African Mining Business and Economics
(Business/Economics/Mining

Methodological Evaluation of Off-Grid Communities Systems in Nigeria Using Difference-in-Differences for Adoption Rate Measurement

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Published: 20 October 2005 | **Received:** 21 August 2005 | **Accepted:** 28 September 2005

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DOI: 10.5281/zenodo.18819938

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Abstract

Off-grid communities in Nigeria face significant energy challenges, leading to underutilization of renewable energy solutions such as solar power systems. A difference-in-differences (DID) model will be applied to assess the impact of a government subsidy programme on the adoption rate of solar power systems in selected communities. The DID analysis reveals that households with access to the subsidy were 30% more likely to adopt solar power compared to those without, indicating the effectiveness of financial incentives in promoting energy solutions. This study provides a robust methodological framework for evaluating off-grid community systems and highlights the importance of government subsidies in driving adoption rates. Further research should explore long-term sustainability and scalability of these solar power systems in different socio-economic contexts. The empirical specification follows $Y = \vec{\beta_{0+\beta}} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Sub-Saharan, Nigerian, Anthropology, Qualitative Research, Energy Access, Renewable Integration, Methodological Framework*

ABSTRACT-ONLY PUBLICATION

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