Methodological Evaluation of Industrial Machinery Fleets in Kenya Using Time-Series Forecasting for Yield Improvement Assessment

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Abstract

Industrial machinery fleets play a crucial role in agricultural productivity in Kenya, yet their performance variability is not well understood. A time-series forecasting model was employed to analyse fleet performance data over multiple years. Robust standard errors were used to assess the uncertainty in predictions. The analysis revealed a consistent direction in yield improvements (2% annually) across different machinery types, with proportions varying by season and terrain type. The time-series forecasting model effectively predicted yield improvements, providing actionable insights for fleet management. Further research should focus on incorporating real-time data to enhance the predictive accuracy of the model. Agricultural Machinery, Time-Series Forecasting, Yield Improvement, Fleet Management The maintenance outcome was modelled as $Y\{\}=beta\,0+beta\,1\,X\{\}+ui+varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *African geographies, time-series analysis, econometrics, predictive maintenance, stochastic processes, grey systems theory, forecasting models*

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