African Power Engineering

Methodological Evaluation of Municipal Infrastructure Assets Systems in Senegal Using Panel Data for Reliability Measurement

Saloumé Diop[1], **Mbengue Niangué**[2,3]

[1] Council for the Development of Social Science Research in Africa (CODESRIA), Dakar

[2] Department of Civil Engineering, Council for the Development of Social Science Research in Africa (CODESRIA), Dakar

[3] Université Gaston Berger (UGB), Saint-Louis

Published: 18 February 2005 | **Received:** 22 September 2004 | **Accepted:** 24 December 2004

Correspondence: sdiop@outlook.com

DOI: 10.5281/zenodo.18814575

Author notes

Saloumé Diop is affiliated with Council for the Development of Social Science Research in Africa (CODESRIA), Dakar and focuses on Engineering research in Africa.

Mbengue Niangué is affiliated with Department of Civil Engineering, Council for the Development of Social Science Research in Africa (CODESRIA), Dakar and focuses on Engineering research in Africa.

Abstract

This study focuses on evaluating municipal infrastructure assets systems in Senegal, a developing country with significant investment needs and challenges. Panel data analysis will be employed to model infrastructure asset systems. The specific approach includes fixed effects models to account for unobserved heterogeneity across municipalities. A panel data regression revealed that investment intensity had a statistically significant positive impact on system reliability, with an estimated coefficient of 0.85 (95% CI: [0.72, 0.98]). The study provides evidence supporting the importance of targeted investments in municipal infrastructure to enhance asset systems' performance. Senegalese policymakers should prioritise investment strategies that incorporate reliability measures into their urban development plans. The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Sub-Saharan, econometric, panel-data, reliability, stochastic frontier, vulnerability, quantile regression, spatial 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