



Methodological Scrutiny of Off-Grid Community Systems in Uganda: Estimating Cost-Effectiveness Using Panel Data Analysis

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Abstract

Recent studies have identified off-grid community systems in Uganda as pivotal for rural electrification, yet their cost-effectiveness remains a matter of debate. The study employs a fixed effects model to analyse cost and utility metrics across different off-grid communities in Uganda, ensuring robustness through time-series data integration. This study underscores the need for further empirical validation to substantiate these findings and inform policy decisions regarding off-grid energy solutions in Uganda. Future research should incorporate more granular data on community-specific needs and technologies to refine cost-effectiveness estimates. The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: Sub-Saharan, rural electrification, fixed effects, spatial econometrics, stochastic frontier analysis, panel data, cost-benefit analysis

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