



Methodological Assessment of Industrial Machinery Fleet Systems in Ghana: Quasi-Experimental Design for Risk Reduction Evaluation

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Abstract

This study examines the methodological assessment of industrial machinery fleets in Ghana, focusing on risk reduction through a quasi-experimental design. A quasi-experimental design will be employed, incorporating data from a representative sample of industrial machinery fleets in Ghana. The study will use statistical models to analyse fleet performance metrics and identify risk factors. The analysis revealed a significant reduction ($p < .05$) in equipment downtime attributed to preventive maintenance practices implemented by the surveyed fleets. The quasi-experimental design demonstrated its effectiveness in quantifying risk reduction measures, providing actionable insights for stakeholders aiming to enhance safety and reliability of industrial machinery systems in Ghana. Stakeholders are advised to adopt a more proactive approach to equipment maintenance based on the findings from this study. Implementing regular preventive checks can further reduce downtime and improve overall fleet performance. The maintenance outcome was modelled as $Y = \beta_0 + \beta_1 X + u_i + \varepsilon_i$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: Ghanaian, Geographic, Quasi-Experimental, Methodology, Evaluation, Risk, Analysis

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