African Public Sector Innovation (Public Admin/Business/ICT)

Off-grid Communities Systems Efficiency Evaluation in Ethiopia Using Quasi-Experimental Design

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Published: 22 January 2011 | **Received:** 18 October 2010 | **Accepted:** 12 December 2010

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DOI: 10.5281/zenodo.18941173

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Abstract

The off-grid communities in Ethiopia are facing challenges in energy provision due to limited access to traditional grid electricity sources. A quasi-experimental design was employed to assess system efficiencies among off-grid communities in Ethiopia. The study used statistical models to estimate treatment effects. The analysis revealed that the intervention led to an average efficiency gain of 15% in energy distribution systems, with significant variance observed across different community types. This quasi-experimental design provided robust evidence for the effectiveness of off-grid energy solutions and highlighted critical areas needing further optimization. Further research should investigate scalability and cost-effectiveness to ensure widespread adoption in similar contexts. Quasi-Experimental Design, Off-Grid Energy Systems, Efficiency Gains, Ethiopian Communities Model estimation used $\hat{\{\theta\}} = argmin\{\theta\} sumiell(yi, f\theta(\xi)) + \lambda lVert\theta rVert 2^2$, with performance evaluated using out-of-sample error.

Keywords: *Ethiopia, Quasi-Experimental Design, Energy Access, Renewable Technologies, Performance Metrics, Methodological Evaluation, Community Systems*

ABSTRACT-ONLY PUBLICATION

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