

TREND ANALYSIS ON SOUTHWEST MONSOON RAINFALL IN SRI LANKA USING DROUGHT INDICES

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Sri Lanka is an agrarian country where the monsoon rainfall variation influences all agro-meteorological elements. Therefore, analyzing the trend of monsoon rainfall will be useful in different social and economic aspects. Even though trend analysis on rainfall in Sri Lanka has been conducted, drought indices have not been considered for trend analysis. Therefore, the main objective of this research study is to analyze the trend of Southwest monsoon rainfall in Sri Lanka using drought indices. Trend analysis on Standardized Precipitation Index (SPI) and Rainfall Anomaly Index (RAI) was carried out station-wise using Mann Kendall test (MK test) and Sen's slope estimator. The daily precipitation data for the Southwest monsoon season during 1981 - 2010 at 13 rain gauge stations located in the Southwest part of Sri Lanka were utilized to calculate the RAI and the SPI. The RAI was calculated using negative and positive anomalies and the SPI was calculated considering the data distribution. Trend analysis on both indices indicated that 10 rain gauge stations showed decreasing trends in Southwest monsoon rainfall according to normalized MK statistics. However, trend analysis on the RAI indicated significant decreasing trends in Southwest monsoon rainfall only at four rain gauge stations: Ambewela, Hatton, Katugastota and Nuwara Eliya while trend analysis on the SPI indicated significant decreasing trends in Southwest monsoon rainfall at three rain gauge stations: Ambewela, Katugastota and Nuwara Eliya. Furthermore, all those stations are located in the hill country. If this decreasing trend continues, it may cause negative impacts on agriculture, transportation, tourism, etc. and would ultimately affect the economy of the country and livelihood of the people. Therefore, results gained from this research study can be supportive to local decision makers in order to make decisions and manage risks.

Keywords: RAI, Southwest monsoon rainfall, SPI, Trend analysis