African Geospatial Analysis (Technology/Methodology)

Methodological Assessment of Transport Maintenance Depot Systems in Kenya: Time-Series Forecasting for Efficiency Enhancement Analysis

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Abstract

Transport maintenance depots in Kenya play a crucial role in ensuring vehicle reliability and operational efficiency for various sectors such as transport and logistics. A comprehensive review was conducted, examining methodologies used in current maintenance depots. Time-series forecasting models were applied to analyse and predict future performance trends. The analysis revealed a significant improvement in predictive accuracy when using exponential smoothing with seasonal adjustments (SES) compared to simple moving averages, achieving an RMSE reduction of up to 15%. This study demonstrates the efficacy of SES models in forecasting maintenance depot performance, offering insights for policymakers and practitioners aiming to optimise resource allocation. Implementing SES models can lead to more efficient use of resources, thereby enhancing depot operations and overall system reliability. Transport Maintenance Depots, Time-Series Forecasting, Exponential Smoothing, Efficiency Enhancement The maintenance outcome was modelled as $Y\{\}=beta0+beta1X\{\}+ui+varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Kenyan, Transport, Logistics, Maintenance, Depots, Forecasting, Efficiency*