



Perception versus reality: Farmers' adaptation and the dynamics of Sahel drought

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The African Sahel has long been a focal point for research and policy discourse on drought. Inhabitants heavily rely for sustenance and economy on agriculture. Thus, crop yield is a key measure of success or failure. Since crop yield depends heavily on water availability, it is indicative of the function and efficiency of the farming-water system used. This system is said to have undergone significant variations in the biophysical and socioeconomic features during the past five decades. Understanding the interactions of climate variability and especially drought process and farming system development is important to sustainable and adaptive resource management. This study explores the coevolution of farming-drought relationship in the Sahel with a special reference to Sudan. We aim at synthesizing a number of insights into the sociohydrological resilience of the Sahel farming system. To this end, we analyzed two gridded datasets on drought indices and two staple crop statistics since 1970 in addition to structured survey questionnaires with ~1100 farmers. The analysis is further bolstered by recent findings from DFG funded SHADRESS project. The analysis shows that farmers have developed different agricultural strategies to cope with drought. Sorghum and millet yields have not kept pace to match the steadily expanding planted areas as would be expected. Both crops thereon reveal an inconsistent performance in terms of yield vulnerability and resilience to both dry and wet conditions. Farmers reported that sorghum (51%) is more affected by climate vagaries as compared to millet (15%). Inadequate rainfall is perceived by more than two-third of the respondents as the main reason for declining yield. However, during the last three decades, the importance of drought characteristics in determining crop yield levels decreased. Notwithstanding the benefits brought about by wet conditions, the farming system is likewise vulnerable to wet extremes, though somewhat to a lesser extent. The above observations suggest that the adjustment measures adopted by farmers are not sufficiently reducing the risk of crop failure. The respondents indicated other non-climatic issues beyond drought as being responsible for low yields, putting constraints on farming adaptations. In conclusion, identifying suitable pathways to adaptive agricultural management is needed to increase stability and resilience. These pathways should address vagaries of both the natural and the societal conditions. The combined implications of both droughts and floods as well as the integrated multi-faceted factors currently influencing the interplay between the farmer and

water system must be recognized.