Bayesian Hierarchical Model for Measuring Adoption Rates of Power-Distribution Equipment in Kenya

Kibet Cherono[1,2], Turko Kirui[3], Ongala Kiprino[4]

[1] University of Nairobi

[2] Department of Sustainable Systems, Maseno University

[3] Department of Civil Engineering, Technical University of Kenya

[4] Technical University of Kenya

Author notes

Kibet Cherono is affiliated with University of Nairobi and focuses on Engineering research in Africa.

Turko Kirui is affiliated with Department of Civil Engineering, Technical University of Kenya and focuses on Engineering research in Africa.

Ongala Kiprino is affiliated with Technical University of Kenya and focuses on Engineering research in Africa.

Abstract

The adoption rates of power-distribution equipment in Kenya are influenced by a variety of factors including socioeconomic conditions and technological advancements. A Bayesian hierarchical model was employed to analyse data from multiple districts in Kenya. The model accounts for spatial heterogeneity and incorporates district-specific covariates to estimate adoption rates with uncertainty quantification. The analysis revealed significant variation in the adoption rates across different districts, indicating that local conditions play a crucial role in determining equipment uptake. This study demonstrates the effectiveness of Bayesian hierarchical models for assessing the deployment patterns of power-distribution equipment, offering policymakers actionable insights to optimise resource allocation. Policymakers should consider district-specific factors when implementing new power-distribution equipment strategies, thereby enhancing overall adoption rates and efficiency. Bayesian Hierarchical Model, Power-Distribution Equipment, Adoption Rates, Kenya The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Kenya, Bayesian Hierarchical Model, Adoption Rates, Power-Distribution Equipment, Methodological Evaluation, Geographic Analysis, Technological Impact*

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