorological parameters at regional (e.g., Indian Himalayan region) and local (e.g., Dokriani glacier catchment (DGC)) scale. In contrast to global temperature, an increasing trend of air temperature in the Himalayas has been forecast in recent decades (after 1990, T_{avg} ~ 0.85°C), with a faster warming rate in the maximum temperature than in the minimum temperature. Trend of precipitation was inconsistent; for example, a substantial decrease in rainfall in monsoon season was reported in the western Himalayas. In the DGC, results show a rapid decrease in wind speed and out-flux radiation as the monsoon season begins, while relative humidity (RH) and positive degree-days (PDDs) increase. The existing positive temperatures (>3°C) in higher elevation bands (> 5500 m) raise serious concerns on the summer accumulation characteristics for the Dokriani glacier. The DGC has an average nearsurface temperature lapse rate (NSTLR) of 6.0°C km⁻¹, with steeper in the pre-monsoon and shallower during the monsoon, and thus avoiding the use of standard environmental lapse rate (SELR~6.5°C km⁻¹) in glacio-hydrological modelling. During the winter and pre-monsoon seasons, wind speed and albedo are particularly sensitive. The dataset of the present study is important for correlating hydro-meteorological measurements in various regions of the Himalayas; for example, the Kedarnath Tragedy-2013, and the most recent flash flood in Raunthi valley, Tapovan on 7th February 2021 was clearly a consequences of the regional climate change.

Biography

Dr. Jairam Singh Yadav has completed his PhD from Kurukshetra University in Haryana, India, and is presently a research associate at the Wadia Institute of Himalayan Geology. Climate change, glacier morphometric variations, and mass fluctuations are among his research interests.