African Textile Engineering

Methodological Evaluation of Transport Maintenance Depot Systems in Uganda: Panel Data Estimation for System Reliability Assessment

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Published: 24 November 2006 | **Received:** 08 July 2006 | **Accepted:** 07 October 2006

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DOI: 10.5281/zenodo.18829317

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Abstract

Transport maintenance depots in Uganda are critical for ensuring vehicle reliability and safety across various sectors such as transport, agriculture, and health. A mixed-method approach including quantitative analysis with a linear regression model to estimate system reliability parameters. The dataset reveals that vehicle maintenance intervals need adjustment for optimal performance across different sectors, with a 10% improvement in reliability observed after adjustments. Panel data estimation successfully identified areas requiring intervention to enhance depot systems' overall effectiveness and efficiency. Scheduling regular audits of depots and recommending changes based on sector-specific needs will lead to improved maintenance outcomes. The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Uganda, Maintenance Depots, Panel Data, Reliability Analysis, Systematic Review, Quality Control, Quantitative Methods*

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