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# Replication and Methodological Evaluation of Water Treatment Facility Adoption in Kenya

*A Difference-in-Differences Analysis*

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**Wanjiku Mwangi**[1]

[1] *Maseno University*

**Correspondence:** wmwangi@gmail.com

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## ABSTRACT

**Background:** The original study employed a difference-in-differences (DiD) model to assess the adoption rates of community-scale water treatment facilities following a national infrastructure programme. Its methodological approach has been influential in engineering policy evaluation, yet its robustness to alternative specifications and data handling assumptions remains untested.

**Purpose and objectives:** This replication study aims to methodologically evaluate the original DiD analysis, verifying the robustness of its core findings and examining the sensitivity of its estimated adoption effects to alternative modelling choices and data construction protocols.

**Keywords:** *Replication study, Difference-in-differences, Water treatment facilities, Sub-Saharan Africa, Kenya, Methodological evaluation, Adoption rates*

### Article Highlights

- Replication confirms a positive, significant effect on water treatment adoption.
- Effect magnitude varies by 7 percentage points across model specifications.
- Statistical significance is robust to all sensitivity and robustness checks.
- Underscores need for methodological transparency in engineering policy evaluation.

### Methodological Insight

The core DiD estimate proved sensitive to the choice of fixed effects structure, while cluster-robust standard errors and alternative sample definitions did not alter the finding of statistical significance.

*This replication validates the original conclusion while clarifying the precision of the effect estimate.*