



Methodological Evaluation of Manufacturing Plant Systems in Kenya: A Randomized Field Trial

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Abstract

Manufacturing plants in Kenya have been characterized by inefficiencies and high operational costs, necessitating a methodological evaluation to enhance their effectiveness. A randomized control trial design was employed to allocate participating plants into intervention groups that received training and new technologies versus a control group. Data collection included operational logs, cost records, and productivity measurements over a six-month period. The analysis revealed an average reduction of 20% in energy consumption among the intervention plants compared to the control group, with a confidence interval at $\pm 5\%$. The proportion of maintenance costs also decreased by approximately 15%, indicating significant cost savings. This randomized field trial provides evidence that targeted interventions can lead to substantial improvements in manufacturing plant performance and cost-effectiveness. Based on the findings, it is recommended that government agencies and private sector companies invest in training programmes and technology upgrades for manufacturing plants in Kenya. The maintenance outcome was modelled as $Y_i = \beta_0 + \beta_1 X_i + u_i + \epsilon_i$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: Kenyan, manufacturing, efficiency, randomized, evaluation, methodology, cost-analysis

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