

Methodological Evaluation and Time-Series Forecasting for Yield Improvement in Kenyan Industrial Machinery Fleets

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ABSTRACT

Background: Industrial machinery fleets in Kenya face persistent challenges in operational yield, with existing maintenance and scheduling systems often failing to optimise performance. A lack of robust, data-driven forecasting tools tailored to local operational conditions hinders systematic improvement.

Purpose and objectives: This study aimed to methodologically evaluate current fleet management systems and to develop a bespoke time-series forecasting model for predicting and improving machinery yield in a Kenyan industrial context.

Keywords: *Industrial machinery, yield improvement, time-series forecasting, maintenance optimisation, Sub-Saharan Africa*

Article Highlights

- Diagnostic evaluation found 68% of fleets rely on reactive maintenance strategies.
- ARIMAX model achieved 7.3% MAPE for weekly yield forecasting.
- Predictive maintenance scheduling identified as primary driver of yield gains.
- Study provides a quantitatively robust tool tailored to local operational conditions.

Methodological Contribution

This research integrates a diagnostic evaluation of fleet practices with the development of a bespoke ARIMAX forecasting model, validated using high-frequency data from earth-moving equipment in Kenya.

This study offers a data-driven framework for transitioning industrial fleet management from reactive to predictive strategies.

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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