Renewable Energy Microgrids and Village Livelihoods in Upper Volta Region, Burkina Faso: An Impact Study

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Abstract

Renewable energy microgrids have been implemented in several regions to enhance energy access and sustainability. However, their impact on village-level livelihoods remains underexplored. A mixed-method approach combining surveys and focus group discussions was employed to gather data from 120 households across five villages. Data analysis included descriptive statistics and thematic content analysis. Households that adopted renewable energy microgrids reported a significant increase in IGAs income, with an average growth of 35% compared to pre-microgrid periods (95% confidence interval: 20-48%). The study underscores the positive impact of renewable energy microgrids on village-level livelihoods, particularly in terms of increased agricultural and trading incomes. Policy makers should support further implementation and expansion of these microgrids to maximise their benefits across broader populations. Community education programmes are also recommended to ensure sustainable adoption. The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Sub-Saharan, GIS, SLEAP, HLM, RESS, LDC, WAMS*

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