



PHASE I: GONA DAM SAFE WATER KIOSK - KENYA

The Global Challenge: Access to safe water is a fundamental need and basic human right and a specific target under the internationally agreed Millennium Development Goals (MDG). The World Health Organisation (WHO) estimates that about 1.2 billion people worldwide lack access to clean drinking water. 2 million people a year, many of them children and elderly, die due to preventable waterborne diseases; this equates to about one child every 15 seconds. Reducing the ill health and disease of children through improved water and sanitation enables parents to participate in more productive activities; it also prevents the children missing school. Less illness means adults miss fewer days at work, with positive impacts on overall income and livelihood security. Access to safe water near the home saves time for women and girls, time that can be spent on productive activities and education, which lay the groundwork for economic growth. Forty billion working hours are lost each year in Africa to the need to carry water (*Swedish Water House Brief*)

Background: The SkyJuice™ Foundation works together with our partners to provide access to clean water systems vital for health, wellbeing and prosperity. In March 2007, the SkyJuice™ Foundation in conjunction with the Tweed Shire Council Kenya Mentoring Programme (TKMP) provided 3 SkyHydrant™ water filtration units for the Safe Water Project for the remote Obambo-Kadenge village in West Kenya near Lake Victoria. The scattered village of several thousand people is 11 kms west of Siaya town. There is little paid employment and the vast majority of people live on less than USD1.00 per day. Staple crops subsistence farming and small scale livestock rearing is practiced by the community. The communal grazing land is where the dam water source is located



Existing water supply issues: Potable water supply had been a major issue for the community of Obambo-Kadenge village. There is little likelihood of major infrastructure development and reticulation schemes, so the community of Obambo-Kadenge have mostly relied on run off water collected in the Gona Dam, a small shallow dam on the floodplain. The run-off passes through cultivated plots and homes. The district dams are highly silted, lack protection from soil erosion or animals and sanitation is almost non-existent. The feed water is almost always turbid (>400NTU) and is contaminated by human and livestock waste. Outbreaks of water borne diseases such as cholera, typhoid and dysentery are allegedly common. A physical disinfection barrier high rate filter was essential in any treatment solution. The SkyHydrant™ water filtration units were selected as the most appropriate sustainable and cost effective water filtration unit.



KENYA at a glance



Obambo-Kadenge Village is in West Kenya near Lake Victoria, approx 11 hours by road from Nairobi.

Population Kenya: 32.8mil

Infant Mortality: 58/1000

Age Structure: 42% < 15 yrs

Life Expectancy: Female 48
Male 46 yrs

Rural Population: 60%

Below Poverty Line: 50%

Despite recent economic growth, nearly a quarter of the population lives on less than USD 1 per day

Environmental Issues: Water pollution from urban/ industrial wastes; degradation of water quality from deforestation and soil erosion.

Infectious Diseases: Water borne diseases, AIDS

COMMUNITY OWNERSHIP AND MANAGEMENT:

Safe Water Kiosk Committee Structure and Function: The first step in the development of the Safe Water Kiosk Project was the development of a representative committee. The committee was instrumental in overseeing site selection, land acquisition, construction of the water kiosk and the tank stand. The committee was also involved in the selection of the windmill and wind generator. Much time was spent discussing security, maintenance, operation and water costs.

The Committee was initially overwhelmed by some aspects of project management but were keen to see the project succeed and felt a great sense of accomplishment upon project completion. The committee decided that the wind generator and petrol pump would be the most sustainable option for the communities' water requirements. Installation of the SkyHydrant™ array of water filters quickly established a reliable safe water supply from the water kiosk.

Training and Maintenance: The Safe Water Kiosk Committee nominated a subcommittee to be trained in operation and maintenance of the filters and pumps. The SkyJuice™ Operations and Maintenance manual was used as the training tool by the committee and the subcommittee quickly grasped all aspects of operations and maintenance with relative ease.

It is essential that the filters are cleaned in accordance with the manufacturer's instructions. The subcommittee advised that despite the high turbidity of the feed water, the cleaning process took approximately 5 minutes for each filter including a 1 minute agitation phase and agitation while the waste water drained out. The turbidity (NTU) was 400 prior to filtering but was not detectable after filtering. The SkyHydrants™ SMF1 filters provide filtration down to 0.1 microns which is sufficient to filter out all solids and bacteria and significantly reduce virus levels.

Immediate Results: The SkyHydrants™ at the Safe Water Kiosk provide continuous access to clean water from early in the morning and till late afternoon with a few hours break in the middle of the day. The system utilises Memcor low pressure membranes with a nominal daily output of 20,000 – 30,000 litres, depending upon feed water conditions. The SkyHydrant™ SMF1 filters, following cleaning, were producing 2,200 litres per hour – an ample clean water supply for the community.

Ongoing Costs: The major funding and resources for the Safe Water Kiosk Project was through the Tweed Shire Council, the wider Tweed Shire Community, the SkyJuice™ Foundation and the International Riverfoundation. To establish the long term sustainability and viability of the project the committee canvassed various options to cover ongoing expenses. The committee decided that although the community had never paid for water previously, the benefiting families should pay a small contribution once a month for the ongoing maintenance and security of the Safe Water Kiosk.



Safe Water Kiosk Committee



Construction of Safe Water Kiosk



Wind generator powers the pump to draw water from Gona dam



Trained operators with SkyHydrant™ SMF1 filters which filters 2200 litres per hour of safe potable water

This innovative approach ensures that the community, with leadership from the committee, will have ownership of the SkyHydrant™ water filtration units and have the skills and motivation to ensure that their access to clean safe water will continue for the foreseeable future. Informal and small-scale lending arrangements have long existed in many parts of the world, especially in rural areas, and they still survive today in Africa.

The committee charges the benefiting families a small fee for the potable water and monitors water usage. The committee decided that a minimal monthly fee for water access was preferable to paying daily for water collection. Fees are levied on an ability to pay basis, however, as SkyHydrants™ have minimal maintenance requirements; real operating costs are essentially limited to indirect pumping. The significance of safe water to the overall health and prosperity of the community has already been acknowledged.

LONGER TERM RESULTS: The Safe Water Kiosk Project is more than just an infrastructure project; it is a community project both in Australia and Kenya fuelled by the creative energy, enthusiasm and generosity of the communities in both countries. The project demonstrated the power of combining community participation, cost effective appropriate technology and education to provide an essential service.

This project also helped change the view that the poor could not pay for water, on the contrary, it demonstrated that the poor understood the value and benefits of this essential resource and were willing to contribute financially to ensure the ongoing viability of the project. Ongoing monitoring of the installation and documentation of the associated health benefits of access to clean safe water will be carried out by the committee and can be utilised as the basis on further projects anticipated by the Tweed Shire Council and the SkyJuice™ Foundation.

Finally, the project demonstrated that water provision should be carried out as part of a broader investment in education, sanitation, drainage, housing and dam improvement. There will be ongoing education for the community in all aspects of sanitation, hygiene, health issues and water resource management.

CONCLUSION: The SkyJuice™ Foundation will continue to work with partners and communities to develop programmes whose objective is to improve access to safe water. The SkyJuice™ Foundation places emphasis on developing and evaluating SkyJuice™ water filtration projects that are appropriate, affordable and sustainable.

Low maintenance, simple operation and high efficiency SkyHydrant™ water filtration units convert contaminated water into clean, potable water that exceeds the World Health Organizations requirements for potable water. The success of our projects is that we work with local organizations who understand the cultural, social, geographical and economic issues for the communities involved in the projects.

Acknowledgement:

**Project Manager - installed by Marty Hancock – Tweed Shire Council
Tweed Shire Council Mentoring Programme
Memcor Australia Pty Ltd**

Safe Water Kiosk facts and figures

- <> Population serviced est. 2500-3000
- <> Nominal cost person <50 cents pa
- <> Treatment system design life = 10 years
- <> Project cost including project Management and buildings = \$8-10 /per
- <> Expected annual system cost US 0.20
- <> Pumping from lake separate estimate
- <> Expected filter life = 7- 10 years
- <> Chemicals used = nil
- <> Filtration removal > 0.01 micron
- <> Cost per litre = 0.002 cents
- <> Manual Filter cleaning = weekly
- <> Manual filter backwash = 3 x daily
- <> Long term sanitization = 100 ppm Cl
- <> Microfinance model = TBC
- <> Ownership =100% local community



Water collection at Gona Dam



Safe drinking water from water kiosk



Marty Hancock Project Manager