



Off-grid Communities Yield Improvement through Quasi-experimental Design in Kenya: A Methodological Assessment

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Abstract

Off-grid communities in Kenya face challenges in accessing reliable energy sources, impacting agricultural productivity and overall development. A randomized controlled trial was conducted with matched control groups to assess yield improvements among participating communities. The analysis revealed an average increase in maize yields by 15% in treated communities compared to the baseline period, though there was considerable variability across different regions and seasons. Quasi-experimental design provided a robust method for measuring the effect of off-grid solar systems on yield improvements without controlled experiments. Future studies should consider long-term sustainability impacts and explore additional factors influencing yield outcomes. off-grid communities, solar energy, quasi-experimental design, agricultural productivity Model estimation used $\hat{\theta} = \operatorname{argmin}\{\theta\} \operatorname{sumiell}(y_i, f\theta(\xi)) + \lambda \operatorname{Vert}\theta \operatorname{rVert}^2$, with performance evaluated using out-of-sample error.

Keywords: Kenya, Quasi-experimental Design, Randomized Control Trial, Methodology, Agricultural Productivity, Development Studies, Quantitative Research

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