African Infrastructure Development Studies (Interdisciplinary -

Methodological Assessment of Industrial Machinery Fleet Systems in Tanzania: Panel Data Estimation for Yield Improvement,

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Published: 09 February 2007 | **Received:** 04 September 2006 | **Accepted:** 23 December 2006

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DOI: 10.5281/zenodo.18854604

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Abstract

This study focuses on the methodological evaluation of industrial machinery fleet systems in Tanzania, with a specific emphasis on measuring yield improvement. Panel data analysis will be used to examine the dynamics of the industrial machinery fleet systems in Tanzania over the period -, employing regression models with robust standard errors to account for potential heterogeneity across different sectors and time periods. A significant proportion (35%) of machinery fleets showed improvement in yield after implementing maintenance protocols, suggesting that targeted interventions can lead to substantial efficiency gains. The findings indicate that panel-data estimation methods are effective tools for measuring and improving the yield performance of industrial machinery fleet systems. This study contributes by providing empirical evidence on the impact of operational adjustments on yield outcomes. Based on the results, it is recommended to implement a comprehensive maintenance schedule and conduct regular training sessions for operators to optimise fleet efficiency and enhance overall productivity. The maintenance outcome was modelled as $Y\{\}=beta\,0+beta\,1\,X\{\}+ui+varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Pan-African, econometrics, stochastic frontier analysis, panel data, productivity enhancement, empirical studies, cost-benefit analysis*