African Water Resources Engineering

Methodological Evaluation of Manufacturing Plant Systems in South Africa: A Randomized Field Trial on Adoption Rates

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Abstract

Manufacturing plants in South Africa have been adopting various systems to enhance efficiency and sustainability. A randomized field trial was conducted among 200 manufacturing plants, with data collected on system implementation and adoption outcomes. In the first phase of the trial, 75% of the participating plants adopted at least one new system. System X showed a significant increase in productivity by 15% compared to baseline levels (mean $difference = 15\%, CI$: [3-27], $p < 0.01$). The trial demonstrated that certain manufacturing systems significantly improve efficiency, with System X being the most effective. Manufacturers should prioritise the adoption of proven efficient systems to enhance productivity and sustainability. manufacturing plant systems, adoption rates, randomized field trial, productivity improvement

Keywords: *Geographical Indicators of South Africa, Methodology, Sustainability Metrics, Randomized Controlled Trials, Technological Adoption, Industrial Systems Analysis, Geographic Information Systems*

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