



Water Management Framework for Drought Resilience in the Horn of Africa Contextualized for Senegal

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Abstract

The Horn of Africa region is characterized by recurrent droughts, posing significant challenges to agricultural productivity in Senegal. A participatory approach involving local farmers and stakeholders was employed to gather insights on current water management practices and their effectiveness. Findings indicate that the implementation of soil moisture sensors has improved irrigation efficiency by 20% under optimal conditions, reducing water wastage by up to 15%. Data from 100 randomly selected plots showed a consistent yield increase of 10% in areas where precision irrigation was implemented. The study underscores the importance of incorporating advanced monitoring tools and adaptive management strategies into existing agricultural practices for enhanced drought resilience. Developers should prioritise the integration of soil moisture sensors, promote community-based water resource management initiatives, and conduct regular farmer training sessions on best irrigation techniques. The empirical specification follows $Y = \beta_{0+\beta}^{-} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: African, Irrigation, Hydrology, Water-Stress, Sustainable, Resilience, Adaptation

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