African Renewable Energy Engineering

Methodological Evaluation of Manufacturing Plants Systems in Kenya: A Randomized Field Trial for Adoption Rates

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Abstract

This study focuses on evaluating manufacturing plants systems in Kenya, considering their adoption rates through a randomized field trial. A randomized field trial was conducted, where manufacturing plants were randomly selected from various sectors across Kenya to test different systems. Data on system usage frequency, maintenance costs, and overall performance were collected over a period of six months. The findings indicate that the adoption rate varied significantly among sectors, with agriculture showing higher rates at 75% compared to manufacturing at 40%. This difference was attributed to varying levels of technological readiness and financial resources available in each sector. The trial also revealed a positive correlation between system complexity and maintenance costs. The randomized field trial provided valuable insights into the adoption dynamics of manufacturing plant systems in Kenya, highlighting disparities based on sector characteristics and system complexity. Based on the findings, recommendations include tailoring support strategies to match the specific needs of different sectors and providing training programmes for operators to reduce maintenance costs and improve overall performance. The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Kenyan, Manufacturing Systems, Adoption Metrics, Randomized Trials, Methodological Evaluation, Geographic Analysis, Statistical Methods*

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