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with planetary health”

Indigenous climatic indicators for early warning in semi-arid smallholder farming of Zimbabwe

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Abstract

The semi-arid regions of Zimbabwe continue to be impacted negatively by climatic shocks. Recurrent climatic events, such as droughts and floods, hamper smallholder productivity in these regions. With climate change, it has become harder for smallholder farmers to plan their cropping season. National meteorological rainfall forecasts provide projections on overall season performance, i.e. whether there will be normal, above normal or below normal rainfall, but not the distribution in this largely unimodal rainfall pattern zone. On the other hand, advance planning by smallholder farmers rather requires that information about rainfall distribution throughout the season, including estimated starting and ending dates, be available before the rain-fed agricultural season begins. Such a limitation calls for the need to strengthen innovative integration of indigenous knowledge as part of agricultural early warning systems (AEWS). Through the Markets and Seeds Access Project (MASAP, since 2021), Focus Group Discussions were held to document indigenous indicators associated with certain climatic phenomena, and whether the mentioned indicators had been observed by smallholder farmers in Mudzi and Tsholotsho districts of Zimbabwe before and during the 2023/24 agricultural season. Responses were summarised into positive (projecting a good season) and negative (projecting a poor season) indigenous climatic indicator categories, namely i) animal behaviour, ii) vegetation/plant characteristics, iii) terrestrial and celestial phenomena and v) weather related. The findings confirmed the existence of many local indicators (> 60) the farmers associated with positive or negative season performance. Of the mentioned animal behaviour indicators, 67% were positive pointers. For the vegetation related indicators, 56% were positive pointers. Among the terrestrial and celestial group, 78% were positive pointers. Forty-two percent (42%) of the mentioned animal behaviour indicators observed for the 2023/24 season were positive while 86% of the observed vegetation/plant group indicators were negative. Further, only negative indicators had been observed strongly for both animal and vegetative categories, conforming to the poor 2023/24 seasonal performance. There is great potential for indigenous knowledge system roles and application in AEWS. The preliminary findings need to be strengthened with long-term empirical data collection and relational analysis on rainfall characteristics and patterns, crop performance, and selected key indigenous indicators.

Keywords: Climate, early warning, indicators, indigenous knowledge, MASAP project, smallholder farming, Zimbabwe

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