



Solar-Powered Irrigation Adoption and Agricultural Productivity Nexus in Northern Nigerian Villages: A Theoretical Framework

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Published: 10 June 2010 | **Received:** 31 January 2010 | **Accepted:** 15 April 2010

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DOI: [10.5281/zenodo.18916185](https://doi.org/10.5281/zenodo.18916185)

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Abstract

Solar-powered irrigation systems have gained traction as a sustainable solution for agricultural productivity in developing regions, particularly in arid and semi-arid areas where traditional water management practices are insufficient. The study will employ a mixed-methods approach combining econometric analysis with qualitative case studies to investigate the socio-economic drivers influencing the uptake of solar irrigation technologies. This theoretical framework underscores the potential of solar-powered irrigation as a viable strategy for enhancing agricultural sustainability in northern Nigerian communities. Future research should focus on scaling up successful pilot projects and exploring policy mechanisms that can facilitate wider adoption of these technologies.

Keywords: *Sub-Saharan, rural, sustainability, renewable energy, econometric, agroecology, GIS*

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