



Time-Series Forecasting Model Evaluation for Yield Improvement in Water Treatment Facilities in Ghana, 2009

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Abstract

Water treatment facilities in Ghana have experienced varying yields over time due to fluctuations in water supply and operational efficiency. The study employs an autoregressive integrated moving average (ARIMA) model to forecast future yields based on historical data from five water treatment plants in Ghana. Robust standard errors are used for inference. A significant trend of yield improvement was observed, with a predicted increase of approximately 10% over the next three years due to optimised maintenance schedules and operational adjustments. The ARIMA model accurately forecasts yield improvements in Ghanaian water treatment facilities, suggesting that targeted maintenance interventions can enhance efficiency. Implementing regular maintenance checks and optimising operation protocols could lead to substantial yield benefits for the evaluated plants and potentially other facilities. Water Treatment Facilities, Yield Improvement, Time-Series Forecasting, ARIMA Model The maintenance outcome was modelled as $Y_t = \beta_0 + \beta_1 X_t + u_t + \text{varepsilon}_t$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: Sub-Saharan, Ghanaian, Autoregressive, Integrated, MovingAverage, Time-Series, Forecasting

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