



Solar Energy and Rural Water Supply: A Cost Efficiency Analysis of Community-Owned Systems in South Africa,

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Abstract

This study examines the cost efficiency of community-owned solar energy systems for rural water supply in South Africa. The research employs a qualitative approach involving interviews with local stakeholders and documentation analysis. Data was collected from multiple rural areas in South Africa over two years. A notable finding is that community-led solar water supply systems achieved cost efficiencies by reducing reliance on traditional water sources, thereby improving access to clean water at lower costs compared to conventional methods. The study concludes that community-owned solar energy systems can be a viable and sustainable solution for rural water supply in South Africa, offering significant economic benefits. Local governments are recommended to support the implementation of more such projects by providing incentives and technical assistance. Community engagement is emphasised as crucial for project success.

Keywords: *Sustainability, Rural Development, Participatory Methods, Case Studies, Energy Poverty, Community Engagement, Solar Photovoltaics*

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