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Methodological Assessment of Transport Maintenance Depot Systems in Tanzania: A Randomized Field Trial on Risk Reduction Analysis

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Abstract

Transport maintenance depots in Tanzania are critical infrastructure for ensuring reliable public transport services. However, their effectiveness and efficiency can be impacted by various operational risks. A randomized field trial was conducted in two Tanzanian cities, involving 10 maintenance depots randomly selected for intervention or control groups. Data on operational efficiency, maintenance quality, and safety incidents were collected over a six-month period using standardised surveys and performance metrics. The analysis revealed that the implementation of preventive maintenance schedules reduced failure rates by an average of 25% (95% CI: 18-32%). Additionally, depots in the intervention group reported a decline in safety incidents from 4.5 to 3.0 per month. The randomized field trial demonstrated significant risk reduction benefits associated with preventive maintenance strategies and improved operational procedures. Transport authorities should prioritise investment in preventive maintenance systems and continuous staff training programmes to enhance the reliability of transport maintenance depots. Maintenance Depots, Risk Reduction, Randomized Field Trial, Tanzania The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Tanzania, Geographic Information Systems (GIS), Randomized Controlled Trials (RCTs), Quality Control (QC), Maintenance Scheduling, Network Analysis, Data Analytics*

ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

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