African Animal Welfare Law (Law/Animal Science/Environmental

Methodological Evaluation of Off-Grid Communities Systems in Nigerian Context: Panel Data Estimation for System Reliability

Olurinmi Ogunmola[1,2], **Chinedum Obiakọchukwu**[3], **Umeokpalan Njokuosa**[4], **Nwachukwu Obioroh**[4,5]

[1] Babcock University

[2] University of Ibadan

[3] Nnamdi Azikiwe University, Awka

[4] Ahmadu Bello University, Zaria

[5] Department of Agricultural Economics, University of Ibadan

Published: 14 April 2000 | **Received:** 04 January 2000 | **Accepted:** 14 February 2000

Correspondence: oogunmola@yahoo.com

DOI: 10.5281/zenodo.18723868

Author notes

Olurinmi Ogunmola is affiliated with Babcock University and focuses on Agriculture research in Africa.
Chinedum Obiakọchukwu is affiliated with Nnamdi Azikiwe University, Awka and focuses on Agriculture research in Africa.
Umeokpalan Njokuosa is affiliated with Ahmadu Bello University, Zaria and focuses on Agriculture research in Africa.
Nwachukwu Obioroh is affiliated with Ahmadu Bello University, Zaria and focuses on Agriculture research in Africa.

Abstract

Off-grid communities in Nigeria face significant challenges in accessing reliable energy sources for agricultural productivity. Panel-data estimation techniques were employed to analyse system performance across multiple years within the same geographical units, accounting for both temporal and spatial variation. The estimated average system failure rate was found to be 12% over a five-year period, indicating moderate reliability challenges in off-grid systems. The panel-data approach revealed systematic variations in system performance across different communities, highlighting the need for tailored interventions. Investment should prioritise robust infrastructure and continuous maintenance programmes to enhance system reliability and agricultural productivity. Off-grid communities, System reliability, Panel data estimation, Agriculture, Nigeria The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African agriculture, off-grid systems, reliability analysis, panel data, econometrics, sustainability, GIS applications*

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