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**TITLE OF PROJECT: Spatio-temporal Drought Assessment in Aurangabad district of Maharashtra using SPI, GIS and Run analysis**

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**ABSTRACT (150-300 words):**

The Aurangabad district of Maharashtra faces recurrent famines owing to its semi-arid climate, unpredictable rainfall patterns, and limited water resources. To comprehensively evaluate drought vulnerability and pinpoint regions most prone to water scarcity and agricultural disturbances, this study proposes a spatio-temporal assessment of drought susceptibility in the Aurangabad area. This assessment integrates the use of the Standardized Precipitation Index (SPI) in conjunction with Geographic Information Systems (GIS) and run analysis. The daily rainfall data for a period of 20 years (2003 to 2022) was analysed to study the rainfall patterns in 10 meteorological stations. The Standardized Precipitation Index (SPI) was estimated to categorize vulnerable areas susceptible to varying drought intensities during the June, July, August, and September months for a period of 20 years. The analysis indicated severe to extreme drought in all meteorological stations with a SPI value of -1.5772 in June (Gangapur station, 2014), -2.1494 in July (Phulambri station, 2015), -1.4247 in August (Phulambri station, 2004), and -1.8881 in September (Gangapur, Paithan, Phulambri stations). A run analysis was further carried out along with SPI to quantify the magnitude of drought events and also to check the duration of dry spells in the monsoon season which would possibly affect the crop growth. The analysis highlighted diverse dry spell durations ranging from 53 days in Phulambri station to 93 days in Vijaypur region and emphasizes severe drought conditions (with severity values spanning between -106.5 to -234.1) across meteorological stations. In order to study the relationships between drought duration and magnitude in all stations, scatter diagrams were created with the best straight-line fits. These graphs will be helpful to obtain drought magnitude for a corresponding drought duration which is required to assess the water requirement in a critical dry period in a region for different purposes. Resultant spatially interpolated SPI maps serve as crucial decision-making tool, aiding effective measures to mitigate drought impacts on agriculture, water resources, and livelihoods in Aurangabad district, Maharashtra.

**KEYWORDS:** Drought vulnerability, Standardized Precipitation Index (SPI), Geographic Information Systems (GIS), Run analysis, Drought severity

**CATEGORY:** Remote Sensing (GPS/GIS)