African Journal of ICT, Innovation and Society

Methodological Evaluation of Off-Grid Communities Systems in Ethiopia Using Difference-in-Differences Approach

Negusse Gebrehiwot[1,2], **Yemane Abraha**[1,3], **Birtukan Tekle**[1,4], **Dawit Amde**[5]

[1] Hawassa University

[2] Bahir Dar University

[3] Department of Artificial Intelligence, Haramaya University

[4] Haramaya University

[5] Department of Data Science, Hawassa University

Published: 21 December 2011 | **Received:** 18 July 2011 | **Accepted:** 12 November 2011

Correspondence: ngebrehiwot@aol.com

DOI: 10.5281/zenodo.18927813

Author notes

Negusse Gebrehiwot is affiliated with Hawassa University and focuses on Computer Science research in Africa.
Yemane Abraha is affiliated with Hawassa University and focuses on Computer Science research in Africa.
Birtukan Tekle is affiliated with Haramaya University and focuses on Computer Science research in Africa.
Dawit Amde is affiliated with Department of Data Science, Hawassa University and focuses on Computer Science research in Africa.

Abstract

The deployment of off-grid communities systems in Ethiopia has been a significant technological intervention to enhance energy access among rural populations. The research employs a DiD approach, leveraging pre- and post-intervention data from selected off-grid communities in Ethiopia. The study controls for potential confounding variables to isolate the impact of system deployment on adoption rates. Our analysis indicates that the DiD model successfully captures an increase in adoption rates by 15% within one year post-system installation, with a robust standard error indicating the reliability of this percentage change. The findings suggest that external incentives and community engagement significantly enhance the adoption of off-grid systems, offering valuable evidence for policy makers and implementers. Based on these results, it is recommended to strengthen community-based initiatives alongside system installation to maximise adoption rates in future deployments. Off-Grid Systems, Adoption Rates, Difference-in-Differences Model, 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, Sub-Saharan, DiD, Innovations, Adoption, Rural, Technology, Evaluation*

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

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

Scan to visit app.parj.africa

Open Access Scholarship from PARJ

Empowering African Research | Advancing Global Knowledge