



Methodological Evaluation of Water Treatment Facilities in Uganda Using Panel Data for Adoption Rate Assessment

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Abstract

Ugandan households rely heavily on water sources that are frequently contaminated with pathogens, necessitating effective water treatment facilities. A mixed-method approach was employed, combining quantitative analysis (panel data estimation) with qualitative assessments of system functionality. Panel data from 120 randomly selected households across six districts were gathered over two years. The panel-data estimation revealed that the adoption rate for point-of-use water treatment systems was approximately 45%, with significant variations observed between urban and rural settings. Panel data analysis provided valuable insights into the factors influencing the adoption of water treatment facilities, highlighting the need for targeted interventions in underserved areas. Targeted educational campaigns and subsidies should be implemented to increase uptake among vulnerable populations. Policy-makers are urged to prioritise investment in sustainable water supply infrastructure. The maintenance outcome was modelled as $Y = \beta_0 + \beta_1 X + u + \epsilon$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *African development, panel analysis, water supply systems, qualitative methods, quantitative methods, sanitation technologies, iterative refinement*

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