



Time-Series Forecasting Model for Measuring Adoption Rates of Water Treatment Facilities in Uganda

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Abstract

Water treatment facilities in Uganda have shown varying levels of adoption over time, necessitating a methodological approach to forecast future trends. A time-series analysis was employed, incorporating relevant historical data on facility installation and usage patterns. The ARIMA (AutoRegressive Integrated Moving Average) model with robust standard errors was used for forecasting adoption rates. The forecasted trend indicated a steady increase in the number of water treatment facilities installed from to , with an expected proportion reaching 15% by the end of the period. The ARIMA model provided reliable forecasts for future adoption rates, highlighting the potential impact on improving access to clean water in Uganda. Public health authorities should consider these findings to plan and allocate resources effectively for expanding water treatment facilities. water treatment facilities, time-series forecasting, ARIMA model, adoption rate, public health The maintenance outcome was modelled as $Y_t = \beta_0 + \beta_1 X_t + u_t + v_t \epsilon_t$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Sub-Saharan, African, Spatio-Temporal, ARIMA, Markov, Regression, Dynamics*

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