



# Methodological Assessment of Off-Grid Community Systems in Kenya Using Difference-in-Differences for Yield Improvement Analysis

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## Abstract

The need for off-grid community systems in Kenya is increasing as access to electricity remains uneven across rural areas. A difference-in-differences (DID) regression analysis was employed, incorporating data on community system performance over time. There is evidence of significant yield improvements in communities using the new off-grid systems compared to control areas without such systems. The DID model effectively quantifies yield improvement and can be used as a robust methodology for future studies. Further research should explore the long-term impacts and scalability of these systems. Difference-in-Differences, Off-Grid Systems, Yield Improvement, Kenyan Communities The empirical specification follows  $Y = \beta_{0+\beta} \vec{p} X + \text{varepsilon}$ , and inference is reported with uncertainty-aware statistical criteria.

**Keywords:** Kenya, Off-grid, Community Systems, Methodology, Difference-in-Differences, Energy Access, Rural Electrification

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