African Population Geography
(Geography/Social/Demography)

Solar-Powered Irrigation Adoption in Ethiopian Highlands Farmers: A Three-Year Comparative Analysis

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Abstract

Solar-powered irrigation systems are increasingly being adopted by farmers in the Ethiopian Highlands to address water scarcity and climate variability. A mixed-methods approach combining quantitative surveys with qualitative interviews was employed to gather data from 200 randomly selected farmers in three different regions. The analysis revealed that the adoption rate varied significantly across the study areas, ranging from 35% to 65%, with a higher proportion of younger and more educated farmers adopting solar-powered irrigation systems compared to older generations or less educated individuals. Solar-powered irrigation has shown promise in improving agricultural productivity and sustainability in the Ethiopian Highlands, though adoption rates and benefits vary by farmer characteristics and geographical context. Further research should focus on developing targeted interventions to enhance solar-powered irrigation adoption among farmers with lower levels of technology and education. Solar Irrigation Adoption, Ethiopian Highlands, Farmer Characteristics, Agricultural Productivity The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Ethiopia, Highlands, Photovoltaics, Sustainable Agriculture, Climate Change Adaptation, Participatory Research, Case Studies*

ABSTRACT-ONLY PUBLICATION

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