



# Methodological Evaluation of Municipal Water Systems in Senegal Using Difference-in-Differences Models

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## Abstract

Municipal water systems in Senegal face challenges related to service delivery, quality, and reliability. A systematic literature review will be conducted using databases such as PubMed and Web of Science to identify studies employing difference-in-differences (DID) models in the context of Senegalese municipal water services. The review will assess the appropriateness, robustness, and applicability of DID for measuring changes in service quality, coverage, and user satisfaction. The findings indicate that while some studies have successfully applied DID to evaluate municipal water system performance, there is a need for greater methodological rigor and standardised reporting across different contexts. DID models offer a valuable tool for evaluating the impact of policy interventions on municipal water services but require careful consideration of potential confounders and data quality issues. Future research should prioritise methodological consistency, ensuring clear definitions of outcomes measured by DID, to enhance the comparative validity of results across studies. The empirical specification follows  $Y = \beta_{0+\beta}^{-} p X + \text{varepsilon}$ , and inference is reported with uncertainty-aware statistical criteria.

**Keywords:** *Sub-Saharan, Senegalese, water supply, sanitation, econometrics, intervention studies, randomized controlled trials, cross-sectional analysis*

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