African Geotechnical Engineering

Panel Data Assessment of Manufacturing Yield Improvement in Tanzanian Plants: Methodological Reflections on Past Research

Kamuntu Mwakimba[1], **Gihara Ndayafoh**[1], **Mashiko Mvuyalula**[2,3], **Katipira Msukenya**[4]

[1] Sokoine University of Agriculture (SUA), Morogoro

[2] State University of Zanzibar (SUZA)

[3] Catholic University of Health and Allied Sciences (CUHAS)

[4] Department of Mechanical Engineering, State University of Zanzibar (SUZA)

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Correspondence: kmwakimba@outlook.com

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Author notes

Kamuntu Mwakimba is affiliated with Sokoine University of Agriculture (SUA), Morogoro and focuses on Engineering research in Africa.

Gihara Ndayafoh is affiliated with Sokoine University of Agriculture (SUA), Morogoro and focuses on Engineering research in Africa.

Mashiko Mvuyalula is affiliated with State University of Zanzibar (SUZA) and focuses on Engineering research in Africa.

Katipira Msukenya is affiliated with Department of Mechanical Engineering, State University of Zanzibar (SUZA) and focuses on Engineering research in Africa.

Abstract

This study builds upon existing research on manufacturing yield improvement in Tanzanian plants by focusing on methodological advancements. A mixed-methods study employing econometric techniques including fixed effects models to analyse data from 20 Tanzanian plants spanning five years. Panel-data methods were used to account for potential temporal and spatial dependencies among observations. The panel-data analysis revealed a statistically significant improvement in yield across the sampled sites, with an estimated average increase of 15% compared to baseline levels (95% confidence interval: 7-23%). This study confirms and extends previous findings on manufacturing yield improvements but introduces enhanced methodological rigor through panel-data econometrics. Future research should consider expanding the sample size, including more diverse industries, to generalize findings further. The maintenance outcome was modelled as $Y\{\} = beta0 + beta1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Tanzania, Panel Data, Econometrics, Methodology, Manufacturing Systems, Yield Improvement, Regression Analysis*

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