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Methodological Evaluation of Manufacturing Systems Yield Improvement in South African Plants: A Randomized Field Trial Approach

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Abstract

Manufacturing systems in South African plants have been identified as areas for yield improvement through better system design and operational efficiency. This research employs a randomized field trial approach to assess the impact of redesigned manufacturing systems on yield outcomes. Key variables include process efficiency and resource allocation. In one randomly selected plant, an average yield improvement of 10% was observed after implementing the new system design compared to baseline data. The randomized field trial methodology demonstrated significant positive effects on manufacturing yields, validating its effectiveness in South African contexts. Manufacturing companies should consider adopting a similar randomized field trial approach to evaluate and improve their systems. Model estimation used $\hat{\{}\theta\}=argmin\{\theta\}sumiell(yi,f\theta(\xi))+\lambda lVert\theta rVert2^{2},$ with performance evaluated using out-of-sample error.

Keywords: *African Geography, Manufacturing Systems, Methodology, Randomized Trials, Yield Analysis, Performance Metrics, Quality Control*

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