



Methodological Evaluation of Process-Control Systems in Rwanda: A Randomized Field Trial for Cost-Effectiveness Assessment

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Abstract

Rwanda has implemented process-control systems in various sectors to enhance efficiency and cost-effectiveness. However, their impact remains unassessed. A randomized controlled trial was conducted across different engineering projects in Rwanda, with participants randomly assigned to either control or intervention groups. Data collection included cost and performance metrics. The analysis revealed that process-control systems significantly reduced costs by an average of 15% compared to the control group (95% confidence interval: -20% to -10%), with a notable decrease in project delays. Process-control systems show promise for improving cost-effectiveness and efficiency in engineering projects, particularly when applied randomly across different contexts. Future research should explore scalability of these systems in various sectors and assess long-term sustainability. process-control systems, randomized field trial, cost-effectiveness, engineering, Rwanda The maintenance outcome was modelled as $Y = \beta_0 + \beta_1 X + u_i + \varepsilon_i$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: Rwanda, Geographic Information Systems (GIS), Randomization, Control Groups, Cost-Benefit Analysis, Evaluation Framework, Quantitative Methods

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