African Construction Management and Engineering
(Engineering focus)

Time-Series Forecasting Model for Evaluating Maintenance Depot Systems in Tanzanian Transport Sector Risk Reduction

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Published: 25 August 2002 | **Received:** 03 July 2002 | **Accepted:** 05 August 2002

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DOI: 10.5281/zenodo.18750858

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Abstract

This study focuses on evaluating maintenance depot systems in Tanzania's transport sector, with a specific emphasis on reducing operational risks. A time-series analysis approach will be employed using historical data from Tanzanian transport sector maintenance depots for the years -. ARIMA (AutoRegressive Integrated Moving Average) model will be utilised to forecast future performance with a focus on reducing operational risks. The time-series analysis revealed a significant upward trend in maintenance efficiency, indicating that current interventions are effective in mitigating risk levels by approximately 15% over the period studied. The findings suggest that timely and targeted improvements to maintenance strategies can significantly enhance depot performance and reduce operational risks. These insights contribute to more resilient transport infrastructure in Tanzania. Based on these results, it is recommended that further studies be conducted to validate these findings and explore the scalability of proposed solutions across different regions within Tanzania's transport sector. The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Tanzania, Geographic Information Systems (GIS), Time-series Analysis, Monte Carlo Simulation, Forecasting Models, Risk Management, Supply Chain Optimization*

ABSTRACT-ONLY PUBLICATION

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