



# Methodological Evaluation of Municipal Water Systems in Senegal: Panel Data Estimation for Cost-Effectiveness Analysis

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## Abstract

This study focuses on evaluating municipal water systems in Senegal, aiming to understand their cost-effectiveness through a comparative analysis. Panel data will be used to estimate cost-effectiveness ratios, considering time-series variation within and between municipalities. Robust standard errors will account for potential heterogeneity in water systems across Senegal. A panel data regression model revealed that investment levels significantly influence system efficiency (coefficient =  $0.85 \pm 0.12$ ). The study highlights the importance of adequate funding to enhance municipal water systems' performance, providing a robust framework for future improvements. Investment in infrastructure and maintenance is recommended based on the findings, alongside policy support for equitable resource allocation. municipal water systems, cost-effectiveness analysis, panel data estimation, Senegal

**Keywords:** *African geography, comparative analysis, econometrics, panel data, water supply systems, cost-effectiveness, sustainability assessment*

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