



Forecasting Efficiency Gains in Kenyan Transport Maintenance Depots Using Time-Series Models: A Methodological Evaluation

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Abstract

This study focuses on Kenyan transport maintenance depots, aiming to improve their operational efficiency through advanced time-series forecasting methods. The methodology involves collecting and analysing time-series data from maintenance depots across Kenya, employing ARIMA (AutoRegressive Integrated Moving Average) models to forecast efficiency metrics with associated standard errors for inference. A significant proportion of the variance in future efficiency gains was explained by historical maintenance records, indicating that past performance is a strong predictor of future outcomes. ARIMA models provided reliable forecasts, aiding decision-making and resource allocation within Kenyan transport maintenance depots. Implementing these forecasting tools could lead to more efficient depot operations and reduced downtime for vehicles. Continuous monitoring and model refinement are recommended. Time-series analysis, ARIMA model, predictive maintenance, efficiency gains, Kenyan transportation. The maintenance outcome was modelled as $Y_t = \beta_0 + \beta_1 X_t + u_t + v \epsilon_t$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: Kenya, Geographic Information Systems (GIS), Time-series Analysis, Econometrics, Forecasting Models, Supply Chain Management, Predictive Maintenance

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