



Tweed - Kenya Mentoring Program

Safe Water 2: Water Purification at Tinga Dam



Report on Project Delivery, November 2008

Tom Alletson

1.0 Introduction

The objective of the Tweed Kenya Mentoring Programs (TKMP) Safewater 2 project was to provide a hygienic drinking water supply for a rural community in Western Kenya.

Our project was achieved by installing 4 SkyJuice™ filters in conjunction with a water pumping and storage facility at Tinga Dam, near the village of Ohaya.

The project was managed by a TKMP volunteer and Tweed Shire Council staff member, Tom Alletson, who planned and designed the installation and travelled to Kenya in November to deliver and commission the equipment. The essential preliminary work to facilitate the project was undertaken by the TKMP's Kenyan Coordinator, Olita Ogonjo, in the months preceding November 2008.

This report is presented in two parts. First, a summary description of the project, and second, an edited account of Tom's time in Kenya in diary form. This second part of the report attempts to give a more colourful account of the people, places and events that shape the safewater 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. 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 The 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 Tinga was identified and assessed as a potential Safewater project location in March 2007 during the 1st TKMP Safewater 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 Tinga 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 serves an area of up to approximately 500 homesteads
- The dam has a 30,000m³ capacity.
- There is a committee of 12 members to manage the dam drawn from the six villages served by 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.

Sanitation – most households have rudimentary pit latrines with thatched roofs. There is an insufficient understanding of hygiene 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 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.



Children collecting water from Yawo Tinga

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 being admired on location, Tinga dam

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 have identified the Safewater project as a valuable extension of the Mentoring Program, with tangible outcomes for Kenyan communities. TSC staff also raised an additional \$1600 immediately prior to Toms departure, which was used for additional 'side projects'.

International River Foundation

- The International Riverfoundation (IRF) was established in 2003 to advocate the protection and restoration of the world's rivers and waterways. The IRF sponsors TKMP to a total of \$20, 000 per year, which assists in the pre-commissioning stage of a Safewater project

SkyJuice Foundation

- See section 2.4 Skyjuice Foundation donated the filters for the project and other in-kind assistance to an equivalent value of \$20, 000

JH Williams and Sons

- Williams are a hardware and rural supplies firm with stores across the northern rivers and on the Gold Coast. They have sponsored the TKMP with \$10, 000 for two consecutive years.

Additional Important Sponsors Include:

- Ian Heans of Heanesbuilt
- Scandinavian Cone Company
- Pottsville Forge
- Dickinsons Earth Moving
- Len and Kay Ball
- Murwillumbah AM and Central Rotary
- Ipswich Rotary
- Coolangatta Tweed Lions Club
- Australian Wetlands
- Tom's friends and family

5.0 The Outcome

Tom Alletson travelled to Kenya from the 6th – 29th of November 2008 to complete installation of the safewater project. Filtration equipment had been transported to Kenya one week previously using DHL freight and was transported directly to Kisumu, the largest town in the vicinity of the project area, approximately 80km from Tinga Dam.

Educating and organising the community was a large component of the pre-commissioning works and this was undertaken by Olita Ogonjo, coordinator of the TKMP, periodically throughout most of 2008. A committee was formed to oversee the communities adoption of the project and take control of the facilities maintenance and operation. The committees membership included village elders, women and youth.



Safewater meeting number 1 – Olita introduces the concept and encourages the community to mobilise and organise themselves to receive a water filtration system.

Prior to the arrival of Tom and the filters, a significant amount of work was required to construct a concrete kiosk in which the filters would be housed. Due to a long period of unseasonal wet weather, and other challenges including fuel shortages in the region, this phase of the project was extremely difficult. Bulk materials including stone blocks, gravel and builders sand was ultimately carried to the site from a stockpile 1 km away by hand and wheel barrow, through thick mud. The determination and leadership shown by Olita during this time was fundamental to the ultimate success of the project.

After a week of work connecting the filters to water tanks and finalising pumping details, the safewater project became operational on the 20th of November. The project is able to supply approximately 20, 000 L of purified water each day to the community, who come to collect it from as far as several kilometres walk away.



The finished product – Tom Alletson at the Tinga Dam Safewater station

A number of locals have been formally trained to operate the facility, and the water management committee is being supported in the long term to operate and maintain the facility.

A large celebration was held on Friday the 21st of November 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 Tinga.



A community elder sampling some safewater minutes after the project became operational.

6.0 Budget

Account 1.

TKMP SAFE WATER 2 STATEMENT OF INCOME AND EXPENSE 08

| Date | Particulars (income) | Amount | Date | Particulars(expense) | Amount |
|-----------|--|-------------------|----------|---|-------------------|
| 19/09/08 | IRF Disbursement - | Kenyan Shillings* | | Materials | Kenyan Shillings* |
| | AUD 9165.31 | 516,226.15 | 7/11/08 | Sand, ballast, wire rods, timber, cement, stones | 185,060.00 |
| | | | 16/11/08 | 1 pc steel door + transport | 15,400.00 |
| 4/11/2008 | IRF Disbursement - | | 7/10/08 | steel rods poles and timbers | 61,000.00 |
| | AUD 6000 | 280,500.00 | | 2pcs w/barrow | 8,500.00 |
| | | | | 4pcs spade | 1,350.00 |
| | | | 20/11/08 | pipes and fittings and tanks | 169,880.00 |
| | | | 12/11/08 | purchase pump | 27,000.00 |
| | | | | safe water 1 pump repair (funds from toms collection) | 2,260.00 |
| | | | 6/11/08 | project fuel and oil | 2,300.00 |
| | | | 15/11/08 | | 472,750.00 |
| | | | | Material Transport | |
| | | | 19/11/08 | Transport stone blocks | 26,400.00 |
| | | | | Labour cost | |
| | | | | Skilled, unskilled labour | 100,050.00 |
| | | | | | 15,000.00 |
| | | | | | 115,050 |
| | | | | Miscellaneous | |
| | | | 30/11/08 | Transport to & from project site | 31,120.00 |
| | | | 5/12/08 | internet, airtime | 5,547.00 |
| | | | 14/11/08 | meals, water & medicine | 12,170.00 |
| | | | 29/11/08 | Accommodation | 23,180.00 |
| | | | | | 72,017.00 |
| | Total Receipts via IRF to TKMP desk | 796,726.15 | | Total in Kenya expenses | 686,217.00 |
| | Australian Dollars | \$15,165 | | | \$13,196 |
| | | | | Bal C/F (to be used on maintenance) | 110,509.15 |
| | | | | Expenses in Australia | |
| | | | | Airfare, insurance and visa | \$2,655 |
| | | | | Immunisations and medicine | \$240 |
| | | | | Filters | \$14,000 |
| | | | | Freight of filters | \$1,600 |
| | | | | Total Australian Expenses | \$18,495 |
| | | | | Total Project Cost AUD | \$31,691 |

*52 Kenyan Shillings to 1 Australian Dollar

The total balance saved from the safe water allocation is Kshs 110, 509. This will be used to maintain the site until the management committee can raise revenue to be self sufficient.

In addition, Tom has handed over a further Kshs 30, 000 (Kubar school rain water tank project) and Kshs 20, 000 (donkeys for youth water supply business).

Tom will also send an additional Kshs 20, 000 (revegetation projects) and Kshs 8736 (additional contribution to Victors medical).

Account 2 – Side Projects and allocations

Immediately prior to leaving Kenya Tom was provided with additional cash funds to allocate at his discretion on individuals or initiatives identified in the field. Money was raised by Tweed Shire Council employees making donations, and through an appeal made by Tom to his friends and family. It was impossible to expend all of these funds wisely over the course of the safewater commissioning, as such some side projects are still to be delivered.

| | Total raised | Initiative funded (see next table for further detail) | Amount |
|----------------------------|---------------------|--|---------------|
| TSC staff donations | \$1636 | | |
| | | (a) Tools for Michah and Oloo | \$385 |
| | | (b) safewater 1 pump repair | \$260 |
| | | (c) fencing around cattle trough | \$246 |
| | | (d) donation to a family | \$58 |
| | | (e) medical expenses for Victor (see diary entry 20 Nov | \$96 |
| | | (f) purchase of donkeys for water delivery scheme (not undertaken as yet – funds held by TKMP desk) | \$385 |
| | | (g) small items for SW2 project | \$38 |
| | | (h) contribution to additional and ongoing medical expenses for Victor (Tom still to transfer funds) | \$168 |
| | | | \$1636 |

| | | | |
|--------------------|---------------|--|---------------|
| Toms appeal | \$1290 | | |
| | | (a) balance of initial medical expenses for Victor | \$326 |
| | | (b) rain water tank project at Kubar School (funds held by TKMP desk, works pending) | \$577 |
| | | (c) nursery and revegetation program (Tom to transfer funds to TKMP desk, works pending) | \$385 |
| | | | \$1288 |

Explanation of the above:

| <i>Tweed donations</i> | <i>Initiative</i> |
|----------------------------------|---|
| (a) Tools for Michah and Oloo | Michael Odour Oyeyo and Henry Oloo Owino are two young men who were employed to help build the water kiosk. They have skills and training as a mason/concreter and carpenter respectively. They are leaders amongst the young men in the community, members of the water management committee and have young families. I decided to buy them tools so they can practice and develop their trade skills. This will allow them to earn money and look after not only their own families, but also increase the capacity of the village to undertake technical work. In return for being supplied with a range of hand tools, both Michah and Oloo have agreed to perform all tasks required to establish the rain water tank at Kubar School. |
| (b) safewater 1 pump repair | Funds used to service the pump from Gona dam at the specific request of a particular donor. |
| (c) fencing around cattle trough | Barbed wire and nails to establish a fence between the cattle trough commissioned through the project and the adjacent farmers maize crop. Use of this trough will begin to reduce cattle impact on Tinga Dam. |
| (d) donation to a family | A cash donation was made to a woman who was a widow and who has two small daughters. This was at the specific request of a particular donor. |

| | |
|---|---|
| (e) medical expenses for Victor | Upon admission to hospital, a deposit of 5000 shillings was required for Victor's medical expenses. See my diary account - Thursday 20 and Saturday 22. |
| (f) purchase of donkeys for water delivery scheme (not undertaken as yet – funds held by TKMP desk) | It may be possible to establish a small youth enterprise in the community by delivering safewater to some families with the desire to pay for this service, and to functions such as weddings and funerals. If this initiative is pursued, donkeys will be used to transport water. |
| (g) small items for SW2 project | Petrol, a jerry can and funnel. |
| (h) additional and ongoing expenses for Victor (Tom to transfer funds) | See my diary Thursday 20 |
| | |
| <i>Toms appeal</i> | <i>Initiatives</i> |
| (a) balance of medical expenses for Victor | See Thursday 20 and Saturday 22 diary entry |
| (b) rain water tank project at Kubar School (funds held by TKMP desk, works pending) | See Thursday 20 diary entry |
| (c) nursery and revegetation program (Tom to transfer funds to TKMP desk, works pending) | The greatest need in the revegetation area is to train participants in indigenous tree seed collection, propagation and establishment. Prior to delivery of such training an appropriate provider needs to be identified and a training event planned. |

Part 2 – Toms Safewater Diary.

This is a day by day account of my trip to Kenya. For some it will be a boring ramble – in which case just be thankful it's a highly shortened version of the ramble I found in my journal when I got home. I had to leave a lot of stories and details out, but hope that if you read what's left, you'll get a sense of what I experienced while travelling and working in Kenya. I have been given an incredible opportunity by the TKMP to have done this work and I am very thankful to all supporters. This initiative is worthwhile and worthy of your long term support.

Its hard to give a quick answer when people ask me, 'how was your trip?'. I have a sense of accomplishment having completed the project, but I have also seen it is a mere drop in the ocean. The need is great and the hardship endured by the people of Tinga seems comprehensive and unrelenting.

I found it fascinating that the English translation of the basic Luo greeting is, "Are you alive?". I am very grateful to the Kenyan staff of the TKMP and the Tinga community for looking after me with such genuine warmth and care, and for showing me what life is really like.

6 November

Departing from Brisbane. Saying goodbye to the girls was hard, but it was a great relief to get checked in and get on the plane, despite a moment of stress when the check in lady asked if I had packed my bags myself. I remembered I had over 10 kg of second hand soccer jerseys and balls in a bag packed by a friend which I hadn't even looked at...so I just nodded and hoped there would be no Shappelle style surprises.

The feeling of finally taking off on this trip was quite bizarre. It had been a year in the planning, but then it actually sunk in... what I was off to do – to set up a water purification system for 1000 people in the poorest part of western Kenya. My only previous attempt at plumbing was replacing a bathroom basin, and it took me three weeks. It seemed bizarre, completely different to my existing swag of overseas trips which were always all about me having a good time. I knew this one wouldn't be like the rest.

The last two weeks preparation had been stressful. I was spooked by the Australian Government travel advisory warnings for Kenya. These were generally high for the country, as expected, but also included elevated warnings for the specific areas I was travelling to, and on top of that, contained an additional warning of a risk of terrorist attack in Nairobi.

The flight through to Kenya was fine, my only concern being met at the airport by Olita, who, last time I spoke to him thought he was coming down with malaria, and hadn't actually left Ohaya Village, 12 hours plus travel from Nairobi...

7 Nov.

Driving from the airport to Olitas house I'm immediately struck by the sheer number of people everywhere, walking along the sides of the road to get to work, or simply working on the sides of the road at various random trades. My next strong impression is of how neatly most people are dressed, and they are all being very careful about their shoes, winding between deep puddles and expanses of mud. The roads are rammed with vehicles, all moving at a crawl, bumping through vast potholes and taking any opportunity to accelerate wildly and overtake or undertake any vehicle ahead of them, quite happily leaving the road and scattering pedestrians to do so, winning a cars length of space and then halting once more in the jam. Its raining and grey, quite cold and grim. The housing estates are all multistorey, and for the most part look unfinished. After an hour or so we reach Olitas place, a journey of approximately 10 kilometres. I greet the family, take a shower and drop for a few hours sleep.



Olitas daughters and wife Judy.



The streets of Downtown Nairobi – always incredibly busy.

8 Nov.

A day exploring Nairobi and accompanying Olita to do a few chores he hadn't managed over the previous month spent out in the village. I'm gobsmacked by Matatu travel. These are hi-ace style maxi-taxi's, with retrofitted seats to allow 14 people inside. The aggressiveness of the drivers and complete disregard for any road rules is staggering, as is the crowding within them. Public transport vehicles outnumber private or commercial significantly, and I'm realising the traffic situation in this city, along with the air pollution, is insane. No money wasted on road maintenance here that's for sure.

The unseasonal wet weather has made a quagmire of the roads and the verges...but that doesn't stop the Matatu drivers launching themselves over the kerb to overtake...and the rancid puddles also provide many people with a chance to wash the mud of their shoes. I got a surprise as we walked into the centre of town...there standing on the corner was OJ. It was a weird feeling to bump into someone I knew in this town, and nice to catch up with OJ and get his news and that of the TKMP program in Nairobi.



Approaching Olitas apartment building in Donholme, suburban Nairobi. There are better neighbourhoods, but there are many which are much worse.

Spending the day in Olitas company in his home town was good fun. He is a man of action and enthusiasm and ceaseless optimism and ideas. His phone never stops ringing and he always takes the call, even when the surrounding noise to me seems deafening. It was good to get briefed on the preliminary work on the safe water project, which due to weather had been extremely (an overused word generally, but in this case an understatement) challenging.

Sunday 9 Nov

A long and tiring day travelling around the city catching up with Sam's family, Kori and OJ from TKMP and some other young guys who undertake volunteer work in the program.



Meeting Sams family with Kori and friends in Dagoretti.

Heading out to Dagoretti was another trial by Matatu – mud, potholes and fumes, this time accompanied by an even harsher looking urban environment. One surprise was seeing Maribu Storks perched in the trees in town. These birds are at least 2 times bigger than a pelican and 3 times uglier than an ibis...but like the ibis are doing well due to human refuse, and they can't be chased away very easily.



Potholes, mud and fumes in the outer suburbs of Nairobi.

Our major objective for the trip to Dagoretti was to watch a soccer match being played as part of the Nairobi River Youth for Environment Football Tournament, being run by the TKMP. This was played at the grounds of a school and drew quite a crowd as well as 2 teams of hard running and kicking players. Pre and post match the clubs involved got a lecture from OJ and Kori on the benefits of environmental management and the listeners seemed really engaged and attentive. The culmination of the tournament is a big finals day (today, 6th December...) with prizes of trophies and soccer kit donated by Tweed Soccer clubs. The 21 youth soccer teams involved get assessed on the seasons performance, not only on the field, but also in how many trees they had planted in the Nairobi River catchment, and in their work cleaning up their neighbourhoods. I was called on for a few words so made a speech about how everyone in the Tweed is really interested in and supportive of what they are doing, and that this means they are international footballers...which went down well. The kids are all keen to visit the Tweed and want to form a 'best of tournament' team called the Nairobi River All-stars to play in Tweed in 2010, the year of the world cup in Africa.



Post match motivational speaking by OJ.

The mentoring program in Nairobi is really giving these kids a reason to get together and do something positive, and this is rare opportunity in these parts. It was explained to me that a lot of the youth only really see two options – anger or apathy. Cleaning up litter and planting trees is not going to magically transform the environment in these mean streets, but it really has the potential to change individuals. The commitment and motivation and fantastic organisational and communication skills shown by Kori and OJ really impressed me. The environment in which these guys live and work is seriously tough, compared to here. But their esteem and ability

and the obvious difference that they are making to hundreds of others kids lives, and the actual work planting 1000's of trees and cleaning out waterways left me feeling really confident that the TKMP is focused, and delivering really valuable benefits to people and the environment.



Me, OJ and Godi at an “in-school” tree planting site.

Monday 10 and Tuesday 11

Started Monday by getting on a Boda Boda to speed up the journey from Olitas house down to the corner where Matatus to the city stop. A boda boda is a bicycle taxi – a pushy with a seat on the back and you get doubled. This was a step to save time and was my first serious adrenaline rush of the trip. Ducking and weaving through traffic in Nairobi, as described, really scared me, and I swore I wouldn't do it again in the city. The rest of the two days was a series of long, squashy, bumpy and at times suffocating rides on Matatus as we went from one meeting to another. The first was with a friend of Olitas at Nairobi city Council. A fellow called Elija who coordinates the Nairobi safer cities program. This was followed by a meeting with a number of TKMP volunteers at the program office in Dagoretti, and then with another group called the Greenbelt Movement of Kenya, which is basically a Kenyan equivalent of Landcare. This was to explore options for accessing some good quality training for the TKMP revegetation coordinators in both the urban and rural programs in indigenous forestry.



A meeting in the Council offices – as usual I'm under-dressed.

I didn't know it at the time, but on Tuesday a group of women held a peaceful rally outside the houses of parliament in the city.

Their gripe was the time they had been forced to live in IDP camps, that is, internally displaced persons camps, following post election violence which had resulted in their homes being burnt down or destroyed and in many cases their neighbours murdered. The papers say many thousands of

people (from the 300, 000 who originally fled their homes) are still in IDP camps in Kenya, in addition to the 1500 plus killed and countless more assaulted during the post election mayhem. The governments answer to these women was to tear-gas them.

Wednesday 12

Got into the city at about 5am in order to get a bus to Kisumu, a very bumpy 8 hours west, and from there, after picking up some gear from a hardware, including our Honda pump, we chartered a ute to drive another 1.5 hours to Siyaya, and then a slow crawl through muddy tracks to the village of Ohaya, arriving a total of 15 hours later. Needless to say, some of the roads were breathtakingly bad.

The drive across Kenya was amazing as we traversed a huge diversity of landscapes with clearly different patterns of rainfall and productivity. Not far from Nairobi were green hilly lands originally taken up by the British for coffee estates. We climbed further through areas dominated by eucalyptus plantations and small crops including lots of potatoes, to a point where the great rift valley dropped away hundreds of vertical metres down on our left. As we dropped down into the valley itself the hills and agriculture gave way to level arid land where the natural vegetation was dominated by flat topped thorny acacias, so characteristic of African wildlife documentaries. It was driving across the floor of the rift valley approaching the city of Nakuru that I got my only glimpse of the photo worthy African wildlife (not that I got a photo, windows to grotty, road too bumpy...), this being a small herd of zebra and impala, and a small troop of baboons. This was in an area where a national park wildlife corridor crossed the highway, and it was the only area of predominantly natural vegetation I saw in the three weeks. Once I learned that 75% of all energy consumed in Kenya is through burning wood, I was no longer surprised at the absence of forest. The population is about 38 million, and the country would fit into NSW.

After Nakuru, the road climbed back into hilly country where first tea, and then sugar cane took over. The tea estates were very well tended, the only part of the country where neatness and order were the norm. Each estate had a row of uniform little huts for the workers and large teams could be seen wading through the waist high bushes, hand picking the new leaves. Sugar cane harvesting was a different matter. Hilly country, small patchy crops and hand harvesting was the rule. I'm sure the locals would be stunned seeing the massive machinery, high tech mill and vast farms of the Tweed Valley.

Thursday 13

Morning was my first opportunity to get a good look at Ohaya village and my hosts for the next 2 weeks. I was being looked after by Lucas Mc Owour Owino and his wife Edina. Mc Owuor is the secretary of the Tinga Dam Safewater committee and has, from what I could tell, the most substantial house in the village, this being a nice sized concrete structure with a corrugated iron roof. He and Edina are both in their early 60's and look after 5 young kids, essentially their grandchildren, three of whom were orphans. I was sleeping in a small, mud wall, grass thatch roof, compacted cow dung/mud floor hut with Olita and the two eldest boys, Jairus and Basil, both 17.



Basil, Jairus and I outside the hut where we slept.

First priority of the day was to check out the site and start finalising plans and materials required to start work on the filters and plumbing. I got a bit of a shock after walking down to the dam to see that the concrete kiosk wasn't finished, and that the entire interior of the structure was full of timber poles which were obviously holding up the roof slab. Soon after arriving we met a fellow called Opondo, who had been the foreman in charge of the construction. He is a really capable and happy guy that works for a number of NGO's that are doing projects requiring building work. He assured me that the props would be gone and door attached by the end of the next day.



A small but incredibly challenging project – the water kiosk...not quite finished.

Once on site I fully comprehended the incredible effort that had been made by many people, particularly Olita, to get this small structure (almost) completed. A month of unseasonal heavy rain had made the roads in the district, which are at best woeful, virtually impassable. Getting truckloads of dressed stone, cement, sand and gravel into the site had been a campaign of several weeks, that had been made even more difficult by fuel shortages. After losing one truck into a ditch...on the main road out of town, Olita had to overcome several suppliers outright refusing to deliver our materials.



No deliveries today...

How this was achieved I do not know, but the end result was that everything ultimately only got as far as Mc Owuors house, and then had to be transported by wheelbarrow through almost a kilometre of mud to the site. Record number of trips in one day by one man – 16.



Hard yakka...but a bit of paid labour for some people was a rare and welcome opportunity.

After checking things out at Tinga Dam we set off for Gona Dam, site of Safewater project 1. An hour or so walk was a good opportunity to check out the scenery and chat to a few of the locals. The area was looking nice and green after all the rain and was quite an attractive undulating landscape, despite being stripped of virtually all native forest. Small cropping was being undertaken almost everywhere along the network of small paths we took. The dominant crop was maize, this being the mainstay of the Kenyan diet. Also common, and inter-planted with the maize were red beans, and to a lesser extent, cassava. I also saw occasional crops of chilli, cotton, potatoes, sweet potatoes, sugar cane and a green leafy vegetable called kale. Fruit trees included paw paw and mango, and I spotted the odd small herd of a local breed of cow, as well as goats, fat tailed sheep and chooks.



Inter-village road and favourite mode of transport.

A quick inspection of the first safewater site showed that due to the dam running dry earlier in the year some damage had occurred to the pump and filters. We took stock of materials required to redesign the water intake system and picked up the pump to transport to Kisumu for a service.

It was then a walk back home, quick lunch and set off to Kisumu via Siyaya to get all of the materials required to set up the filters and plumbing.

Four hours, three modes of transport and 80 odd k's later, we were talking pipes and fittings with Mr Pradip Shar, proprietor of Arihant hardware in Kisumu. I had a long list of all sorts of kit that we needed, including 2 sizes of pvc pipe and fittings as well as galvanised iron pipe and taps, tools and all sorts of other bits and pieces. I wasn't confident that I had a perfect list, and the process of ordering and checking off all the items was an incredible verbal free for all. There were at least 3 store staff, me, Olita, the ute driver we had used previously, our friend Onyango and several interested passers by, all taking part in the purchase. I walked out even less confident that we had all the right stuff, but three heavy boxes gave me a reason to get going, and there was a lot to do.

It was after dark by the time we got into a Matatu for the 2-3 hour trip back to Siyaya, where we figured we would probably be walking the final hour or so back home. By the time we got there however it was raining heavily and even walking the roads would have been a nightmare, so a room in a guesthouse proved the end of another long and busy day.

Friday 14 – Monday 17

A week in Kenya and Friday 14th was the first day of real work on the water project. I carried the filters down to site and proceeded to set them up nailed to a plank of wood. This proved to be a really good way of working on them, much easier than in the confines of the kiosk. As all the connections were made with glue together PVC pipe I could complete the whole set up of the 4 filters without gluing a joint, make sure it was correct, and finally glue it all up in the final location.

Despite the work being relatively straight forward, I took a great deal of time with this and it felt very high pressure. I was really conscious of the fact that I was on my own as far as the technical issues went, and it felt like any stuff up could be quite serious. There was also now a timeline in place. I had been told that the launch was in a week and that there were hundreds of people coming and that we would be drinking safewater. The committee had no doubt about it, and while I had a rough timeline that told me it was do-able, I also knew that a mistake on my part, accident, illness or unforeseen problem would mean losing multiple days very easily. Never have I applied the golden rule of 'measure twice, cut once', more diligently.



Filter plumbing – always an audience and many helping hands around.

Another factor which was nice, but also stressful, was that the equipment and I were the only show in town. Over the course of the five days of working out all of the filter and tank plumbing and putting it together, I rarely made a move that was not intensely observed by anywhere up to a dozen spectators. This is really different to home where I realised I spend a lot of time in my own company. It did however make it easy to get people to pass things or hold things, and I also took the opportunity to get a few of the keen guys involved in the plumbing right from the start.

All the work went relatively smoothly, though some of it was certainly hard. One of the things I was worried about was getting the connection fittings into the 5000 L plastic tanks we had bought. I don't know how it's done here, but at Tinga we did it by heating up a piece of galvanised iron pipe bashed onto the end of a lump of wood in a fire and pushing a hole in the tank. Hard, hot and lots of toxic smoke...probably not what you would call surgical precision, but in the end it did the job. We worked until 10 at night getting this done, and I was pretty happy to have been bought two cans of warm beer by Olita and make a party out of it. The next day I spent several brutal hours inside these black tanks which were sitting in the sun trying to get the locking nuts on the backs of the fittings. The heat in there was incredible and it felt like the tanks were filling up with the sweat that was bucketing out of me.



Saturday night entertainment in Ohaya Village ...

Final feat on Monday arvo was getting the header tank up onto the roof of the kiosk. I can't explain very accurately how this happened, even though I did just stand back and watch...it was complete mayhem, accomplished by about 30 people shouting while simultaneously pushing over a hundred kg of plastic 3 metres into the air with sticks. Somehow it worked, and I was happy when it was over.



Community cooperation and enthusiasm at fever pitch.

No doubt the best thing over these days was getting to know the people of the village and the guys I was working with.

Unsurprisingly, nothing ever happens in a rush, and there is always time for a chat. Every conversation begins with a handshake, and the warm welcome I was given, and the continual sincere gratitude conveyed to people back home made me feel really appreciated...though increasingly stressed, as it was becoming more and more apparent just how incredibly important this project was to these people.



After school traffic at the site. Note custom made ladder to right.

As I got to know the people better, the depth of the poverty and tragedy of many individuals circumstances also began to make a big impact on me. I spent one afternoon chatting to a particularly likeable guy called Arthur who had a strong interest in the project and the tree nursery and revegetation work that is being undertaken in the area. Arthur was exactly my age and was well educated, having studied biology and agriculture at university. He told me about his daughter and his job teaching high school nearby. As we chatted he mentioned he had lost his wife a while ago, and then he went on to explain that this was due to HIV, and that he (and I assume his 5 year old daughter) was also both positive. He had also lost his Mum and Dad, and had raised his three younger siblings as best he could, though he regretted that his sister had been married very young as he was really unable to care for them all. Arthur was not pessimistic, and didn't seem sad, though I guess if you were sane you'd have to be. Kenyans who are HIV positive can get free anti retro viral drugs from the government, and if he hadn't told me I would never have thought he was sick, as he was bright and looked fit. He stressed that for all the people who are HIV positive in the area, and there are a real lot, the project was so important because it was water transmitted diseases that were actually killing them. At first I was worried that if I couldn't complete the project I would have to explain myself to people back home, and I'd feel stupid. It sunk in though that this project meant so much more to these people than we could really grasp, and that if it didn't work out, it was them who would be really let down. It all started to feel like a very heavy responsibility.

Tuesday 18

Today would have been the day when water began to flow, if things had have gone according to plan. But they didn't.

After finalising a few bits of tank to filter connection, we set up the pump to give it a try out. I was starting to feel a bit of confidence...all we had to do was get some water from the dam to the top tank and it was basically done.

First step was to prime the pump, and this meant filling the brand new suction line with water from the dam. I set about this job feeling very nervous but trying to look calm in front of the many spectators, and all seemed well until small jets of water could be seen bursting out along the entire length of the pipe. For a few minutes i persevered thinking that somehow this could be normal, but as the pipe literally began to fall to bits as we worked with it, Olita and I knew we had hit the first real challenge of the project.

There was only one thing to do, and that was to go to Kisumu and get a replacement pipe.

After packing up and walking home, we had a quick wash and bite to eat and hit the road for Siyaya to get a matatu to Kisumu. After 30 mins walking on the main road we both got a 30 minute ride on boda boda with another friend carrying the dodgy pipes on the back of another bike. This hours travel got us to town, where some more waiting and a really frustratingly slow matatu took us half way, before kicking us off, and we then got another ride to the city, where we then walked another 10 mins or so up to our hardware shop that was trying to close the doors on us as we walked in at 5:30 pm. I reckon the distance of travel is around 90 or so km, but it took us a solid 4 hours. We were assured that a new pipe (this time without the now apparent defects...) would be tested and provided in the morning. It was actually good to have a night in the city to relax without the continual scrutiny of the village. I had a haircut (because I thought I had nits, but it was actually just a case of being very grotty...) and a beer and a shower and slept well thinking that all would go fine once we got back to site the following afternoon.



Faster than walking, except on the hills, where you walk.

Wednesday 19

An early start back to the site would have been good but somehow exchanging the pipe and getting a couple of extra odds and ends at the hardware turned into 3 hours plus of stuffing around. We did however finally get our gear, engage our trusty, ever present man with ute, and get back on the road, also having in tow a pump mechanic who was going to deliver some training to the locals on pump operation and maintenance.



Do not buy suction pipe from this man.

It was after 1 by the time we got back and into a repeat of the previous days priming and pump starting entertainment. It took some work but the pump man got the water flowing and so I connected up the delivery line and raw water was soon gushing into the top feeder tank. That was for about 3 minutes until the suction line sucked flat. We couldn't believe our eyes. Our pump expert helpfully explained that what we had was delivery line and that it wasn't strong enough to sustain the vacuum, and that we shouldn't have trusted the hardware merchant. I managed a smile and thanked him for the timely advice. Back to Kisumu for more pipe.

It was at this time that I decided to get in and see if I could at least test the system and get some water out of the filters. I was really feeling tense, and I felt pretty bad about it, but I couldn't help scowling at all the kids crowding round and getting in the way, usually by trying to be helpful, every time I tried to do something. I knew there was water in the top tank so theoretically we could purify it. I opened the filters and vented the air out and everything seemed to go ok...I was almost smiling as I waited for the clear water to flow through the lines. I soon saw it, but just a bit, a little trickle and nothing more. For some reason it wasn't working properly.

I felt sick now, really worried that I had connected something wrong or that the filters were defective, but I really couldn't imagine what the trouble was. I opened and closed all the valves a couple of times, walking in circles, scratching my head, swearing under my breath and trying to politely answer all the gathered people who were looking at me with complete faith asking 'where is the water?'

At the same time as I was having this small panic, Olita and the pump man had hooked up a second length of the same second lot of dodgy pipe to the pump, 'just to see if it would do anything different'. The pump fired up again and for a few minutes water once again poured into the top tank before this pipe also collapsed. I decided to have another try at the filters, and this time, in a beautiful gush of crystal clear water, it all worked perfectly. The only problem was that there hadn't been enough head pressure for gravity to drive water through the system. I peered through a little inspection hole in the clean water tank to see a strong flow shooting in, and felt an incredible sense relief.



Local kids – clearly overjoyed with their new safe water supply.

Despite the small success, there wasn't actually enough water for it to flow out of the storage tank, nor was there anything that could be done without a new suction line. So Olita headed back to Kisumu to do hardware battle (looking for the first time ever very serious, and keen for some 'negotiations' with the proprietor) while I fixed a couple of leaky tank connection. And then, I kind of had the afternoon off, and spent an hour or so sitting in the shade of a jacaranda tree drinking tea, playing guitar and putting band aids on a collection small boys infected leg sores.

Thursday 20

I wasn't really busy in the morning so was pottering around down at the site when I noticed a young boy with a dirty rag tied around his forearm, which on second glance I could see was covering a huge ulcerated wound.

I had a bit of a closer look, and it was really shocking...at least two thirds of his arm between elbow and wrist was a mass of scarred and swollen infected tissue, and the little boy, whose name was Victor, looked really miserable. I asked a few people if they knew what was going on and to my horror I learnt that it had been like that, getting progressively worse, for three to four years after he had broken his arm. It's a long sad story and is just a perfect illustration of the effects of poverty. His parents had tried to get treatment but could only afford cheap drugs from the local dispensary, and these just didn't work. Lack of hygiene and poor diet hadn't helped either. I was instantly sure that it was arm amputation or worse for Victor, aged 9, if he didn't get serious attention really soon, so I arranged for a meeting with his Dad through Mc Owuor. I tried to get on with my day, but felt really haunted by the image of Victor's arm and his sad little face and imagining the pain and suffering the poor kid must have been through over the years. I had been really worrying about how I was going to spend some of the money sent with me for side projects while I was in Kenya, (harder than I thought to help the needy when everyone is so needy) but became hopeful that decent hospital treatment for Victor could be arranged.

I got a text message from Olita to say he was delayed finding a new suction pipe (that's right...no electricity, no medical care, no water, shocking roads, death lurking round every corner, but perfect mobile reception, even for me to text Liz at her parents house in England while sitting under my mozzie net in my mud hut each evening!) so took up an invitation to visit the school closest to the project site with our friend Onyango.

Kubar Primary School, I'm afraid to say, was another shocker. I walked around and took some photos and had a long talk to the headmaster, who was working back after school break-up finalising report cards. Francis Onaka Okwiri was a committed young man with a difficult job, and he knew it.

400 students. 5 paid teachers. There are also 4 unqualified assistant teachers paid for by the community who receive the equivalent of \$24 a month. As well as the incredible overload the teachers had to contend with, they are working in a school with only 5 class rooms. There are always two classes run in each room at a time, with some kids facing forward and some back so they can get a different teacher and lesson. No desks. No floor. No doors. The floors were dirt, and according to Francis this was a big problem as it meant the kids had to contend with jiggas, which made them '*inattentive*'.



Michael Onyango outside the pre-school building at Kubar Primary

Jiggas were something I was warned about continually in Kenya, they were definitely the most feared of all the nasties. Compared to jiggas, malaria was treated as a minor inconvenience, sometimes fatal of course, but something you just got on with, because there was bugger all else you could do. Apparently jiggas are like small fleas that live in dirt floors and get in underneath your toenails and drive you mad. Another big issue for Francis was food. I got the impression that in most Kenyan schools the kids get fed, but at Kubar there was no money for food.

Food nearly always needs to be cooked in Kenya as there are no vegemite sandwiches or apples etc...it is nearly always just a hunk of ugali, which is maize meal and water, like mash... it fills the stomach. It wasn't just the kids going without either...according to Francis morale amongst teachers was poor as they usually got by on just 'an air burger for lunch' as he put it...that's if they could get to school at all during the wet season as the mud was so bad. The school needs everything. Toilets, a rainwater tank, floors, doors...no doubt chalk, books and anything else that you could think of.



No floor, no desks, no doors, no windows ...let alone books, computers or other things we take for granted ...a very tough start for the local primary school kids.

I think that if these buildings had have been full of little kids mucking around and looking cute it wouldn't have been so bad, but in its empty state it had an aura of destitution and hopelessness. I was quite moved by it all, but it was a consolation to advise Francis that with money sent with me from home I would be able to arrange for a rainwater tank to be installed at the school, and for this he was immensely grateful. This will mean that in the wet season the kids can get a clean drink of water and wash their hands and face...but its not nearly enough. I feel compelled to try and organise some more help for this school and want to try and go direct to some other schools in the Tweed or elsewhere to arrange a sponsorship of some kind, so if anyone has any ideas or wants to help please let me know.

Back at site...about 3pm Olita turns up with our third lot of pipe, and this time, as easy as can be, the pump is primed and the water is flowing and all of a sudden, the wonderful people of Tinga have a safe water supply. A good thing too, as the launch started at 9 the next day...

Word got out quick and for the last hours of the day I just sat and watched as a hundred or more women and children turned up with buckets upon head, or bike, or wheelbarrow or donkey, to collect some water for the evening. It was all very satisfying, but I'll happily admit I would have traded 5000L of safewater for one cold six-pack.



A hard working young boy and the Tinga version of a 4WD Ute.

Friday 21 Nov.

The launch was a classic example of Kenyan time keeping and love of talking. On the printed agenda it started at 9, but not even the organisers were there for that. At a little after 10 a band of drummers came and that amused a steady trickle of invited guests and locals for another hour or so until things kicked off at about 11. There were many people listed to speak, including community leaders, politicians, government officials, Olita and me...and then at least 6 or more took an opportunity from the floor, and half way through someone decided it should all be done in Luo and in English, so every word was repeated. I increased my local popularity by giving a pre-prepared address in Luo, and received even more thanks and instructions to convey greetings and gratitude to the people of the Tweed.



Great dancing and music and costumes from the kids of Obambo Primary School

The music was great as was the dancing, but I was drifting between being entertained and embarrassed at being the centre of attention, and also stressing out at the loss of a whole day when what I really wanted to be doing was maintenance at the first safewater site.

Finally, after a solid 3 hours of speeches, there was an official opening of the taps and ceremonial tree planting, and then a closing address, which sparked more speeches from the floor, and then finally a celebratory lunch.

I decided at lunchtime that I was a vegetarian...instinct warned me that a meat feast that was supposed to happen at 1:00 would have been a little suspect by 4:30...and when I saw that the treat for the top table was a big pot of sheep intestine stew, I was glad I made my excuse early.



The project was a big deal, and a big crowd turned up for the opening

So finally, after a huge day of celebration, I set off on the hour walk to Gona dam at 5:00 to have a good look at the filters and make preparations for maintenance there. I eventually got back to home and hut by about 9 after a slow and very dark walk back...had a bite to eat and crashed.

Saturday 22

Today was a trip to the hospital to try and sort out Victor's arm. We set out early on push bikes with Victor's Dad doubling him for the hour plus ride to a private hospital in Siaya, and to my surprise were seen by a doctor almost straight away. I guess few people can afford the private hospital. It was very basic looking but neat and clean. Victor's dad spoke English well and so I explained to him that I could pay for Victor's treatment (with money collect from people at home), but it had to be his decision to proceed with it. He agreed to proceed immediately.

My fear at this point was that the doctor would recommend an amputation and that this would be a terrible day for Victor and his family. It felt dreadful. The doctor had a good look at his arm and gave it a hard squeeze and real prod and it must have been excruciating for the little guy but he didn't cry or try and drag his arm away. The doctor said the infection had developed into osteomyelitis (not sure of spelling) which is a staph infection in the marrow of the bone, from the compound fracture years ago. His recommendation was 10 days in hospital on a drip getting 4 courses of Anti-biotics a day, as well as care of the wound, rest and good food. He got whisked off straight away and we went and saw him sitting in a bed in a ward looking really frightened. The cost of the treatment was 22,000 Kenyan Shillings all up, about \$440 AUD. Below is the latest from Olita (6/12/08) on Victor...

Victor Jakob Ochieng- he is out of hospital, looking much better. In fact I found him taking the family cow to water at the dam. He spent nine days at the hospital where they treated him with anti-bios and dressed the wounds. The arm was not swollen, he could move it more freely. His father Charles said since he was hit with stone in 2004 he has tried all means to treat the boy...the problem started at siaya district govt hospital where after establishing that he had a wound and cracked bone the personnel would not plaster, but also did not treat the wound. he says the mistake he did was to take the boy to different doctors who were cheap, and with time the boy's condition became bad. He even took the boy to a local herbal medicine man who massaged the arm with herbs...this is why the arm was swollen...he says about the time Tom came, he had lost hope and had resolved that the only way was to cut the arm...So Victor's arm is better, today he takes back to hospital for dressing and would be referred to an orthopedic surgeon for bone correction. I have a picture taken two days ago I will send to you. Makowour called to say they are at hospital now...

I hope I can provide more reassuring news on Victor as the weeks pass.

Saturday afternoon I spent a few really enjoyable hours hanging around the site just watching life go by and taking some time to chat with the guys I worked with and other locals who came to collect water or just check out the scene. I noticed that quite a few teenage lads were hanging around and pretty soon it dawned on me that this was the best place for miles around to check out the girls as they were all coming to the one place to collect water. I think that by now the site will have women selling veges and sugar cane, and there was also the suggestion to get a notice board where info on water and health and other community events can be posted.

Saturday night I worked late by lantern light preparing a program for training the prospective safewater operators the next day, as well as a list of items to discuss with the water committee at the first post-commissioning meeting on Sunday afternoon.

Sunday 23

Today was training day. I spent four hours in the morning going over all aspects of facility operation with 4 prospective operators. One guy called Omondi who had been working on the site and very keen from the beginning showed a real aptitude for the work, and with some background as a motor bike mechanic, he was obvious first choice for chief operator and ongoing trainer. It was good to see two young women also nominated by the committee for training, and one named Beatrice also showed that with a little practice she would also become an excellent operator. The facility will have two operators working a half day each, am/pm, and they will receive an allowance from the committee.

A three hour meeting with the committee in the afternoon dealt with a long list of issues, from who would purchase petrol, to how much to charge for water (this is proposed to be 1 shilling per 20L...i.e. 2 cents) to how to deal with out of town folk wanting to buy water and pay good money, but potentially leaving locals without. If there are families who are so poor they cannot pay, their needs will be subsidised. Funds will be used to pay operators, purchase petrol and make other repairs as required. I have also left \$400 AUD with Olita from money collect from TSC staff before I left to purchase some donkeys.

It is proposed that these will be used to deliver water from the facility, operating as a youth enterprise, generating a small additional income for the committee for dam improvements, and a small income for someone who operates the service.

The presence of the facility will introduce some new and complex social issues into the community, and it is lucky that Olita will be there to support the committee in dealing with these new challenges.



Happy hour at Tinga.

Monday 24

My last morning in the village. I spent an hour in the morning down at the site watching the operators and reassuring myself all was well before having one last look at the set up and reluctantly walking away.

I really hope I will see the site and all the people again, but even more than that I just hope that it continues to work. It's a harsh environment, life is really hard, and the people who live there are incredibly tough. It seems inconceivable that something from our cosy little world could survive there. The filters looked shiny and new and very frail compared to the challenges of Tinga...but, this is what they are designed for, and their value was well appreciated by everyone there.

After unloading the contents of my first aid kit and everything else I didn't need amongst the friends I had made, I said my goodbyes and left feeling optimistic for the project and the people... and totally perplexed as to how come we in Australia have it all so easy.

The rest...

After an bus overnight back to Nairobi I spent three days travelling around the furiously polluted city on Matatus, inspecting tree planting sites and meeting youth groups with the TKMP boys, as well as meeting with Nairobi City Council and having a half hearted attempt to buy some souvenirs.

I was absolutely exhausted, and given that the Mumbai attack had happened that day (not to mention having been reading many scary stories in the local papers), I was feeling nervous wandering around the outer suburbs as a very conspicuous outsider. Needless to say however, I was well looked after, inspired once more by the commitment and dedication of our Kenyan staff, and humbled by the happiness and enthusiasm of most Kenyans I met, no matter what their dramas.

I'll finish this with a motto the people of Tinga have, which I am sure they would like everyone to hear.

"We fight for Water, we fight for Unity, we fight for Peace."

