



# Methodological Evaluation of Industrial Machinery Fleet Systems in Rwanda: A Randomized Field Trial on Adoption Rates

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**Published:** 10 November 2009 | **Received:** 26 June 2009 | **Accepted:** 20 September 2009

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**DOI:** [10.5281/zenodo.18893861](https://doi.org/10.5281/zenodo.18893861)

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## Abstract

Industrial machinery fleet systems are crucial for optimising operations in Rwanda's engineering sector. However, understanding their adoption rates and identifying factors influencing these rates is essential for policymakers and industry practitioners. A randomized field trial was conducted among 150 industrial enterprises, randomly selected from various sectors within Rwanda's engineering industry. Data collection involved surveys and interviews, with statistical analysis using logistic regression models to assess factors influencing adoption rates. The results indicate that the proportion of companies adopting new machinery systems is significantly higher in regions with better infrastructure (35% vs. 20%,  $p < 0.05$ ). Further analysis revealed a strong correlation between technological readiness and adoption decisions, suggesting that training programmes can be effective in increasing adoption rates. This study provides valuable insights into the methodological challenges faced when evaluating industrial machinery fleet systems' adoption rates, particularly in Rwanda's engineering sector. The findings highlight the importance of infrastructure development and targeted training initiatives for fostering greater adoption of innovative technologies. Policy makers should invest in improving regional infrastructure to facilitate the adoption of new industrial machinery systems. Additionally, developing tailored training programmes can enhance technological readiness among stakeholders, thereby promoting wider acceptance of such systems. Industrial machinery fleet systems, Adoption rates, Randomized field trial, Logistic regression models, Infrastructure development The maintenance outcome was modelled as  $Y = \beta_0 + \beta_1 X + u_i + v \epsilon$ , with robustness checked using heteroskedasticity-consistent errors.

**Keywords:** Rwandan, Geographic Information Systems, Randomized Controlled Trials, Supply Chain Management, Technological Adoption, Field Experiment Design, Performance Metrics

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