



# Renewable Energy Microgrids and Livelihoods in Western Ethiopian Villages: A Mixed-Methods Evaluation

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## Abstract

Renewable energy microgrids are increasingly deployed in rural areas to address power shortages and enhance economic development. A mixed-methods study employing both quantitative survey data ( $N = 300$ ) and qualitative interviews ( $n = 25$ ), conducted in 10 randomly selected  $\frac{\text{villages}}{\text{two}}$  years.

Microgrids increased electricity access by 85% compared to pre-intervention levels, with significant improvements noted in agricultural productivity and income generation. Renewable energy microgrids have positively influenced livelihoods through enhanced power supply and economic activities, demonstrating their potential as a sustainable development tool. Policy makers should prioritise investment in renewable energy infrastructure to support rural electrification efforts.

**Keywords:** Ethiopia, Microgrids, Livelihoods, Mixed-Methods, Sustainability, Community, Development

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