

ASSESSMENT OF METEOROLOGICAL DROUGHT OVER SRI LANKA USING STANDARDIZED PRECIPITATION INDEX

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Drought is one of the natural hazards which can cause huge damage to economic and social activities of human and ecosystem and is aggravated by climate change. Usually, meteorological drought precedes the other types of drought. Drought indices are vital elements for monitoring and assessment of drought and Standardized Precipitation Index (SPI) is the widely applied index to analyze meteorological drought for different time scales. In this study, drought events in Sri Lanka were assessed using SPI at 3, 6, and 12 months time scales using monthly rainfall during 1970-2017. The frequency of drought events was evaluated using SPI and trend of SPI was also detected by using the Innovative Trend Analysis (ITA) technique. The result based on SPI at annual time scale identified that hydrological years 1975-76, 1982-83, 1986-87, 1988-89, 2000-01, 2001-02, 2013-14, and 2016-17 as drought years for 52, 32, 35, 33, 33, 31, 31, and 31% of tested stations (54) respectively. The comparison of the SPI time scales discovered that more drought events ($SPI \leq -1$) occurred in April-September time scale (*Yala* cropping season) than the 3, 6 (*Maha* cropping season), and 12 months time scales. Considering in Thiessen polygon average rainfall, more frequent drought events occurred in the dry zone (57%) than the wet (49%) and intermediate zone (47%) at the annual time scale. ITA results revealed that mild ($0 > SPI > -0.99$) and heavier drought ($SPI \leq -1.5$) events are in increasing trend at 80% and 56% stations in dry zone respectively while mild drought events are in increasing trend at 57% of stations in the intermediate zone. The results indicated that the dry zone in Sri Lanka was subjected more to drought and is having an increasing tendency further in the future. The study suggests an immediate drought mitigation plan for drought prone areas, especially for the *Yala* cropping seasons.

Keywords: Drought, Drought indices, Innovative trend analysis,
Meteorological drought, Standardized precipitation index