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Evaluation of Transport Maintenance Depot Systems in Ghana: A Randomized Field Trial on Cost-Effectiveness Evaluations

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Abstract

The transport maintenance depot systems in Ghana are critical for ensuring efficient vehicle operations, but there is limited empirical research on their effectiveness and cost-effectiveness. A randomized field trial was conducted across multiple depots in Ghana, with data collected over a six-month period. Depot efficiency and costs were measured using statistical models. Depot A showed an average reduction of 15% in vehicle downtime compared to the control group ($p < 0.05$), indicating improved maintenance system effectiveness. The randomized field trial demonstrated significant cost savings for Depots B and C, with a confidence interval of ±3%, suggesting robust performance metrics. Based on findings, depots should invest in advanced diagnostic tools to further enhance efficiency and reduce downtime. The maintenance outcome was modelled as $Y\{\} = beta0 + beta1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Geographic Terms Related to Ghana:*
1. Sub-Saharan
2. West African

Methodological and Theoretical Terms Relevant:
3. Econometrics
4. Randomized Controlled Trials
5. Cost-Benefit Analysis
6. Supply Chain Management

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