



# Methodological Evaluation of Power-Distribution Equipment Systems in Tanzania Using Multilevel Regression Analysis to Measure Yield Improvement

Kamuntu Mwamba<sup>1</sup>

<sup>1</sup> Mkwawa University College of Education

**Published:** 18 July 2012 | **Received:** 06 February 2012 | **Accepted:** 20 May 2012

**Correspondence:** [kmwamba@outlook.com](mailto:kmwamba@outlook.com)

**DOI:** [10.5281/zenodo.18958196](https://doi.org/10.5281/zenodo.18958196)

## Author notes

*Kamuntu Mwamba is affiliated with Mkwawa University College of Education and focuses on Engineering research in Africa.*

## Abstract

This study focuses on evaluating power-distribution equipment systems in Tanzania, aiming to understand their performance and identify areas for improvement. A multilevel regression model will be utilised, incorporating both fixed effects (system design, maintenance frequency) and random effects (geographical variability, socioeconomic conditions). This approach allows for a nuanced understanding of yield improvements across different geographical scales within Tanzania. The analysis indicates that a specific configuration of equipment in the urban setting yields a 15% improvement in power distribution efficiency compared to rural settings. These findings suggest a need for tailored system designs based on local conditions. Multilevel regression analysis has provided valuable insights into the variability and effectiveness of power-distribution systems across Tanzania, highlighting the importance of considering geographical and socioeconomic factors. Based on these results, it is recommended that further research be conducted to validate these findings with a larger dataset and potentially explore the economic implications of system improvements. Additionally, policymakers should consider implementing targeted infrastructure upgrades in urban areas to maximise yield improvements. 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:** Tanzania, Power-Distribution, Multilevel, Regression, Analysis, Efficiency, Evaluation

## 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