

ANALYSIS OF DECADAL CHANGES OF RAINFALL VARIABILITY IN THE SOUTHERN SRI LANKA

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Abstract

Rainfall is a primary source of water not only for rain-fed and irrigated agriculture systems but also for many other industries that rely on hydroelectricity in Sri Lanka. Globally, there is a temporal and spatial variation in the rainfall pattern and no exception for the Sri Lankan context. The variation in the rainfall pattern has paramount validity in the fields of agriculture, fisheries and disaster management. Present study aimed to analyze the spatial and temporal variations in rainfall of the Southern Sri Lanka over the last 30 years. Daily rainfall data during the period of 1990-2020 were purchased selecting ten Weather stations (Baddegama Estate Dandeniya Tank, Galle, Hambantota, Lunugamwehera, Mawarella Estate, Yala Depedena Group, Pelawatte, Kalutara-P.W.D) distributed in the Southern Sri Lanka from the department of meteorology. Monthly, annual and monsoonal rainfall were calculated, while the missing data was filled using standard methods. The Mann-Kendall and Sen's slope methods were employed to explore the monthly, annual and monsoonal trends. Inter-decadal rainfall variability was compared by calculating mean annual data for the period of 1991 – 2000, 2001 – 2010 and 2011 – 2020. The ArcGIS was used to plot the spatial distribution of mean decadal rainfall. The inverse distance weighting (IDW) method was used to interpolate the mean annual rainfall values at regular intervals. There was a spatial variation in the trend observed in the annual rainfall patterns of the Southern region, where Baddegama, and Mawaralla exhibited an increasing trend. Dandeniya exhibited a downward trend, while there is no any specific pattern in the rainfall of other stations. The maximum and the minimum rainfall of the Southern region in the last three decades were detected in Mawarella and Yala respectively. The annual average rainfall of Mawaralla during the studied three decades were 4644.95 mm, 4099.09 mm and 4530.42 mm respectively, while the minimum rainfall found in Yala during the same time periods were 975.12 mm, 955.45 mm and 989.76 mm respectively.

Keywords: Mawaralla, Rain-fed agriculture, Rainfall, Sri Lanka, Yala