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This project is implemented by Welthungerhilfe and APT



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SIMBA NEWS FLASH

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Smallholder Drought Mitigation in Gokwe South

The Chifamba family has managed to install a water pumping system to supply water to their drip kit irrigation for Chili production. This is one of the success stories of the SIMBA program in Gokwe South district. The story of the Chifamba is based on hard work and determination to solve their water problem which had affected their harvest in the preceding season.

The family was able to drill a borehole from the proceeds of last year's chili sales (> USD 3300) and to install a submersible pump powered by a generator to supply water for the irrigation. The funding for this came from a bank loan, the first of its kind in Gokwe south. One of the objectives Welthungerhilfe is to tie small scale farmers into the formal banking system, including access to credit.



A happy Innocent Chifamba. Water is flowing from the solar power – no noise, no more diesel costs!

This set-up, using a diesel generator does however pose several problems and proved to be unsustainable in the future. Firstly diesel is not available anywhere close to the scheme and Innocent Chifamba had to fetch the diesel with a 20 liter jerry can from Gokwe center – more than 3 hours of travel each way for the 80 km trip and USD 10 for each trip!

Secondly, the generator should be serviced every 50 hours of run-time, ideally after every 4 days with the current usage. The technical knowledge and spare parts for a service are also not available in Chisina ward, where the family lives and has their plot.

After drilling the borehole Chifamba had a dream of putting a solar system, which he observed from the previous WHH program which had installed solar water pumps in schools. For more than 5 years the schools have not faced any water problems and the

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solar system haven't broken down. This inspired the Chifamba family to put a solar system, but they didn't know of how much it cost. They family got a \$2000 loan through a local bank which he used to purchase the tank, piping, generator, cement and diesel and all the money was used up. Thus the dream of having a solar system was crushed and the family was greatly disappointed.

Realizing the effort the family had made WHH SIMBA project staff approached the Welthungerhilfe Head Office (Germany) looking for a grant to make the Chifamba family dream come true. The Welthungerhilfe Germany office moved swiftly and managed to get private donor, who made EURO 3000 available to change the system to a solar powered driven pump. This made the Chifamba family dream come true and it was all smiles after the installation which was done on the 7 of July 2016.

It was decided to use the already installed submersible AC pump and power it using solar panels and a DC to AC inverter. This solution was more cost efficient than the procurement of a dedicated solar pumping system.

Currently the system is able to pump about 15000 liters of water per day, enough the area to be irrigated The family kept on site as a backup measure in case of the necessity to pump more water. Please see pictures below and go to the end of the document for a technical detail of the installation.



Wiring of the solar panels. 6 panels of 250 watts each were connected to create a 1500 watt array running on 48 Volt DC





Connecting the panels to an inverter with build in solar regulator and to 4 back-up batteries.



Everyone worked together as a team to make it happen! (Rodney Mushongachware behind camera)



The entire set up: Chili plants irrigated with a drip kit (front), maize irrigated using a hose-pipe system (top left)



Mr. Chifamba used his own funds to have a stand for the panels welded after installation

Item	Cost (US\$)
6 Panels, 24 Volt, 250 watt	1410
Mecer 3kva, pure sine wave inverter with built-in 50amp MPPT controller.	790
4 x 200 AH sealed AGM batteries	760
Cables, connectors	Donated
1.5 HP submersible pump	Already installed

Calculations:

1500 watts of solar power with a least 5 hours of sunshine: 7500 watts produced – 15% of losses (cabling, higher voltage produced) = daily output of approximately 6,4 kW.

1.5 hp Submersible pump rated to use 1100 watt – actual usage: 1.6 kW which relates to 4 hours of running the pump with the solar panels.

200 Ah of battery power @ 48 V: 9600 watts @ 50% DoD and 15% losses = 4 kW of battery power when fully charged.

For any further information contact: webmaster@gokwe.org