



## **Evaluation of climatic changes in South-Asia**

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Literature has sufficient evidences of climate change impact all over the world and its impact on various sectors. In light of new advancements made in climate modeling, availability of several climate downscaling approaches, the more robust bias correction methods with varying complexities and strengths, in the present study we performed a systematic evaluation of climate change impact over South-Asia region. We have used different Regional Climate Models (RCMs) (from CORDEX domain), (Global Climate Models GCMs) and gridded observations for the study area to evaluate the models in historical/control period (1980-2010) and changes in future period (2010-2099). Firstly, GCMs and RCMs are evaluated against the Gridded observational datasets in the area using precipitation and temperature as indicative variables. Observational dataset are also evaluated against the reliable set of observational dataset, as pointed in literature. Bias, Correlation, and changes (among other statistical measures) are calculated for the entire region and both the variables. Eventually, the region was sub-divided into various smaller domains based on homogenous precipitation zones to evaluate the average changes over time period. Spatial and temporal changes for the region are then finally calculated to evaluate the future changes in the region. Future changes are calculated for 2 Representative Concentration Pathways (RCPs), the middle emission (RCP4.5) and high emission (RCP8.5) and for both climatic variables, precipitation and temperature. Lastly, Evaluation of Extremes is performed based on precipitation and temperature based indices for whole region in future dataset. Results have indicated that the whole study region is under extreme stress in future climate scenarios for both climatic variables i.e. precipitation and temperature. Precipitation variability is dependent on the location in the area leading to droughts and floods in various regions in future. Temperature is hinting towards a constant increase throughout the region regardless of location.