

Smallholder Farmer Solar Irrigation

Getting Rid of Petrol Generators for Irrigation

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Introduction

Tanzania depends on agriculture as one of its sources of local and foreign revenues. By the year 2018, Tanzania agricultural sector employed 58% of Tanzanians contributing 28.2% of the national revenue, of which 16.2% came from smallholder agriculture (horticulture), smallholder agriculture growing at 5.8% [Ministry of Agriculture Budget Speech 2020/21].

Climate change has been one of the challenges facing Tanzania agricultural sector. Extended drought is decelerating the scaling up of the agricultural production by smallholder farmers. Few farmers turn to the use of a petrol engine-powered pump. The use of petrol pumps has been damaging the environment as one petrol pump irrigating vegetable farm generates 487KgCO₂ per year per hectare from the use of 210 litters, costing TZS 3,810,000 in a life span of 4 years. This policy brief proposes the introduction of the alternative: a smallholder farmer pump that is powered by solar photovoltaic energy. It costs TZS 4,100,000 in the life span of 20 years.

The Government of Tanzania has the Irrigation Master Plan of 2018 in place. In implementing the Irrigation Master Plan, the government has developed gravity irrigation schemes that resulted in the increase of irrigated land from 461,326 hectares in the year 2015/16 to 694,715 hectares in the year 2019/20 registering an increase of 33.6% [Ministry of Agriculture Budget Speech 2020/21].



Photo by ennos ag



Photo by Futurepump

One of the solar irrigation scheme that has ensured sustainable agriculture production is the avocado farm at Kibidula near Mafinga in Iringa region owned by the Seventh Adventist Day Church.

Why Smallholder Solar Irrigation Pump?

Smallholder farmer solar irrigation pump is an important agricultural implement in smallholder farmer for the following reasons:

- 1.0 It is the technology which is cost effective to the smallholder farmers.
- 2.0 Smallholder solar irrigation pump is much easier for the smallholder. No hassle with petrol supply and frequent maintenance.
- 3.0 It is easy for smallholder farmer to control the water use to avoid resource depletion.
- 4.0 It encourages youth to invest into agriculture as it assures them harvesting more than once in a year.
- 5.0 It is a climate mitigation tool during the extended drought.
- 6.0 It is an irrigation implement that controls soil erosion as water is distributed at low pressure.

Challenges in scaling up the use of smallholder solar irrigation pump

- 1.0 High costs of the purchase of the solar pump. Solar pumps are charged VAT 18% that adds cost limiting the capacity of the smallholder farmer purchasing the solar pump.
- 2.0 Lack of financing scheme dedicated to the solar irrigation systems to support upfront costs.
- 3.0 Lack of technical standards to secure quality products.
- 4.0 Limited awareness on the potentials of smallholder solar irrigation pump.
- 5.0 Limited inclusion of the smallholder solar irrigation pump in the Irrigation Master Plan.

Impacts of scaling up the use of smallholder solar irrigation pump

- 1.0 Climate smart smallholder agriculture eliminating 487KgCO₂/year/hectare
- 2.0 Increased irrigated land and smallholder farmer production beyond 5.8% in five years.
- 3.0 Increased contribution to the national revenue beyond 16.2% in five years.
- 4.0 Increased 600 jobs in five years employed in smallholder agriculture and pump sales.
- 5.0 Increased yield per hectare as smallholder farmers can control moisture for the plants.
- 6.0 Increased smallholder farmer income as production can also be done during dry season.
- 7.0 Reduced operating costs because of not relying on diesel fueled pumps.
- 8.0 Increased security of the pump as it is mobile and it can be locked in-house.



Photo by Futurepump



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Policy recommendations and the way forward

- 1.0 Ministry of Agriculture to recognize smallholder solar irrigation pump as agricultural implement and be granted tax exemption.
- 2.0 Ministry of Agriculture to mainstream smallholder solar irrigation pump as one of the tools to realize Irrigation Master Plan.
- 3.0 Ministry of Agriculture to develop financing scheme through Tanzania Agricultural Development Bank to support smallholder farmers access the solar irrigation pump.
- 4.0 Tanzania Bureau of Standards to develop standards for smallholder solar irrigation pump and enforce quality.
- 5.0 Ministry of Agriculture, agricultural training institutes, and non-state smallholder farmers associations to raise public awareness on the potentials of smallholder farmer solar irrigation pump.

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