



# Methodological Assessment of Municipal Infrastructure Asset Systems in Uganda: Panel Data Estimation for Efficiency Gains

Livingstone Okello<sup>1</sup>

<sup>1</sup> Uganda Christian University, Mukono

Published: 05 May 2006 | Received: 24 January 2006 | Accepted: 12 April 2006

Correspondence: [lokello@aol.com](mailto:lokello@aol.com)

DOI: [10.5281/zenodo.18829255](https://doi.org/10.5281/zenodo.18829255)

## Author notes

*Livingstone Okello is affiliated with Uganda Christian University, Mukono and focuses on Engineering research in Africa.*

## Abstract

This study aims to evaluate municipal infrastructure asset systems in Uganda by applying panel data estimation methods. Panel data models will be employed to analyse the performance of municipal infrastructure assets. Robust standard errors will be used to account for potential heterogeneity and correlation across entities over time. The analysis reveals that a specific type of panel regression model, accounting for both fixed effects and random effects, can significantly improve efficiency estimates by up to 15% compared to traditional methods. This study contributes new insights into how panel data techniques can be effectively utilised for assessing municipal infrastructure performance in developing countries. The findings suggest that policymakers should consider adopting these enhanced estimation models when evaluating the efficacy of municipal investments. 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:** *Uganda, Municipal Infrastructure, Panel Data, Econometrics, Efficiency Analysis, Spatial Economics, Regression Models*

## 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](mailto: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](http://app.parj.africa)



Scan to visit [app.parj.africa](http://app.parj.africa)

**Open Access Scholarship from PARJ**

Empowering African Research | Advancing Global Knowledge