Solar irrigation pump

For basic understanding of pumps, solar energy and irrigation



TRAINING MANUAL

PRACTICA FOUNDATION

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Introduction

This training material was developed by Practica Foundation in collaboration with Futurepump to support the training and introduction of the Futurepump SF1. The training has been developed with support from the Netherlands Fellowship Programmes (NFP) from Nuffic and the Dutch Ministry of Foreign Affairs. It is a tailor-Made Training (TMT) that was requested by Solar Development PLC, the future distributor of the Futurepump SF1 in Ethiopia. The developed materials can be used to train potential new distributors in other countries as well. The envisaged duration of the training is 9 days of which 3 days field training; but this can be adjusted according to the identified training need.

The target participants are technicians and marketing staff from local distributors who will advise farmers on the purchase, operation and maintenance of the pumps. This technical and field training guide is part of a larger distributor training package consisting of the following documents:

- **Technical and field training guide**
- Marketing training guide
- Installation and trouble shooting manuals guide.
- Corresponding powerpoint presentations

The Futurepump SF1 is a solar irrigation pump. A solar pump has different characteristics compared to conventional petrol or diesel pumps used for irrigation. From the technical point of view, the most important difference is the amount of water the pumps can provide in a given time period. Farmers with fossil fuel based pumps can pump a lot of water at any given time in the day with a constant discharge rate. Farmers with solar pumps will have to take into account that the output is not constant and that, depending on the need, they may have to pump for much longer.

These characteristics will influence the functioning of an irrigation scheme as a whole. This training manual will explain the basic principles behind the pump and make technicians and farmers aware of the consequences that solar pumping will have on irrigation. The manual will describe the technical, pump related, issues only. Irrigation, however, should be placed in a much wider context including financing, fertilizing, crop selection, local habits & circumstances, labor input, donor support, etcetera to be complete.

The manual consists of three modules:

1. *'Basic Hydraulics and pumps':* the basic principles behind pumping water in general and the working of the Futurepump SF1;
2. *'The sun as a power source'*: this module looks into solar energy as a power input for the pump.
3. *'Solar irrigation':* an explanation of the most common irrigation systems and how the solar pump can be integrated in these systems.

Each module starts with the theory after which an exercise is presented to test the gained knowledge of the participants.

The manual is not exhaustive but focuses on the Futurepump SF1 model. It is meant as a first step to improve the very basic understanding of pumps that is needed for a sustainable introduction of solar irrigation. It allows future retailers and field mechanics to prevent and solve problems based on a more fundamental understanding of the pump and its context.

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