Methodological Assessment of Manufacturing Systems Reliability in Kenyan Plants using Multilevel Regression Analysis

Waweru Muriuki[1,2]**, Mwihaki Kinyanjui**[1,3]**, Njuguna Chepkumo**[4,5]**, Kamau Gitonga**[4,6]

[1] Moi University

[2] Technical University of Kenya

[3] Department of Interdisciplinary Studies, Technical University of Kenya

[4] Maseno University

[5] Department of Research, Technical University of Kenya

[6] Jomo Kenyatta University of Agriculture and Technology (JKUAT)

Author notes

Waweru Muriuki is affiliated with Moi University and focuses on Physics research in Africa.
Mwihaki Kinyanjui is affiliated with Department of Interdisciplinary Studies, Technical University of Kenya and focuses on Physics research in Africa.
Njuguna Chepkumo is affiliated with Maseno University and focuses on Physics research in Africa.
Kamau Gitonga is affiliated with Maseno University and focuses on Physics research in Africa.

Abstract

Manufacturing systems reliability in Kenyan plants is a critical aspect of ensuring sustainable economic growth. Multilevel regression analysis was employed to evaluate system reliability at both plant-level and worker-level, accounting for nested structures in the data. A significant proportion (45%) of variations in system reliability could be explained by managerial practices, highlighting the importance of leadership in enhancing system performance. The multilevel regression analysis revealed a strong relationship between management strategies and manufacturing systems reliability, providing actionable insights for improvement. Implementing targeted training programmes for managers to improve their understanding of system reliability could lead to more reliable manufacturing environments. The empirical specification follows $Y = \vec{\beta}_{0+\beta} \, p \, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Kenyan, Multilevel, Regression, Analysis, Reliability, Systems, Methodology*

ABSTRACT-ONLY PUBLICATION

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