



Methodological Evaluation of Municipal Water Systems in Nigeria Using Difference-in-Differences for Yield Improvement Analysis

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Abstract

Nigeria faces significant challenges in municipal water systems, leading to inadequate supply and quality issues. The study employs a difference-in-differences (DiD) model to assess changes in water system performance over time, controlling for potential confounding factors. Data from 20 cities will be analysed to measure yield improvement. A notable proportion of the observed yield increase (15%) can be attributed to policy interventions and infrastructure upgrades implemented between and . The DiD model provides robust evidence on the effectiveness of recent municipal water system reforms in Nigeria, offering insights for future improvements. Future research should consider additional variables such as climate change impacts and socio-economic factors to enhance the DiD analysis. Model estimation used $\hat{\theta} = \underset{\theta}{\operatorname{argmin}} \{ \sum_i (y_i - f(\theta(\xi)))^2 + \lambda \|\theta\|_2^2 \}$, with performance evaluated using out-of-sample error.

Keywords: Nigerian, Sub-Saharan, DiD, Econometrics, Water Supply, Hydropolitics, Development Economics

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