



Risk Reduction in Water Treatment Facilities: A Field Trial Evaluation in Uganda

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Abstract

Water treatment facilities in Uganda face challenges related to microbial contamination, leading to poor water quality that affects public health. A randomized controlled trial was conducted among 100 randomly selected households across four regions in Uganda. Water samples were collected monthly for microbial analysis, with results compared to baseline data from before the intervention period. Significant reductions ($p < 0.05$) in E. coli and coliform counts were observed after the implementation of water treatment systems, indicating effective risk reduction strategies. The randomized trial demonstrated that the implemented water treatment systems significantly improved microbial quality, reducing risks associated with waterborne diseases. Further studies should be conducted to evaluate long-term sustainability and cost-effectiveness of these interventions in different geographical settings. Water Quality, Risk Reduction, Randomized Trial, Uganda, E. coli The maintenance outcome was modelled as $Y_i = \beta_0 + \beta_1 X_i + u_i + \epsilon_i$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: Water Quality, African Geomorphology, Microbial Contamination, Risk Assessment, Randomized Controlled Trial, Public Health, Engineering Systems

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