



# Evaluation of Water Treatment Facilities Systems in Uganda: A Randomized Field Trial

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## Abstract

Uganda faces significant challenges in providing safe drinking water to its population due to inadequate infrastructure and frequent outbreaks of waterborne diseases. A randomized field trial was conducted across multiple regions in Uganda to assess the performance of different water treatment methods. Participants were randomly assigned to one of several groups using specific water treatment systems for a period of six months. The trial revealed that the use of UV light purification significantly reduced contamination levels by 75% compared to traditional chlorination methods, indicating its superior efficacy in reducing pathogens and improving water quality. The randomized field trial demonstrated the effectiveness of UV light purification as a robust method for reducing contamination risks associated with water treatment facilities in Uganda. Stakeholders should prioritise the implementation of UV light purification systems to improve public health outcomes in areas lacking adequate water treatment infrastructure. The maintenance outcome was modelled as  $Y = \beta_0 + \beta_1 X + u_i + \epsilon_i$ , with robustness checked using heteroskedasticity-consistent errors.

**Keywords:** Sub-Saharan, African, SpatialStatistics, QualitativeResearch, Randomization, HybridModels, WaterMicrobiology

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