



Water Management Strategies for Drought Resilience in the Horn of Africa Contextualized for Gabon Agriculture

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Abstract

In the Horn of Africa, including countries such as Ethiopia and Somalia, drought resilience is a significant challenge for agricultural communities. These regions face unpredictable rainfall patterns and water scarcity issues, which can severely impact livestock health and productivity. Water management practices were evaluated based on climate data, soil moisture content, and historical rainfall records. These factors were analysed using a statistical model to predict water scarcity patterns across different regions of Gabon. A key finding is that in the southwestern region of Gabon, annual precipitation variability can lead to significant fluctuations in groundwater levels, affecting both crop and livestock water supplies. The identified climate patterns suggest a need for adaptive irrigation systems and improved water storage facilities to enhance drought resilience in agricultural sectors. Farmers should consider investing in water-efficient crops and the development of early warning systems for water scarcity. Additionally, government support is needed to facilitate the adoption of these strategies. Agriculture, Drought Resilience, Water Management, Climate Patterns, Statistical Modelling The empirical specification follows $Y = \beta_{0+\beta}^{-1} p X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African, Irrigation, Conservation, Hydrology, Resilience, Sustainable, Precision Agriculture*

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