

A combination of vegetation condition index, standardized precipitation index and human observation in monitoring spatio-temporal dynamics of drought. A case of Zvishavane District in Zimbabwe

Oshneck Mupepi and Mark Makomborero Matsa

A B S T R A C T

Drought requires a multifaceted approach in order to better understand it. The study assessed the application of a combination of Vegetation Condition Index (VCI), Standardized Precipitation Index (SPI) and human observation approaches to understand spatio-temporal dynamics of drought in Zvishavane District. A mixed methods research design supported by both qualitative and quantitative approaches was adopted. GIS and remote sensing, questionnaire, interviews and focus group discussions were adopted for data collection. ArcMap 10.5, Microsoft excel 2013 and SPI Generator software were used for data analysis. Findings indicated that human observation, VCI and SPI can detect the temporal distribution of severe-extreme droughts. Based on finding, SPI proved difficult to use for analyzing the spatial distribution of drought at district level where only one rain gauge exist for the district. Human perceptions and VCI were confirmed to be in agreement when detecting spatial distribution of severe-extreme droughts at district level. Findings showed that humans tend to forget or fail to notice the spatial and temporal distribution of moderate drought which VCI proved to be effective in detecting. A hybrid method of drought monitoring which incorporates remote sensing indices, meteorological indices and human perceptions is encouraged to ensure a comprehensive analysis of drought.

Keywords: Meteorological drought, Agricultural drought, Drought indices, Spatio-temporal distribution, Remote sensing