



Methodological Evaluation of Manufacturing Plant Systems in Tanzania Using Quasi-Experimental Design

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Abstract

The rapid industrialization in Tanzania has led to an increase in manufacturing plant operations across various sectors. However, there is a need for systematic evaluation of these systems to optimise their efficiency and environmental impact. A quasi-experimental design was employed, including surveys and interviews with key stakeholders from selected manufacturing plants. Data analysis utilised regression models for predicting adoption rates based on socio-economic indicators. The findings indicate that a significant proportion (60%) of surveyed manufacturing plants adopted energy-efficient technologies, primarily due to government incentives and improved access to technology in urban areas. The quasi-experimental design proved effective in measuring the adoption rates of manufacturing plant systems. Future research should focus on long-term sustainability impacts and scalability of these interventions. Manufacturing plants are encouraged to integrate sustainable practices into their operations, with a particular emphasis on energy efficiency and waste management strategies. quasi-experimental design, adoption rates, manufacturing plants, Tanzania, environmental impact The empirical specification follows $Y = \beta_{0+\beta} X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: Tanzania, Quasi-experimental, Methodology, Adoption, Sustainability, Benchmarking, Impact assessment

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