

The sprinkler irrigation system powered by solar energy

By Elisabeth Kisakye



90% of Mozambican rural population depends on agriculture for their livelihoods. The methods used for cultivation are in most cases rudimentary and do not yield sufficient produce for income generation and subsistence consumption.

UNIDO through the Towards Sustainable Energy for All in Mozambique (TSE4ALLM) project works towards promoting the dissemination of integrated renewable energy systems (RE) in a market-based approach for productive activities in rural areas of Mozambique

SUPERKWICK LDA cultivates a wide range of crops including macadamia, cashew, beans, and vegetables on a 10ha farm in Macia Bilene, in Mozambique. The company received

funds through the BCI SUPER credit line and recently installed a solar system capable of generating 2515W of power to enable the pumping of water for irrigation of macadamia, cashew, rice, bean crops farms

“1 macadamia tree consumes 20 litres of water per day. The installation of the solar-powered submersible water pumps enables sufficient and reliable supply of water all year round” ---Aldo Bauque

In this article Miss Sheila Macia, SUPERKWICK’s field activities’ coordinator explains how the sprinkler irrigation system powered by solar energy is used.

What is the Sprinkler irrigation system?

Sprinkler irrigation is a method of applying irrigation water which is similar to natural rainfall. Water is distributed through a system of pipes usually by pumping. It is then sprayed into the air through sprinklers so that it breaks up into small water drops which fall to the ground.

Sprinklers are small sized emitters that distribute water in the form of rain with a 90% efficiency rate. *“We use the micro-sprinkler irrigation system for irrigating the macadamia plants and this is determined by the hydric needs of each plant, which is 20 litres per day”* Since the system requires high and continuous power supply to enable the pumping of water which is consequently sprayed to the entire field, solar energy was found to be the most efficient and reliable source of energy for this purpose. 1 hectare of macadamia orchard contains 300 trees. The spacing used is 8*4m (8 metres between plants and 4 metres between rows). Each row contains 12 trees and 1 hectare contains 25 rows. The number of rows to be watered varies according to the pressure and slope of the land. But on average at least 6 rows are watered simultaneously

Mounting of the irrigation system using micro sprinklers

The assembling of the system is done according to the orientation of the land as well

as the water source. To assemble the system, pipes, emitters, sprinkler heads, valves, and reduction joints are the materials needed.

Advantages of the sprinkler irrigation system

The Sprinkler Irrigation Systems ensures reliability, uniform distribution of water with high efficiency, high quality, affordability, ease of installation and maximum water saving. Besides, it is affordable and completely easy to set up. There is no need of spending much on labor costs for setting it up. In addition, Soluble fertilizers, herbicides and fungicides can be added in water before distributing to the crops.

What are the challenges of using the sprinkler irrigation system?

Despite the enormous advantages, using the sprinkler irrigation system also comes with some challenges. The initial cost of setting up the system is high, the water must be clean and free of sand, debris and dissolve salts, and, it cannot be used in windy climate. In addition, Fruits/crops/vegetables can be damaged due to excessive water, and requires high and continuous power supply.