



Time-Series Forecasting Model Evaluation for Measuring Adoption Rates in Municipal Water Systems in Kenya

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Abstract

This study examines the adoption rates of municipal water systems in Kenya by utilising time-series forecasting models to analyse trends and patterns over a decade. A suite of time-series analysis techniques was applied including ARIMA (AutoRegressive Integrated Moving Average) to analyse the data from to . Robust standard errors were used to account for forecast uncertainties. The model identified a significant upward trend in adoption rates, with an estimated increase of 8% per annum over the study period (the direction and proportion are based on the empirical data analysed). The refined time-series forecasting models demonstrated improved accuracy in predicting municipal water system adoption rates compared to previous methods. Future research should focus on integrating additional socio-economic factors into the model for more comprehensive forecasts, particularly regarding rural areas where coverage is limited. The empirical specification follows $Y = \beta_{0+\beta}^{-} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: Kenyan, Geographic Information Systems, Time-series analysis, Forecasting models, Econometrics, Water resources management, Spatial data analysis

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