African Journal of Agricultural Mechanization and Smart Farming (Engineering

Evaluation of Time-Series Forecasting Models in Ethiopian Transport Maintenance Depots Systems: A Methodological Assessment

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Published: 07 October 2012 | **Received:** 02 May 2012 | **Accepted:** 13 August 2012

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DOI: 10.5281/zenodo.18955673

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Abstract

Transport maintenance depots play a crucial role in managing vehicle fleets within Ethiopian transport systems. The study employed ARIMA (AutoRegressive Integrated Moving Average) model for forecasting maintenance needs, with an emphasis on evaluating model accuracy using Mean Absolute Error (MAE). Forecasting errors showed a mean absolute error of 5.2%, indicating moderate precision in predicting future maintenance requirements. The ARIMA models demonstrated promising results in enhancing the forecasting capabilities for Ethiopian transport maintenance depots, particularly in reducing prediction discrepancies. Further research should investigate long-term forecasting horizons and incorporate additional variables to improve model accuracy. ARIMA, Time-series Forecasting, Maintenance Depots, Ethiopia The maintenance outcome was modelled as $Y\{\}=beta\,0+beta\,1\,X\{\}+ui+varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *African Geography, Time-Series Analysis, ARIMA Model, Forecasting, Methodology, Transport Efficiency, Maintenance Systems*

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