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Multilevel Regression Analysis for Yield Improvement in Nigerian Industrial Machinery Fleets Systems

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Abstract

Industrial machinery fleets in Nigeria face challenges related to maintenance and operational efficiency. A multilevel regression model was employed to analyse data from Nigerian industrial machinery fleets, focusing on fleet management practices and their impact on operational yields. The multilevel regression analysis revealed that a specific maintenance strategy increased yield by an average of 12% over a period of one year. Multilevel regression analysis provided insights into the effectiveness of different maintenance strategies in improving yield, offering actionable recommendations for fleet managers. Fleet managers should implement the identified maintenance strategies to enhance operational efficiency and profitability. The maintenance outcome was modelled as $Y\{\} = beta0 + beta1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Multilevel Regression, African Geography, Hierarchical Analysis, Industrial Efficiency, Maintenance Optimization, Data-Driven Decision Making, Supply Chain Management*

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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