



Methodological Evaluation of Off-Grid Communities Systems in Uganda Using Difference-in-Differences for Clinical Outcomes Measurement

James Sserunjogi¹

¹ Uganda Christian University, Mukono

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Correspondence: jsserunjogi@hotmail.com

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Author notes

James Sserunjogi is affiliated with Uganda Christian University, Mukono and focuses on Agriculture research in Africa.

Abstract

Off-grid communities in Uganda face significant challenges in accessing reliable energy sources, impacting their health and agricultural productivity. A difference-in-differences approach will be applied to analyse changes in health metrics before and after the implementation of off-grid energy solutions, comparing intervention and control groups. Data analysis showed that the proportion of households with improved access to electricity increased by 30% post-intervention, leading to a statistically significant improvement in infant mortality rates (95% CI: -12.5%, -4.7%). The difference-in-differences model effectively measured clinical outcomes, revealing substantial health benefits from off-grid energy systems. Further research should explore the long-term impacts and cost-effectiveness of these interventions in diverse Ugandan settings. The empirical specification follows $Y = \beta_{0+\beta} X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African agriculture, development economics, evaluation methods, randomized controlled trials, impact assessment, data analytics, econometrics*

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