



Renewable Energy Technologies' Impact on Off-Grid Tanzanian Communities: Access and Productivity Growth Analysis

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Abstract

Renewable energy technologies have become increasingly important in addressing electricity access challenges in off-grid communities worldwide. A mixed-methods approach combining statistical analysis and qualitative interviews was employed to gather data from 150 households across three Tanzanian regions, focusing on solar home systems (SHS) and mini-grids. Electricity access rates increased by 40% among SHS users and by 35% among mini-grid users, with notable improvements in lighting and cooking activities. Renewable energy technologies significantly enhanced household productivity through improved energy efficiency and the introduction of new income-generating activities. Government policies should prioritise investment in renewable energy infrastructure and support for community-led initiatives to accelerate access and adoption.

Keywords: *African contexts, renewable energy, off-grid communities, sustainability studies, mixed methods, productivity growth, electrification models*

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