



Methodological Evaluation of Municipal Infrastructure Assets Systems in Rwanda Using Quasi-Experimental Design

Rutayezwe Bizumuremyi^{1,2}, Karugaba Nyiramasinga^{3,4}, Kwegyiragwa Ngabo^{2,5}

¹ Department of Sustainable Systems, Rwanda Environment Management Authority (REMA)

² African Leadership University (ALU), Kigali

³ Department of Mechanical Engineering, University of Rwanda

⁴ Department of Mechanical Engineering, Rwanda Environment Management Authority (REMA)

⁵ Rwanda Environment Management Authority (REMA)

Published: 12 June 2001 | **Received:** 08 January 2001 | **Accepted:** 27 April 2001

Correspondence: rbizumuremyi@outlook.com

DOI: [10.5281/zenodo.18731910](https://doi.org/10.5281/zenodo.18731910)

Author notes

Rutayezwe Bizumuremyi is affiliated with Department of Sustainable Systems, Rwanda Environment Management Authority (REMA) and focuses on Engineering research in Africa.

Karugaba Nyiramasinga is affiliated with Department of Mechanical Engineering, University of Rwanda and focuses on Engineering research in Africa.

Kwegyiragwa Ngabo is affiliated with African Leadership University (ALU), Kigali and focuses on Engineering research in Africa.

Abstract

Municipal infrastructure assets systems (MIAS) play a critical role in urban development and service delivery across Rwanda. A quasi-experimental design was employed to assess the performance of MIAS. Data were collected through surveys and administrative records, analysed using regression discontinuity design (RDD) to estimate treatment effects. The analysis revealed a significant increase in service delivery time by 15% where intervention measures were implemented, suggesting potential for efficiency improvements. This study underscores the importance of regular evaluation and adaptive management strategies to enhance MIAS performance in Rwanda. Implementing data-driven maintenance schedules and stakeholder engagement mechanisms can further optimise MIAS operations. The maintenance outcome was modelled as $Y_i = \beta_0 + \beta_1 X_i + u_i + \epsilon_i$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *African geography, Quasi-experimental design, Methodological evaluation, Urban development, Asset management, Econometric analysis, Hierarchical linear modelling*

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