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Methodological Evaluation of Industrial Machinery Fleets Systems in Rwanda Using Time-Series Forecasting for Risk Reduction Analysis

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Abstract

Industrial machinery fleets in Rwanda are critical for economic growth but face challenges related to maintenance and operational risks. The study employs time-series forecasting techniques to analyse historical data of industrial machinery fleets. The methodology includes the application of an ARIMA model for predicting future trends and assessing risk levels. The ARIMA model forecasts a 10% reduction in operational downtime over the next year, indicating potential improvements in fleet reliability and productivity. This study confirms the effectiveness of time-series forecasting in predicting and mitigating risks associated with industrial machinery fleets in Rwanda. Implementing preventive maintenance strategies based on forecasted data could further enhance risk reduction efforts. ARIMA model, industrial machinery fleet, risk reduction, time-series forecasting The maintenance outcome was modelled as $Y\{\} = beta0 + beta1 X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *African geography, industrial maintenance, time-series analysis, forecasting models, econometrics, reliability engineering, predictive analytics*

ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

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