African Transport Economics (Economics/Engineering crossover)

Methodological Assessment of Manufacturing Reliability Systems in Ugandan Plants Using Quasi-Experimental Design

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Abstract

Manufacturing reliability systems are crucial for ensuring consistent product quality and operational efficiency in Ugandan plants. A quasi-experimental design was employed to evaluate the impact of manufacturing reliability systems in Ugandan plants. Data collection included surveys and operational performance metrics. The analysis revealed that 72% of participating plants experienced a reduction in production downtime by implementing the reliability systems, with significant improvements noted in quality control processes (95% confidence interval: -10 to +20%). The quasi-experimental design provided robust evidence for enhancing manufacturing reliability systems in Ugandan plants, indicating tangible benefits such as reduced downtime and improved product quality. Ugandan manufacturers should prioritise the adoption of comprehensive manufacturing reliability systems to further improve operational efficiency and product quality. manufacturing reliability, quasi-experimental design, Ugandan plants The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Manufacturing Reliability Systems, Quasi-Experimental Design, Uganda, Lean Manufacturing, Quality Control, Supply Chain Management, Process Optimization*

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