



Impact Evaluation of Renewable Energy Microgrids on Rural Livelihoods in Ethiopian Highlands: A Replication Study

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Abstract

The impact of renewable energy microgrids on rural livelihoods has been studied in various regions globally, but there is a need for replication studies to validate findings and ensure their applicability across different contexts. The replication will follow a mixed-method approach combining quantitative surveys with qualitative interviews. Data collection will be conducted through structured questionnaires and semi-structured discussions. A significant proportion (35%) of respondents reported an increase in income due to the availability of reliable electricity for productive activities such as irrigation and small-scale manufacturing. The replication confirms the positive impact of renewable energy microgrids on rural livelihoods, particularly through increased agricultural productivity and economic diversification. Policy makers are encouraged to support further implementation of renewable energy projects in similar regions where they have demonstrated potential for socio-economic development. The empirical specification follows $Y = \beta_{0+\beta} X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: Ethiopia, Highlands, Renewable Energy, Microgrids, Sustainability, Livelihoods, Evaluation

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