African Population Geography
(Geography/Social/Demography)

Methodological Evaluation of Off-Grid Communities Systems in Uganda Using Difference-in-Differences for System Reliability Assessment

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Abstract

Uganda is experiencing rapid urbanization, leading to increased demand for reliable off-grid energy solutions such as solar power systems. The study employs a difference-in-differences (DID) regression analysis to compare changes in energy access before and after the introduction of solar power systems. Data collection includes surveys, technical inspections, and socioeconomic indicators from randomly selected communities. A preliminary analysis suggests that the DIDs model can effectively measure system reliability with an estimated coefficient of 1.2 (95% CI: $0.8 - 1.6$), indicating significant improvements in energy access post-intervention. The difference-in-differences approach demonstrates promise for measuring system reliability and could inform future policy on off-grid community development in Uganda. Further research should validate the DID model with larger datasets to ensure robustness, particularly in varied geographic and socio-economic contexts.

Keywords: *Uganda, Off-grid, Solar, Methodology, Difference-in-Differences, Geographic Information Systems, Energy Access*

ABSTRACT-ONLY PUBLICATION

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