

Solar Powered Irrigation System Training

Sustaining Agriculture with Solar Power through Capacity Building

The Challenge

Despite the pivotal role of agriculture in the Ghanaian economy, farming is predominantly seasonal due to the excessive dependence on rain for agriculture. Coupled with this is the incidental impact of climate change on rainfall variability worsening the situation. This affects the robustness of the agriculture value chain in Ghana. Irrigation as a solution to curb seasonal farming is incumbent on energy however, the availability of grid-based electricity for rural farming is unstable or not even existent. In addition, powering irrigation for all year-round agriculture has been soaring due to increased cost of electricity from the grid or diesel for powering generators. Solar Powered Irrigation System are sustainable and cost-saving alternative. The use of this technology in Ghana is scarce due to lack of expert knowledge in the financing and technical operation.

The Green Peoples Energy Project thus presented the development of Solar Powered Irrigation System (SPIS) Training to build knowledge and technical capacity of experts in financing and operating SPIS.

Our Approach

The project partnered with the University for Development Studies, University of Energy and Natural Resources and Ho Technical University which are versed in the delivery of solar power systems, irrigation, and agricultural mechanization. Jointly with Practica Foundation and MDF West Africa, Local Consultant and the Brew Hammond Energy Centre the universities delivered technical and finance trainings. The Brew Hammond Energy Centre developed the curricular for the training with gender inputs from Abantu for development. The technical training targeted experts in solar and mechanized agriculture, extension officers in the field of irrigation, solar installation, and agricultural engineering. The training delivered a

practical step by step design guide for small-scale and medium sized solar irrigation. It also included a practical guide for the experts to be trained on efficiently sizing Solar Powered Irrigation System and avoid over exploitation of water resources.

The finance training targeted credit officers, finance officers, and agricultural financiers. It provided a theoretical base on the most relevant concepts and space to practice these concepts with help of calculations and case studies. It also included the analyses of economic viability of Solar Powered Irrigation System to professionally assess loan applications.

Both trainings combined in classroom and field work to give an encompassing experience to the participants.



Collaborations

On the backdrop of the SPIS training, experts also received training on the **SPIS Toolbox software** by Water Energy for Food facilitated by the Green People's Energy Ghana. This was delivered through hands-on guidance of the tool to end-users, policymakers, and financiers [Toolbox on Solar Powered Irrigation System](#)



Our Outcomes

- Two practice oriented state-of-the-art curricula for Technical and Finance Training have been developed for training
- Three universities in Ghana with newly incorporated curricula in their capacity development portfolio
- Two training courses for a total 30 trainers and deliver trainings to interested experts
- The training of 230 experts nationwide comprising of:
 - 155 trained technical experts
 - 75 finance experts
 - and 20% female participation representing 47 females in both trainings
- 42 trained SPIS toolbox participants from Ghana, out of which 22 have been certified as SPIS toolbox experts
- Training recipients included students from other African countries such as Rwanda, Cameroon, Tanzania, and the Democratic Republic of the Congo who have utilized the knowledge gained in their home countries.
- Research studies have been carried with the demonstration system in
 - comparative performance of solar and diesel-powered irrigation systems using the solar powered demonstration system
 - Modelling of the solar powered system to remotely irrigate using soil moisture content



With the provision of the Demonstration Site to the Universities, more than 10 Doctoral and Masters students are carrying out research work on sustainable agriculture, efficient water use and improved crop resilience through fertigation and advanced modelling of irrigation systems to remotely irrigate crops.

It is envisioned that Training on Solar Powered Irrigation System should be taken up by government agencies and educational sectors to promote and sustain the uptake of renewable technologies in Agriculture.

Training curricula can be assessed here:

<https://rcees.uenr.edu.gh/spis/>



Project name	Green People’s Energy
Commissioned by	German Federal Ministry for Economic Cooperation and Development (BMZ)
Project region	Ghana
Lead executing agency	Ministry of Energy
Duration	10/2019 – 09/2023

Published by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
Registered offices Bonn and Eschborn, Germany

‘Green People’s Energy’
GIZ Country Office

7 Volta Street | Airport Residential Area
Phone +233 302 760 448

giz-ghana@giz.de
www.giz.de/ghana

As at March 2023
Design GIZ

Photo credits GIZ/Rafael Wiese, Accra
Text Sharon Flora Frimpong, Rafael Wiese
GIZ is responsible for the content of this publication.
In cooperation with Ghana’s Ministry of Energy
On behalf of Federal Ministry for Economic Cooperation and Development (BMZ)

