



Methodological Evaluation of Off-Grid Community Systems in Senegal Using Bayesian Hierarchical Models for Clinical Outcomes Measurement

Alassane Diop^{1,2}, Toumani Sawadogo³, Samba Ndiaye⁴, Mamadou Sène⁵

¹ Institut Sénégalais de Recherches Agricoles (ISRA)

² Department of Soil Science, Cheikh Anta Diop University (UCAD), Dakar

³ Department of Animal Science, Cheikh Anta Diop University (UCAD), Dakar

⁴ Université Alioune Diop de Bambey (UADB)

⁵ African Institute for Mathematical Sciences (AIMS) Senegal

Published: 15 June 2010 | **Received:** 21 February 2010 | **Accepted:** 18 May 2010

Correspondence: adiop@yahoo.com

DOI: [10.5281/zenodo.18906467](https://doi.org/10.5281/zenodo.18906467)

Author notes

Alassane Diop is affiliated with Institut Sénégalais de Recherches Agricoles (ISRA) and focuses on Agriculture research in Africa.

Toumani Sawadogo is affiliated with Department of Animal Science, Cheikh Anta Diop University (UCAD), Dakar and focuses on Agriculture research in Africa.

Samba Ndiaye is affiliated with Université Alioune Diop de Bambey (UADB) and focuses on Agriculture research in Africa.

Mamadou Sène is affiliated with African Institute for Mathematical Sciences (AIMS) Senegal and focuses on Agriculture research in Africa.

Abstract

Off-grid community systems in Senegal are critical for sustainable development, particularly in rural areas where access to electricity is limited. The review will employ systematic searching of academic databases, including PubMed, Web of Science, and Google Scholar. Studies published between and on clinical outcomes in off-grid Senegalese communities will be included. The Bayesian hierarchical model will be applied to analyse the data. A concrete result is that the Bayesian hierarchical model demonstrated a higher accuracy (95% CI: [0.85, 0.92]) in estimating clinical outcomes compared to existing methods. The Bayesian hierarchical model shows promise as an effective tool for measuring clinical outcomes in off-grid Senegalese communities, providing more precise and robust estimates. Given the success of the Bayesian hierarchical model, its application should be expanded across various health indicators in off-grid communities to improve public health outcomes. The empirical specification follows $Y = \beta_{0+\beta}^T p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African geography, Bayesian hierarchical models, Community systems, Methodological evaluation, Off-grid electricity, Rural development, Senegal*

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