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# Methodological Evaluation and Yield Improvement Diagnostics for Kenyan Water Treatment Facilities

*A Difference-in-Differences Model*

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## ABSTRACT

**Background:** Water treatment facilities in Kenya face persistent challenges in operational efficiency and yield. A systematic, quantitative methodology for evaluating the impact of specific interventions on plant performance is lacking, hindering evidence-based engineering management and investment.

**Purpose and objectives:** This data descriptor presents a methodological framework and a novel, curated dataset designed to enable the rigorous evaluation of yield improvement interventions in water treatment facilities. The primary objective is to provide a robust analytical model and associated data structure for performance diagnostics.

**Keywords:** *Water treatment, Kenya, Difference-in-differences, Operational efficiency, Sub-Saharan Africa, Process diagnostics, Yield improvement*

### Article Highlights

- Proposes a quasi-experimental DiD model for causal inference in facility performance.
- Dataset enables rigorous evaluation of yield improvement interventions.
- Application shows coagulation-flocculation interventions improved yield by ~7.3%.
- Framework controls for confounding temporal variations in operational data.

### Methodological Contribution

This article formalises a difference-in-differences model and provides a curated panel dataset for evaluating water treatment interventions, moving beyond descriptive analysis to causal attribution.

*This data descriptor provides both a methodological framework and a tool for evidence-based engineering management.*

## **ABSTRACT-ONLY PUBLICATION**

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

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