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Methodological Evaluation of Manufacturing Systems Risk Reduction in Ethiopian Plants: A Randomized Field Trial

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Abstract

Manufacturing systems in Ethiopian plants are vulnerable to various risks that can disrupt production processes and lead to inefficiencies. A randomized field trial was conducted across ten randomly selected Ethiopian plants. Data were collected using standardised surveys to assess current risk levels and identify areas requiring intervention. Statistical analysis employed logistic regression models to predict the likelihood of future risks based on existing data. The findings revealed a significant reduction in identified system vulnerabilities, with a p-value < 0.05 for the predictive model indicating robust accuracy of the statistical approach used. This randomized field trial successfully demonstrated the effectiveness of risk reduction methodologies tailored to Ethiopian manufacturing environments. The findings provide actionable insights for implementing and scaling up these risk reduction strategies in other Ethiopian plants, aiming for further efficiency gains and cost savings. manufacturing systems, risk reduction, Ethiopia, randomized field trial, logistic regression

Keywords: *Ethiopia, Geographic Information Systems (GIS), Monte Carlo simulation, Lean manufacturing, Quality control, Supply chain management, Risk assessment*

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