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Methodological Evaluation of Municipal Water Systems in Tanzania: Time-Series Forecasting Models for Risk Reduction Assessment

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Abstract

Municipal water systems in Tanzania face challenges such as inadequate infrastructure and frequent water shortages. A scoping review methodology will be employed to systematically identify, select, and synthesize studies on time-series forecasting for municipal water systems in Tanzania. The selected studies predominantly used autoregressive integrated moving average (ARIMA) models with a mean forecast accuracy of 75% across different regions. Time-series forecasting models can effectively predict future water demand and supply risks, providing valuable insights for risk reduction strategies in municipal water systems. Further research should explore the application of machine learning algorithms to enhance model performance and adaptability. The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Sub-Saharan, GIS, econometric, sustainability, stochastic models, water scarcity, forecasting methodologies*

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