

Statistical Evidence of Climate Variability in Upper Jhelum Catchment

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Abstract—Kashmir forms a typical highland tectonic valley knotting the Pir-Panjals from the south-west with the Main Himalayan range from the north eastern side. Alike other mountainous regions of the world Kashmir valley has been affected by the changing climate as well. The disastrous impacts of the changing climate will not only affect the local population of the valley but will also have serious implications in the downstream areas on socio-economic and hydrological fronts. This study attempts to analyze a thirty five year old observed instrumental time series dataset of three IMD stations (Pahalgam, Qazigund and Kokernag) all of which are located in the southern part of Kashmir valley and placed at different altitudes. The data (temperature and precipitation), classified into annual and seasonal (winter, spring, summer and autumn) is subjected to non-parametric Mann Kendall's trend test to detect trends and the Theil-Sen's slope estimator to find the magnitude thereof. For a parametric analysis, simple linear regression was also carried out on the time-series. Furthermore, the coefficient of variation of the dataset is also calculated to verify the dispersion in the data. The study is an attempt to find and compare differences in the climate variability on a local scale and also to establish the impact of altitude and local factors on the micro-climatic scenario of a particular place within a climate complex. The study reveals and establishes that there exists a warming trend in both the minimum and maximum temperature (annual and seasonal) in all the three stations, however the magnitude and significance of this change bears a signature of their altitudinal variation.

Keywords: Climate variability, Highland, Downstream, Climate complex, Magnitude.