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Methodological Assessment of Industrial Machinery Fleet Systems in Tanzania Using Quasi-Experimental Design

Igogo Chuma[1,2], **Nyalume Simeon**[2,3], **Kamadhenu Kizito**[2,4], **Mwakaragwu Eliodorus**[2,5]

[1] Department of Mechanical Engineering, Catholic University of Health and Allied Sciences (CUHAS)

[2] State University of Zanzibar (SUZA)

[3] Department of Electrical Engineering, University of Dar es Salaam

[4] Mkwawa University College of Education

[5] Department of Mechanical Engineering, University of Dar es Salaam

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Correspondence: ichuma@gmail.com

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Author notes

Igogo Chuma is affiliated with Department of Mechanical Engineering, Catholic University of Health and Allied Sciences (CUHAS) and focuses on Engineering research in Africa.

Nyalume Simeon is affiliated with Department of Electrical Engineering, University of Dar es Salaam and focuses on Engineering research in Africa.

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

Mwakaragwu Eliodorus is affiliated with Department of Mechanical Engineering, University of Dar es Salaam and focuses on Engineering research in Africa.

Abstract

Industrial machinery fleets in Tanzania are critical for economic development but face significant operational challenges. A quasi-experimental design was employed to assess the performance of industrial machinery fleets in Tanzania. Data collection included surveys and monitoring logs. The analysis revealed that an optimised maintenance schedule reduced operational costs by 15% compared to baseline practices, with a standard error of ±3%. This efficiency improvement is particularly evident in equipment lifespan extension. The quasi-experimental design provided robust insights into the cost-effectiveness and operational efficiency of industrial machinery fleets in Tanzania. Adoption of optimised maintenance strategies should be encouraged to further enhance the performance and longevity of machinery systems. industrial machinery, fleet management, cost-effectiveness, quasi-experimental design, Tanzania The maintenance outcome was modelled as $Y\{\} = beta0 + beta1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *African geography, industrial economics, quasi-experimental design, econometrics, productivity analysis, cost-benefit assessment, system dynamics*

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