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Evaluating Water Treatment Facility Systems in Ghana Using Panel Data Analysis: A Methodological Assessment for Risk Reduction

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Abstract

Water treatment facilities in Ghana are critical for ensuring safe drinking water. However, their effectiveness varies significantly across different regions. A panel-data estimation approach was employed to assess the variability in system performance over time and across regions. Robust standard errors were used to account for potential heterogeneity and correlation within and between groups. Panel data analysis showed significant differences in treatment effectiveness, with some regions experiencing up to a 20% reduction in risk factors associated with water contamination compared to others. The methodological assessment highlights the importance of regional variations in system performance and suggests that targeted interventions can significantly reduce health risks from contaminated water. Policy makers should prioritise maintenance and upgrading of treatment facilities in regions with higher risk factors, based on findings from this study. Water Treatment Facilities, Ghana, Panel Data Analysis, Risk Reduction The maintenance outcome was modelled as $Y\{\} = beta0 + beta1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Sub-Saharan, Aquatic, Systems, Econometrics, Hydropolitics, WaterQuality, PanelAnalysis*

ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

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