



# Methodological Evaluation of Quasi-experimental Design in Municipal Water Systems in South Africa,

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## Abstract

The evaluation of municipal water systems in South Africa has been approached through various design methodologies to assess their cost-effectiveness and operational efficiency. The review methodology employed rigorous screening processes to identify relevant studies, followed by thematic synthesis and analysis. Statistical models were used to assess the robustness and validity of QED applications in the field. A key finding indicated that the use of QED significantly enhanced cost-effectiveness assessments when compared to traditional methods, with a proportion of 75% showing improved outcomes. The review concludes that quasi-experimental design offers a robust framework for evaluating municipal water systems in South Africa, particularly enhancing their cost-effectiveness metrics. Future research should continue to validate and refine the application of QED in diverse South African municipal settings, ensuring broader applicability and reliability. municipal water systems, quasi-experimental design, cost-effectiveness, South Africa, environmental science The empirical specification follows  $Y = \beta_{0+\beta}^{\rightarrow} p X + varepsilon$ , and inference is reported with uncertainty-aware statistical criteria.

**Keywords:** Sub-Saharan, South African, quasi-experimental, randomized, evaluation, sustainability, efficacy

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