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Revisiting Quasi-Experimental Designs in Ethiopian Municipal Water Systems: A Replication Study

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Abstract

Quasi-experimental designs have been used to evaluate municipal water systems in Ethiopia, but their effectiveness remains uncertain. A replication study employing a modified version of the original quasi-experimental design with enhanced data collection techniques was conducted in selected urban areas of Ethiopia. The study utilised advanced statistical software to analyse data from surveys, meter readings, and operational logs. The analysis revealed significant improvements in system reliability across all monitored sites, demonstrating a 15% increase in water supply efficiency compared to the original findings (95% confidence interval: 10-20%). This replication study confirms the robustness of quasi-experimental designs for evaluating municipal water systems in Ethiopia. Further research should consider expanding the scope of monitoring and potentially incorporating machine learning algorithms to enhance system performance predictions. Model estimation used $\hat{\{}\theta\}=argmin\{\theta\}sumiell(yi,f\theta(\xi))+\lambda lVert\theta rVert2^{2}$, with performance evaluated using out-of-sample error.

Keywords: *Ethiopia, Quasi-experimental Design, Methodology, Evaluation, System Reliability, Randomized Controlled Trials, Programme Evaluation*

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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