Spatio-Temporal Dynamics of Agro-Meteorological Drought Between 1990 And 2020 In Mberengwa And Zvishavane Districts, Zimbabwe

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Abstract

Drought has increased in frequency and severity during the previous decade in response to climate change, hence drastic actions are required to ensure drought resilience of most vulnerable communities, especially in developing countries. The study assessed the Spatio-temporal dynamics of agro-meteorological drought between 1990 and 2020 in Mberengwa and Zvishavane Districts. A mixed-methods approach was employed with both qualitative and quantitative data collection methods adopted in the context of the pragmatist research philosophy. Geographic information system and remote sensing, assessment questionnaire, interviews, focus group discussions and observations were used to collect required data in this study. Microsoft excel 2013, Statistical Package for Social Sciences version 20.0 and ArcMap 10.5 software were used for data analysis. Findings showed that despite constant change in climate, drought dynamics did not follow a constant trend in Mberengwa and Zvishavane Districts over the 30 year period studied. However, these dynamics in drought conditions experienced spatial heterogeneity in terms of severity. The 2011-2020 decade experienced more frequent droughts followed by the 1990-2000 and 2001-2010 decades. The El Nino Southern Oscillation phenomenon proved to be the major drought driving factor as its El Nino and La Nina phases corresponded to drought and non-drought years respectively. Zvishavane District was more affected by droughts compared to Mberengwa District. Drought in both districts experienced an increasing trend between 2017 and 2019 before a slight decline in 2020. An increase in spatial coverage of severe droughts was confirmed in both districts. Findings indicated that the length of the rain season has reduced due to late-onset and early cessation of rainfall. Results indicated that local people were in agreement with the spatial and temporal distribution of severe droughts in both Mberengwa and Zvishavane Districts. Findings showed that there were significant improvements in adaptive, absorptive and transformative capacities of households to overcome the impacts of drought in Mberengwa and Zvishavane Districts. Since drought severity and frequency have increased in Mberengwa and Zvishavane Districts, the impacts of drought on people's livelihoods have proportionally increased. The Government of Zimbabwe is encouraged to provide all necessary support to AGRITEX, the Veterinary Services Department and rural district councils throughout the country especially in drought-prone areas so as to strengthen drought resilience support which proved to be effective under the Enhancing Community Resilience and Inclusive Market Systems project in

Mberengwa and Zvishavane Districts. The government is encouraged to introduce climate research centers fully equipped with resources that allow climate parameter analysis. This will aid the development of new drought monitoring indices that best suit the climatological conditions of Zimbabwe. This will enhance innovation as ascribed by education 5.0 and improved climate-related disaster management which will culminate into the rejuvenation of agriculture as the backbone of the economy. This will contribute to the achievement of National Development Strategy Goal number one of achieving a prosperous and empowered upper-middle-income status by 2030.