



Adoption Dynamics and Economic Efficiency of Solar-Powered Irrigation Systems among Kenyan Pastoralist Communities,

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Abstract

Solar-powered irrigation systems have been introduced to Kenyan pastoralist communities as a sustainable solution for water management in arid regions. A survey research design was employed to gather data from pastoralist households across multiple districts in Kenya. Quantitative analysis using statistical software was conducted to analyse patterns of adoption and economic outcomes associated with the use of solar-powered irrigation systems. The survey revealed that a significant proportion, approximately 42%, of respondents adopted solar-powered irrigation systems over the study period, indicating a growing interest in this technology. Economic efficiency varied significantly across different communities, influenced by factors such as access to credit and local climate conditions. This research underscores the importance of understanding community-specific needs and economic constraints when implementing solar-powered irrigation technologies in pastoralist settings. Policy makers should consider offering subsidies or concessional loans to promote adoption among financially constrained communities, while encouraging further R&D into enhancing system efficiency under varying climatic conditions.

Keywords: *African geography, pastoralism, renewable energy, economic efficiency, technology adoption, sustainability, rural development*

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