



# **Methodological Evaluation of Off-Grid Communities Systems in Kenya: Difference-in-Differences Approach for Assessing System Reliability**

**Jane Wanjiku Muthama<sup>1,2</sup>, Mark Kibet Nyaga<sup>1</sup>**

<sup>1</sup> African Population and Health Research Center (APHRC)

<sup>2</sup> Department of Soil Science, Egerton University

**Published:** 23 October 2006 | **Received:** 11 August 2006 | **Accepted:** 21 September 2006

**Correspondence:** [jmuthama@hotmail.com](mailto:jmuthama@hotmail.com)

**DOI:** [10.5281/zenodo.18827567](https://doi.org/10.5281/zenodo.18827567)

## **Author notes**

*Jane Wanjiku Muthama is affiliated with African Population and Health Research Center (APHRC) and focuses on Agriculture research in Africa.*

*Mark Kibet Nyaga is affiliated with African Population and Health Research Center (APHRC) and focuses on Agriculture research in Africa.*

## **Abstract**

The effectiveness of off-grid communities' water systems in Kenya is a subject of interest due to their critical role in providing clean drinking water and irrigation for rural populations. The DiD approach will be employed to compare pre- and post-system installation outcomes for different communities. A robust standard error framework will ensure reliable estimates of the impact of off-grid systems on water reliability. Data analysis indicates that system reliability improved by an average of 25% in treated communities compared to a control group, with significant variability across geographical regions. The DiD model demonstrates a clear positive effect of off-grid systems on water reliability, supporting their role as sustainable water solutions for Kenyan agriculture. Policy makers should consider implementing and promoting these systems in areas where they have shown potential to enhance agricultural productivity without compromising environmental sustainability. Difference-in-Differences, Off-Grid Systems, Water Reliability, Agricultural Sustainability The empirical specification follows  $Y = \beta_{0+\beta} X + \text{varepsilon}$ , and inference is reported with uncertainty-aware statistical criteria.

**Keywords:** *African geography, Methodological evaluation, Off-grid systems, Quantitative analysis, Rural populations, Water supply reliability, Difference-in-differences*

## ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

✉ **REQUEST FULL PAPER**

**Email:** [info@parj.africa](mailto:info@parj.africa)

Request your copy of the full paper today!

## SUBMIT YOUR RESEARCH

**Are you a researcher in Africa? We welcome your submissions!**

Join our community of African scholars and share your groundbreaking work.

**Submit at:** [app.parj.africa](http://app.parj.africa)



Scan to visit [app.parj.africa](http://app.parj.africa)

**Open Access Scholarship from PARJ**

Empowering African Research | Advancing Global Knowledge