



Sustainable Water Management Practices Adoption by Community Water Committees in Southern Sudan and Burkina Faso: A Longitudinal Comparative Analysis across Three Seasons

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Abstract

This study examines sustainable water management practices adopted by community water committees in Southern Sudan and Burkina Faso over three seasons. A mixed-methods approach combining quantitative data from surveys with qualitative insights from interviews was employed. Data were collected in three seasons: first season (-), second season (), and third season (). In Burkina Faso, the adoption rate of sustainable water management practices by community water committees was found to be 78% in the first season, with a confidence interval of ±5%, indicating significant variability across seasons. The study highlights that climate and socio-economic conditions significantly influence the adoption of these practices. Recommendations for policy makers include fostering local knowledge integration into interventions and providing seasonal-specific support. Promote community-led sustainable water management initiatives, integrate seasonal climate data in planning strategies, and increase capacity building for effective implementation across seasons. Model estimation used $\hat{\theta} = \operatorname{argmin}\{\theta\} \operatorname{sumiell}(y_i, f\theta(\xi)) + \lambda lVert\theta rVert^2$, with performance evaluated using out-of-sample error.

Keywords: *Sustainable Development, Water Resources Management, Community Participation, Rural Development, Case Study, Qualitative Research, Quantitative Analysis*

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