

Evaluating the Adoption and Performance of Rural Water Treatment Systems in Ethiopia

A Quasi-Experimental Diagnostic Study

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ABSTRACT

Background: Despite significant investment in rural water infrastructure, sustained adoption and technical performance of point-of-use treatment systems in sub-Saharan Africa remain poorly understood, with a lack of rigorous field-based engineering evaluations.

Purpose and objectives: This study aimed to diagnostically evaluate the real-world adoption rates and operational performance of installed ceramic filter and chlorination systems in rural communities, identifying key engineering and socio-technical determinants of success.

Keywords: *point-of-use water treatment, sub-Saharan Africa, quasi-experimental design, technology adoption, rural water supply, household water treatment, Ethiopia*

Article Highlights

- A quasi-experimental design compared intervention and control villages to isolate treatment effects.
- Logistic regression modelled adoption probability, identifying key socio-technical determinants.
- System failures were prevalent due to filter clogging and supply chain issues for chlorine.
- Findings advocate shifting policy from installation targets to long-term performance metrics.

Core Diagnostic Finding

The gap between installation and sustained use is driven more by post-installation support logistics and user technical literacy than by initial community acceptance.

This study provides a validated predictive model for infrastructure sustainability in low-resource settings.

ABSTRACT-ONLY PUBLICATION

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