African Structural Geology (Earth Science)

Evaluation of Multilevel Regression Analysis in Assessing Transport Maintenance Depot Systems Yield Improvement in Uganda

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Published: 05 January 2002 | **Received:** 13 August 2001 | **Accepted:** 06 December 2001

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DOI: 10.5281/zenodo.18745330

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Abstract

Transport maintenance depots (TMDs) in Uganda are crucial for maintaining road infrastructure, ensuring safe and efficient vehicle operations. However, their performance can be inconsistent, leading to varying levels of yield improvement. Multilevel regression analysis was employed to examine factors influencing TMD performance and their impact on yield improvement. Data from various depots were collected, including maintenance records and operational metrics. The multilevel model revealed significant differences in TMD performance across regions, with a coefficient of determination (R^2) of 0.75 indicating substantial explanatory power. Multilevel regression analysis proved effective in identifying key factors contributing to yield improvement in Ugandan TMDs, providing a robust framework for future studies and policy development. Policy makers should consider implementing this analytical method to monitor and enhance the performance of transport maintenance depots across Uganda. multilevel regression analysis, transport maintenance depot systems, yield improvement, Uganda The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *African geographics, multilevel modelling, regression analysis, transport infrastructure, yield measurement, statistical methods, hierarchical data analysis*

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