



Time-Series Forecasting Model Replication Study for Transport Maintenance Depot Systems in Tanzania,

Kamasi Mvila¹, Chanzo Tuyahaye^{2,3}

¹ Department of Civil Engineering, State University of Zanzibar (SUZA)

² Department of Electrical Engineering, Catholic University of Health and Allied Sciences (CUHAS)

³ State University of Zanzibar (SUZA)

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Correspondence: kmvila@yahoo.com

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Author notes

Kamasi Mvila is affiliated with Department of Civil Engineering, State University of Zanzibar (SUZA) and focuses on Engineering research in Africa.

Chanzo Tuyahaye is affiliated with Department of Electrical Engineering, Catholic University of Health and Allied Sciences (CUHAS) and focuses on Engineering research in Africa.

Abstract

This study addresses a current research gap in Engineering concerning Methodological evaluation of transport maintenance depots systems in Tanzania: time-series forecasting model for measuring efficiency gains in Tanzania. The objective is to formulate a rigorous model, state verifiable assumptions, and derive results with direct analytical or practical implications. A structured analytical approach was used, integrating formal modelling with domain evidence. The results establish bounded error under perturbation, a convergent estimation process under stated assumptions, and a stable link between the proposed metric and observed outcomes. The findings provide a reproducible analytical basis for subsequent theoretical and applied extensions. Stakeholders should prioritise inclusive, locally grounded strategies and improve data transparency. Methodological evaluation of transport maintenance depots systems in Tanzania: time-series forecasting model for measuring efficiency gains, Tanzania, Africa, Engineering, replication study This work contributes a formal specification, transparent assumptions, and mathematically interpretable claims. 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, Geospatial, Econometrics, Time-series, Forecasting, Optimization, Simulation*

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