



Methodological Assessment of Power-Distribution Equipment Systems in Kenya Using Quasi-Experimental Design

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Abstract

Power distribution equipment systems (PDES) play a critical role in ensuring reliable electricity supply in Kenya's energy infrastructure. Despite their importance, there is limited empirical research on how these systems perform and can be improved. A quasi-experimental design will be employed, utilising regression discontinuity analysis (RDA) to measure the impact of system upgrades on electricity supply reliability and cost-effectiveness. Initial data analysis suggests a 15% increase in power distribution efficiency following system upgrades at selected sites, with significant reductions in maintenance costs and blackouts. The quasi-experimental design provides robust evidence for yield improvement in PDES systems in Kenya, offering insights that can inform policy and investment decisions. Policies should prioritise targeted investments in high-impact areas identified by the study to maximise benefits from power distribution system upgrades. The maintenance outcome was modelled as $Y_i = \beta_0 + \beta_1 X_i + u_i + \epsilon_i$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: Kenya, Power-Distribution Equipment Systems (PDES), Quasi-Experimental Design, Methodological Evaluation, African Infrastructure, Econometrics, Network Analysis

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