

# Technologies for Self-supply

## Short courses in Malawi

The recently published book “Self-Supply”<sup>1</sup> indicates that over 1 billion people world-wide have Self-supply so water supply for which they paid themselves. Some 80% of all self-supply systems are wells. It is clear that scaling self-supply has a huge potential to help in reaching Sustainable Development Goals for water, poverty and food.

If the cost of technologies like rain water storage, wells and pumps reduces, more families can afford them. This is what the short courses on Self-supply technologies are about: training in and demonstration of a range of improved or new (proven) affordable technologies for wells, hand and solar pumps and household water filters that are affordable for families. The courses will take place in Mzuzu and are organized by the SMART Centre in Malawi in collaboration with EMAS and the SMART Centre Group. The trainings will be given by specialists with long term experience in self-supply including Mr. Wolfgang Buchner (EMAS), Mr. James Mhango (SMART Centre Malawi), Henk Holtslag (SMART Centre Group) and others. Corona related measures will be taken in account. There are 2 courses.

**Course 1: Hands on training in self-supply technologies**

Date: 6 – 17 September 2021

Target group Well drillers, welders, masons, technicians, entrepreneurs, others

**Course 2: Demonstration of self-supply technologies and ideas to scale up**

Date: 21 – 24 September 2021

Target group: WASH program officers of NGOs and governments and those with general interest in approaches that can help to reach SDG6 and water related goals like poverty, food security and employment.



SMART CENTRE IN MZUZU, MALAWI WHERE THE TRAININGS WILL TAKE PLACE

<sup>1</sup> Buy or download from; <https://practicalactionpublishing.com/book/2530/self-supply>

Those interested from Malawi can contact James Mhango at: [jamemhango@gmail.com](mailto:jamemhango@gmail.com)

Those interested from other countries can contact Henk Holtslag at [henkholtslag49@gmail.com](mailto:henkholtslag49@gmail.com)

## Course 1;

### Hands on training in Self-supply technologies

Duration: 10 days

Dates: 6 to 17 September 2021

Fee: 400 US\$

This includes a Covid self-test, manuals, small tools, tea breaks and lunch, transport from Training Centre to possible drilling site, field trip. It excludes accommodation and transport to Mzuzu to be arranged by participants themselves.

#### Content of Course 1;

##### Modules:

1. Wells Hydro geology, Hand dug, Hand drilled wells
2. Pumps Focus on locally produced pumps, solar pumps
3. Storage Recharging groundwater, Storage tanks
4. Treatment Household water filters. Table top models. diatom and membrane filter elements
5. Sanitation Different latrines, Satopan

#### Hands on training in:

- Basic technologies for site selection for wells
- Production of drilling tools for EMAS drilling
- Drilling wells with the EMAS drilling technology.
- Production, installation, maintenance of EMAS pumps
- Making of EMAS underground storage tanks

#### Demonstration of and limited production of technologies like:

- Drilling with SHIPO (jetting, percussion) and Mzuzu drill (augering, bailing)
- Hand pumps for self-supply incl. rope pump models 2, 3, 4, Canzee pump, Mark 5
- Solar pumps models ZLDC, BLDC, Future pump. Cost range 100 - 800 US\$
- Wire brick cement tanks, Calabash tanks, groundwater tube recharge system.
- Assembly and maintenance of household water filters
- Assembly of SaTopan latrines and demonstration of corbelled latrines

## Course 2

### Demonstration of self-supply technologies and ideas to scale up

Duration: 4 days

Dates: 21 to 24 September 2021

Fee: 200 US\$

This includes a Covid self-test, manuals, tea breaks and lunch, transport from training centre to possible drilling site, field trip. It excludes accommodation and transport to Mzuzu to be arranged by participants themselves.

#### Content of course 2;

Information on;

- State of art on self-supply, focus on Africa, examples of social and economic impact
- Concerns on self-supply (water quality, depletion of ground water, etc.) discussion
- Experiences with option to support and scale self-supply in a sustainable way

- The SMART approach, the combination of Market-based, Affordable, Technologies and approaches like Family Based Management, supported Self-supply, Well clubs and Faith & Water.
- Discuss if and how to apply and support self-supply in your situation.

A range of technologies that are fit for self-supply, including field visits

- Rain water harvesting (EMAS underground, Wire brick, Calebash tanks).
- Rain water harvesting, soil conservation (Green roads for water. Deep bed farming)
- Well drilling technologies (EMAS, Mzuzu, SHIPO/rotary jetting),
- Handpumps, locally produced (EMAS, Rope pumps, Canzee, Mark 5)
- Small solar pumps for households and small scale irrigation (range 100 to 800 US\$ incl. panel)
- HWTS (household water treatment and safe storage). Most cost effective options demos of a range of water filters incl. assembly and maintenance

### **Examples of technologies fit for self-supply**

In many situations families can have some kind of self-supply. From roofs rainwater can be collected in storage tanks like **EMAS underground**, **Calebash**, **wire-brick** or **plastic** storage tanks. Options to store rainwater in the ground at the household level include the **Tube recharge** that can store 50 to 200 cubic metres of rainwater in the ground at a cost of 20US\$. In areas without rocks, wells can be dug by hand or with manual drilling. For example **EMAS drilling** can drill as deep as 60 metres deep or more and cost 8 to 12 US\$/meter so a tube well of 20 m deep cost around 180 US\$ including casing and pump and with labor of users. Options like the **SHIPO drill** go to 45 meter deep and **Mzuzu drill** to 20 metres, both drill through stony layers. The Mzuzu drill is so simple that families themselves can drill the well after a short training. **EMAS pumps** have a total head of 40 meters and can pump up to overhead tanks. **Rope pumps** can pump from wells to 35 m deep and give a high pump volume so fit for small scale irrigation. New **solar pumps** of 40 to 100 Watt fit in tube wells (boreholes) of 2 to 4 inch and cost 30 to 80 US\$ excl. panel. For water treatment at the household there are a range of **Table top filters** with **ceramic** and **membrane filter elements** and for sanitation there are **SaTopan latrines**. Almost all options mentioned above can be produced with materials that are available in every country in Africa so knowledge and spares are available and affordable for maintenance.

### **EMAS and SMART Centres**

Both are training centres who train technicians in production of drill sets, pumps etc. and maintenance of pumps and other technologies. Entrepreneurs selling SMARTechs are trained in business skills. There are now EMAS Centres in Bolivia, Sierra Leone and Senegal and SMART Centres in Tanzania, Zambia, Malawi, Mozambique, Ghana and Nicaragua and starting in Ethiopia, Kenya, South Sudan and Niger. Results of these training centres include 100.000 wells drilled manually and over 100.000 EMAS pumps and 15.000 Rope pumps installed. Costs of a Tube well and hand pump with these options range from \$150 to \$1200 depending on depth, soil, and diameter of casing. Over 60% of the rope and EMAS pumps are paid for by families (Self-supply)

Information EMAS see: [https://www.emas-international.de/images/weltweit/Fieldnote\\_2013-04\\_01.pdf](https://www.emas-international.de/images/weltweit/Fieldnote_2013-04_01.pdf)

Information SMART Centres; [www.smartcentregroup.com](http://www.smartcentregroup.com) & [www.smartcentremalawi.com](http://www.smartcentremalawi.com).



**Some technologies fit for self-supply**



EMAS drill



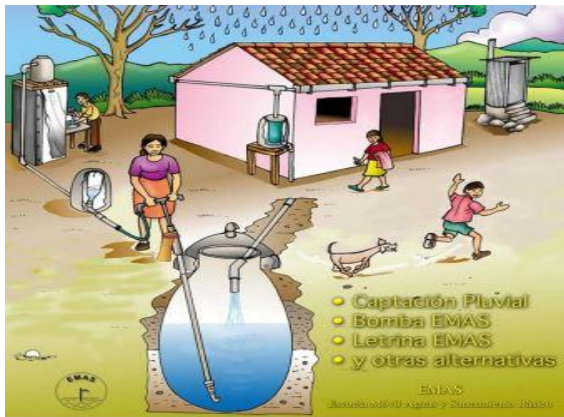
Mzuzu drilling



EMAS Pump



Rope pump model 4



EMAS underground tank



Solar pumps

Information on other affordable technologies see resources on

[www.smartcentregroup.com](http://www.smartcentregroup.com)