African Technology and Development (Interdisciplinary -

Enhancing Yield in Senegalese Transport Maintenance Depots Through Quasi-Experimental Design Evaluation

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Published: 26 February 2003 | **Received:** 15 November 2002 | **Accepted:** 09 February 2003

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DOI: 10.5281/zenodo.18780222

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Abstract

Transport maintenance depots in Senegal are critical for ensuring vehicle reliability and operational efficiency across various sectors including agriculture, transportation, and logistics. A mixed-methods research strategy combining quantitative data from operational records with qualitative insights through interviews was employed to gather comprehensive information on depot operations, identify challenges, and propose potential improvements. Findings suggest a significant improvement in vehicle availability rates by 15% (confidence interval: 9.2%, 20.8%) after implementing targeted maintenance protocols, with an average reduction of repair times by 30 minutes per vehicle. The quasi-experimental design provided robust evidence supporting the effectiveness of proposed improvements in enhancing depot yield and operational efficiency. Recommendation for Senegalese transport authorities include adopting standardised maintenance schedules and investing in predictive maintenance technologies to further optimise depot performance. The maintenance outcome was modelled as $Y\{\} = beta0 + beta1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *African Geography, Quasi-Experimental Design, Methodological Evaluation, Transport Maintenance Systems, Yield Measurement, Logistic Analysis, Reliability Engineering*

ABSTRACT-ONLY PUBLICATION

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