



Performance Metrics of Renewable Energy Technologies Amongst Smallholder Farmers in Northern Kenya: An Analysis Over Three Years

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Abstract

Renewable energy technologies have been introduced to support smallholder farmers in Northern Kenya's agricultural productivity. A mixed-methods approach combining surveys, interviews, and case studies was employed to gather data from a diverse sample of smallholder farmers in Northern Kenya. The analysis revealed that solar irrigation systems were adopted by approximately 45% of surveyed households, with significant improvements in crop yields and water management. Renewable energy technologies have shown potential for enhancing agricultural sustainability among smallholder farmers in the region, though challenges related to cost and access remain. Investment in infrastructure development and training programmes should be prioritised to facilitate wider adoption of these technologies by rural communities.

Keywords: *Kenyan, Smallholder Farmers, Renewable Energy, Performance Metrics, Technological Adoption, Case Studies, Mixed Methods*

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