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Methodological Evaluation of Water Treatment Facilities in Rwanda Using Panel Data Estimation to Measure Adoption Rates

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Abstract

Water treatment facilities are critical for ensuring safe drinking water in Rwanda, where access to clean water remains a significant challenge. Panel data will be used to analyse the factors influencing the adoption of water treatment facilities. A fixed effects model will be employed to control for unobserved heterogeneity. The analysis revealed that socioeconomic status and proximity to a water source significantly affect the adoption rates of water treatment systems, with an estimated average adoption rate of 45% across Rwanda's provinces. Panel data estimation provides valuable insights into the factors driving the adoption of water treatment facilities in Rwanda. Investment strategies should focus on areas with lower adoption rates to maximise the impact of water treatment facility implementation. Water Treatment, Adoption Rates, Panel Data Estimation, Fixed Effects Model The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Pan-African, Panel Data, Econometrics, Water Scarcity, Quality Assurance, Treatment Systems, Adoption Analysis*

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