African Energy Economics (Economics/Energy crossover)

Methodological Evaluation of Municipal Water Systems in Kenya Using Difference-in-Differences Approach for Reliability Assessment

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Abstract

Municipal water systems in Kenya face challenges related to reliability, leading to significant socio-economic impacts. A difference-in-differences approach was employed to estimate the impact of policy interventions on water system reliability, with control and treatment groups identified based on geographical proximity to new infrastructure developments. The DID model revealed a statistically significant increase in system reliability for treated areas compared to controls, indicating that recent investments have improved service delivery. However, variability was observed across different regions within the treatment group. This study provides robust evidence on how policy interventions can enhance water system reliability in Kenya, offering valuable insights for policymakers and stakeholders aiming to improve service provision. Policymakers should focus on expanding coverage of new infrastructure investments while addressing regional disparities observed in the findings. The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Kenya, reliability, water systems, policy brief, econometrics, D-I-D, urbanization, sustainability*

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