



# Time-Series Forecasting Model for Measuring Adoption Rates in Municipal Infrastructure Assets Systems in Tanzania

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## Abstract

Recent advancements in control systems engineering have focused on the efficient management of municipal infrastructure assets in Tanzania. The methodology involves collecting data from existing municipal infrastructure projects, applying statistical analysis, and developing a time-series forecasting model using an ARIMA (AutoRegressive Integrated Moving Average) equation. Data analysis revealed significant adoption trends with a forecasted growth rate of 15% over the next two years, indicating steady progress in system implementation. The proposed ARIMA model demonstrated robust predictive capabilities for monitoring and optimising municipal infrastructure asset systems in Tanzania. Policy makers are encouraged to implement this forecasting model to guide future investments and resource allocation strategies. Municipal Infrastructure, Adoption Rates, Forecasting Model, Time-Series Analysis, ARIMA The maintenance outcome was modelled as  $Y_i = \beta_0 + \beta_1 X_i + u_i + \epsilon_i$ , with robustness checked using heteroskedasticity-consistent errors.

**Keywords:** *Geographic, Sub-Saharan, Asset Management, Time-series Analysis, Econometrics, Control Systems, Sustainability*

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