African Water Resources Management
(Environmental/Earth Science)

Solar-Powered Irrigation and Agricultural Productivity in Mozambique's Western Indian Ocean Islands: A Cost-Benefit Analysis

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Abstract

Solar-powered irrigation systems have shown promise in enhancing agricultural productivity in various regions, particularly for small-scale farmers who lack access to traditional energy sources. A case-study approach was employed, involving surveys and interviews with farmers, as well as data collection from local meteorological stations to evaluate the system's performance under various climatic conditions. In selected regions, solar-powered irrigation systems increased crop yields by an average of 20% compared to traditional methods, particularly in areas with limited access to electricity and water. The findings suggest that solar-powered irrigation can be a viable solution for enhancing agricultural productivity among small farmers in Mozambique's Western Indian Ocean Islands, offering significant economic benefits despite initial costs. Government support should be provided through subsidies or grants to facilitate the adoption of solar-powered irrigation systems by small farmers. Additionally, training programmes on sustainable farming practices and system maintenance are recommended.

Keywords: *Sahelian, GIS, STIR, IRRIS, econometrics, agroecology, participatory rural appraisal*

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