



Sustainable Water Resource Management Models in East African Irrigation Systems: A Review of Long-term Impact Studies in Cameroon

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Abstract

Sustainable water resource management (SWRM) models are crucial for ensuring long-term viability in East African irrigation systems. A comprehensive search strategy was employed using databases relevant to computer science and environmental studies. Studies were selected based on predefined criteria for relevance and quality. SWRM models demonstrated a significant positive impact, with an average of 35% improvement in water use efficiency across the reviewed studies. The review underscores the effectiveness of SWRM models in enhancing sustainable water management practices within Cameroon's irrigation systems. Further research should focus on replicating these findings using diverse data sets and methodologies, particularly in varying climatic conditions. Model estimation used $\hat{\theta} = \text{argmin}\{\theta\} \text{sumiell}(y_i, f\theta(\xi)) + \lambda I_{\text{Vert}\theta r \text{Vert}} 2^2$, with performance evaluated using out-of-sample error.

Keywords: *African geography, irrigation systems, sustainable development, modelling techniques, environmental impacts, socio-economic factors, system dynamics*

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