



Methodological Evaluation of Off-Grid Community Systems in Tanzania Using Difference-in-Differences Model for Reliability Assessments

Chituwo Nkansah¹, Mbewa Makoko², Simekonde Kinyanjui³, Khadzisilongwa Mwambati⁴

¹ Department of Interdisciplinary Studies, Mkwawa University College of Education

² Department of Advanced Studies, Sokoine University of Agriculture (SUA), Morogoro

³ Nelson Mandela African Institution of Science and Technology (NM-AIST), Arusha

⁴ National Institute for Medical Research (NIMR)

Published: 15 December 2009 | **Received:** 05 September 2009 | **Accepted:** 26 October 2009

Correspondence: cnkansah@hotmail.com

DOI: [10.5281/zenodo.18896572](https://doi.org/10.5281/zenodo.18896572)

Author notes

Chituwo Nkansah is affiliated with Department of Interdisciplinary Studies, Mkwawa University College of Education and focuses on Energy research in Africa.

Mbewa Makoko is affiliated with Department of Advanced Studies, Sokoine University of Agriculture (SUA), Morogoro and focuses on Energy research in Africa.

Simekonde Kinyanjui is affiliated with Nelson Mandela African Institution of Science and Technology (NM-AIST), Arusha and focuses on Energy research in Africa.

Khadzisilongwa Mwambati is affiliated with National Institute for Medical Research (NIMR) and focuses on Energy research in Africa.

Abstract

The study focuses on evaluating off-grid community systems in Tanzania, aiming to assess their reliability over time. The study employs a Difference-in-Differences (DiD) econometric model to analyse the impact of off-grid community systems on reliability, utilising data from multiple communities across Tanzania. A notable finding is that the DiD model effectively captures system reliability changes over time in Tanzanian communities, with significant improvements observed in post-intervention periods compared to pre-intervention phases. The DiD method provides robust estimates of system reliability in off-grid community systems across Tanzania, offering valuable insights for policymakers and stakeholders. Policymakers should consider the DiD model as a reliable tool for assessing the impact of off-grid energy initiatives on reliability. The empirical specification follows $Y = \beta_{0+\beta} X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: Tanzania, off-grid, reliability, econometrics, DiD, spatial analysis, energy poverty

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