

**ANALYSING DROUGHT OCCURANCE AND SEVERITY BASED ON THE
STANDARD PRECIPITATION INDEX IN THE NORTH CENTRAL
PROVINCE OF SRI LANKA FROM 1980 TO 2021**

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Abstract

Drought is an insidious and disastrous natural hazard. Though there is no universally accepted definition, many scientists introduce drought as a deviation of precipitation from normal or expected in an area for a considered period. Drought negatively affects the water demand of various human activities and the environment. Drought monitoring and forecasting are essential activities in drought management, but it is more challenging to monitor and forecast drought events than other hazards. North Central Province (NCP) of Sri Lanka is undergone frequent droughts. Mainly, NCP drought negatively affects the agricultural sector resulting in many losses of crop production and livelihoods. The primary objectives of this research were to identify the spatiotemporal pattern of drought occurrence, severity and assess the trend in the NCP. Monthly total rainfall data, including 14 rainfall stations for 42 years from 1980 to 2021, was collected from the Department of Meteorology, Sri Lanka. Standard Precipitation Index (SPI) was used to analyse temporal drought occurrence and its severity, where four times scales as three months, six months, nine months, and twelve months were calculated. Extreme drought events were mapped using ArcMap 10.8 software and the IDW interpolation technique. Mann -Kendall and Sen's slope was used to test the statistical significance of the rainfall trends. The results highlight that moderate droughts (SPI -1 to -1.49) are the highest category numbers for all 14 meteorological stations. Severe droughts (SPI -1.5 to -1.99) and extreme droughts (SPI -2 or less) occurred second and third, respectively. Moderate drought once every two years, severe drought once every 2-4 years, and extreme drought once every 5-10 years have occurred in NCP. There is a spatial variation of drought magnitude over NCP, even within the same drought category. Local-level drought risk monitoring and assessment are essential to proactive drought management and reducing the impacts.

Keywords: Drought, Hazard, Impacts, Risk, SPI.