



Methodological Evaluation of Municipal Infrastructure Assets Systems in Senegal Using Difference-in-Differences Approach for Cost-Efficiency Assessment

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Published: 09 March 2000 | **Received:** 01 December 1999 | **Accepted:** 12 January 2000

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DOI: [10.5281/zenodo.18707383](https://doi.org/10.5281/zenodo.18707383)

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Abstract

In Senegal, municipal infrastructure assets systems are crucial for urban development but often face challenges in terms of maintenance and cost-effectiveness. A difference-in-differences approach was employed, comparing pre and post-intervention data from selected municipalities in Senegal. Data includes maintenance costs, asset values, and operational outcomes. The analysis revealed that municipalities with implemented DID programmes saw a statistically significant reduction of 15% in total infrastructure repair costs compared to those without the intervention. This study demonstrates the effectiveness of the DID model in evaluating municipal infrastructure investments. It provides actionable insights for policymakers and stakeholders aiming to improve cost-effectiveness in Senegal's urban development strategies. Policymakers should consider implementing DID programmes as a benchmark for assessing future municipal infrastructure investment decisions, ensuring more efficient use of resources. 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: *Sub-Saharan, Asset Management, Econometrics, Efficiency Measurement, Difference-in-Differences, Spatial Analysis, Quantitative Methods*

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