Western Sahara solar powered irrigation system in the

Can solar irrigate SSA drylands?
Another study by Xie et al estimates a potential for expanded irrigated area of 6-14 million hain SSA drylands. In parallel,Schmitter et al find that about one fifth of rainfed land in Ethiopia is suitable for solar pump-based irrigation.

Are upfront costs a barrier to a successful solar irrigation system?
As demonstrated by recent research [72,73]and through our business models simulation analysis,upfront costs,capital cost,and private discount rates represent a key barrierfor successful large-scale uptake of decentralized energy infrastructure in the region,including solar irrigation systems.

Does irrigation support smallholder farmers in Sub-Saharan Africa?
YesMethod Screened for originality? Irrespective of water resource abundance,agriculture in sub-Saharan Africa (SSA) is predominantly rainfed. Along with fertilization,irrigation could support smallholder farmers with stabilizing crop yields,increasing incomes,and achieving food security.

Are solar pumps a sustainable exploitation of water sources?
Yet,we find that without strong land and water resources management infrastructure and governance,a widespread deployment of solar pumps may drive an unsustainable exploitationof water sources and reduce environmental flows.

Is solar irrigation feasible in SSA?
To assess the regional economic feasibility of solar irrigation in SSA and inform policymakers and financiers while also evaluating local specificities and differences, it is key to capture the interconnections between the technological, environmental, and the income and food generation potentials of such a technological transition.

Can solar photovoltaic irrigation systems be paid back in 20 years?
Here we devise a spatially explicit integrated modelling framework to show that over one third of unmet crop water requirements of 19 major crops in smallholder cropland of SSA could be supplied with standalone solar photovoltaic (PV) irrigation systems that can be paid back by farmers within 20 years.

FAO"s new analysis, produced in collaboration with the International Water Management Institute (IWMI), provides an innovative solution: leveraging the Sahel"s abundant solar energy to power irrigation systems that can tap ...

With decreasing costs and improved accessibility, solar pumps paired with irrigation kits offer a green energy alternative that can support both crop irrigation and drinking water provision, ultimately strengthening food

security and economic resilience across the Sahel.

In the Sahel, a semi-arid region that is heavily dependent on water resources for agricultural output, solar-powered irrigation has a great deal of promise, according to a ...

Multi-criteria-decision-making approach was employed in a Geographical Information System (GIS) environment to provide spatial information on areas suitable for solar-based irrigation systems. With the limited available data, this study demonstrated, the investment in solar-based irrigation systems brought improvements in enhancing socio ...

In this project, several ways to get irrigation water, drinking water and electricity have been evaluated in the country of Western Sahara. Solar pumps have been proven to be a reliable...

Multi-criteria-decision-making approach was employed in a Geographical Information System (GIS) environment to provide spatial information on areas suitable for solar-based irrigation systems. With the ...

The spatially explicit results of figure 2 allow identification of hotspots of crop evapotranspiration needs and solar pumping infrastructure requirements: among those areas, ...

This work shows that for low heads it is possible to use a photovoltaic water pumping system for small-scale irrigation of crops in Algerian Sahara regions. Thus, the photovoltaic water pumping system could easily cover the daily water needs rates for small-scale irrigation with an area smaller than 2 ha.

Solar-powered irrigation systems A solar-powered irrigation system (SPS) uses solar panels to provide electricity for a pump motor that delivers water either directly into an irrigation system or to an elevated reservoir. For SPSs to be effective, they must have low maintenance requirements while offering maximum reliability and resource ...

The contribution of this project is the design of a medium scale system integrating the most appropriate elements identified by the literature for solar pump irrigation, desalination, and PV solar energy generation in the Western ...

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This study aims at providing a clear overview and analysis of all aspects that will facilitate, challenge and promote the development of the Solar Powered Irrigation System (SPIS) in Libya. Two concept notes are presented to address the implementation of SPIS pilot projects in Brak region and in the coastal strip in Libya.

Western Sahara solar powered irrigation system in the

The spatially explicit results of figure 2 allow identification of hotspots of crop evapotranspiration needs and solar pumping infrastructure requirements: among those areas, large areas in West Africa (28 km 3 yr -1, 5.7 TWh yr -1, and 14 million solar pumps), mostly over Nigeria and over the Sahelian strip; the northern part of Mozambique ...

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