



Methodological Evaluation of Water Treatment Facilities in Kenya: A Randomized Field Trial on Efficiency Enhancement

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Abstract

Water treatment facilities in Kenya are crucial for ensuring safe drinking water, but their efficiency varies widely. A randomized field trial was conducted to assess the impact of various interventions on the efficiency of water treatment systems in Kenya. Data were collected from randomly selected treatment plants and analysed using statistical models. The analysis revealed that implementing regular maintenance checks led to an average increase in effluent quality by 15% (95% CI: [12%, 18%]) compared to baseline conditions. This study demonstrated the effectiveness of targeted interventions in improving water treatment facility efficiency, providing a robust method for future improvements. The findings suggest that ongoing maintenance and regular monitoring are essential components of efficient water treatment systems. Future research should explore scalability and cost-effectiveness of these methods. The maintenance outcome was modelled as $Y_i = \beta_0 + \beta_1 X_i + u_i + \varepsilon_i$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: Kenya, Water Supply Systems, Methodology, Randomized Control Trial, Evaluation, Treatment Efficiency, Data Analytics

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