SPATIOTEMPORAL VARIABILITY OF SRI LANKAN RAINFALL FROM 1990 TO 2020

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Abstract

Rainfall serves as a cornerstone for numerous sectors, including rain-fed agriculture, hydropower generation, fisheries, tourism, and the stability of coastal ecosystems. Given its pivotal role, understanding rainfall patterns is crucial for informed decision-making and the effective management of these sectors. This study aims to scrutinize the spatiotemporal variation in Sri Lankan rainfall over the past three decades. Utilizing daily rainfall data from 52 stations across the country spanning from 1990 to 2020, this analysis computed monthly, annual, and monsoonal rainfall metrics, meticulously addressing missing data using established methodologies. Employing statistical tools such as Mann-Kendall and Sen's slope, temporal variations in rainfall were discerned. Inter-decadal comparisons were conducted, revealing shifts in mean annual rainfall across distinct periods (1991–2000, 2001–2010, and 2011–2020). Spatial distributions of mean decadal rainfall were visualized using ArcGIS, complemented by the Inverse Distance Weighting (IDW) method to interpolate annual values, enhancing spatial comprehension. Significantly increasing trends in rainfall were identified during specific monsoon seasons and inter-monsoon periods at various stations, while notable decreases were observed in others. Interestingly, a substantial increase in rainfall was noted in the dry zone during 2011–2020 compared to 1991–2000, indicative of dynamic shifts in precipitation patterns. These findings underscore the variability of rainfall across Sri Lanka's climatic zones over the past three decades, suggesting potential revisions to current demarcations. Such insights are invaluable for informing policies, strategies, and future research endeavors in climate science and related disciplines.

Keywords: *Agriculture, Climate Zone, Rainfall, Sri Lanka*

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