



Time-Series Forecasting Model for Evaluating Municipal Water Systems Efficiency in Kenya: A Methodological Assessment

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Abstract

Municipal water systems in Kenya face challenges such as inadequate treatment facilities and insufficient data collection for performance evaluation. A time-series forecasting model was developed using ARIMA methodology, incorporating uncertainty with robust standard errors (e.g., $ARIMA(p, d, q)$). The model predicted an average improvement of 15% in system efficiency over the next five years, based on historical data. The time-series forecasting model offers a promising method for evaluating and improving municipal water systems in Kenya, with potential for wider application. Further research should include validation through field tests and integration into existing monitoring frameworks. Municipal Water Systems, Efficiency Evaluation, Time-Series Forecasting, ARIMA Model

Keywords: *African Geography, Time-Series Analysis, Methodology, Water Resources Management, Forecasting Models, Performance Evaluation, Geographic Information Systems*

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