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Methodological Evaluation of Regional Monitoring Networks in Uganda: A Time-Series Forecasting Model for Risk Reduction Analysis

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Abstract

Regional monitoring networks have been implemented in Uganda to enhance energy sector governance and risk management. These systems aim to provide real-time data on various aspects of the energy sector, including power generation, transmission, distribution, and consumption. A time-series forecasting model will be employed, incorporating historical data on energy sector performance to forecast future trends. Monte Carlo simulations will be used to quantify uncertainties associated with these forecasts, providing robust standard errors for each prediction. This study demonstrates the potential of time-series forecasting models for enhancing regional monitoring systems in Uganda's energy sector, offering a more precise and actionable approach to risk reduction. Based on this theoretical framework, recommendations include refining network coverage, integrating advanced analytics tools, and fostering collaboration between stakeholders to maximise the benefits of these networks. The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African geography, Monitoring networks, Time-series analysis, Risk assessment, Forecasting models, Data analytics, Geographic Information Systems*

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