



# Methodological Foundations for Quasi-Experimental Design in Evaluating Municipal Water Systems in Senegal: A Theoretical Framework

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## Abstract

The evaluation of municipal water systems in Senegal faces challenges due to the complexity of interactions between environmental and social factors. The proposed framework will integrate econometric techniques such as regression analysis with sensitivity tests to assess model robustness. Specific attention will be given to understanding how different factors influence system performance and user satisfaction. This theoretical framework provides a robust methodological foundation for future empirical studies aiming to evaluate municipal water systems in Senegal, emphasising the importance of stakeholder involvement and system adaptability. Recommendation is to conduct comprehensive field surveys alongside systematic data collection from multiple sources to validate model assumptions and enhance generalizability across different regions and contexts. The empirical specification follows  $Y = \beta_{\alpha+\beta} X + \text{varepsilon}$ , and inference is reported with uncertainty-aware statistical criteria.

**Keywords:** *Sub-Saharan, econometric, randomized, stratified, intervention, sustainability, efficacy*

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