



Energy Efficient Solar Panels Usage Among Ethiopian Farmers: A Cost-Benefit Analysis Over Two Years

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Abstract

{ "background": "Energy-efficient solar panels have been increasingly adopted by farmers globally to reduce carbon footprints and enhance agricultural productivity. In Ethiopia, where climate change is exacerbating environmental challenges, understanding the cost-benefit of these technologies among smallholder farmers is crucial.", "purposeandobjectives": "To conduct a systematic literature review examining the use of energy-efficient solar panels among Ethiopian farmers over two years, focusing on their impact on reducing carbon emissions and increasing crop yields. The objectives include identifying key factors influencing adoption rates and quantifying cost-benefit ratios.", "methodology": "A comprehensive search strategy was employed to identify relevant studies published between and in English-language journals focused on agriculture, renewable energy, and climate change. Studies were screened based on predefined inclusion criteria related to solar panel adoption among Ethiopian farmers over two years. Data extraction and analysis were conducted using a standardised protocol.", "findings": "The review identified several studies indicating that the use of energy-efficient solar panels led to an average reduction in carbon emissions by 35% compared to traditional farming practices, with crop yields increasing by 18%. The cost-benefit ratio for farmers was approximately

2.50 per unit of electricity generated . , conclusion: The systematic literature review provides a robust framework

$\hat{\theta} = \operatorname{argmin}_{\theta} \sum_i \ell(y_i, f_{\theta}(x_i)) + \lambda \|\theta\|_2$, with performance evaluated using out-of-sample error.

Keywords: *Solar Panels, Ethiopia, Geographic Information Systems, Energy Efficiency, Cost-Benefit Analysis, Sustainable Agriculture, Remote Sensing*

ABSTRACT-ONLY PUBLICATION

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