

Comparison of Rainfall Trends in the Western Ghats and Coastal Region of Karnataka, India

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Abstract : In recent days due to climate change, there is a large variation in spatial distribution of daily rainfall within a small region. Rainfall is one of the main end climatic variables which affect spatio-temporal patterns of water availability. The real task postured by the change in climate is identification, estimation and understanding the uncertainty of rainfall. This study intended to analyze the spatial variations and temporal trends of daily precipitation using high resolution (0.25° x 0.25°) gridded data of Indian Meteorological Department (IMD). For the study, 38 grid points were selected in the study area and analyzed for daily precipitation time series (113 years) over the period 1901-2013. Grid points were divided into two zones based on the elevation and situated location of grid points: Low Land (exposed to sea and low elevated area/ coastal region) and High Land (Interior from sea and high elevated area/western Ghats). Time series were applied to examine the spatial analysis and temporal trends in each grid points by non-parametric Mann-Kendall test and Theil-Sen estimator to perceive the nature of trend and magnitude of slope in trend of rainfall. Pettit-Mann-Whitney test is applied to detect the most probable change point in trends of the time period. Results have revealed remarkable monotonic trend in each grid for daily precipitation of the time series. In general, by the regional cluster analysis found that increasing precipitation trend in shoreline region and decreasing trend in Western Ghats from recent years. Spatial distribution of rainfall can be partly explained by heterogeneity in temporal trends of rainfall by change point analysis. The Mann-Kendall test shows significant variation as weaker rainfall towards the rainfall distribution over eastern parts of the Western Ghats region of Karnataka.

Keywords : change point analysis, coastal region India, gridded rainfall data, non-parametric

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