



Methodological Evaluation of Transport Maintenance Depots in Rwanda: A Randomized Field Trial on System Reliability

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Abstract

This study examines transport maintenance depots in Rwanda to understand their reliability under a randomized field trial approach. A randomized field trial design was employed to assess the performance of transport maintenance depots. Data collection involved monitoring depot operations over one year. The analysis revealed that operational efficiency varied significantly across different depots (direction: some depots performed better than others, proportion: about 40% showed improved reliability). The randomized field trial provided valuable insights into the effectiveness of transport maintenance depots in Rwanda. Based on findings, recommendations for depot management and future research are suggested to enhance system reliability and efficiency. The maintenance outcome was modelled as $Y = \beta_0 + \beta_1 X + u_i + \text{varepsilon}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Rwanda, Geographic Information Systems (GIS), Monte Carlo simulation, Randomized Field Trial (RFT), Reliability engineering, Supply chain management, System dynamics*

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