African Restoration Ecology (Environmental Science)

Methodological Evaluation of Municipal Water Systems in Senegal: Panel Data Estimation for System Reliability Assessment,

Muhammad Diallo[1,2], **Seyni Guedjiga**[1,3]

[1] African Institute for Mathematical Sciences (AIMS) Senegal

[2] Department of Research, Institut Sénégalais de Recherches Agricoles (ISRA)

[3] Institut Sénégalais de Recherches Agricoles (ISRA)

Published: 05 December 2006 | **Received:** 25 July 2006 | **Accepted:** 24 October 2006

Correspondence: mdiallo@aol.com

DOI: 10.5281/zenodo.18826761

Author notes

Muhammad Diallo is affiliated with African Institute for Mathematical Sciences (AIMS) Senegal and focuses on Environmental Science research in Africa.

Seyni Guedjiga is affiliated with African Institute for Mathematical Sciences (AIMS) Senegal and focuses on Environmental Science research in Africa.

Abstract

This review assesses the methodological approaches used to evaluate municipal water systems in Senegal, focusing on reliability assessment. The review employs a systematic approach to evaluate existing methodologies, including econometric models such as the Fixed Effects (FE) model and Random Effects (RE) model. Panel data from four major cities are analysed using Stata software with robust standard errors to account for potential heterogeneity and autocorrelation. Panel analysis revealed significant variability in system reliability across different cities, with a notable proportion of systems operating below the recommended service level (70% or more). This review underscores the need for standardised methodologies and robust data collection to enhance the reliability assessment of municipal water systems in Senegal. Recommendations include developing a common framework for panel data analysis, improving data quality through regular system audits, and integrating stakeholder feedback into the evaluation process. The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Sub-Saharan, Senegalese, panel-data, econometrics, stochastic, reliability, water-resources*

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