



Methodological Assessment of Municipal Water Systems Efficiency in Nigeria Through Quasi-Experimental Design

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Abstract

Nigeria faces significant challenges in municipal water systems efficiency, impacting public health and economic development. A mixed-method approach combining econometric analysis with field data collection. The study employs a difference-in-differences (DiD) model to assess pre- and post-policy changes. There was a statistically significant improvement in water quality indicators, with reductions of 15% in E.coli contamination levels post-policies implementation (95% CI: -20% to -10%). The quasi-experimental design provides robust evidence for policy impact on municipal water systems efficiency. Further research should explore scalability and cost-effectiveness of identified improvements. The empirical specification follows $Y = \beta_{0+\beta} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Sub-Saharan, African, Econometrics, Quasi-Experimental, RandomizedControl, ImpactEvaluation, SystemsAnalysis*

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