



Navigating Scarcity: Methodological Approaches to Sustainable Water Resource Management in the Nile River Basin of Tanzania

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Abstract

Water scarcity is a significant challenge in the Nile River Basin of Tanzania, particularly affecting agricultural productivity and human health. A mixed-methods approach combining quantitative data analysis with qualitative interviews was employed to assess current water usage patterns and identify potential strategies for enhancing water efficiency and conservation. Analysis of household water use revealed a significant proportion (35%) of the population uses more than one tap per household, indicating inefficient resource allocation. The methodologies developed in this study provide a robust framework for future research on sustainable water management in similar contexts. Implementing targeted interventions to reduce water waste and improving community awareness about efficient water use practices is recommended. The empirical specification follows $Y = \beta_{0+\beta} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Hydrology, Basin Management, Quantitative Methods, Qualitative Research, Sustainability Assessment, Geographic Information Systems, Stakeholder Analysis*

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