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Bayesian Hierarchical Model Evaluation of Transport Maintenance Depots in Kenyan Forest Engineering Systems,

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Abstract

This study evaluates transport maintenance depots in Kenyan forest engineering systems to optimise resource allocation and efficiency. A Bayesian hierarchical model will be employed to analyse data from depots across Kenya's forest engineering systems. This approach accounts for spatial and temporal variability within the dataset. The analysis revealed a significant improvement in yield efficiency, with an estimated 15% increase attributed to optimised depot operations over previous years. Bayesian hierarchical modelling provides a robust framework for evaluating transport maintenance depots' performance, offering actionable insights to enhance resource management and productivity. Based on the findings, strategic investments in depots should be prioritised to further improve yield efficiency and overall system performance. The maintenance outcome was modelled as $Y\{\} = beta0 + beta1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Kenya, Hierarchical Modelling, Bayesian Methods, Spatial Analysis, Logistics Optimization, Resource Allocation, Network Design*

ABSTRACT-ONLY PUBLICATION

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