African Maintenance Engineering

Methodological Evaluation of Water Treatment Facilities Adoption in Uganda Using Multilevel Regression Analysis

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Published: 15 December 2011 | **Received:** 19 August 2011 | **Accepted:** 19 November 2011

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DOI: 10.5281/zenodo.18706345

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Abstract

Water treatment facilities are essential for ensuring clean drinking water in Uganda's rural areas. A multilevel logistic regression model was used to analyse data from 100 villages across Uganda, accounting for both individual household-level and community-level variables. In 45% of the sampled communities, at least one water treatment facility was adopted. Factors such as education level and access to clean water significantly influenced adoption rates. The multilevel regression analysis provided insights into the determinants of water treatment facilities' use in rural Uganda. Targeted interventions should focus on improving access to clean water and enhancing community awareness about the benefits of water treatment facilities. Water Treatment Facilities, Adoption Rates, Multilevel Regression, Rural Development The maintenance outcome was modelled as $Y\{\} = beta0 + beta1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *African geography, multilevel modelling, logistic regression, adoption rates, rural development, qualitative methodology, intervention effectiveness*

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