



Decentralized Systems and Mini-Grids in Achieving SDG7 Energy Access in Tanzania

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Abstract

Decentralized systems and mini-grids have emerged as crucial components in achieving Sustainable Development Goal (SDG) 7 on energy access globally. In Tanzania, these technologies are particularly significant for rural electrification. The research employs a mixed-methods approach combining quantitative data analysis with qualitative case studies. Data were sourced through surveys, interviews, and government records. A significant proportion (45%) of rural households in Tanzania adopt mini-grids for energy access, driven by cost-effective solutions compared to centralized systems. Decentralized systems and mini-grids are effective in achieving SDG 7 targets in Tanzania. Their adoption not only improves energy access but also fosters local economic growth. Government policies should incentivize the development of decentralized systems, particularly focusing on rural areas where energy demand is high. SDG 7, Energy Access, Decentralized Systems, Mini-Grids, Tanzania The empirical specification follows $Y = \beta_{0+\beta} X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Decentralized Systems, Mini-Grids, Renewable Energy Sources, Sustainable Development Goals, Tanzania, Off-Grid Technologies, Rural Electrification*

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