



# Methodological Evaluation of Power-Distribution Equipment Systems in Nigerian Context: Time-Series Forecasting Model for Adoption Rates

Chidera Ndiogwu<sup>1,2</sup>, Felix Owojaipegi<sup>3,4</sup>, Victor Ekeruekwa<sup>2,3</sup>

<sup>1</sup> Department of Mechanical Engineering, University of Port Harcourt

<sup>2</sup> University of Ilorin

<sup>3</sup> University of Port Harcourt

<sup>4</sup> University of Ibadan

Published: 25 April 2002 | Received: 05 January 2002 | Accepted: 05 March 2002

Correspondence: [cndiogwu@aol.com](mailto:cndiogwu@aol.com)

DOI: [10.5281/zenodo.18750705](https://doi.org/10.5281/zenodo.18750705)

### Author notes

Chidera Ndiogwu is affiliated with Department of Mechanical Engineering, University of Port Harcourt and focuses on Engineering research in Africa.

Felix Owojaipegi is affiliated with University of Port Harcourt and focuses on Engineering research in Africa.

Victor Ekeruekwa is affiliated with University of Port Harcourt and focuses on Engineering research in Africa.

### Abstract

Recent technological advancements have led to an increasing focus on power-distribution equipment systems (PDES) in Nigeria's urban areas, necessitating a methodological evaluation for effective adoption and management. A comprehensive analysis was conducted, incorporating data from a diverse set of urban areas across Nigeria. Time-series forecasting models were applied to historical adoption rate data, ensuring the use of appropriate statistical techniques for accurate predictions. The findings indicate that there is a significant upward trend in PDES adoption rates within cities (direction: increasing), with an estimated annual growth rate of 5% based on the time-series model. The study concludes that while current models predict steady growth, challenges such as infrastructure limitations and economic factors may impact future adoption rates. These insights are crucial for policymakers and urban planners in Nigeria. Given the identified trends, it is recommended that investments in PDES be prioritised in areas with growing populations to ensure adequate power supply. Additionally, fostering public-private partnerships could enhance system reliability and efficiency. The maintenance outcome was modelled as  $Y_t = \beta_0 + \beta_1 X_t + u_t + \epsilon_t$ , with robustness checked using heteroskedasticity-consistent errors.

### Keywords:

Nigerian

Geographic

Terms:

Methodological

Qualitative Analysis, Quantitative Analysis, Time-Series Analysis, Forecasting

Terms:

Models

*Theoretical  
System Dynamics, Network Theory, Systems Engineering*

*Terms:*

## 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