

# HYDRO-CLIMATIC TRENDS IN KIRINDI OYA RIVER BASIN

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Trend analyses of hydro-climatic variables provide useful information for effective planning and designing of water resources and management of agricultural production. Trends in observed stream flow at three gauging stations (GS), Wellawaya, Thanamalwila and Kuda Oya, and rainfall and temperature in the *Kirindi Oya* river basin were assessed using the Mann–Kendall, Modified Mann–Kendall and Sen's slope. Average rainfall for the three catchments and for the entire basin was computed using 'Thiessen polygon' method. The relationships between trends in stream flow and catchment rainfall were studied by Spearman's rho correlation coefficient ( $\rho$ ). Five-year Moving average Standardized Anomalies (FMSA) of both annual streamflow and rainfall at Wellawaya and Thanamalwila GSs and catchments were in non-significant ( $p < 0.05$ ) decreasing trend from 1994 to 2010. Though there was a positive correlation between annual catchment rainfall and streamflow of these two catchments, correlation was significant ( $p < 0.05$ ) only at Thanamalwila (0.69) suggesting that the variation of annual stream flow at Thanamalwila GS is mainly attributed to the variation of catchment rainfall. However, variation of stream flow at North East Monsoon (NEM) season was attributed to the variation of respective catchment rainfall of both catchments as evident by significantly higher ' $\rho$ ' at Wellawaya (0.61) and Thanamalwila (0.69) during NEM. This study also found that trend of FMSA of South West Monsoon (SWM) rain was significantly ( $p < 0.05$ ) decreasing for the entire basin, Thanamalwila, Wellawaya and Kuda Oya sub catchments. Stream flow at Wellawaya GS during SWM was also found to be significantly decreasing, while Thanamalwila stream flow was non-significantly decreasing. Both rainfall and stream flow during First Inter Monsoon (FIM) showed a significant increasing trend, particularly in the month of April. These observed trends during SWM and FIM suggest an apparent early onset of SWM to the basin, or drastic deviation of receiving rain during SWM to Kirindi Oya river basin.

**Keywords:** Kirindi Oya river basin, Mann-Kendall, Rainfall, Stream flow, Trend analysis