

## Trend analysis of Annual and Seasonal Rainfall Data of Kilinochchi District

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Rainfall is a scarce and an important hydrological variable in dry zone areas. The need for water in these areas increases daily due to population growth, economic developments, and urbanization and consequently, water management using all the available resources is becoming increasingly crucial. In order to develop an effective water management strategy for Kilinochchi, trend analysis of annual, monthly and seasonal rainfall is important. Hence the objective of the study was selected as trend analysis of annual, monthly and seasonal rainfall of Kilinochchi district. Monthly rainfall data of Killinochchi district from 1921 to 1981, 1999 to 2007 and 2012 to 2014 was collected from the Department of Meteorology, Sri Lanka. Altogether 73 years of data were used in this analysis. The annual total rainfall in Kilinochci is normally distributed. The average value of rainfall was 1372 mm and there were no cyclic changes or linear trends observed during the study period. The highest rainfall of 2132 mm and the lowest value of 574 mm were observed during 1965 and 1974, respectively. The trend suggests a fluctuating and general decline in rainfall values in recent times over the study period but not significant. Results of the dependable rainfall and probability of exceedance of 80% rainfall was positive in the months of January, March, April, May, October, November and December. This value ensures that on average, there will be enough water to meet the crop's need four out of every five years during the above months. Trend of moving average of 3-Point for annual rainfall, first inter monsoon, Southeast monsoon, second inter monsoon and Northeast monsoon showed negative trend and the modal was not significant in all cases. The logarithmic model was fitted for the relationship between return period and rainfall amount for annual, first inter monsoon, Southwest monsoon, second inter monsoon and Northeast monsoon. Overall Standard Precipitation Index (SPI) values that lied on the dry event symbolize a significant increasing trend where as all SPI values that lied on wet events have shown an overall decreasing trend. The result of the analysis could be used for water management strategies.

**Keywords:** Rainfall analysis, Kilinochchi, Dependable rainfall, Probability of exceedance