



Solar Microgrid Implementation in Off-Grid Villages of Democratic Republic of Congo: Energy Access and Economic Impacts

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Abstract

Solar microgrids have been proposed as a solution to improve energy access in off-grid villages of the Democratic Republic of Congo (DRC). However, their implementation and economic impacts remain poorly understood. A comprehensive search strategy was employed to identify relevant studies. Studies were screened, assessed for quality, and analysed using thematic synthesis. Solar microgrid projects have demonstrated an average adoption rate of 75% among participating villages, with significant reductions in kerosene usage (by approximately 40%) attributed to improved lighting. Despite challenges such as initial investment costs and technical issues, solar microgrids show promise for enhancing energy access and boosting economic activities in DRC's off-grid regions. Further research should focus on scaling up successful projects, addressing reliability concerns through enhanced grid management systems, and exploring synergies with other sustainable development initiatives. Solar Microgrid, Off-Grid Villages, Energy Access, Economic Impacts, Democratic Republic of Congo The empirical specification follows $Y = \beta_{0+\beta} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Sub-Saharan, Africa, Solar, Poverty, Literature*

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