Usisya Water Project Progress Update
August 2012

Jim McGill, CCAP

Proj Ref: S11008

New developments since the March 2012 report:

General information

Economic Changes and Fuel Availability

Since the time of the last report, a new President and a different government are in place in Malawi. This has improved the economic atmosphere in the country and is assists project implementation. Fuel shortages that have been relieved but not entirely alleviated.

Filter activities

School identified for trial of 100% filter coverage

Following the study of Joe Brown regarding DALYs averted vs. adherence to purification discussed in the March report, the Usisya Full Primary School was chosen as a trial school for 100% filter coverage for pupils. 735 pupils from 294 households and 9 villages attend the Usisya F.P. School. These 9 villages have only 2 functional protected shallow wells such that most of the households use water from the lake, unprotected shallow wells and gravity fed taps. We are proposing that the 294 households participate in a filter programme and measure health impact on a community with 100% coverage of filters. Regarding the schools that received filters, two schools were visited by J. mc Gill and H. Holtslag. It appeared that more follow up is needed to guide the schools and teachers on how to use the filters. This will get attention in the coming period.

The coordinator of the programme in Usisya, Mr. Jumbo Kalua has resigned from TEMWA to return to school. A new coordinator must be identified and contracted to continue the work with the Usisya community.

National Household Water Treatment and Storage Policy for Malawi

The Malawi Government committed itself to a National Action Plan for Household Water Treatment and Storage (HWTS) at a regional meeting held in Maputo, Mozambique in June of this year. As part of that plan, Mr. Ryan Rowe of the International Network on Household Water Treatment and Safe Storage was contracted through support from 300in6 and Aqua for All to develop a Desk Study for the Malawi HWTS Strategy. This Desk Study has produced the following vision statement: The vision of the government is to ensure universal access to safe drinking water at the household level by 2018. The Government has made its objective to increase the proportion of the population in need practicing HWTS from 32 percent to 70 percent by 2018.

The range of HWTS products that are certified and available in Malawi is being expanded to include various filters including the Tulip filter, chlorine and chlorine dioxide and colloidal silver products. These products are being marketed and sold through the building up of private sector, which is performing social marketing to understand how to

increase usage of the HTWS products. One innovation that has developed through social marketing is the TableTop filter that uses the Tulip filter element in a small filter system that can be set on a table. Another innovation from Usisya was using clay pots instead of plastic buckets. The clay pots are traditionally known to cool water and are preferred for drinking water.

The CCAP has been able to participate in the national HWTS policy discussions because of its experiences in HWTS in the Usisya project. The lessons learned from Usisya as well as the use of the Tulip filter has been an important contribution to Government of Malawi's formation of it HWTS policies.

Rehabilitation of the existing gravity-fed system. Water problems

The government has obtained a grant from World Bank to rehabilitate and finish the Usisya gravity water system through the provision of roughing and slow sand filtration. The grant will also provide for implementation of another gravity-fed system north of Usisya proper. This has significantly diverted attention for filters as people have high expectations and feel that free safe water is coming soon. Therefore the marketing strategies for safe water in Usisya need to be adapted to include these changes in the supply of safe water to Usisya. Recently there is news that the water gravity scheme does not deliver water because of the drought and people go back to the habit of taking water from the lake. This water is however strongly contaminated and cases of dysentry are increasing. In the coming period we will see if Siphon water filters can by used to reduce these problems. One option seems to install filters on a loan base to some families. Filtered water can be stored in containers and people can buy filtered water.

Pumps and wells activities

Drilling Programme

Some of the wells drilled by the new companies have been in soil conditions similar to the Usisya soils, such that the companies are now more prepared to drill in Usisya. Wells or manual drilled bore holes and pumps were one of the original objectives in the project and in the coming period we will go on with the implementation.

Smart Centre

After the preparing period the Smart Centre now has been established in June 2012 at Mzuzu University which will complement the existing Centre of Excellence for Water

and Sanitation of Mzuzu University. The Smart Centre in Mzuzu is a new addition to a network of several Smart Centres in Southern and Eastern Africa, and will focus on building 'self-supply' of water and sanitation through training and promotion of low-cost WASH solutions. Smart Centres support to NGOs and local private sector like well diggers and welders by the teaching of state-of-the-art technologies that improve their skills and increase the range of products they are able to provide. The Centre also teaches business skills and provides links to support the business aspects of their services. The Centre also starts to work with micro-financing and loan organizations to establish packages for both service providers and clients that improves the financial strength of the providers and opens the market to clients who would otherwise be unable to purchase services.

One 'in-house' training of hand-drilling companies and fabricators has taken place at the Smart Centre in Mzuzu with drill trainer Mr Nkoma and Rope pump trainer mr Mweso, Both were trained in January at the SHIPO Smart centre in Tanzania. Both In Tanzania and in Malawi the training was supervised by Henk Holtslag. A new training programme is currently underway in which six hand-drilling companies have been contracted by customers who are all located within a 10 km radius such that all companies are able to witness the siting of each well location, the problems incurred at each borehole, as well as the finishing of each well. This model of training will be replicated in the future so that the drilling companies are able to gain experience of six boreholes in the timeframe of the production of one well.

Support

It is noted that the establishment of the Smart center was made possible because of the support of the Arrakis funded project . The activities planned for the Smart centre are based on the experiences during the first part of this project. Therefore CCAP , the CoE centre of exellence of the Mzuzu university and the organisation SWI are grateful for the support provided by Arrakis and its donor Aqua 4 all.

Usisya Water Project Report
March 2011
Jim McGill, CCAP

Context
Safe and clean water is one of the highest priorities for the Usisya community. The community in Usisya has long been aware that drinking water from the gravity scheme taps as well as from the Lake causes illnesses and diarrheal diseases. However, similarly to many people around the world, the people of Usisya are as of yet unwilling to either pay the costs and to establish the daily routines related to the purification of the existing water sources and have difficulty in financing repairs to safe water supply systems. The focus of this programme is on increasing the perceived value of safe water within the community, such that people are able to make the availability of safe water a financial priority within their daily lives – which can be considered to be more of a long term behavioral change rather than purely a change brought about through increased awareness and education.

Objective
The original objective in the programme was stated to improve the health of the people within the Usisya community 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.

Activities
Drilling, Rope pumps
Since the start of the project there have been several drilling trainings and a short rope pump training in Mzuzu. Mr Laban Kaduma came to Mzuzu to train in hand-drilling from the Southern HIghlands Participatory Organization (SHIPO) based in Njombe, Tanzania., Mar. Laban trained using the so called Baptist method and drilled boreholes in semi hard soils. The geography of Usisya is a sandy delta and drilling in Usisya did not yet take place since more training is needed to drill in these specific soft soils. Also there were and are serious fuel problems and combined with a rough and often impassable road the transport of drill tools and teams was complicated. When the economic situation in Malawi has stabilised, drilling of boreholes will be planned.
In February two persons form Mzuzu, Mr Isaac Nkhoma, a driller, and Mr Esau Mweso, a welder, went to Tanzania to participate in a drilling and welding training for 3 weeks. These skills will be very useful for the drilling and pump production in Malawi
Results of the drilling and rope pump training are

- 1 complete drill set Baptist drill set produced
- 2 boreholes drilled
- 2 Rope pumps installed at the welders workshop, one communal model and also one family model
- 1 cement well cover produced and installed with pump
- 1 Rope pump mounted on a demonstration drum
- 6 drillers received first training in Baptist drilling
- 4 welders received training in producing rope pumps and use of jigs

Water filters
The project focus has been on water filters since water from the gravity system in Usisya is very contaminated. Water can be treated at the household level with Tulip water filters. Waterguard is presented as another option, but lack of use after long-term availability and promotion of the product indicates that other interventions are also needed to solve the water contamination problems.
The interventions have taken place through the Church of Central Africa, Presbyterian (CCAP) taking a coordinating role in partnering with both the Malawi Government run Usisya Health

Centre and the Non-Governmental Organisation (NGO) Temwa which is focusing on sustainable development issues in the Usisya catchment area. Over the past year, four local coordinators have worked on the programme:

- Ms. Bonnie Harvey, United States Peace Corps Volunteer, supporting the Usisya Health Centre and the Usisya community focusing on water and sanitation issues through March 2011
- Sara Ebbinghaus, United Kingdom Gap Year Student, working through both the Usisya Health Centre and Temwa July – August 2011
- Kamini Tavanandi, an English drama specialist, has been volunteering with Temwa for several months using the "forum theatre" technique to educate schools and communities about AIDS and associated issues September 2011 – January 2012
- Junior Jumbo Kalua, employee of Temwa also focusing on water and sanitation issues February 2012 – present

There has been a high turn-over in local coordination; however the interests and talents of each of these coordinators have brought several benefits to the programme. In January 2012, Mr. Henk Holtslag and Mr. Jim McGill met with the director of Temwa, and were reassured of the complete support for the programme. Part of this support is an official secondment of a Temwa employee Mr. Jumbo Kalua as the local coordinator of the programme as a part of his job responsibilities.

Schools

The introduction of filters in schools began with four focus schools within Usisya proper through an expansion of existing AIDS Action Clubs with water and sanitation activities. Water filters sets (consisting of 2 filters, buckets and taps) were distributed to the schools via the AIDS Action clubs who are responsible for training the schools and community in health issues with particular attention drawn to those health issues related to HIV/AIDS, water and sanitation. The clubs consist of 25/30 selected students from age 13 - 19. These clubs have a 'patron' teacher who oversees and supports their activities. They meet weekly to discuss and train on issues of HIV/AIDS, devise dramas for the community and raise funds for schools and club activities. The clubs were trained by Ms. Tavanandi in conjunction with Temwa on safe water practices and use of filters, HIV/AIDS, leadership and communication skills, forum theatre/drama techniques and working in a team. These clubs are now responsible for training the rest of the schools and the community in safe water practices and they are also responsible for installing, maintaining and safeguarding them. They with their patron and the other teachers will decide the best places for future water interventions.

After this introduction the interventions were expanded to 13 schools that are located within a day's going and return walking distance. Expansion to additional schools within the catchment area has been restricted due to the availability of fuel.

Results of these interventions:

- 17 schools have been trained and filter sets distributed and installed in these schools. The 4 schools in Usisya proper have one in each classroom and the other schools have one set for each school. In total 38 sets with two filters per set have so far been distributed totalling 76 filters being used. Two filters are used in each set in order to double the output of each water station to meet the high demands a school break times and arrival and departure times. 5 patrons (from 5 of the focus schools) also were given filters as incentive to spread the message to other teachers and encourage sales in school and ensure the children are drinking safe water. Altogether 81 filters have been distributed.
- All students and teachers are drinking water from the filter sets in the classrooms. Some are taking water home in bottles. On average the pupils in primary schools are drinking 40 litres per classroom per day and the secondary schools 20 litres per classroom per day. However they would be drinking more if there were more sets available for the large number of children.

- The AIDS Action clubs have taken their responsibilities seriously and are ensuring the filter sets have been installed successfully and are being maintained and cleaned well.

Health Centre

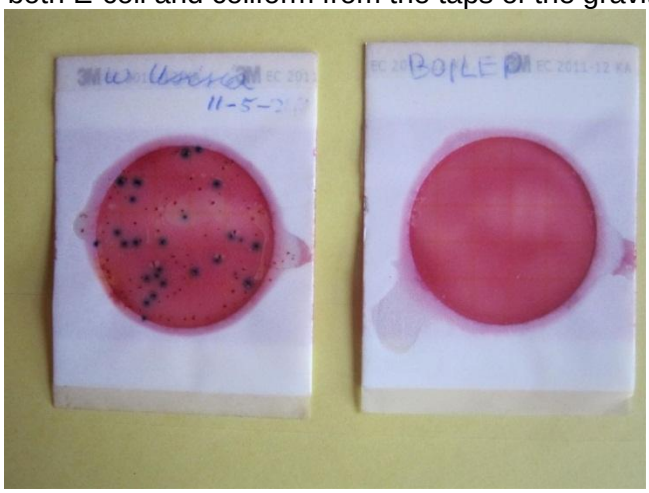
Mr. Matthews Njiko and Mrs. Kayira are Health Surveillance Assistants (HSAs) employed by the government and based at the Usisya Health Centre. They have been demonstrating the tulip filter at Under-five clinics and the Anti-retroviral (ARV) clinics and educating mothers and those attending the clinics that clean water can prevent diarrheal diseases and save the lives of infants and children and those suffering with the HIV virus. Although there is interest in these presentations, simply learning about water-borne diseases does not result in the purchase of filters or changing of behaviours. No filters have been sold at these clinics.

Water Monitoring Assistant

Mr. Angel Simwaka is a Water Monitoring Assistance who is hired under the Ministry of Irrigation and Water Development for the Usisya area, primarily responsible for groundwater borehole and pump repair and not for water quality issues. Although Mr. Simwaka has interest in water quality he is currently not participating in the programme.

Water Quality Testing

The 3M product “Petri film” for testing for E-coli and coliform has been introduced through Mr. Kalua. The Petri-film test is a 1 ml test, so cannot be compared directly to the WHO standards for counts within a 100 ml sample, however it is a good indicator of the levels of contamination. A sample taken by Mr. Henk Holtslag in May of 2010 shown below indicates very high contamination levels of both E-coli and coliform from the taps of the gravity-fed scheme.



Mr. Jumbo Kalua is now performing these Petri-film tests with community members to show them a sample of the contamination levels within their own water sources. The communities know that the water in the taps are unsafe because of history of diarrheal diseases from drinking the water, but also from the fact that water from the tap is much more turbid during the rainy season than during the dry season. Through these tests, Mr. Kalua is able to confirm that clean water does not mean safe water.

Financing

The true cost of the filters after delivery to Usisya is roughly MK 2000 or US$ 13.50. This cost discourages the people of Usisya from buying the filters. Therefore, the programme must continually come up with clever schemes for making financing options available for consumers. One such option is through short-term discounting.

It is expected that if subsidies are used, people will perceive the value of the filters to be much lower than the cost so at all times the real cost of the filter is mentioned. Any time that the perceived value is less than the actual cost of the filters, people will refuse to buy because they feel they are being cheated. Therefore the real price of the filter is being announced as being

MK 2000.00 and the filters are available at price for a limited time, which has corresponded with the duration of the rainy season to be half price, or MK 1000.00 ($6.70). It is known that cholera and water borne diseases are more highly prevalent during the rainy season. It is particularly important to ensure that water is safe during the time that soils are saturated and there are easy pathways from contamination sources to drinking water sources. However, even with this dramatic reduction in price and the knowledge that the rainy season is a time when water-borne diseases are most prevalent, without an actual outbreak of cholera sales of the filters have not been increased.

The Tulip filters have been sold both separately, and as a complete system with an upper 'dirty' water bucket where the filter was placed in untreated water and a lower 'clean' bucket into which the filtered water was siphoned. The lower bucket has a tap so that the filtered water can be obtained without touching the clean bucket. The two buckets with the tap were purchased by the project at about $5 per set, and were resold at MK 1000 or $6.70. Several families bought buckets without the filter, reportedly for use with Water Guard at MK 30 ($0.20) per bottle.

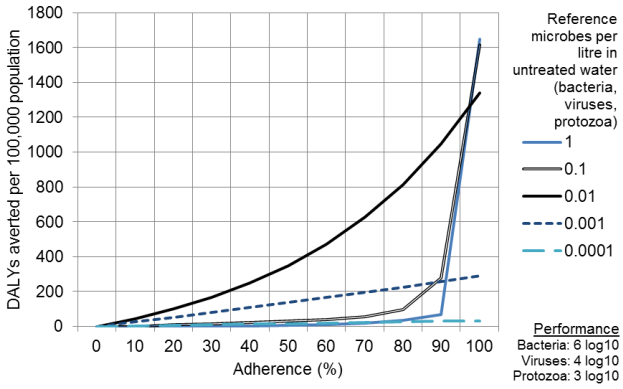
Some individuals have agreed to pay over time through installments to the Temwa administrative office. This programme of payment over time is too new to know if it is indeed an option for payment of the filters.

Adaptation, Creating a Critical Mass

Because of the reasons mentioned above it is proposed to shift the focus of the project to a pilot study that will supply more filters and to help to create a critical mass to see the effects. There are two reasons for creating a 'critical mass' of filter usage in Usisya:

- Health

Research has shown that when the water source of a population is contaminated to levels , greater than 0.1 microbe per liter of water, there must be over 95% adherence to the usage of purification methods in order to have any health benefits from that intervention. In other words, if people are using filters or chlorine every 9 times they drink water, but do not use purified water for the 10th glass, there will be minimal health benefit from that intervention. Therefore, with the contamination levels observed in Usisya, we must be very close to 100% adherence to the use of filters or other water purification methods if we are to see health benefits for the community.



- Acceptablity

The thought is that a critical mass of filters being used within the community is needed to create demand and a sustainable market to ensure that the intervention will continue. Once a critical mass has been established within the community, then behaviors have changed where the intervention has become a critical part of daily life. Until this critical mass has been reached, the intervention is highly unlikely to be able to be maintained.

In looking at the statistics collected in 2010, there are about 1100 households that are served by the gravity-fed scheme.

	Mpata	Njikho	Kamanga	J Kamda	**Total**
Epidemiology					
Total Population	725	860	1473	2741	**5799**
Under 5	115	91	217	396	**819**
Under 1	27	39	67	112	**245**
Total Households (HHs)	145	165	298	473	**1081**
Total Dwelling Houses (DHs)	149	189	316	514	**1168**
Households with access to...					
Boreholes	0	26	100	219	
HH Connection taps	3	5	1	23	
communal taps	143	165	298	473	
Protected Shallow Wells	0	0	141	0	
Protected Springs	20	14	16	290	**2090**
Water Point Committees (WPC)	0	0	13	0	
WPCs trained with CBM & HESP	12	11	13	5	

Over 1100 filters are available and imported before the project started. There some 1000 households in the area that is covered by the gravity scheme. What would the critical mass look like? What kind of subsidy scheme could be established to create a critical mass? Could Usisya be used to create a critical mass that could then be transferred beyond Usisya?

Issues

There were several problems with the filters – primarily, several of the candles became detached from the plastic lids and had to be re-glued. Some of the valves for backwashing broke. These manufacturing issues were recognized by the factory and it has been reported that these quality issues has been addressed and in a next load filters be replaced free of charge.
The lack of fuel has made transport difficult and recent increases in the rate of inflation is having adverse effects upon the programme.

Opportunities

Electricity is now in Usisya, which can assist in all aspects of development.
Churches play a very important role within the Usisya community. The churches and its leaders need to become more involved in the programme and use the churches to promote safe water in Usisya.
Curriculum for both schools and churches should be improved to assist with the in promotion of safe water.
There is a need to recognise and to be clever in these new opportunities.

School Water filters. Malawi 25 Nov 2011

	
Use buckets of 20 or 30 litres. Distance between buckets, should be maximum	Lower bucket at least 20 cm from the ground Lower bucket with two taps (Faucets)
	
Use 2 Tulip filters per system. The filter tap should fit with a tight fit into the lid of the lower bucket. Because of ceramic taste, do not drink the first 20 litres filtered	Teachers and pupils are trained in use maintenance by a trainer. Cleaning of filter in 3 ways **A** Everyday backwash. **B** If flow is low, clean element with brush. **C** If flow is low, scrape element a little with scrub pad