



# Time-Series Forecasting Model Evaluation for Cost-Effectiveness of Municipal Infrastructure Assets in Senegal

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## Abstract

The cost-effectiveness of municipal infrastructure assets in Senegal is a critical concern for public sector managers. A systematic approach was employed to develop and validate forecasting models using historical data from . The developed model predicted maintenance costs with an accuracy of  $\pm 5\%$  over a five-year horizon. The time-series forecasting models are reliable tools for assessing municipal infrastructure cost-effectiveness in Senegal. The models should be used alongside other data sources to inform policy decisions on asset management and funding allocation. Senegal, Municipal Infrastructure, Cost-Effectiveness, Time-Series Forecasting, Asset Management The maintenance outcome was modelled as  $Y_t = \beta_0 + \beta_1 X_t + u_t + \varepsilon_t$ , with robustness checked using heteroskedasticity-consistent errors.

**Keywords:** *Sub-Saharan, econometrics, regression analysis, ARIMA, Monte Carlo simulation, grey systems theory, fuzzy logic*

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