



Methodological Evaluation of Off-Grid Community Systems in Ethiopian Agriculture,

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Abstract

This study evaluates off-grid community systems in Ethiopian agriculture, focusing on yield improvements over a period of time. Panel-data estimation techniques were employed to analyse the data collected from off-grid community systems in Ethiopia's agricultural sector. A significant proportion (35%) of communities showed improved yield, with an estimated average increase of 12% over a two-year period. The analysis supports the effectiveness of these systems in enhancing agricultural productivity, though variability exists among different regions and community setups. Further research should focus on understanding specific factors contributing to yield improvements and exploring scalability across diverse Ethiopian communities. The empirical specification follows $Y = \beta_{0+\beta} X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African agriculture, panel data, econometrics, sustainable farming, yield gap, off-grid systems, community networks*

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