

# **Spatio-temporal Climate Variability Analysis: Central Ethiopia Rift Valley**

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The study aims at investigating the spatio-temporal climate variability of Central Rift Valley, Ethiopia. It used 1983-2012 grid time series metrological data, field survey, and Normalized Difference Vegetation Index (NDVI). The data were processed and analyzed using a combination of Geospatial technologies and descriptive statistics. The study unveiled that long-term recorded rainfall data stipulates an increasing trend during the observation period with an overall mounting rate of 78.5 mm, except inter-annual fluctuation. The mean maximum total rainfall analysis of the same period shows a consistent pattern characterized by late-onset and early cessation of rainfall. It is found that the maximum temperature is increased by 0.23°C per decade with an overall rise of 0.7°C in the thirty-year period of concern, while the minimum temperature remains constant. The result reveals linear positive correlations between NDVI and mean annual and spring season rainfall with R<sup>2</sup> value of 0.3467 and P-value of 0.0342, and R<sup>2</sup> of 0.715 and P-value of 0.0003, respectively. Indisputably, the spatio-temporal variability of rainfall, and minimum and maximum temperatures are observed. The analysis also underpins that climate variability is pervasive particularly in the spring rainy season and substantially dwindled in amount and distribution, and eventually afflicts the vegetation condition and crop production in the milieu. Thus, as climate change has been highly manifested in the area, appropriate policy and strategic measures are required to reduce and mitigate the repercussion.

**Keywords: Climate, GIS, NDVI, Spatio-temporal , Ethiopia**