African Construction Management and Engineering
(Engineering focus)

Methodological Assessment of Industrial Machinery Fleet Systems in Rwanda: Quasi-Experimental Design for Yield Improvement Evaluation

Kizito Munyaneza[1], **Gabriel Bizimana**[2]

[1] University of Rwanda

[2] Department of Sustainable Systems, Rwanda Environment Management Authority (REMA)

Published: 23 April 2004 | **Received:** 13 December 2003 | **Accepted:** 27 March 2004

Correspondence: kmunyaneza@aol.com

DOI: 10.5281/zenodo.18794620

Author notes

Kizito Munyaneza is affiliated with University of Rwanda and focuses on Engineering research in Africa.
Gabriel Bizimana is affiliated with Department of Sustainable Systems, Rwanda Environment Management Authority (REMA) and focuses on Engineering research in Africa.

Abstract

The industrial machinery fleet systems in Rwanda have seen limited adoption of advanced management techniques, leading to suboptimal performance and inefficiencies. A mixed-method approach combining quantitative analysis with qualitative interviews was employed. Data on fleet utilization, maintenance costs, and operational yields were collected from ten randomly selected enterprises over one year. Significant variations were observed in the yield improvement across different fleet management systems, with an average increase of 18% in those using predictive maintenance models compared to baseline systems. The quasi-experimental design proved effective for measuring yield improvements and highlighted the benefits of adopting advanced machinery management strategies. Rwanda's industrial sectors should consider implementing a similar comparative analysis to identify optimal fleet management solutions. This could lead to substantial cost savings and efficiency gains. industrial machinery, fleet systems, quasi-experimental design, yield improvement, Rwanda The maintenance outcome was modelled as $Y\{\} = beta0 + beta1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Sub-Saharan, econometrics, stochastic frontier, productivity, simulation, regression, parametric models, data envelopment analysis*

ABSTRACT-ONLY PUBLICATION

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

✉ REQUEST FULL PAPER

Email: info@parj.africa

Request your copy of the full paper today!

SUBMIT YOUR RESEARCH

Are you a researcher in Africa? We welcome your submissions!

Join our community of African scholars and share your groundbreaking work.

Submit at: app.parj.africa

Scan to visit app.parj.africa

Open Access Scholarship from PARJ

Empowering African Research | Advancing Global Knowledge