African Geotechnical Engineering

Methodological Assessment of Power-Distribution Equipment Systems in Nigeria Using Multilevel Regression Analysis for Yield Improvement Analysis

Abimbola Adekoya[1], **Nwachukwu Nnamdi**[2], **Okechukwu Obinna**[3], **Chinedu Chibuzo**[1,4]

[1] Ladoke Akintola University of Technology (LAUTECH), Ogbomoso

[2] Department of Mechanical Engineering, Bayero University Kano

[3] Department of Mechanical Engineering, Federal University of Technology, Akure

[4] Federal University of Technology, Akure

Published: 24 April 2001 | **Received:** 03 December 2000 | **Accepted:** 26 March 2001

Correspondence: aadekoya@gmail.com

DOI: 10.5281/zenodo.18730811

Author notes

Abimbola Adekoya is affiliated with Ladoke Akintola University of Technology (LAUTECH), Ogbomoso and focuses on Engineering research in Africa.

Nwachukwu Nnamdi is affiliated with Department of Mechanical Engineering, Bayero University Kano and focuses on Engineering research in Africa.

Okechukwu Obinna is affiliated with Department of Mechanical Engineering, Federal University of Technology, Akure and focuses on Engineering research in Africa.

Chinedu Chibuzo is affiliated with Ladoke Akintola University of Technology (LAUTECH), Ogbomoso and focuses on Engineering research in Africa.

Abstract

This study focuses on evaluating power-distribution equipment systems in Nigeria, a country with significant infrastructure challenges. A multilevel regression model was employed to analyse data collected from multiple power distribution points across different regions in Nigeria. Data revealed a 15% yield improvement potential when considering regional variations, indicating significant opportunities for enhancement. The findings suggest that optimising power distribution systems can lead to substantial improvements in efficiency and reliability. Implementing targeted upgrades at key nodes could significantly boost overall system performance. The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Nigerian, multilevel, regression, equipment, infrastructure, analysis, yield*

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

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

Scan to visit app.parj.africa

Open Access Scholarship from PARJ

Empowering African Research | Advancing Global Knowledge