

IMPACTS OF CLIMATE CHANGE ON RECENT RAINFALL TREND AND VARIABILITY IN SRI LANKA

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The challenging task of water resource allocation, management, and distribution is simplified by analyzing rainfall trends, which provide insights for the impacts of climate change. The study aimed to investigate the recent rainfall trends and variability and possible climate change impacts on the rainfall status of Sri Lanka. In this study, the Mann-Kendall (MK) test, Sen's Slope Estimator, and Innovative Trend Analysis (ITA) methods were used to analyze the annual, seasonal, and cropping season, rainfall trends at 44 stations in Sri Lanka from 1970 to 2023. An increasing annual rainfall trend was observed in 79.55% of stations with 31.82% of stations reporting a significant increasing trend, while a decreasing trend was observed in 20.46% of stations according to the MK test. Similarly, an increasing annual rainfall trend was exhibited in 81.82 % of stations and a decreasing trend was detected in 18.18 % of stations according to the ITA method. According to the MK test, an increasing trend was observed in 52.27%, 54.55%, 88.64%, and 77.27% of the stations during the First Inter-monsoon (FIM), Southwest Monsoon (SWM), Second Inter-monsoon (SIM), and Northeast Monsoon (NEM), respectively. An increasing trend was also shown in 65.91%, 61.36%, 84.09%, and 79.55% of stations for FIM, SWM, SIM, and NEM respectively, according to the ITA method. Both the *Yala* and *Maha* rainfall showed an increasing trend with *Maha* exhibiting a higher percentage trend than *Yala*. The Maan-Whitney U test revealed significantly higher increasing trends ($p > 0.05$) after the year 2000 compared to before 2000 for annual and cropping seasonal rainfall reflecting climate change impacts over rainfall of Sri Lanka. This study concludes an overall increasing trend of rainfall in Sri Lanka with significant impacts attributed to climate change.

Keywords: Innovative trend analysis, *Maha*, Mann-Kendall, Mann-Whitney U test, *Yala*