



Methodological Evaluation of Off-Grid Community Systems in Kenya: Quasi-Experimental Design for Clinical Outcomes Assessment

Kibet Kigen¹, Mwangi Muriuki^{1,2}, Odhiambo Odhiambo³

¹ Maseno University

² Technical University of Kenya

³ Moi University

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Correspondence: kkigen@yahoo.com

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Author notes

Kibet Kigen is affiliated with Maseno University and focuses on Agriculture research in Africa.

Mwangi Muriuki is affiliated with Technical University of Kenya and focuses on Agriculture research in Africa.

Odhiambo Odhiambo is affiliated with Moi University and focuses on Agriculture research in Africa.

Abstract

Off-grid community systems in Kenya are critical for providing reliable electricity to remote areas. A longitudinal study employing a difference-in-differences (DID) regression model with robust standard errors to assess impact across different communities. Initial results suggest an improvement in health metrics by 15% among participants who received off-grid systems compared to control groups, with a 95% confidence interval of [7%, 23%]. The quasi-experimental design successfully mitigates selection bias and confounding variables, providing evidence for the effectiveness of off-grid systems in improving clinical outcomes. Further studies should explore long-term sustainability and cost-effectiveness of these systems. The empirical specification follows $Y = \beta_{0+\beta} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: Kenya, Off-grid Systems, Quasi-experimental, Longitudinal Study, Difference-in-Differences, Regression Analysis, Methodology

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