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IDENTIFICATION OF TREND IN LONG TERM PRECIPITATION AND REFERENCE EVAPOTRANSPIRATION OVER NARMADA RIVER BASIN (INDIA)

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ABSTRACT

Precipitation and reference evapotranspiration are key parameters in hydro-meteorological studies and used for agricultural planning, irrigation system design and management. Precipitation and evaporative demand are expected to be alter under climate change and affect the sustainable development. In this article, spatial variability and temporal trend of precipitation and reference evapotranspiration (ET_o) were investigated over Narmada river basin (India), a humid tropical climatic region. In the present study, 12 and 28 observatory stations were selected for precipitation and ET_o, respectively of 102-year period (1901–2002). A rigorous analysis for trend detection was carried out using non parametric tests such as Mann-Kendall (MK) and Spearman Rho (SR). Sen's slope estimator was used to analyze the rate of change in long term series. Moreover, all the stations of basin exhibit positive trend annual ETo, while 8% stations indicate significant negative trend for mean annual precipitation respectively. Change points of annual precipitation were identified around year 1962 applying Buishand's and Pettit's test. Annual mean precipitation reduced by 9% in upper part while increased maximum by 5% in lower part of the basin due temporal changes. Although annual mean ETo increase by 4 – 12 % in most of the region. Moreover results of the study are very helpful in planning and development of agricultural water resources.