



Methodological Evaluation of Water Treatment Systems in Ghana: Quasi-Experimental Design for Efficiency Gains

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Abstract

Water treatment systems in Ghana face challenges related to efficiency and sustainability. A mixed-method approach combining quantitative data analysis from treated water quality indicators with qualitative interviews to assess user satisfaction and operational challenges. Treatment systems showed an average improvement of 12% in effluent quality metrics over six months, with significant variance across different treatment stages. The quasi-experimental design validated the effectiveness of selected water treatment strategies for improving system efficiency and sustainability. Implementing continuous monitoring and user feedback loops can enhance future system performance and user satisfaction. Water Treatment, Ghana, Quasi-Experimental Design, Efficiency Gains
The maintenance outcome was modelled as $Y = \beta_0 + \beta_1 X + u + \epsilon$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: Ghana, quasi-experimental design, water treatment, methodology, indicators, sustainability, efficacy

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