



Methodological Assessment of Water Treatment Facilities in Uganda: A Randomized Field Trial

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Abstract

Water treatment facilities in Uganda are essential for ensuring safe drinking water supplies. However, their effectiveness varies significantly across different regions and facilities. A randomized field trial was conducted across multiple regions in Uganda, with each facility receiving a standardised set of inputs and outputs monitored over a period of six months. Statistical models were used to analyse data on water quality parameters before and after treatment. The findings indicate that 75% of the facilities significantly reduced E.coli levels by more than 90%, with some achieving reductions as high as 98%. However, there was a notable variance in performance across different regions. This study provides valuable insights into the effectiveness and variability of water treatment systems in Uganda. The findings suggest that standardised monitoring is crucial for consistent risk reduction. Further research should focus on understanding regional-specific factors affecting facility performance to optimise resource allocation and improve overall system efficiency. 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: African geography, randomized controlled trials, water quality assessment, microbial contamination, treatment efficacy analysis, statistical modelling, community participation

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