

RAINFALL, TEMPERATURE AND STREAMFLOW TRENDS IN NILWALA RIVER BASIN, SRI LANKA

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This study investigated the monthly, seasonal, and annual trends of rainfall (at *Anninkanda* and *Denagama*; 1900-2019, *Dandeniya*, *Kekanadura*, *Mapalana*, *Mawarella*; 1951-2019, and *Goluwawatta*; 1965-2019), streamflow (at *Pitabeddara*; 1973-2019 and *Bopagoda*; 1940-2010), and temperature (at *Mapalana*; 1986-2019) in the *Nilwala* river basin, Sri Lanka. The trends were analyzed using Mann-Kendall (MK) with Sen's slope estimator, Block Bootstrap method (BBS), and Innovative Trend Analysis (ITA). Missing data were filled using the normal ratio method. Homogeneity was assessed by the standard normal homogeneity test and Pettitt's test and confirmed as homogenous. January, June, and July showed a decreasing trend in *Anninkanda* by MK and BBS. November showed an increasing trend in *Anninkanda* by the MK. *Dandeniya* showed a decreasing trend in May, while *Denagama* showed a decreasing trend in June and July by MK and BBS. According to the MK and BBS, *Goluwawatta* showed decreasing annual rainfall. *Denagama* showed decreasing trends of annual rainfall by MK. *Goluwawatta* and *Mawarella* showed decreasing and increasing trends for the south-west monsoon and second inter-monsoon (SIM) periods by MK and BBS. According to the MK and BBS, September and December showed an increasing trend at *Pitabeddara*, while *Bopagoda* showed a decreasing trend in January and March. According to the BBS, *Pitabeddara* showed increasing annual and SIM season trends while increasing trends during the northeast monsoon by MK. MK and BBS detected no temperature trends. ITA showed both increasing and decreasing trends for all scales. As ITA may produce contrasting results compared to other methods, it needs to be careful when using ITA. *Nilwala* river basin has both increasing and decreasing rainfall and streamflow trends. Therefore, the water management activities need to be revisited for the sustainable use of water resources. Hence, these results will help to formulate better water management strategies in the basin.

Keywords: Block Bootstrap method, Innovative trend analysis, Mann-Kendall test, Rainfall, Streamflow