Tweed - Kenya Mentoring Program

Safe Water 3: Water Purification at Ochilo Primary School

Report on Project Delivery, April 2010

Sebastien Garcia-Cuenca

1.0 Introduction

The objective of the Tweed Kenya Mentoring Programs (TKMP) Safewater 3 project was to provide a hygienic drinking water supply to a rural community in Western Kenya.

Following Safewater 1 & 2 undertaken in 2007 and 2008 in the Siaya district of the Nianza province of Kenya, a Safewater 3 project was planned and delivered between mid 2009 and April 2010. Subsequent to community and government representatives' consultation undertaken by Tweed Kenya Mentoring Project (TKMP) Officers in Kenya, the community of Ochilo was determined a suitable location to undertake the project.

Our project aim was achieved by installing 4 SkyJuice™ filters in conjunction with a water pumping and storage facility at Ochilo primary school.

The project was managed by TKMP volunteer and Tweed Shire Council staff member, Sebastien Garcia-Cuenca, who planned and designed the installation and travelled to Kenya in March, April 2010 to deliver and commission the equipment. The essential preliminary work to facilitate the project was undertaken by the TKMP's Kenyan Coordinator, Olita Ogonjo and TKMP Officers, David Opondo and Kori Kinuthia in the months preceding March 2010.

This report includes a description of the project's background, partners, design, budget and outcome as well as a summary of Sebastien's impressions on his journey and the project's delivery. This summary gives a more personal account of the events that shape this safewater project delivery.

2.0 Background

2.1 Mentoring Program

The Tweed Kenya Mentoring Program is a relationship between the Tweed Community in Northern NSW, and a small non-government organisation called Gallamoro Network based in Nairobi, Kenya. The program seeks to increase the capacity of Kenyan communities to access safe water and rehabilitate their environment, through funding and technical exchange. Background on the mentoring program can be found at http://www.tweed.nsw.gov.au/kenya/

2.2 Community Need

Most Kenyans in rural areas have limited access to safe drinking water. Generally, women and children walk for long distances in search of this precious commodity and use it untreated from rivers, lakes and dams. Untreated water is often turbid, and contains disease causing bacteria and pathogens. Water borne disease outbreaks are common in Kenya, particularly cholera, typhoid and dysentery, and this leads to high mortality rates, especially amongst infants.

2.3 Target Community

The Alego area in the southern parts of Siaya district of western Kenya is water stressed. The few rivers in the area have reduced flow due to deforestation, farming

and settlement activity. Wells and boreholes have been sunk by the government, NGOs and individuals, but the water is often high in dissolved salts and unsuitable for human consumption.

As a result, several Yawo (the local name for dam or pan) have been constructed by the government and have become important sources of water for people and cattle. These dams collect surface runoff during the wet season, and are therefore prone to contamination from agricultural and domestic pollution.
Yawo Ochilo was identified and assessed as a potential Safewater project location in November 2008 during the 2nd safe water installation.

The dam is highly silted, lacks protection from stock and receives runoff contaminated by pit latrines and bush toileting. The water is turbid and should not be consumed in its raw state. During the wet season some households in the area take advantage of small scale rainwater harvesting, however this is not reliable or capable of providing a long term supply.

Cattle and people drinking direct from Ochilo Dam

2.3.1 Locality details

- The project site is approximately 12 hours travel west of Nairobi, and approximately 10km (usually by bicycle or walking) from the closest town, which is Siaya.
- The dam is located 14km away from Yawo Gona (TKMP Safewater1 project, 2007), and Yawo Tinga (TKMP Safewater2 project, 2008).
- The dam was dug in 1953 by the then African District Council and desilted in 2002 by the Ministry of Water.
- The dam is in better condition than Tinga, with lower siltation levels due to vegetated silt traps, however no cattle trough present (opportunity).
- Yawo Ochilo has 95,000m^3 capacity.
- The dam serves some 1500 homesteads (or an estimated 24,000 people: based on advice that each homestead has five houses with 5 people at each) in the area surrounding Rabour, Bar Osimbo and Ongaro sub locations.
- There is a committee of 12 members who manage the dam drawn from the villages of Uyema, Ochilo, Rabour, and Twing Wangi. Note that each village has at least one woman representative in the committee.

- The dam is located 200m from Ochilo primary school (500 pupils/ 8 teachers).
- The SW3 plant was built on Ochilo's Primary school grounds, 170m from the dam

2.3.2 Regional Context

The villages west of Siaya town are accessed along a dirt road served by bicycle taxis "boda-boda" and impassable by motor vehicles after heavy rains.

There is little paid employment in this area and the vast majority of people live on less than 1 US dollar a day. HIV/AIDS, is a major issue and there are a large number of orphaned children being cared for by surviving relatives with scarce resources.

Subsistence agriculture is the main activity. Maize and beans are the staple crops and small scale livestock rearing is practiced. Most households have a plot of approximately one acre, with better off families owning several cows, goats or sheep. These animals are grazed on the communal land with uncontrolled access to the dam and its catchment.

2.3.3 Sanitation and health

Most households have rudimentary pit latrines with thatched roofs. There is an insufficient understanding of hygienic behaviour and scarce resources to achieve good hygiene.
As such, many people go to the toilet in the outdoors, amongst fields and scrub. Major water related health problems include typhoid, cholera, eye infections, ring worms (on children's heads), jiggers (parasites infesting feet), sores on the feet and legs and diarrhoea. Poor water related hygiene makes the issue of managing other diseases such as malaria (which is endemic – i.e. if your alive you've survived it at least once…) and HIV/AIDS more difficult.

Health statistics for this area are amongst the worst in Kenya. The Infant Mortality Rate in Siaya District has been estimated at 102/1000 live births as compared to 74/1000 live births nationally. Siaya district's Under-Five Mortality Rate is estimated by Ministry of Health sources to be 210/1000 live births. For comparison, Australias infant mortality rate is 4.5 / 1000 live births.

Ochilo's Primary School latrine

School children at recess collecting water from Yawo Ochilo

3.0 Project Design

3.1 Filtration Equipment - SkyJuice Foundation

The SkyJuice™ Foundation is an Australian non-profit venture that has developed a range of filtration technologies that allow developing communities to access safe potable water.

The SkyJuice™ water filter, or Skyhydrant, uses a Memcor membrane filtration unit. It is intended for use in remote locations or disaster relief applications for production of potable water. It operates under as little as one metre gravity head without the need for an electrical power supply. The Skyhydrant uses microfiltration for primary disinfection and particulate removal.
The internal filter is robust, cleanable and long lasting. All operating and membrane cleaning functions are simple and manual. It provides filtration down to 0.1 microns which is sufficient to separate out virtually all solids and bacteria and significantly reduces virus levels. The Memcor filter consists of banks of vertically suspended tubular filter modules containing thousands of hollow microporous fibers.
Unfiltered water enters the module under low pressure, surrounding the outside surfaces of the fibers.
It passes through the fibers' porous walls, depositing suspended solids and microorganisms on their outside surface. Filtered water flows through the inside of the hollow fibers and exits at each end of the module.

SkyJuice™ – Skyhydrants will prevent enteric diseases and most importantly allow recess time

4.0 Project Partners

This project was made possible due to support from the following people and organisations:

Tweed Shire Council Staff - Kenya Contributions Scheme

- A group of TSC staff members have initiated a voluntary wage deduction for the purposes of assisting the Kenya Mentoring Project. These staff identified the Safewater project as a valuable extension of the Mentoring Program, with tangible outcomes for Kenyan communities. TSC staff also raised an additional $700 immediately prior to Sebs departure, which was used to purchase school material (e.g. Exercises books, pens etc) for the 500 pupils of Ochilo's Primary school.

International River Foundation

- The International River Foundation (IRF) was established in 2003 to advocate the protection and restoration of the world's rivers and waterways. The IRF has been an active supporter and sponsor of TKMP since its creation

SkyJuice Foundation

- See section 2.4. Skyjuice Foundation donated 2 filters for the project and other in-kind assistance. The delivery of this project, as for the other two, has been greatly facilitated by the technology, technical mentoring and financial contribution of the Foundation.

The project was made possible through the ever generous donations and support from the following sponsors and partners:

- Mr Alec Peden and Mr Burt Thiess
- Scandinavian Cone Company (Warren Stratton pictured with white shirt)
- Dickinsons Earth Moving (Jim pictured with blue shirt)
- Crystal Creek Primary School
- Murwillumbah Soccer Club

Jim and Warren are amongst the generous locals

Ochilo's orphans

Ochilo Junior soccer team

5.0 The Outcome

Sebastien Garcia-Cuenca travelled to Kenya from 21 March – 14 April 2010 to complete installation of the safewater project. Filtration equipment had arrived in Kenya one week prior using DHL freight, however due to unforseen clearance/ custom matters it took an additional 7 days and AU$2350 for the equipment to reach Kisumu (the largest town in the vicinity of the project area, approximately 100km from Ochilo).

Educating and organising the community was a large component of the pre-commissioning works and this was undertaken by Olita Ogonjo, coordinator of TKMP in Kenya, and David Opondo, Safewater Officer in Siaya. Despite consultation and community engagement efforts initiated throughout 2009, a dispute involving political antagonists proved a serious challenge to the project. The politicians seeded confusion and division within the community thus preventing the election of a committee to oversee the community's adoption of the project and take control of the facilities maintenance and operation. Upon arrival Sebastian had to pursue further negotiation and consultation in order to demonstrate the intention and good will of TKMP. The community was soon very supportive and work could start again.

Safewater community meeting – Seb is pressing the community to re- mobilise and unite to receive the water filtration system

Prior to the arrival of Seb and the filters, a significant amount of work was required to construct a concrete kiosk in which the filters would be housed. Due to the many challenges occasioned by the local politicians' misinformation campaign, work stoped on numerous occasions, the site was vandalized three times, and equipment including a water tank was stolen. Finally, a court order was unjustly raised by a local councillor, against TKMP Siaya officer (Mr Opondo) and the aspiring councillor supportive of the project. Nevertheless the determination and selflessness of Opondo during this time was fundamental to the ultimate success of the project.

Starting the construction of the kiosk

After a week of work connecting the filters to water tanks, finalising pumping details and on-going negotiation, the safewater project became operational on the 6th of April. Unfortunately two young people from Ochilo (one was a mother of two) died from cholera a few days before commissioning. The project able to supply approximately 20,000l of purified water each day to the community (who come to

collect it from as far as several kilometres walk away) and will assist in the prevention of further incidence of enteric diseases such as Cholera, Typhoid and Dysentery.

The finished product 4 months later

Three local young men who participated in the construction and community engagement have been formally trained to operate and maintain the facility. Despite ongoing governance challenges an interim committee was appointed in order to support the management of the facility.

Ochilo resident and George (in yellow), one of the three operators

A large celebration was held on the 6th of April to launch the project. This was attended by hundreds of locals of all ages as well as government officers and politicians. An overwhelming and sincere expression of gratitude has been sent to all supporters of the Tweed Kenya Mentoring Program and project sponsors by the people of Ochilo.

Ladies fetching the first buckets of safe water for their families (see the emotion of the lady in the background)

6.0 Budget

TKMP SAFE WATER 3 STATEMENT OF INCOME AND EXPENSE 2010

Date	Particulars (income)	Amount Kenyan Shillings*	Date	Particulars(expense)	Amount
8/1/2010	IRF Disbursement - AUD 8,782.00			**Materials**	
		601479.18	23/03/2010	Total Materials purchased	364,933.00
			30/03/2010	Additional materials + 1x tank, pipes and fittings	97875.00
8/3/2010	IRF Disbursement - AUD 6,428.00	432176.00	04/04/10	**Labour** Total labour construction & excavation	153,990.00
				Transport	
			20/03/2010	Taxi to and from airport	6,000.00
			23/03/2010	Total transport	53,355.00
				Accommodation	
			1/2/2010	Pre installation visits accommodation and meals	18,829.00
			30/04/2010	total accommodation and meals 25/03 to 7/04/2010	147009.00
				Miscellaneous	
			19/03/2010	DHL payment	6,775.00
			18/2/2010	Facilitate DC/DO meeting at Ochilo – transport	45,390.00
			14/3/2010	Youth exchange -Tinga & tournament	10,500.00
			15/04/2010	SW3 commissioning	11,240.00
			30/03/2010	Total internet and phone	10151.00
			14/04/2010	Lab testing Kisumu and transport	15,200.00
			1/2/2010	Total stationery, p/copy	10,151.00
				Court Case	
			17/05/2010	court case - lawyer charges	21,000.00
			17/05/2010	Court EIA transport to Kisumu	14800.00
			20/05/2010	court order - Geo consultant- EIA	25,000.00
			24/05/2010	Court case community mob.	32,200.00
			24/05/2010	court case transport	4,300.00
	Total Receipts via IRF to TKMP desk	**1033655.18**		**Total in Kenya expenses**	1,048,698.00
	Australian Dollars	**$15, 200**			**$15, 422**
				Bal C/F	-15042.80 - $222
				Expenses in Australia	
				Airfare, insurance and visa	$ 2762.00
				Immunisations and medicine	$ 317.78
				Tools	$152.38
				Filters + Freight	$ 8921.63
				Import duty	$ 2349.71
				Miscellaneous	$ 209
				Total Australian Expenses	**$14, 712.5**

Total Project Cost AUD **$30, 134.5**

*68 Kenyan Shillings to 1 Australian Dollar

Note that due to unforseen circumstances and events, the project costed an additional $4,282.5. The additional expenditure which resulted from the challenges mentioned earlier in the report included:

- 1 stolen tank: + $600
- Accommodation in Siaya guesthouse (security precaution): + $1500
- Additional import duty raised on filters and soccer/ school uniforms: + $ 2350
- Court case costs: + $1430

In addition to the main budget, $700 was raised by staff to build a urinal for the Ochilo school boys in order to mitigate sanitation, health and gender issues occasioned by unisex pit latrines. Unfortunately, due to time constraints occasioned by the challenges encountered, not enough time was left to build the urinal. We reached agreement with the school committee that the work could be undertaken at a later date. Instead, Seb used $400 to purchase school equipment for the school (500 text books, math kits, drawing kits, rulers, pens and chalk boxes – enough for a few years). Note last year the Kenyan department of education had given 3 exercise books for the whole school.

School committee meeting: Seb showing parents what TSC staff had given for their children

The remaining $300 was committed to setting up a waste collection/ recycling business to be run by the Dagoretti Soccer team. In the Nairobi slums some youth already collect waste that clever business men buy from them for a few Ks before reselling for a profit. $100 was left with the team to build 2 carts for collection and the $200 remaining to be sent later when Seb would receive proof (i.e. pictures of the karts). The $200 will allow for one year's rent of a block of land for waste separation and storage + basic running costs.

A young boy selling plastic bottles to someone who will make profit

6.0 Sebastien's impressions

"Following Safewater 1 & 2 undertaken in 2007 and 2008 in the Siaya district of the Nianza province of Kenya, a Safewater 3 project was planned and delivered between mid 2009 and April 2010. Subsequent to community and government representatives' consultation undertaken by Tweed Kenya Mentoring Project (TKMP) Officers in Kenya, the community of Ochilo was determined a suitable location to undertake the project."

Despite a political duel involving, antagonists to the Ochilo local government chair, the project advanced to a stage where I eventually travelled (21 March) to Kenya to install a water purification plant.

Upon arrival the first challenge awaiting me, Kori and Opondo was to clear from Nairobi Airport Customs materials which had been held at that point for 10 days. It took 4 more days of intense negotiation and the payment of Ks160000 (Au$2350) of additional taxes to clear emergency relief equipment including 4 water filters and second hand school uniforms. The same type of shipment did not attract taxes in the past (Safewater 1 and 2), as emergency relief equipment is waved from Value Added Tax (VAT), import and other various taxes.

On day 3 Kori and I left Nairobi. Opondo had urged the importance of their earliest arrival to unlock the logger-head situation between community needs and officials agendas. After intense negotiation and multiple meetings with local officials - we almost jumped all hurdles - and could finally start working on what brought us to Ochillo: Assembling a water purification plant!

No more troubles? Not this time! Challenges kept coming in the form of vandalism, theft, threats and other kind of intimidation, widely believed to be orchestrated by Local Councillor Rajula Awadhi Owino. As a result of these demonstrations of resistance to the project by some parties, it was decided that there was a security concern thus we decided it was preferable for us to reside in Siaya rather than Ochilo.

On the 2 of April two young people died in Ochilo! They died... of cholera! This enteric disease still exists elsewhere than in history or medical books! With Typhoid and Dysentery, Cholera is endemic to unsafe water and prevalent in rural Kenya like other developing regions of the world. These diseases are treatable however due to the obvious reasons they still claim many lives. A simple plant could prevent this...

Progressively the community joined the project to stand up for their rights, to stand up for their safe water and in spite of the odds (or at least of those who thought they could stop the project)...they... with Georgie, Omondi, Joseph, William, the Leopard, the Chief, Issene and all the people who gave a minute, an hour, a day or their time

and sometimes, fear, away... they did it... they got it assembled... their water purification plant.

On 6 April: “Ochilo fresh” was running! The Safewater 3 plant was formally commissioned by the District Chief and an interim management committee formed with representatives of all user groups was nominated. The committee’s first actions were to approve 3 suggested operators and claim community ownership of the plant. We made it!

Note that despite the obvious success of the project, as well as formal recognition by government representatives a final blow was attempted in the form of a court order against the main project officer. The order initiated by the Councillor (previously mentioned for obstructing the project) claimed that Mr Opondo delivered the project against community will. The judge in charge of the case as since lifted most injunctions and will most probably lift the remainder at the next hearing.

All the above challenges were blessings in disguise as they helped a community that was divided by politicians, to reunite around safe water.

My experience in Kenya with the safewater 3 project showed me that the greatest challenges and endurance for the Kenyan people may not be the lack of safe water or poverty but governance. I found that, for the most part, the government agencies, officers and politicians in charge of development, work in very different ways than to us and the potential for corruption is rife. Unfortunately this seems to be slowing development rather than facilitating it.

Nevertheless the need remains and through the commitment and moral values of a few, community development and self determination can and will prevail. Let’s keep supporting the few in order for them to become many.

Thank you and keep smiling (no reason not to…)