



# Microgrids in Indigenous Communities: Feasibility and Impact of Renewable Energy Implementations in Ethiopia's Yucatec Maya Villages

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## Abstract

Microgrids are increasingly being considered as a solution to energy access challenges in remote communities, particularly in indigenous settings where traditional grid integration is impractical or prohibitively expensive. The analysis employs a mixed-methods approach, combining quantitative data from household surveys with qualitative insights gathered through interviews and focus group discussions to evaluate the implementation of renewable energy microgrids. The findings indicate that although initial adoption rates were moderate (around 30% of households using the microgrid systems), there was a significant improvement in electricity reliability, which led to enhanced agricultural productivity and educational opportunities for children. While challenges persist regarding cost recovery and technological maintenance, the preliminary results suggest that renewable energy microgrids can be viable solutions for improving energy access in indigenous communities. Based on the findings, it is recommended that further investment should focus on developing sustainable business models to ensure long-term viability of these projects and addressing community-specific needs.

**Keywords:** *Ethiopia, Indigenous, Microgrids, Renewable Energy, Sustainability, Community Engagement, Participatory Assessment*

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