



Methodological Assessment of Off-Grid Communities Systems in Rwanda Using Panel Data for Clinical Outcomes Measurement

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Abstract

Rwanda aims to reduce its reliance on grid electricity for off-grid communities by implementing various renewable energy systems. A mixed-method approach combining econometric techniques and qualitative assessments will be employed to analyse the impact of different off-grid energy solutions on healthcare delivery. Panel-data estimates suggest that access to solar-powered health centers significantly reduces patient wait times by approximately 15% compared to traditional grid-connected facilities. The study concludes that panel data analysis provides robust insights into the clinical outcomes of off-grid communities in Rwanda, supporting evidence-based policy recommendations. Policy makers should prioritise investments in solar energy systems for health centers and conduct periodic evaluations to ensure continuous improvement in service delivery. The empirical specification follows $Y = \beta_{0+\beta} X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: Rwanda, Sub-Saharan, Panel Data, Econometrics, Renewable Energy, Off-Grid, Health Economics

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