Community Acceptance and Technological Adoption of Renewable Energy in Off-Grid South African Cities: Impacts on Household Power Supply

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Abstract

This study examines the community acceptance of renewable energy technologies in off-grid South African cities, focusing on their impact on household power supply. A mixed-methods approach combining quantitative surveys with qualitative interviews was employed to gather data from 300 households across five off-grid cities in South Africa. Community acceptance varied significantly, with a majority (65%) expressing willingness to adopt solar energy systems. A regression analysis revealed that this acceptance positively correlated with improved household power supply reliability by an average of 21%. Findings suggest that targeted community engagement strategies are essential for successful renewable energy adoption in off-grid South African cities, particularly those focusing on education and empowerment programmes. Policy recommendations include enhancing educational outreach initiatives and providing financial incentives to encourage greater participation in renewable energy projects. The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

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