

Caracas Solar Drip Irrigation System





Overview

Smallholder farmers, who hold 84% of the approximately 570 million farms worldwide, are vital stakeholders in the process of sustainable agricultural intensification, but often lack the capital to invest.

What is solar-powered drip irrigation optimal performance model (sdrop)?

The subsystems are highly interdependent during system operation. This paper presents the Solar-Powered Drip Irrigation Optimal Performance model (SDrOP), a holistic model that accurately captures subsystem relationships and employs a particle swarm optimization (PSO) algorithm to produce optimal low-cost, solar-powered drip system designs.

What is a solar-powered drip irrigation system?

Fig. 1. A solar-powered drip irrigation system consists of a power system, a pump, a hydraulic pipe network, and emitters. The subsystems are highly interdependent during system operation.

Can solar-powered drip irrigation reduce the life cycle cost?

Reducing the life cycle cost (LCC) of solar-powered drip irrigation systems could make this technology more accessible, enabling smallholders to increase their household incomes and contribute to greater global food security.

Can analytical insights be applied to low-cost solar-powered drip systems?

Although this paper focuses on a specific case study, the analytical insights can be applied more generally as guidelines for designing and operating low-cost, solar-powered drip systems, which may be of interest to irrigation engineers and researchers globally.



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