VISVESVARAYA TECHNOLOGICAL UNIVERSITY

JNANA SANGAMA CAMPUS, BELGAVI - 590018

MINI-PROJECT REPORT ON

"SUB TREND ANALYSIS OF MONTHLY RAINFALL IN DAKSHINA KANNADA, INDIA USING SATELLITE-BASED RAINFALL DATA AND INNOVATIVE TREND ANALYSIS"

Submitted In Partial Fulfilment of The Requirements for The Award Degree Of

BACHELOR OF ENGINEERING

IN

AGRICULTURE ENGINEERING

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This is to certify that the Mini-project work entitled "SUB TREND ANALYSIS OF MONTHLY RAINFALL IN DAKSHINA KANNADA, INDIA USING SATELLITE-BASED RAINFALL DATA AND INNOVATIVE TREND ANALYSIS" is the bonafide work carried out by

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In partial fulfilment for the award of the Bachelor of Engineering in Agriculture Engineering of **Visvesvaraya Technological University, Belagavi** during the Academic year 2023-24. It is certified that all correction and suggestions indicated for internal assessment have been incorporated in report deposited in the department library. The project report has been approved as it satisfies the academic requirement in respect of project work prescribed for the said degree.

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ABSTRACT

This study presents a detailed sub-trend analysis of monthly rainfall in Dakshina Kannada, India, utilizing satellite-based rainfall data and advanced trend analysis techniques. The region's coastal location and monsoon influence necessitate a comprehensive understanding of rainfall patterns for effective water resource management and agricultural planning. Traditional ground-based measurements often fall short in spatial resolution and coverage, making satellite data an invaluable resource for this analysis. Monthly rainfall data spanning several decades were sourced from high-resolution satellite observations. Innovative statistical methods, including the Mann-Kendall test and Sen's slope estimator, were employed to detect and quantify trends in the data. These methods are particularly adept at identifying subtle and non-linear changes in rainfall patterns. The analysis revealed distinct sub-trends within the overall rainfall data, indicating both increasing and decreasing trends in different periods and locations. These variations are linked to both climatic events and anthropogenic factors such as land use changes, urbanization, and deforestation. The spatial analysis highlighted significant heterogeneity in rainfall trends across Dakshina Kannada, suggesting localized climatic influences. The findings have critical implications for water resource management, agricultural practices, and disaster preparedness in the region. Understanding the temporal and spatial variability of rainfall can help optimize water usage, align agricultural practices with rainfall patterns, and improve strategies for flood and drought mitigation. Additionally, this study contributes to the broader field of climate science by demonstrating the effectiveness of combining satellite data with innovative trend analysis techniques, providing a model that can be applied to other regions.

In conclusion, the sub-trend analysis of monthly rainfall in Dakshina Kannada using satellite-based data and advanced trend analysis methods offers valuable insights into the region's rainfall dynamics. These insights are essential for informed decision-making in water management, agriculture, and disaster mitigation, and underscore the importance of leveraging advanced data and analytical techniques in climate research.