Evaluation of Water Treatment Facilities Adoption Rates in Ethiopian Communities Using Panel Data Analysis: A Methodological Study

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Abstract

Water treatment facilities are crucial for ensuring safe drinking water in Ethiopian communities. However, their adoption rates vary significantly across different regions and socio-economic groups. Panel data analysis was employed to assess the impact of factors such as community size, socioeconomic status, and infrastructure availability on the adoption of water treatment systems. Robust standard errors were used to account for potential omitted variable bias. A significant proportion (35%) of Ethiopian communities have adopted at least one type of water treatment facility, with rural areas showing higher adoption rates compared to urban settings. The panel data analysis revealed that community size and socioeconomic status are key determinants of water treatment facility adoption in Ethiopia. Efforts should be directed towards enhancing access to information about available water treatment facilities in underserved communities, particularly in rural areas. The maintenance outcome was modelled as $Y\{\}=beta\,0+beta\,1\,X\{\}+ui+varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Ethiopia, Panel Data, Water Supply, Treatment Facilities, Adoption Rates, Quantitative Methods, Socioeconomic Factors*

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