



# Methodological Evaluation of Transport Maintenance Depot Systems in Uganda Using Multilevel Regression Analysis

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## Abstract

Transport maintenance depots (TMDs) play a crucial role in ensuring efficient transportation systems in Uganda's agricultural sector. A multilevel logistic regression model was employed to analyse data collected from 100 depots across Uganda. Dependent variable: Adoption rate (yes/no). Independent variables: Funding, training availability, infrastructure quality. The multilevel logistic regression revealed that funding and infrastructure quality had significant positive effects on adoption rates, with a model coefficient for funding of 0.45 (95% CI: [0.23, 0.67]). This study provides insights into the factors driving TMD adoption in Uganda. Investment strategies should prioritise allocation of funds and improvement of infrastructure to enhance TMD effectiveness. Transportation maintenance depots, multilevel regression, adoption rates, agricultural sector, Uganda The maintenance outcome was modelled as  $Y_{ij} = \beta_0 + \beta_1 X_{ij} + u_i + v_j + \epsilon_{ij}$ , with robustness checked using heteroskedasticity-consistent errors.

**Keywords:** *African geography, multilevel regression, logistic regression, econometrics, spatial analysis, infrastructure maintenance, agricultural logistics*

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