Time-Series Forecasting Model Evaluation of Municipal Water Systems in Tanzania

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Abstract

Municipal water systems in Tanzania have faced challenges related to reliability and efficiency over time. The study employed a Box-Jenkins ARIMA (AutoRegressive Integrated Moving Average) time-series forecasting model to predict future water demand based on historical data from to . The forecasted demand showed an upward trend, indicating potential future shortages if no interventions are made, with a 95% confidence interval around the mean estimate of ±10%. The ARIMA model provided insights into system performance and highlighted areas for improvement in water management strategies. Investment in infrastructure upgrades and demand-side management policies should be prioritised to ensure sustainable municipal water supply. Municipal Water Systems, Time-Series Forecasting, Efficiency Gains, Box-Jenkins ARIMA Model The empirical specification follows $Y = \vec{\beta}_{0+\beta} \, p \, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African economies, time-series analysis, econometrics, forecasting models, water management systems, Box-Jenkins methodology, ARIMA models*

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This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

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