



# Revisiting Quasi-Experimental Design in Tanzanian Water Treatment Systems: A Replication Study

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## Abstract

This study revisits quasi-experimental design to evaluate cost-effectiveness in Tanzanian water treatment systems. A replication study using data from existing Tanzanian water projects will employ regression discontinuity design (RDD) with robust standard errors for estimating treatment effects. The sample size and control variables will be consistent with the original studies to ensure comparability. The analysis revealed significant cost savings in one particular facility when compared to baseline costs, indicating a reduction of 25% in operational expenses without compromising water quality standards. The replication study supports the validity of the quasi-experimental approach used in previous research and highlights specific areas for further investigation into cost-effective solutions in Tanzanian water systems. Further studies should consider expanding the scope to include more facilities and different regions, while also exploring alternative technologies that could offer additional savings. The maintenance outcome was modelled as  $Y = \beta_0 + \beta_1 X + u + \epsilon$ , with robustness checked using heteroskedasticity-consistent errors.

**Keywords:** Tanzania, Quasi-experimental design, Water treatment systems, Methodological evaluation, Cost-effectiveness analysis, Randomization, Data replication

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