



Time-Series Forecasting Model for Evaluating Power-Distribution Efficiency in Ghanaian Infrastructure Systems,

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Abstract

This study examines power-distribution equipment systems in Ghanaian infrastructure, focusing on their efficiency over time. A multiple linear regression model was employed to forecast power-distribution system efficiency. The model incorporates historical data on electricity consumption and infrastructure conditions. The analysis indicates a significant decrease in power loss by 15% over the five-year period, suggesting improved equipment performance. The time-series forecasting model effectively identified trends and potential improvements in Ghanaian power distribution systems. Investment should be directed towards upgrading older infrastructure to align with forecasted demands for efficient and reliable service delivery. The maintenance outcome was modelled as $Y = \beta_0 + \beta_1 X + u + \epsilon$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: Geographical Information Systems (GIS), Geographic Information System (GIS), spatial analysis, econometrics, forecasting methodology, regression analysis, power distribution systems

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