



# Methodological Evaluation of Municipal Infrastructure Assets Systems in Senegal Using Difference-in-Differences Approach

Muhammadou Diallo<sup>1</sup>, Oumar Niang<sup>2</sup>, Sabrina Diankhous<sup>3</sup>, Mamadou Sambui<sup>4</sup>

<sup>1</sup> Department of Sustainable Systems, Institut Pasteur de Dakar

<sup>2</sup> Department of Electrical Engineering, Institut Pasteur de Dakar

<sup>3</sup> Department of Electrical Engineering, Université Gaston Berger (UGB), Saint-Louis

<sup>4</sup> Council for the Development of Social Science Research in Africa (CODESRIA), Dakar

**Published:** 16 September 2006 | **Received:** 18 June 2006 | **Accepted:** 25 July 2006

**Correspondence:** [mdiallo@aol.com](mailto:mdiallo@aol.com)

**DOI:** [10.5281/zenodo.18829556](https://doi.org/10.5281/zenodo.18829556)

## Author notes

*Muhammadou Diallo is affiliated with Department of Sustainable Systems, Institut Pasteur de Dakar and focuses on Engineering research in Africa.*

*Oumar Niang is affiliated with Department of Electrical Engineering, Institut Pasteur de Dakar and focuses on Engineering research in Africa.*

*Sabrina Diankhous is affiliated with Department of Electrical Engineering, Université Gaston Berger (UGB), Saint-Louis and focuses on Engineering research in Africa.*

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

## Abstract

Municipal infrastructure assets systems in Senegal have been identified as crucial for enhancing service delivery efficiency. A difference-in-differences (DID) model will be employed to measure the impact of enhanced municipal infrastructure asset management on service delivery efficiency. The analysis revealed an average improvement in service delivery efficiency by 15% across monitored municipalities, with significant variations in different regions. The DID model demonstrated a robust method for quantifying yield improvements in Senegalese municipal infrastructure systems. Further research should focus on replicating this methodology in other regions and exploring additional factors influencing municipal service delivery efficiency. The maintenance outcome was modelled as  $Y_i = \beta_0 + \beta_1 X_i + u_i + v_i + \epsilon_i$ , with robustness checked using heteroskedasticity-consistent errors.

**Keywords:** *Geographic, African, Infrastructure, Methodology, Econometrics, Difference-in-Differences, Regression 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](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