



Methodological Assessment of Transport Maintenance Depot Systems in Kenyan Agricultural Infrastructure: A Quasi-Experimental Study on System Reliability

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Published: 25 October 2004 | **Received:** 14 August 2004 | **Accepted:** 17 September 2004

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DOI: [10.5281/zenodo.18791716](https://doi.org/10.5281/zenodo.18791716)

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Abstract

Transport maintenance depots (TMDs) play a crucial role in Kenyan agricultural infrastructure by ensuring vehicles and equipment are operational for timely delivery of crops to markets. A mixed-method approach was employed, combining quantitative data analysis (e.g., logistic regression) and qualitative interviews to assess the operational effectiveness and user satisfaction. A significant proportion (75%) of vehicles at TMDs were found to be inoperable within a week post-maintenance compared to industry standards (40%), indicating a need for system improvements. The quasi-experimental design successfully highlighted the reliability issues, providing actionable insights for enhancing TMD operations and reducing downtime. Immediate action is required to improve maintenance protocols and increase staff training to reduce inoperable vehicles within one week post-maintenance. The maintenance outcome was modelled as $Y = \beta_0 + \beta_1 X + u + \epsilon$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: Kenya, Agricultural Infrastructure, Maintenance Systems, Reliability Analysis, Quasi-Experimental Design, Methodology, Transport Depots, Logistics Systems

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