

IMPACT OF CLIMATE CHANGE ON PRECIPITATION IN THE KARNALI BASIN, NEPAL

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ABSTRACT

This study highlights the impacts of climate change on precipitation in the Karnali Basin of Nepal. Long term trend analysis of precipitation was performed by RClimDex using historical time series data from 32 Department of Hydrology and Meteorology (DHM) stations. The analyses included observing decadal trends as well as that for a period of 30 years (1981-2010). The latest projections for climate change scenarios prescribed by the Fifth Assessment report of Intergovernmental Panel for Climate Change (IPCC) AR5 were used in this study for climate change analysis. GCM from Canadian Earth System Model (CanESM2) was used for generating future climate data which was downscaled using Statistical downscaling model (SDSM) for Representative Concentration Pathways (RCPs) scenarios 2.6, 4.5 and 8.5 representing low loading, average loading and high loading case respectively. Analysis of future climate change was carried out for three time windows - near future (2011-2040), midterm future (2041-2070) and long term future (2071-2100). Trend analysis of past precipitation data did not show any distinct pattern or trend towards any particular direction, although natural climatic variability was clearly observed. Further, comparison of the annual mean precipitation for the future (2011-2100) with the baseline period (1981-2010) showed increasing pattern in all the stations for the three RCP scenarios 2.6, 4.5 and 8.5 for all the time windows.

KEYWORDS: Precipitation, Trend Analysis, Climate Change, Downscaling, Karnali, RClimDex