

# Water for Usisya, Malawi Final Project Report, September 2013 CCAP

## Context

The Church of Central Africa, Presbyterian (CCAP), Synod of Livingstonia has been implementing the 'Water for Usisya' project in northern Malawi. The project began in 2011 and is now being completed. The objectives of this project were to 'increase health and reduce the number of water borne diseases by means of making new wells, improving existing open wells and the introduction of household water filters'. During the project period, local private sector drillers have gained skills required to run hand-drilling companies, and three of those companies have drilled five boreholes within Usisya. Household water filters have been introduced, and much learning with regards to understanding marketing of filters has been gained. Local entrepreneurs are selling filters, and are also building permanent school filters, of which three of the school filters have been produced at institutions within Usisya. This is a final report on results of the project.

Usisya is an isolated fishing community located about 40 km northeast of Mzuzu, Malawi. It is isolated because it inhabits a delta that has been formed between a very steep rift escarpment and Lake Malawi.



Usisya can only be accessed by a 6 hour boat trip from Nkhata Bay, or by a switch-back dirt road that becomes impassible during the rains and limits the kinds of vehicles that can travel there. Because of its inaccessibility, at the time the project began there were only two boreholes within the Usisya delta. Conventional drilling rigs cannot get to Usisya, so different drilling methods were needed to meet the project objective of new water points. In this way the 'Water for Usisya' project became a driver to establish manual drilling in the area, which in turn led to the June 2012 establishment of the Mzuzu SMART Centre at Mzuzu University ([www.mzuzusmartcentre.com](http://www.mzuzusmartcentre.com)). The Lead Advisor for the Mzuzu SMART Centre, Mr. Henk Holtslag has supported the 'Water for Usisya' project and has brought several training missions during the course of the project.

## Results of Activities

In short the activities of the project resulted in:

1. An estimated 3000 children have safe drinking water at school with water school water Filters of which 3 have now been installed. Children get basic information and learn about maintenance and hygiene aspects
2. Some 100 Siphon and table top water filters have been sold on a commercial base
3. 3500 people gained access to water from improved water sources by means of the manual drilled tube wells in this project or as a direct spin off of this project
4. There is a sustainable supply chain of spares both for Rope pumps and water filters both siphon and table top model so families can buy new parts after the project has stopped.
5. Ideas for payment options for families that want to buy a hand pump or water filter are in an initial phase and will be followed up with the example of the SACCOS project in Tanzania.
6. The access of water nearer to the houses is indeed stimulating productive use and some 15 pumps are already used for small scale irrigation
7. More than 70 wells have been drilled by hand as a result of training that started with this project and that has continued under the supervision of the Mzuzu SMART Centre. Five of these wells have been drilled in Usisya.
8. The first import of water filters for the project started interest in filters and result now is that a commercial supply chain ( J d Gabrielle) started in Malawi which has sold 15.000 filters already.

## Conclusions

1. Although not all targets were reached. it can be said that the project was very productive especially in lessons learned, in the development of manual drilling, in marketing of water filters and pumps and technology
2. As a direct result of this project, the initial ideas and project proposal for the Mzuzu SMART Centre was formulated and the SMART Centre started 1 year ago.
3. As a result of the first trainings in manual drilling and Rope pumps, some private entrepreneurs started their own companies whose products include manual drilling of wells and production of ropepumps. With the follow up training via the SMART Centre this number now has increased to 10 private companies; 8 in drilling and 2 in Rope pumps

## **Additional Information**

### **Manual drilling and Rope pumps**



#### **Staff to SHIPO for training:**

At the start of the project Mr. Easu Mweso, a local fabricator, was trained by Mr. Henk Holtslag to fabricate several models of rope pumps including the wind pump. Mr. Mweso went to Njombe, Tanzania as an exchange visit to produce a set of jigs and pumps for the Mzuzu Smart Centre. Two drillers, Mr. Isaac Mkandawire and Mr. Isaac Nkhoma accompanied Mr. Mweso and received training from both Mr. Walter Mgina and Mr. Laban Kaduma.

#### **External trainers and Follow up:**

Arjen van der Wal taught hydrogeology and drilling standards to the drillers-in-training. Mr. Robert Vuik of Practica came with a project to compare percussion drilling with SHIPO percussion - sludging drilling and also taught drilling standards to the drillers-in-training. Mr. Laban Kaduma of Tanzania has taught on-the-job training during four visits to the North of Malawi. Henk Holtslag has done follow up through the project with regular visits to Mzuzu and the 'Water for Usisya' project with about 3 visits per year.

#### **Drilling in Usisya:**

The 'Water for Usisya' project initially provided two boreholes for drillers-in-training in November and December of 2012. As the drillers have gained knowledge and competence through the year, a second group of drillers has now drilled an additional three institutional boreholes:

1. Nkhutu Primary School (Nov 2012)
2. Well for irrigation farming (Nov 2012)
3. Usisya Health Center (July 2013)
4. Usisya Community Day Secondary School (July 2013)
5. Church of Central Africa, Presbyterian Prayer House (July 2013)

The original four wells were drilled with the 'SHIPO' sludge hand-drilling technique, while the last well was drilled with through a technique called 'Jetting' in which drilling mud is pumped down the same SHIPO drilling equipment as is used for sludging. Jetting can be used in areas that are primarily sands, so is a good technique to use in the sandy soils near the lakeshore. By

using this Jetting drilling method, a hole of 15 meters was drilled in one day, decreasing the time required for sludging to the same depth in the same material by one-half. Not only did the Jetting provide much valuable experience to the drillers-in-training, but because of time and labour reduction, the costs of producing the wells are decreased. The lower prices of the wells can be passed along to the customers, which in turn can improve the marketability of the product for the drilling companies.

Although large crowds gathered to observe the hand-drilling operations, the drilling companies have not yet sold more wells within Usisya. Some initial thoughts as to why individuals are not very interested to buy water pumps and water filters include:

**CASH FLOW:** There are several indicators (such as house structure, prevalence of iron sheet roofing, television dishes) that families in Usisya are more well-to-do than families in many other communities. This may be due to the fishing industry and as well to the large Diaspora of professionals in the cities who consider Usisya to be their home, and support their families at home. Regardless of these indicators that money is present in Usisya, there appears to be minimal cash flow in the area. Stores within Usisya tend to sell essentials at high prices, and try to make their profits by high pricing rather than through volume selling.

**FREE or HEAVILY SUBSIDIZED WATER:** most of the community lives very near the lake, from which their ancestors have been drinking since the establishment of Usisya. There is the attitude of 'It was good enough for grandmother, it must be good enough for me.' The Malawi government also installed the gravity-fed scheme with 82 taps located throughout the Usisya community. A problem there is the management of the system with many public taps dysfunctional and private taps opened within the confines of personal properties. Fee collection is irregular.

**UNFAMILIAR WITH A NEW CONCEPT OF SELF SUPPLY:** Development in Usisya has primarily been attempted through NGO models of providing the poor with what they cannot provide for themselves. The concept of Self-supply is foreign and not yet well understood in the community. More examples are needed

## **Water filters**

The 'Water for Usisya' Project tries to follow the 300-in-6 guidelines of 'No Gifts', and the SMART Centre has brought in marketing expertise to help better understand how the perceived values of the water filters can be increased, and to improve potential customer's understanding of the benefits from the use of a filter. The SMART Centre has been gaining knowledge to be able to balance between the cost of the product and the incentives needed for the vendors with a result of sales of filters increasing. The 'Water for Usisya' project began marketing the filters in Usisya, which has now been recognized to be a very difficult market. Mzuzu University has proven to be a much easier market, with early adaptors purchasing and then convincing their friends to buy. New options of filters such as the 'Table Top' filter and lessons learned from the sales of filters within Mzuzu University and Mzuzu City will increase the possibilities of reaching

a 'critical mass', after which time many more families will want to buy a filter in Mzuzu and eventually Usisya as well.

### **Filter promotion**

Temwa is a local NGO based in Usisya which took the lead in facilitating the filter promotion in primary schools where they were involved in HIV – AIDS prevention work. Ms. Kamini Tavanandi, a volunteer for Temwa utilized Drama for Development in promoting the filters during her work with HIV-AIDS drama productions. Mr. Jumbo Kalua, a Temwa employee, became the lead promoter of the filters upon the departure of Ms. Tavanandi until his departure for school in August 2012. After the departure of Mr. Kalua, Mr. Njiko from the Usisya Health Centre took the lead role for filter promotion. The lack of continuity and follow-up in the promotion of the filters was a hindrance to their acceptance within the schools and the community.

### **Filters in private markets**

This work was to be an extension of the stores that already sold Water Guard and Water Guard wa Ufa (PUR) to sell replacement filters. As the market for filters has yet to be established in Usisya, wholesaling replacement filters to HWTS providers has not taken place to date.

### **School filters**



The first attempts at school filters required a staff member to be responsible to ensure that the school Environmental Club members would fill and maintain the water filters. The first filters were installed in buckets with taps. Because of the value of the buckets, they had to be locked after school and set out during the day. It was found that this system does not work in the primary schools, therefore evoking the change to the permanent cement-tank school filter.

In the cement tank school filter design, taps are placed low in order that children will refrain from drinking directly from the tap, but rather will fill bottles with water for drinking. The children are taught the benefits of safe water and sanitation through the Environmental Clubs and are encouraged to take their bottles of safe water home with them. Now School filters are being produced at a cost of \$300 with 5 Tulip siphon filters and are being improved with filter. Three are produced at Usisya at Nkhutu Primary School, Usisya Health Centre and Usisya Community Day Secondary School.

The filters have been built at institutions where hand-drilled wells have been made, but which are also sites that have taps from the gravity scheme. The filters are positioned so that water can be filtered from either source. Pipes from the gravity system have been connected to the school filters so that the gravity fed water can be filtered before consumption.

### **Relevant developments occurring during project period**

During the period of the project several changes and developments took place affecting the water situation in Usisya;

- The late 2012 drying of the river source for the gravity-fed scheme. As an emergency measure, water was pumped from the lake to the distribution reservoir. This has increased the awareness amongst the community that alternative water sources will be required in the near future
- The removal of the USAID subsidy from WaterGuard tripling the cost of WaterGuard
- Inflation since the commencement of the project in 2011 has changed the original price of the filter of MK 1,500 (\$10) to today's price of MK 4000 (\$11)
- Introduction of a new filter model **Table top** which is simpler and more attractive
- Upgrading of the gravity-fed scheme with the construction of a roughing filter and a slow sand filter before the water flows to the distribution reservoir. The government has been promoting that the slow-sand filter will purify the water, which will affect the promotion of HWTS.
- The District Water Office suggesting adding a flocculation tank and chlorination station after the distribution reservoir such that water from both the stream source of the gravity system or the lake could be chlorinated before distribution to the taps. This has not been approved by the government to date.

### **Challenges:**

- **Economic:** A government austerity programme increased taxes on almost all items, increasing costs for Self-supply items such as drilling and filters. The government has changed from a fixed exchange rate to the US Dollar to a much more realistic floating exchange rate, however costs relative to hard currencies now vary as much as 20% during the year.
- **Personnel:** Changes in the coordinator's position occurred too frequently. We will be meeting with the community and the Water and Sanitation sector to improve this situation for future work.
- **Accessibility:** Difficulties in monitoring due to road conditions during the rains, and sea conditions during the cooler dry season.