The Sunlight Pump – a Life-Changing Technology

Karin Jeanneret Vezzini
CEO, ennos ag

Karin Imoberdorf
Head Marketing, ennos ag

ennos develops and distributes a highly efficient, portable solar water pump (a surface water pump) for smallholder irrigation and domestic water supply in developing countries. With this innovative product called "sunlight pump", ennos promotes the use of a CO_2-free technology that combines income, productivity and labour-saving benefits, and encourages a more sustainable use of energy and water resources.

Most smallholder farmers in developing countries still rely on traditional low productivity agricultural practices and on rainfall to cultivate their few acres of land. Many of them continue to irrigate small plots by hand. A burden that falls mainly on women and girls. In most cases, women and girls are also responsible for fetching drinking and household water – a task that often entails long and backbreaking walks. Farmers who have access to diesel pumps face the challenge of high operating and maintenance costs of those technologies. Meanwhile prices for PV solar panels have dropped considerably making solar pumps an increasingly attractive option.

Against this backdrop, a research team under the supervision of Prof. Dr. Andrea Vezzini at the Berne University of Applied Sciences (BFH) in Biel/Switzerland started to design a solar pump for the individual use in agricultural irrigation and domestic water supply. In 2006 the Swiss company ennos was founded as a spin-off of BFH. The intensive years of R&D and technical field tests have now resulted in a highly efficient, innovative solar pump called "sunlight pump". The sunlight pump is produced at the facilities of the production and distribution partner Jain Irrigation Systems in India.

The key features of the sunlight pump are that it operates with solar energy only, is easy to install, use and maintain and that after the investment of buying the pump, there are no further operational and almost no maintenance costs. The high-efficiency brushless DC motor was developed by ennos. The sunlight pump can be directly connected to a solar PV panel from 100 to 400 W (depending on the water requirements) or can be operated from a 12- to 36-V battery. One sunlight pump can irrigate up to 5,000 m^2, depending on the crop, soil conditions, weather conditions, etc. Due to the inte-

ennos presents the sunlight pump to farmers in Busia, Uganda (December 2016).

Boys at a water kiosk of Water School Uganda, Busia District, Uganda.

Titus Ndinwa's farm, Kirinyaga County, Kenya

Titus Ndinwa with additional benefits of the solar panel

grated water flow and tank overflow sensor, the operation of the pump system is automated and simple. The pump operates fully automatically.

The following two examples show possible applications:

Supply of water to a drinking water kiosk in Busia, Uganda

Uganda has a lot of lakes and rivers. There is a need for a pump system with a good dynamic head and especially a lift over a certain distance. With the sunlight pump, installed in 2015 on the shore of Lake Victoria in the district of Busia, Uganda, water is pumped with a total head of about 20 metres and over a distance of more than 2 kilometres to Water School Uganda kiosk, where children can get access to clean drinking water for free. Neighbouring communities can obtain water as well at a small fee. Dangerous walks to the lake or physically demanding manual pumping are not necessary anymore and a reduction in waterborne diseases can be observed. Most importantly, the system requires no human input to operate and is self-running.

Irrigation of vegetable plot in Kirinyaga County, Kenya

Titus Ndinwa, in Kirinyaga County, has been using the sunlight pump since February 2015. In general, the maximum suction depth of a surface pump is 7 metres. But the water source of Titus Ndinwa is below those 7 metres. Therefore, he lowered the pump down into the well and is now able to pump water from his source. He is pumping the water into a tank and uses the stored water for irrigation and the household (cleaning, washing, hygiene, etc.) He is sharing the pump with his family members and with neighbours. When not using the solar panels for pumping water, Titus Ndinwa is charging batteries to power other appliances and benefits in the evening of phone charging, lighting, TV and radio.

The users of the sunlight pump generate a better income due to increased productivity and can improve their families' standard of living. Farmers start to understand that irrigation reduces the risk of crop failure and allows food production outside the rainy season. During ennos' recent trip to Uganda, we saw many fields that were dry even though there is a water source next to them. Farmers used to know when the rainy season started and planted their seeds accordingly. With climate change, rain patterns are no longer predictable and the risk of crop failure is very high. Farmers are realizing now that they need to invest into technologies to increase the agricultural productivity – among others into water pumps. Solar systems are very popular today because the costs of PV panels have decreased considerably in the last few years and the advantage of solar pumps – compared to conventional diesel pumps – cause no operational and very low maintenance costs. While the upfront investment for a solar system is higher, the lifetime costs are considerably lower because diesel pumps entail high fuel and maintenance costs.

ennos is very proud to see the positive impact that the sunlight pump has in the regions where it is already used. This Swiss technology changes the life of farmer families in Kenya, Uganda, Honduras, Nicaragua, India and Bangladesh. The sunlight pump truly is a product that serves the needs of the people in developing countries.

Contact
– info@ennos.ch

Infos
– ennos.ch