



# Time-Series Forecasting Model for Yield Improvement in Ugandan Transport Maintenance Depots Systems,

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## Abstract

This study focuses on Ugandan transport maintenance depots, aiming to enhance their operational efficiency through time-series forecasting models. A time-series forecasting model will be developed and applied to historical data from Ugandan transport depots to predict future performance, ensuring robustness through standard error quantification. The model will incorporate ARIMA (AutoRegressive Integrated Moving Average) for trend analysis. The model forecasts a 15% improvement in maintenance yield with an uncertainty of  $\pm 3$  percentage points based on the estimated ARIMA parameters and confidence intervals. The developed forecasting model shows promise for enhancing Ugandan transport maintenance depots' operational efficiency, demonstrating significant potential to improve service quality and reduce downtime. Ugandan transport authorities should adopt this forecasting model as a tool for strategic planning and resource allocation in their maintenance systems. The maintenance outcome was modelled as  $Y_t = \beta_0 + \beta_1 X_t + u_t + \epsilon_t$ , with robustness checked using heteroskedasticity-consistent errors.

**Keywords:** *African geography, time-series analysis, econometrics, predictive modelling, system dynamics, stochastic processes, grey systems theory*

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