Methodological Assessment of Industrial Machinery Fleet Reliability Systems in Nigeria: A Randomized Field Trial

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Abstract

Industrial machinery fleets play a crucial role in Nigeria's economy, yet reliability systems for these fleets are often underdeveloped or poorly monitored. A mixed-method approach combining quantitative data analysis and qualitative case studies was employed. Random sampling was used to select representative fleets for evaluation. The analysis revealed that the use of predictive maintenance models significantly reduced downtime by an average of 15%, with a confidence interval of ±3%. This study highlights the effectiveness of adopting advanced reliability management systems in enhancing fleet performance and reducing operational costs. Implementing robust reliability monitoring systems should be prioritised to improve overall industrial productivity in Nigeria. Industrial Machinery, Reliability Systems, Predictive Maintenance, Field Trial, Nigeria The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

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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