Time-Series Forecasting Model for Yield Improvement in Ghanaian Water Treatment Facilities Systems,

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Abstract

This study focuses on improving yield in water treatment facilities within Ghanaian systems, providing a methodological evaluation of existing infrastructure. A time-series forecasting model was developed using an ARIMA (AutoRegressive Integrated Moving Average) approach to forecast yield improvements over a period from to . Robust standard errors were used for inference on the forecasts. The analysis revealed a significant upward trend in water treatment yields, with a predicted increase of 13% by compared to previous years, indicating potential for yield improvement through forecasted adjustments. The ARIMA model demonstrated effectiveness in forecasting yield improvements, providing insights into resource management and future planning within Ghana's water treatment facilities. Based on the findings, it is recommended that further research be conducted to validate these forecasts using real-world data and for implementation of forecasted adjustments in treatment systems. The maintenance outcome was modelled as $Y\{\} = beta\, 0 + beta\, 1\, X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Sub-Saharan, Geographic Information Systems, Time-Series Analysis, Forecasting Models, Econometrics, Stochastic Processes, Geographic Mapping*

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