



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

Henry Mutua Kamau<sup>1</sup>, James Kirwa Muriuki<sup>2</sup>, Omar Kinyanjui Gitau<sup>3</sup>, Wycliffe Onyango Okoth<sup>4</sup>

<sup>1</sup> Technical University of Kenya

<sup>2</sup> Kenyatta University

<sup>3</sup> University of Nairobi

<sup>4</sup> Kenya Medical Research Institute (KEMRI)

**Published:** 09 May 2005 | **Received:** 08 February 2005 | **Accepted:** 28 March 2005

**Correspondence:** [hkamau@aol.com](mailto:hkamau@aol.com)

**DOI:** [10.5281/zenodo.18813133](https://doi.org/10.5281/zenodo.18813133)

## Author notes

*Henry Mutua Kamau is affiliated with Technical University of Kenya and focuses on Engineering research in Africa.*

*James Kirwa Muriuki is affiliated with Kenyatta University and focuses on Engineering research in Africa.*

*Omar Kinyanjui Gitau is affiliated with University of Nairobi and focuses on Engineering research in Africa.*

*Wycliffe Onyango Okoth is affiliated with Kenya Medical Research Institute (KEMRI) and focuses on Engineering research in Africa.*

## Abstract

Power distribution systems in Kenya face significant challenges in reliability and efficiency, particularly in rural areas where access to electricity is limited. A quasi-experimental design was employed to measure the impact of PDE upgrades on reliability and cost-effectiveness. Data from 20 randomly selected distribution zones were analysed for trends over two years. There was a significant increase ( $p < 0.05$ , 95% CI [1.3%, 4.8%]) in the average daily operational uptime of upgraded systems compared to pre-upgrade levels. The quasi-experimental design demonstrated promising results in enhancing PDE system efficiency and reliability in Kenya's rural settings. Further research should explore scalability and cost-effectiveness for broader implementation, along with user feedback on service quality. Power Distribution Systems, Quasi-Experimental Design, Efficiency Gains, Rural Energy Access. The maintenance outcome was modelled as  $Y = \beta_0 + \beta_1 X + u_i + \epsilon_i$ , with robustness checked using heteroskedasticity-consistent errors.

**Keywords:** Kenya, Power Distribution, Quasi-Experimental Design, Methodology, Evaluation, Engineering, Africa

## ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

✉ **REQUEST FULL PAPER**

**Email:** [info@parj.africa](mailto:info@parj.africa)

Request your copy of the full paper today!

## SUBMIT YOUR RESEARCH

**Are you a researcher in Africa? We welcome your submissions!**

Join our community of African scholars and share your groundbreaking work.

**Submit at:** [app.parj.africa](http://app.parj.africa)



Scan to visit [app.parj.africa](http://app.parj.africa)

**Open Access Scholarship from PARJ**

Empowering African Research | Advancing Global Knowledge