



Methodological Evaluation of Process-Control Systems in Rwanda: A Field Trial on System Reliability Assessment

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Abstract

This study addresses a current research gap in Engineering concerning Methodological evaluation of process-control systems systems in Rwanda: randomized field trial for measuring system reliability in Rwanda. The objective is to formulate a rigorous model, state verifiable assumptions, and derive results with direct analytical or practical implications. A mixed-methods design was used, combining survey and interview data collected over the study period. The results establish bounded error under perturbation, a convergent estimation process under stated assumptions, and a stable link between the proposed metric and observed outcomes. The findings provide a reproducible analytical basis for subsequent theoretical and applied extensions. Stakeholders should prioritise inclusive, locally grounded strategies and improve data transparency. Methodological evaluation of process-control systems systems in Rwanda: randomized field trial for measuring system reliability, Rwanda, Africa, Engineering, original research This work contributes a formal specification, transparent assumptions, and mathematically interpretable claims. The maintenance outcome was modelled as $Y = \beta_0 + \beta_1 X + u + v + \epsilon$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Rwandan Engineering, Process-Control Systems, Methodology, Reliability Assessment, Field Trials, Statistical Analysis, System Dynamics*

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