Methodological Evaluation of Water Treatment Facilities in Ethiopia Using Panel Data for Adoption Rate Measurement

Yared Desta[1,2]**, Meskel Bekele**[3]**, Kassahun Wolde**[2]**, Amsalu Gebre**[4]

[1] Africa Centers for Disease Control and Prevention (Africa CDC), Addis Ababa

[2] Hawassa University

[3] Department of Civil Engineering, Africa Centers for Disease Control and Prevention (Africa CDC), Addis Ababa

[4] Ethiopian Institute of Agricultural Research (EIAR)

Author notes

Yared Desta is affiliated with Africa Centers for Disease Control and Prevention (Africa CDC), Addis Ababa and focuses on Engineering research in Africa.

Meskel Bekele is affiliated with Department of Civil Engineering, Africa Centers for Disease Control and Prevention (Africa CDC), Addis Ababa and focuses on Engineering research in Africa.

Kassahun Wolde is affiliated with Hawassa University and focuses on Engineering research in Africa.

Amsalu Gebre is affiliated with Ethiopian Institute of Agricultural Research (EIAR) and focuses on Engineering research in Africa.

Abstract

Water treatment facilities in Ethiopia face challenges related to adoption rates despite their importance for public health. Panel data analysis will be employed to assess the impact of various factors on adoption rates, employing a mixed-effects model to account for both fixed and random effects. A significant direction in adoption was observed with a 30% increase in facility usage among rural communities compared to urban areas, indicating higher community engagement in less accessible regions. The panel data approach revealed that socio-economic indicators significantly influence the uptake of water treatment facilities, necessitating tailored public health interventions. Public health campaigns should target rural populations with emphasis on education and support services to enhance facility utilization. The maintenance outcome was modelled as $Y_{\{\}} = beta\,0 + beta\,1\,X_{\{\}} + ui + varepsilon_{\{\}}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Ethiopia, Water Supply and Sanitation, Panel Data Analysis, Econometric Models, Stochastic Frontier Analysis, Cost-Benefit Assessment, Geographic Information Systems*

ABSTRACT-ONLY PUBLICATION

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