



# Sanitation

## MATTERS

A Magazine for Southern Africa

ISSUE 2 - 2011

# URBAN SANITATION IN SADC

### CHALLENGES & OPPORTUNITIES

*"Within the communities there are difficulties around the incorrect use of facilities, vandalism and theft..."*

■ PAGE 3 - 6



### SUSTAINABLE SANITATION SYSTEMS

Sustainable sanitation in South Africa has not been achieved.

■ PAGE 12 - 13

### WHAT HAPPENS WHEN THE PIT IS FULL?

A trillion dollar question and an urgent one.

■ PAGE 16 - 17

### URBAN PLANNING AND CONSEQUENCES FOR SANITATION

Informal settlements continue to proliferate.

■ PAGE 8-9

Sanitation Matters is a knowledge sharing publication of the Southern Africa knowledge node on sustainable sanitation (SAKNNS). The purpose of the publication is to share information and knowledge on sustainable sanitation within the Southern Africa region.

Subscription is free. Material in this publication does not necessarily reflect the considered opinions of the members of the Water Research Commission, Stockholm Environment Institute and Water Information Network.

**Editorial offices:**

Water Information Network  
Private Bag X03  
Gezina  
0031  
Republic of South Africa

Tel (+27) 12 330- 9062  
Fax (+27) 12 330- 2565

**Editor:**

Ditshego Magoro,  
Email: [ditshegom@win-sa.org.za](mailto:ditshegom@win-sa.org.za)  
[www.afrisan.org](http://www.afrisan.org) / [www.win-sa.org.za](http://www.win-sa.org.za)

**Editorial team**

Dr. Valerie Naidoo  
Ms. Lebogang Nhleko  
Miss Juliet Mwale  
Miss Ditshego Magoro  
Mr. Victor Moila

Cover photograph: Chris Kirchhoff

# In this issue

- |  |              |
|--|--------------|
| 1. Urban sanitation in SADC: challenges and opportunities  | Page 3 - 6   |
| 2. Scaling up sustainable sanitation in rural Peri - Urban   | Page 7       |
| 3. Urban Planning and Consequences for sanitation - The case of Zambia   | Page 8 - 9   |
| 4. Sanitation Problems in Urban Areas in Blantyre  | Page 10 - 11 |
| 5. Sustainable Sanitation Systems  | Page 12 - 13 |
| 6. South Africa's first Sanitation Technology Demonstration Centre   | Page 14 - 15 |
| 7. What happens when a pit is full?  | Page 16 - 17 |
| 8. Assessing Sanitation Service Levels – A New Approach  | Page 18 - 19 |
| 9. Tokologo Municipality pilots closed circuit wastewater treatment and recycling sanitation system for a small urban community in Seretse Township, South Africa. | Page 20 - 21 |
| 10. The story of Ecosan toilets in Malawi  | Page 22- 23  |
| 11. Safe use of greywater for urban food production  | Page 24 - 25 |
| 12. The role of capacity development in rehabilitation of water and sanitation systems: lessons from Zimbabwe  | Page 26 - 27 |



# URBAN SANITATION IN SADC CHALLENGES & OPPORTUNITIES

*Why is urban sanitation important? On World Water Day 2011 came bad news from the United Nations.<sup>i</sup> The number of people without access to adequate water and sanitation facilities in Africa has risen fast in recent decades.*

**David Schaub-Jones**

It seems, despite water and sanitation being central to the Millennium Development Goals, that rapid urbanisation has outpaced the ability of many African governments to provide essential services.<sup>ii</sup> As a result, more people now lack access to reasonable sanitation services than in 1990; the number of those without has doubled to around 175 million.

Africa is the continent urbanising most rapidly and SADC, with large existing rural populations, is also undergoing rapid urbanisation.<sup>iii</sup>

In 2010 already four in ten of Africa's one billion people lived in urban areas. Six in ten of those lived in slums, where water supply and sanitation are severely inadequate.<sup>iv</sup> This means that almost 250 million people now live in African slums

(eight times the total population of South Africa). Despite these alarming facts, until recently more priority has been given to sanitation in rural areas than to urban sanitation. Neither issue has received anything like the level of attention given to water supply or HIV and AIDS.

Yet sanitation is a crucial issue for governments, both for health and economic productivity. It is particularly in slum areas that the consequences of poor sanitation are felt. As Dr Maria Neira, the WHO Director of Public Health and Environment recently put it: "neglecting sanitation and drinking-water is a strike against progress."

*Without it, communities and countries will lose the battle against poverty and ill-health... Unsafe water, inadequate sanitation and the lack of hygiene claim*

*the lives of an estimated 2.2 million children under the age of 5 every year. Of these deaths, 1.5 million are due to diarrhoea, the second leading contributor to the global burden of disease".<sup>v</sup>*

These figures mean that the impact of diarrhoeal disease in children under 15 is greater than the combined impact of HIV and AIDS, malaria, and tuberculosis.

## **Why pay more attention to urban sanitation?**

There are three main reasons for paying more attention to urban sanitation. Firstly, slum areas are forecast to grow fast across Africa (SADC included) and it is here that sanitation conditions are the worst. Secondly, given the sheer density of urban living and the way slums and their

cities are intertwined, the impact of poor sanitation is worse in urban than in rural contexts. The health, environmental and economic consequences are severe.

Cities pay the price through cholera, polluted streams, high healthcare spending and lost productivity. Thirdly, the situation is entirely avoidable – proactive government intervention can, at relatively little cost, deal with the urban sanitation challenge. Studies suggest that \$1 invested in sanitation generates between \$3 and \$34 in direct benefits and avoided costs, depending on the country.

## Who currently deals with urban sanitation?

In SADC, as elsewhere in Africa, the spread of sewerage networks is limited. Consequently most sanitation is 'on-site' (i.e. no network of pipes removes human waste) and responsibility for this is shared between two major groups.

These are households and local government. In most towns and cities in SADC the provision of an adequate toilet is usually considered the household's responsibility. Most countries in SADC make this a legal requirement, one that is enforced by local environmental health officers (who are also responsible for enforcing hygienic practices in restaurants and businesses).

Households deemed to lack 'adequate' sanitation can be fined. In reality though, SADC governments are largely ineffective at compelling residents to supply adequate sanitation at their own cost, particularly so in slum communities. Although laws required landlords to supply sanitation for their tenants, these are widely flouted.<sup>xi</sup>

In slums, where many people rent, sanitation conditions are often at their worst. Adequate drainage is a further challenge for informal settlements, which are often found in 'unsuitable' locations such as wetland areas and river valleys or on steep hillsides.

The rainy season is particularly challenging and floodwater mixed with latrine waste poses clear health risks. Whether households provide adequate sanitation or not, local government still needs to play a role in dealing both with

## THE ECONOMIC IMPACT OF POOR SANITATION

The health impact of poor sanitation has severe knock-on effects for the economy. SADC-specific figures are not available, but a recent estimate in South East Asia suggested that Cambodia, Indonesia, the Philippines and Vietnam lose an aggregated \$9bn a year due to poor sanitation.<sup>iii</sup> This is equivalent to 2% of their combined GDP and comparable to the impact from climate change in the region.<sup>viii</sup> If such a figure is applied to SADC, then the annual loss to the region is around \$4.3bn.<sup>ix</sup> Looking beyond dry numbers, nearly one in five child deaths - about 1.5 million each year - is due to diarrhea.<sup>x</sup>

drainage and with handling of waste emptied from full toilets.

For these reasons many municipalities add waste collection and drainage to the responsibilities of the waste departments (whose primary activity is otherwise rubbish collection). In contrast, the final treatment of human waste often falls to the water utility, which usually manages any wastewater treatment works intended to deal with sewage. This sharing of responsibilities (between utility, waste department, environmental health bureau, landlords, tenants and households) often leads to a confused situation on the ground that undermines progress on urban sanitation.

Worse yet, this confusion are often mirrored at national level, with responsibility for sanitation divided between the Ministry of Health, Ministry of Water, Ministry of Local Government and Ministry of Housing (or their equivalents).

Unfortunately, few countries in the region have a specific sanitation policy in place, and fewer still are clear on how they propose – at a policy level – to tackle the growing challenge of sanitation in urban areas.

## Nairobi makes steady progress

After many years of slums in Nairobi being largely ignored by urban planners and municipal officials, recent developments have been promising. The two main organisations responsible for water and sanitation provision in the city, Athi Water Services Board and Nairobi Water and Sewerage Company, have adopted 'strategic guidelines' that commit them to "promoting, facilitating, and supporting the increase of basic sanitation facilities to informal settlements".

Better still; the City Council of Nairobi has permitted the private sector to take over the construction and management of new public toilet blocks. These now provide a respectable service to Nairobians at bus stops, public parks and other public places. Progress downtown is being mirrored in the slums, where a range of NGOs are helping to provide communal ablution blocks that serve poor communities. Some are even succeeding to persuade landlords to improve the sanitation service that they provide for themselves and for their tenants. Plans are even being developed to provide low-cost sewerage connections to the slums – these will, over time, help deal with the significant challenge of removing and dealing with sludge from the many thousands of poorly built latrines in Nairobi. Change is in the air!

“ More people now lack access to reasonable sanitation services than in 1990. ”

## What is the situation in SADC?

Country	Urban Sanitation Access % in 08	Urban Population millions Wolfram Alpha & JMP	Urbanisation Rate % growth p.a. UN Habitat	On-track for sanitation MDGs? JMP report	Rough est. cost of poor sanitation Millions of USD p.a. Estimate, using WSP initial data
Angola	86%	10.8	4.3	Yes	457
Botswana	74%	1.2	2.7	Yes	135
DR Congo	23%	23.1	4.6	No	344
Lesotho	40%	0.5	3.8	No	37
Madagascar	15%	5.8	3.8	No	309
Malawi	51%	3.0	5.4	No	80
Mauritius	93%	0.5	0.5	Yes	24
Mozambique	38%	8.7	4.5	No	236
Namibia	60%	0.8	3.5	No	136
South Africa	84%	30.8	1.8	Yes	1,703
Swaziland	61%	0.3	0.8	No	43
Tanzania	32%	11.3	4.6	No	541
Zambia	59%	4.7	2.8	No	231
Zimbabwe	56%	4.7	1.6	No	83

Sources<sup>xii</sup>

## What are some of the main challenges?

As the box on page 4 shows, Nairobi is starting to make progress. Durban in South Africa is also well known for its sanitation innovations. Unfortunately however, progress across SADC is uneven, as the table above shows. Several challenges specific to sanitation have defeated others' best efforts.

1. Sanitation is not always a priority for households, or for government officials. This stems partly from the real (and perceived) difficulties of providing adequate sanitation, but partly this stems from a lack of awareness of the full costs of poor sanitation.
2. While affordable options for sanitation provision do exist, toilet designs promoted by State agencies are often too expensive, particularly for poor communities.
3. A lack of space is a real challenge in many urban slums; there is little space to build a toilet and land is often given over to more 'productive' uses (such as more rooms).
4. Building a toilet involves a significant investment 'below the ground'. A toilet becomes a fixed asset that cannot be easily moved or altered. People with insecure land tenure, renting or those planning to

move soon are duly discouraged from investing scarce cash in sanitation.

5. Urban communities, which are not always cohesive, are hard to engage in development. It can be particularly difficult to drive projects that seek to improve 'public goods' (as sanitation programmes often do).

## What promising developments are there?

Although urban sanitation can be a challenge, the situation is not as dire as some portray. For a start, much urban growth expected in coming decades will not be in dense inner-city slums, but in smaller towns and the satellite settlements of large cities. Here, physical space is less of a constraint and proactive urban planning can have a huge impact, helping to shape the growth of new communities and settlements to be built in ways that allow adequate drainage and full toilets to be emptied more easily. Government and NGOs can also boost demand by explaining the importance of sanitation and by suggesting practical steps that communities can take. Sanitation marketing, a fairly new approach, is based on the insight that people invest in sanitation less for health reasons than for reasons of status, dignity and comfort. It has shown that, when offered a range of appropriate sanitation products and

services, poor households are willing and able to invest in sanitation improvements. Sanitation entrepreneurs progressed up to provide households with appropriate products and services on a sustained basis.

In dense inner-city slums, where space is in short supply and households struggle to invest, progress is possible via public or communal ablution blocks. Previously such blocks tended to be managed by municipal authorities, often with poor results. Recently though, management by communities or by the local private sector has brought stark improvements. From Maputo to Durban, Nairobi to Mumbai, such blocks are proliferating and bringing affordable sanitation within the reach of many millions of poor households.

Last of all, a focus on what to do when the pit is full is generating useful insights. Alternatives to waterborne sanitation are being seriously considered, such as dry sanitation. These alternatives make the waste easier and safer to handle (as well, perhaps, as converting waste into a valuable resource of energy and fertiliser). New pit emptying techniques are making the job safer and new institutional models (such as franchising) offer hope to municipalities that despair of the challenge of emptying thousands of full toilets.<sup>xiii</sup>

As governments increasingly realise the importance of sanitation and households grow impatient with a lack of progress, sanitation is rising up the 'service delivery' agenda. Urban sanitation is intimately tied to wider issues of housing, water supply and urban planning, which means that it sometimes falls through the cracks. Yet experience has shown that proactive leaders, whether within government, communities or NGOs, can have a positive impact on sanitation and start to remedy the situation. The benefits are great – both in terms of health, environmental protection, economic productivity and, importantly, in restoring dignity to millions of urban families. As even rich countries are demonstrating, sanitation does not have to be about expensive sewerage schemes, but can be delivered in a more environmentally conscious and sustainable fashion. Small changes, such as hand washing with soap, can deliver huge rewards. While doom and gloom is fashionable, it does not have to be the reality. Positive developments are happening across the region – they just need some help to grow.



Privately built and operated public toilet in Maputo (© Schaub-Jones)

## Sanitation in Johannesburg

The City of Johannesburg has around 180 informal settlements, which equates to almost 200 000 households. The city provides three levels of service, depending on the nature of the settlement and the plans for its development. It's most basic service – called 'a nominal service' – is provided to those settlements that will either be formalised soon or where a housing programme is planned within 5 years. It also applies to those settlements that are particularly congested, on a flood plain, on dolomite land (which drains poorly), sited on private land or where the water table is high. For sanitation this nominal service involves the provision of chemical toilets (alongside water tankers). The next step up (LOS 1) is to provide VIP toilets – this applies to those informal settlements with a 'developmental horizon' of more than five years. The final level of service (LOS) provides flush toilets and full water reticulation. This applies to already formalised settlements that have approved layout plans. In 2010, 90.8% of those households that qualified for Level Of Service 1 were covered, leaving 107 000 households in the 'backlog'. For those that only qualified for nominal services, 82.6% were covered, meaning an additional backlog of 34 000 households. There are at least four sets of challenges to the city in addressing its sanitation backlogs. Physical challenges include the congestion of settlements, poor soil conditions and high water tables, plus frequent proximity to natural watercourses (many settlements are sited on floodplains). This makes VIP unsuitable and technical innovations to get round this have not always succeeded. Institutional challenges abound, with lack of coordination between roleplayers a hurdle, plus delays in service delivery resulting from significant delays in the formal processes required for the institutionalisation and regularisation of informal settlements.

Many informal settlements are found on private land and it is not uncommon for private land owners to refuse the provision of basic services (fearing the 'legitimation' and 'concretisation' of any invasions that have taken place). Within the communities there are difficulties around the incorrect use of facilities, vandalism and theft (and a rejection, in certain cases, of attempts to introduce on-site dry sanitation). The City is attempting to redress some of this via a communication strategy around its basic services roll-out and by giving support to awareness raising programmes. On the maintenance front, the desludging of full latrines is difficult as is the management of increasing quantities of greywater. Both of these are costly and access becomes a problem when settlements grow and become congested. As it is, greywater is frequently poured into VIPs by users, which disrupts their functioning and leads them to fill quickly. ■

*Provision of basic services in informal settlements in the city of Johannesburg, presentation by Zakhele Kunene, 22 July 2010*

- i World Water Day is on March 22 each year.
- ii Source: <http://allafrica.com/stories/201103240873.html>
- iii UN HABITAT have stated that by 2050, 60% of Africans will be living in cities. Joan Cloos, the Executive Director of UN-HABITAT, said: "No African government can afford to ignore the ongoing rapid urban transition taking place across the continent. Cities must become priority areas for public policies, with hugely increased investments to build adequate governance capacities, equitable services delivery, affordable housing provision and better wealth distribution."
- iv See Green Hills, Blue Cities: An Ecosystem Approach to Water Resources Management for African Cities, Rapid Response Assessment, UNEP & UN-HABITAT, 2011
- v See UN-Water Global Annual Assessment of Sanitation and Drinking-Water (GLAAS), WHO, 2010
- vi See Costs and Benefits of Water and Sanitation Improvements at the Global Level, Hutton G & Haller L, World Health Organization, 2007.
- vii According to a recent report by the Water and Sanitation Program (WSP), a multi-donor partnership administered by the World Bank. Governments are commonly unaware of the costs of inaction. Economic impacts of sanitation in Southeast Asia: summary report, Hutton G, Rodriguez UE, Naphthupulu L, Thang P, Kov P, World Bank, Water and Sanitation Program, 2007.
- viii As estimated by the Stern Review on the Economics of Climate Change (a 700-page report released for the British government on October 30, 2006, discussing the effect of global warming on the world economy. See [http://en.wikipedia.org/wiki/Stern\\_Review](http://en.wikipedia.org/wiki/Stern_Review)
- ix Indeed, WSP, the same report estimated that Sub-Saharan Africa actually loses about 5% of GDP, or some \$28.4 billion annually, a figure that exceeded total aid flows and debt relief to the region in 2003 (Economic Impacts of Sanitation in Southeast Asia: Summary, WSP, 2007).
- x See Diarrhoea: Why children are still dying and what can be done, UNICEF & World Health Organization, 2009.
- xi Some slums are predominantly rental accommodation; others are 'owner-occupied'. It varies from city to city.
- xii Sources: The State of African Cities, ps 242 & 243, UN Habitat, 2005-10; Walfram Alpha, <http://www.walframalpha.com/input/?i=population+of+of+sadc>; JMP, <http://www.wsisinfo.org/data-estimates/table/>; Wikipedia, [http://en.wikipedia.org/wiki/List\\_of\\_African\\_countries\\_by\\_GDP\\_\(nominal\)](http://en.wikipedia.org/wiki/List_of_African_countries_by_GDP_(nominal)); JMP report, Progress on Sanitation & Drinking Water, 2010 Update, p. 8; Mauritius status, povertynewsblog, [blogspot.com/2010\\_10\\_01\\_archive.html](http://blogspot.com/2010_10_01_archive.html); WSP, Takes urban sanitation lag relative to that of 4 ASEAN countries, multiplies this by 2% 'GDPIloss p.a.' then by GDP
- xiii For a country like South Africa, which has invested billions of rand in new sanitation infrastructure, this is a key issue. A recent conference in Durban, 'What to do when the pit is full' (co-convened by WIN-SA, PID and WRC), looked at how this can be addressed.

## WHERE TO GO FOR MORE INFORMATION

### SAKNSS

The Southern Africa Knowledge Node on Sustainable Sanitation aims to fast track and accelerate the delivery of sanitation through sustainable solutions - [www.african.org/](http://www.african.org/)

### WELL - Resource Centre Network for Water, Sanitation and Environmental Health

The WELL website is a focal point for providing access to information about water, sanitation and environmental health and related issues in. - [www.lboro.ac.uk/well/](http://www.lboro.ac.uk/well/)

### IRC Sanitation

News updates on sanitation, as well as other resource materials - [www.irc.nl/page/116](http://www.irc.nl/page/116)

### BPDWS - Sanitation Partnerships

How partnership can make a difference to the urban sanitation challenge and resources on sanitation approaches, entrepreneurship, etc. - [www.bpdws.org/web/w/www\\_37\\_en.aspx](http://www.bpdws.org/web/w/www_37_en.aspx)

### WASH Statistics - Lifewater International

Lifewater International aims to provide the most reliable and up-to-date statistics on water and sanitation - [www.lifewater.org/water-crisis](http://www.lifewater.org/water-crisis)

### WaterSanitationHygiene.org

Is a forum to ask an online community technical questions on Water, Sanitation & Hygiene - [www.WaterSanitationHygiene.org](http://www.WaterSanitationHygiene.org)

# Scaling up sustainable sanitation

## in peri urban - market centres in Malawi

Elias Chimulambe

In the peri urban areas of Malawi access to improved latrines is pegged at 7%. About 87 % of the population has access to basic sanitation and most of the households share latrines. Operation and maintenance of the available latrines (either improved or basic) are poor. The worst situations are in the market centres than in any other places due to economical and social activities taking place. Human and solid waste poses great and potential danger to human health and general living conditions due to unavailability of proper human and solid waste management. The situation has caused people to suffer from cholera and diarrhoea in some parts of the peri urban areas of Mulanje, Zomba and Machinga in Southern and Lilongwe in central part of the country.

The Government of Malawi through the Ministry of Irrigation and Water Development with financial support from Africa Development bank initiated a sustainable sanitation and hygiene projects after a situation analysis conducted by local firm – TM Associates dealing with sanitation and hygiene issues. The results confirmed great need for sanitation support and interventions.

The project combines different approaches to curb the sanitation problems in the Market centres in the 4 districts. First, the Community Led Total Sanitation (CLTS) is applied by well trained government extension workers to trigger the communities living in these areas to realize their own situation and make a decision, and after attaining the Open Defecation Free (ODF) status, the community moves through the ladder where the sanitation marketing approach is applied. This combination



Photo: WIN-SA 2007

of approaches is termed Community Led Total Sanitation Marketing (COLESAMA). The private small scale entrepreneurs are now replacing the extension workers in the application of the CLTS as they have realised that the community in the areas will eventually move on the ladder and would look for better services. One SME, Mr Mabvoto Kawombola of Limbule Market centre in Mulanje District is a full time business entrepreneur in sanitation and also engages himself in initiating the village CLTS knowing that households from ODF villages will be his customers.

“This is good sanitation business promotion initiative” said Mr Kawombola. “I have managed to increase sales and

customer base due to CLTS. I have constructed 250 latrines and sold 300 sanitation slabs within a period of six months”. What I need now is to acquire a pit emptying machine to support the households and markets constructing the VIP latrines” continues Mr. Kawombola. Combination of CLTS and sanitation marketing has demonstrated strong replication of services. More communities are demanding for better services as they learn and emulate from neighbouring villages and households with improved sanitation status. The project supports the villages to attain the ODF status and train the Small Scale Entrepreneurs in business management and marketing.

The development of low cost latrine and sanitation products catalogue and skills training on construction played an important role to in the successful implementation of the sustainable sanitation activities. The experience from this suggests a need to demonstrate technically low cost latrine options, approaches (CLTS and Sanitation marketing) and proper institutional arrangements. ■

“ I have constructed 250 latrines and sold 300 sanitation slabs within a period of six months. What I need now is to acquire a pit emptying machine to support the households and markets constructing the VIP latrines ”

# Urban planning

## and consequences for sanitation - The case of zambia

*In Zambia, the rate of urbanisation has generally exceeded the capacities of national and local government to plan and manage water supply and sanitation systems in an efficient, equitable and sustainable way. Unserved or poorly served informal settlements continue to proliferate.*

**\*Mubu Kalaluka**

**T**hese settlements present unique problems. Residents of these informal urban areas often do not have legal land tenure, and in most cases, the site itself has not been legally urbanised. As a result, they are excluded from social statistics on housing and basic services, and municipalities and utility companies face acute problems in extending services to them. Improving sanitation services to the urban poor is an urgent priority that can have a major positive impact on health, economic productivity and the environment. The poor comprise the majority of potential new dwellers in most urbanising cities, and sanitation systems need to be designed with the particular needs of these low-income groups in mind. Take an example of Misisi compound in Lusaka where there is no form of appropriate sanitation and facilities, where diarrhoeal diseases like cholera have become the norm.

Sanitation systems in peri-urban areas in Zambia are often characterised by the neglect or absence of the public sector. Where public services exist, they often do not fully respond to demand. As a consequence, a range of non-governmental services fill the gap and offer sanitation services to private customers. Service providers in this case range from small-scale informal entrepreneurs, NGOs, to large private companies. Clients may be landlords, tenants or users of a shared toilet facility etc. These private sanitation transactions are often taking place with limited or no oversight of the public authorities. The challenge for policy



Un-serviced area in Lusaka during rainy season

makers is to provide a regulatory framework that encourages and supports private initiatives in the provision of sanitation services while at the same time ensuring that public and environment health standards are being met.

Such a regulatory framework will have to ensure that poor people with limited ability to pay for private sanitation services are able to access the services.

### Sanitation Market and Financial Flows

Most public financing in sanitation goes to already serviced areas or newly planned centralised systems and by-passes the urban poor. As a result, self-financing is a common way through which the urban poor finance improved sanitation. Understanding the sanitation



market (including ability and willingness to pay, the price of services, financial flows, etc.) is thus a prerequisite to develop models for pro-poor urban sanitation service chain. There are many aspects of the “sanitation market” and financing that are relevant and need further research, for instance, understanding how the poor participate in urban sanitation markets; pro-poor financing mechanisms; understanding the role of subsidies and quantifying the financial flows in urban sanitation.

## Governance

National and local government bears the responsibility for appropriate policy and regulatory frameworks in relation to pro-poor urban sanitation. This includes ensuring the satisfactory legal framework and technical development of sustainable sanitation service chains, and related supporting issues such as awareness raising, demand generation, hygiene promotion, demand led and participatory planning processes which are sensitive to the needs of the vulnerable groups, etc.

The framework should allow for financing and cost recovery mechanisms ensuring that investments lead to sustainable service delivery, (including operation and maintenance) that are accepted and affordable to the poor. Sex-disaggregated data and the documentation of paid and unpaid labour in relation to water use, hygiene needs and domestic work are important as basis for policy decisions. Technological aspects are important for the description of appropriate technological components and options that need to form a sustainable sanitation service chain. ■

### Reference:

1. The current state of water and sanitation in Zambia report: 2009 –NGO WaSH FORUM
2. Multi stakeholders learning and sharing workshop on water and sanitation in Zambia; October, 2009

\*Former Advocacy and Community Liaison Project Officer Zambia Water and Sanitation Alliance (ZWASA)



Water kiosk in a shanty compound in Lusaka

“ *The challenge for policy makers is to provide a regulatory framework that encourages and supports private initiatives in the provision of sanitation services while at the same time ensuring that certain public and environment health standards are being met* ”



CSOs in Lusaka engaged in an advocacy Workshop on water & sanitation

# Sanitation Problems in Peri Urban Areas in Blantyre

## Faecal Sludge Management Interventions by Water For People-Malawi

*Blantyre is the commercial centre of Malawi with a population of over 850,000 and growth rate of 2.8%. In addition the majority of the population live in unplanned areas.*

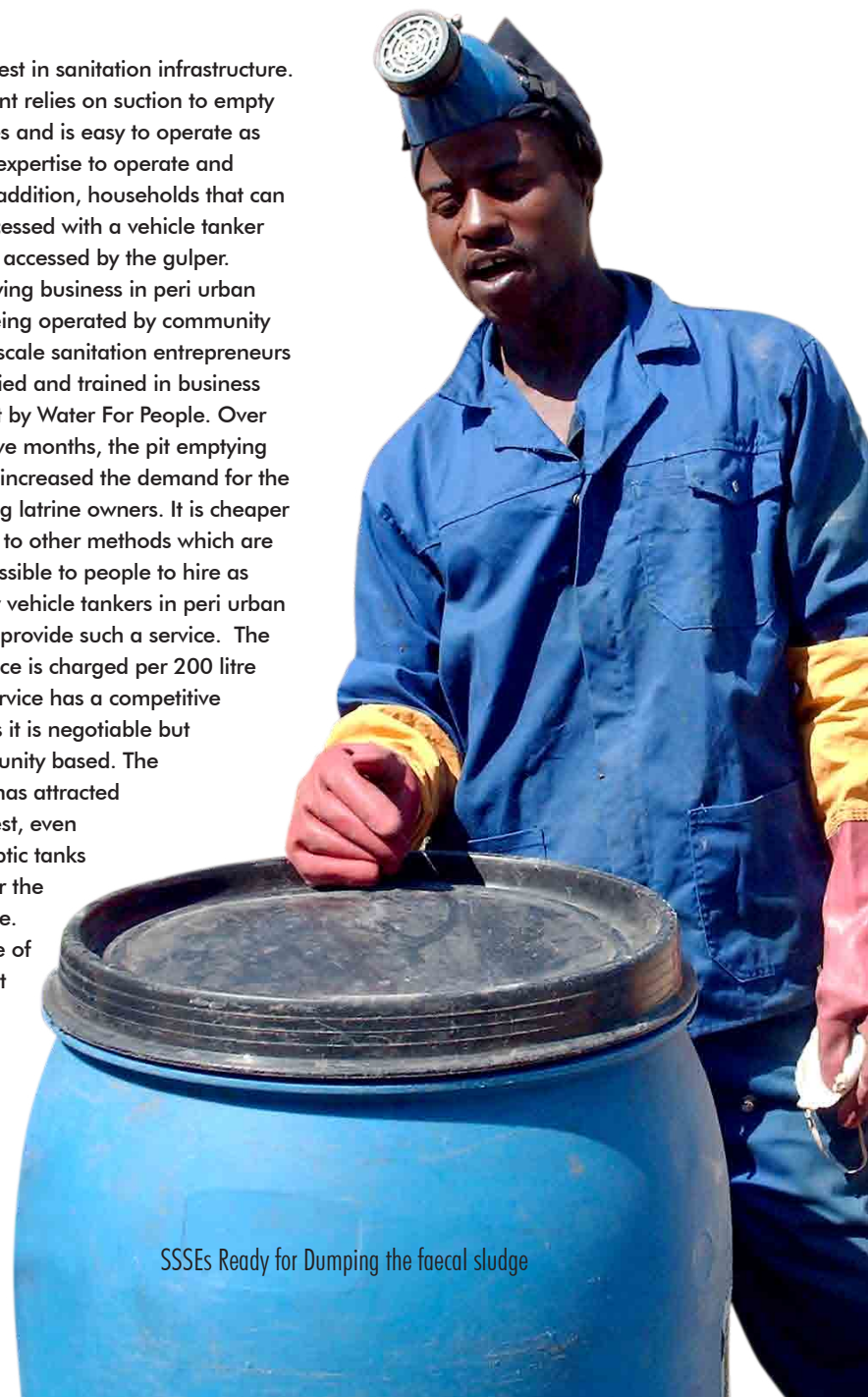
**Joseph Magoya**

It is estimated that 70% of the population in Blantyre live in unplanned areas characterised by poor housing patterns, overcrowding and poor road networks. Traditional pit latrines and Ventilated Pit latrines are the common types of latrines found within the peri urban communities. Most of the residents in the communities are tenants, with a number of houses sharing a single toilet; as such there is high user-latrines ratio which makes the latrines fill up quickly. Provision of latrines in tenancy-leased properties is regarded as the sole responsibility of the landlords. However, due to unavailability of sustainable faecal management interventions that can reach all the corners of the low income areas, the landlords are not motivated to invest in improved latrines as they already collect little from rentals.

### Pit Emptying Services in Low Income Areas (LIA)

Water For People uses Sanitation Marketing approach to promote sanitation in its targeted communities. The approach empowers the private sector to provide sanitation infrastructure and services at a fee as a business. Under this programme a simple manual and locally-made pit emptying equipment was developed in 2010, called the Gulper, to enable the households in peri urban communities to access the pit emptying service and motivate

people to invest in sanitation infrastructure. The equipment relies on suction to empty the pit latrines and is easy to operate as it needs less expertise to operate and maintain. In addition, households that can hardly be accessed with a vehicle tanker can easily be accessed by the gulper. The pit emptying business in peri urban Blantyre is being operated by community based small-scale sanitation entrepreneurs (SSSE) identified and trained in business management by Water For People. Over the past twelve months, the pit emptying business has increased the demand for the service among latrine owners. It is cheaper as compared to other methods which are also not accessible to people to hire as there are few vehicle tankers in peri urban Blantyre that provide such a service. The Gulping service is charged per 200 litre drum. The service has a competitive advantage as it is negotiable but is also community based. The intervention has attracted a lot of interest, even owners of septic tanks are calling for the Gulper service. However, one of the significant challenges facing the equipment is that it cannot go more than three



SSSEs Ready for Dumping the faecal sludge

meters deep. The other challenge facing the pit emptying business by the small scale sanitation entrepreneurs is the cost of transporting the drums of faecal sludge on a vehicle to the sewer disposal. This impedes the entrepreneurs from making enough profits.

The SSSE entrepreneurs employ a number of approaches to coax households to demand for their services e.g. they conduct house to house visits and distribute flyers to potential customers that might demand for the service. In an effort to solve the transport problem of the pit emptiers, Water For People is developing and testing a technology to dry the faecal matter after emptying within the LIAs so as to reduce the transportation cost to the business. The equipment relies on solar energy to dry the faecal matter. The dried sludge from the solar sludge drier can be used as manure on agriculture production. ■



A solar Sludge Drier under Construction



Dried Sludge from the Solar Sludge Drier

“ *The intervention has attracted a lot of interest as even owners of septic tanks are calling for the Gulper service.* ”

## ABOUT WATER FOR PEOPLE

Water For People is a Non Profit International Development Organization that helps people in developing countries to improve their quality of life by supporting the development of locally sustainable drinking water resources, sanitation facilities, health and hygienic programmes. Our vision is a world where all people have access to safe drinking water and adequate sanitation; A world where no one suffers or dies from water or sanitation related diseases. Water For People believes in the power of partnership. As such it develops a working relationship with other players in the sector to ensure sustainability of the interventions. Over the past years Water for People has been working in developing locally made faecal sludge management interventions for its both Peri Urban and Rural programmes.



SSSEs on their way to Sewer Disposal



CSOs in Lusaka engaged in an advocacy Workshop on water & sanitation

# Sustainable Sanitation Systems

Richard Holden

It is the contention of the author that the provision of sustainable sanitation in South Africa has not been achieved due to the focus on the provision of a toilet facility rather than the provision, operation and maintenance of an entire sanitation system as defined:<sup>1</sup>

“The infrastructure necessary to provide a sanitation facility which is safe, reliable, private, protected from the weather and ventilated, keeps smells to the minimum, is easy to keep clean, minimises the risk of the spread of sanitation-related diseases by facilitating the appropriate control of disease carrying flies and pests, and enables safe and appropriate treatment and/or removal of human waste and wastewater in an environmentally sound manner”

As a result although infrastructure is built, backlogs are not being eliminated as the infrastructure provided is not sustainable. This is true of both on-site and centralised systems and despite numerous reports and studies highlighting the problem South Africa is no closer to solving the problem than it was in 1994 when the first White Paper<sup>2</sup> was published. The result is that instead of building infrastructure that would assist in creating a cleaner environment and helping people improve their circumstance, the sanitation and housing programmes have contributed towards maintaining the vicious cycle of poverty and provoking unrest against unsustainable service delivery.

The 2010 Green Drop Report<sup>3</sup> highlighted the problem of lack of systems thinking with waterborne sewage in that only 449 out of approximately 852 municipal wastewater systems could be assessed and of those assessed only 203 scored better than 50% in measurement against the stringent criteria set. The Free State performed particularly badly yet this was recently a major focus of the Bucket Eradication Programme where buckets were replaced with waterborne sewage. Although an assessment of the Municipalities' ability to operate and maintain the system was supposed to be undertaken, it was not done. An example of this is Matjhabeng (which could not present the information to DWA for assessment) where in 2007 nearly 14,000 buckets were eradicated but there were already considerable problems with most of the wastewater treatment works, pump stations and outfall sewers. This lack of systems thinking is also evident in Rouxville where a pipeline is proposed from the Orange River even though there is no credit control or water demand management<sup>4</sup>, Jagersfontein and Fauresmith where a pipeline has been under construction for 3 years from Kalkfontein Dam and Trosberg where a new Wastewater treatment works was constructed on top of a hill but is still not in use. The last two examples are in Kopanong Municipality which was unable to give information to DWA for Green Drop assessment. This contrasts with the approach taken by the Department of Water Affairs, Northern Cape. In 2003 a request

by Nieuwoudtville for grant funding for an additional borehole was turned down as an assessment by DWA was that a lack of credit control in the high income areas was leading to excessive demand. The enforcement of credit control led to a dramatic decline in water consumption and the existing resource was able to cater for the demand in the entire town<sup>5</sup>. This experience was incorporated into the toolkit produced in the DWAF NORAD funded programme<sup>6</sup> but there is very little evidence that this approach, or anything similar, has been adopted.

With on-site sanitation, particularly VIPs and Urine diversion toilets that same lack of system thinking is evident. Toilets have been constructed but with little thought on how to ensure “safe and appropriate treatment and/or removal of human waste and wastewater in an environmentally sound manner.” With VIPs the issue is what to do with the excreta once the pit is full. Having no viable way to empty pits, households in rural areas had solved this problem many years ago by building either very large pits, generally in stable soils, with brick superstructures that would be demolished when the pit filled up, or smaller pits with tin superstructures that could be moved to a new hole when the pit was full. With small pits households saw no point in lining the pit as the investment would be lost as soon as the pit filled. Instead of building on this experience and trying to solve the problems of pit emptying and disposal before changing the technology there was a widespread introduction of brick superstructures with small pits (often being sealed which made them conservancy tanks and subject to very rapid filling). In both the Northern Cape<sup>7</sup> in 2005 and eThekweni Municipality in 2007 it was found that it was not viable to empty pits using vacuum tankers and that hand desludging, which poses considerable



Figure 1: Permanent Dry Sanitation Facility



Figure 2: Urine Diversion Toilet with Easily Removable Cover and Emptying of Chamber



Figure 3: Co-Composting of Faeces with Kitchen Waste

“ *With on-site sanitation, particularly VIPs and Urine diversion toilets that same lack of system thinking is evident. Toilets have been constructed but with little thought on how to ensure “safe and appropriate treatment and/or removal of human waste and wastewater in an environmentally sound manner* ”

health risks to the workers, was the most viable option. In schools the situation is even worse and a project in the Eastern Cape found that an estimated 1 million children and their teachers did not have functioning sanitation.<sup>8</sup> In response to this many municipalities have started to specify lightweight moveable VIP toilets with two shallower pits with only a collar. This is essentially the fossa alterna<sup>9</sup> as developed by Peter Morgan and builds on current practice household practice. However, South Africa is left with a legacy of an estimated 500,000 brick VIPs that need to be manually emptied for them to be sustainable. The Eastern Cape provides an excellent example of where households are making choices that are very different to government programmes, which would seem to indicate a complete lack of faith in these programmes to deliver sustainably. In Idutywa there is a manufacturer of tin toilets who has been in business for over 20 years. Despite the government ban on tin toilets in government sponsored sanitation programmes, households have continued to buy tin toilets (with increased household wealth, the design has improved considerably over the years) indicating a very different approach to what they regard as sustainable. With Urine Diversion toilets,

the intention has always been that the household empty the pit and dispose of the contents themselves. The design, therefore, should allow easy access to the pit and easy removal of the faeces whilst at the same time keeping rainwater out. However what households got in many cases were concrete slabs mortared into place that could not be easily removed (eThekweni<sup>10</sup> and Kgalagadi Municipalities), manholes that were not water proof (Genadendal) and often with the construction of single chamber UD toilets, no composter. With the notable exception of eThekweni Municipality, neither the municipality nor the consultant has taken responsibility for fixing the problem and as with VIPs there are now many toilets that have been abandoned by the households as they are unsustainable.

For South Africa to achieve sustainable sanitation systems, it must radically change the current approach and:

- 1) Rigorously apply decision making systems and ensure money and systems are in place to operate and maintain the technology before implementation (i.e. no waterborne sewage if people are already not paying and the waste water treatment works is not

functioning correctly;

- 2) Implement tried and tested designs for VIPs and urine diversion toilets that build existing knowledge and experience. If consultants and municipal officials wish to deviate from this without testing the approach first then they must be held personally responsible for the costs of fixing the problem. If this approach is followed then it will result in sustainable sanitation that has a positive impact on people's lives. ■

1. Strategic Framework For Water Services, September 2003
2. Water Supply and Sanitation Policy, October 1994
3. Green Drop Report 2009 Version 1 South African Waste Water Quality Management Performance Department of Water Affairs
4. Assessment of Rouxville Bulk Water Supply : DBSA 16 September 2007
5. Case Study Presented at the Northern Cape Water Summit 2004.
6. Decision Making Framework for Municipalities DWAF, March 2004
7. Pilot Project to Establish Affordable and Acceptable Emptying Solutions for Both VIP and UDS Toilets, H Fouche Consultants: May 2005
8. Proposal To Establish Sustainable Operation And Maintenance System For School Sanitation In Rural Areas. Department of Science & Technology. 2006
9. Toilets That Make Compost: Low-cost, sanitary toilets that produce valuable compost for crops in an African context. Peter Morgan
10. Report on Visit to eThekweni Sanitation Programme Richard Holden 8 April 2004

## 2011 GREEN DROP

The number of systems that scored more than 50% increased from 216 in 2009 to 460 in 2011. We should also note that the number of systems increased from 449 assessed in 2009 to 821 in 2011. This is an increase of 83% in the number of systems assessed and it is an improvement and provides for a more accurate baseline of information from which sustainable improvement should be facilitated.

- The number of systems awarded with Green Drop certification therefore rose from 33 to 40. This increase is despite the fact that 20 of the previous recipients of the Green Drop certificates fell off the wagon as it were, and lost their certification status. However we are encouraged by the fact that 26 systems are being awarded the Green Drop status for the first time.
- The average percentage deviation toward maximum cumulative risk rating for the country increased from 66.8 % to 69.2 %. This tells us that local government capacity building is still required to ensure sustainable improvement. DWA: 30 June 2011

# South Africa's

## first Sanitation Technology Demonstration Centre

*South Africa and neighbouring countries will benefit from the newly launched Sanitation Technology Demonstration Centre located at the Council for Scientific and Industrial Research (CSIR) Built Environment and Innovation Site in Pretoria.*

**Hlengiwe Cele and Ditshego Magoro**

**T**he Centre was officially opened to the public on 27 May 2011. The aim of the centre is to provide practical and visual information on various sanitation technologies that support sustainable human settlements. The

demonstration centre is a one-stop site for full-scale examples of some sanitation technologies and superstructures. Inappropriate solutions or lack of sanitation coincide with high prevalence of diarrheal and related diseases, often linked to large-scale epidemics and deaths

of children under the age of 5 (estimated at about 2 million children per annum globally). This is often as a result of poor planning and the lack of an integrated approach to sanitation and health management. Policy makers, planners and implementers should consider a holistic approach to sanitation in order to address the health and hygiene, environment, technology choice, operation and maintenance, financial and economic issues and socio-cultural and institutional aspects.

"Recent documents estimate that between 1 and 2 billion people globally (estimate depends on the definition of what is appropriate sanitation solution) do not have the appropriate access to sanitation" says Dr Rivka Kfir, Water Research Commission (WRC) Chief Executive Officer during the launch. "Some local statistics, according to the Statistics South Africa Community Survey, published in 2008, indicated that nationally, in total 73% of the population had access to some form of sanitation". "South Africa, compared to other countries in the Sub-Saharan Africa region, has achieved relatively great progress for drinking water, but still lags behind on sanitation compared to the developed countries. South Africa will probably not meet the goals set for sanitation because of poor technology choices" adds Dr Kfir.

The Sanitation Centre responds to the real challenges faced by municipalities in South Africa. Mr Jay Bhagwan, Director: Water Use and Waste Management

Technologies displayed at the centre: photos by Hlengiwe Cele



at WRC says: "Municipal officials and communities when faced with technology choices do not have the full range of physical models on display, and decisions are made on pictures and diagrams.

When delivery takes place at community level, there are often poor or non-existent education and awareness campaigns on the technology targeted at the users. This leads to poor use and management of the sanitation systems, thus leading to operational and sustainability problems".

In South Africa a vast majority of people have realised the need to have dignified sanitation structures. Just recently, a huge political debate erupted due to open toilet structures in the City of Cape Town and Viljoenskroon in Moqhaka Municipality. This demonstrates the importance of sanitation, not only as a health issue, but as a human rights issue. Therefore, it becomes important for municipalities to understand the needs of their communities

and ensure that the proposed sanitation technologies fit the local conditions.

One of the factors that contribute to Africa lagging behind is lack of knowledge and awareness on appropriate technologies. This is exacerbated by the fact that there is a wide range of sanitation products on the market and often decision makers lack the technical skills to assess and evaluate products that will be suitable to their geographic conditions and socio-economic factors.

Louiza Duncker, principal researcher at the CSIR Built Environment Unit and the project leader for the Sanitation Technology Demonstration Centre, says: "People visiting the centre will get first-hand information on existing and some new sanitation technologies. This will create a better understanding and appreciation of different and alternative technologies. The targeted audience for the centre includes the general public,

learners, communities, government officials, municipal councillors, non-governmental organisations (NGOs), technical professionals and the private sector".

With this sanitation centre in place, visitors will have the opportunity to view full-scale examples of sanitation products and technologies and acquaint themselves with various sanitation systems available in South Africa. Besides the displayed technologies, information sheets and supporting documentation are provided, making the centre information-rich. ■

**Contact details:**

Santechcentre@csir.co.za  
Tel: 012 841 2566  
Fax: 012 841 3400

[www.csir.co.za/built\\_environment/santechcentre](http://www.csir.co.za/built_environment/santechcentre)

“Recent documents estimate that between 1 and 2 billion people globally (estimate depends on the definition of what is appropriate sanitation solution) do not have the appropriate access to sanitation”



Technologies displayed at the centre: photos by Hlengiwe Cele

# What happens when a pit is full?

*Although sanitation is one of the Millennium Development Goals, many countries and regions are performing poorly in attaining their declared sanitation targets, including Sub-Saharan Africa.*

**Hlengiwe Cele and Ditshego Magoro**

**W**hilst much of the focus is, understandably, on the provision of new toilets, the maintenance of those toilets already built cannot be forgotten.

In South Africa, as part of a drive to provide basic sanitation for all, over two million Ventilated Improved Pit latrines (VIPs) and other similar on-site sanitation systems have been built since the early '90s. As many are yet to be built, an emerging crisis is that soon a large proportion of these systems will become full. It is therefore important for Water Service Authorities (WSAs) to have solutions to the emerging challenges and have a good handle on the following aspects:

- At what rate does faecal waste accumulate in on-site sanitation systems?
- What are WSAs in South Africa doing about the management of faecal waste from on-site sanitation systems, especially VIPs?
- What technologies are available, in South Africa and elsewhere, for the emptying of VIPs? What new technologies for VIP emptying are under development and testing?
- What disposal options are available for faecal sludge? What is the cost of faecal waste management? Is there any evidence for the effectiveness of pit additives?

These questions are all significant in contributing to understanding the sustainability of dry sanitation systems. The large scale roll-out of basic sanitation in South Africa brings many challenges associated with the emptying up of pits. The problems include poor construction of pits and linings, undersized pits, dumping of solid wastes and the addition of smell retardants and disinfectants. Research by the Water Research Commission (WRC) confirms that pits are filling up faster than expected design life. Mr. Jay Bhagwan, WRC Director for Water Use and Waste Management confirms that municipalities are accordingly facing challenges with planning and budgeting for the emptying of VIPs. The current approaches and technology deployed offers very little opportunities for ease of pit emptying and the environmental and health risks. Municipalities need to understand and predict the rate of sludge accumulation and the emptying methods that may be required. Furthermore, they will have to dispose of the pit contents without endangering the health of residents or the functioning of existing wastewater treatment works, and do so with as little damage to the environment as possible. The city of Durban has been a focal point for much of this innovation and learning through a collaborative research between the WRC, the UKZN and Partners in Development. The research covers aspects



Pit emptying in eThekweni, Umlazi: Photo by Jay Bhagwan

related to scientific understanding of processes in pits and the accumulation of faecal sludge, appropriate and innovative techniques for pit emptying, new lightweight superstructures, as well as the safe and beneficial disposal and management of faecal sludge.

eThekweni was therefore an appropriate place to gather a range of practitioners dealing with Faecal Sludge Management (FSM), from the 14th to 15th of March 2011. Approximately 100 participants gathered - from local government, NGOs, research organisations and academia - in order to discuss the latest developments and share experience across four continents. The objective of the seminar was to enable anyone responsible for the sustainable operation of on-site sanitation systems to find out about new developments in the field, and to share their experience with counterparts from elsewhere in Southern Africa and the world. The seminar was hosted by the



## SEMINAR HIGHLIGHTS

The seminar was split across six sessions and ended with two field visits (hosted by eThekweni's Water and Sanitation Department, EMWS). The sessions ran as follows:

### Session 1: What happens when the pit is full? A trillion dollar question and an urgent one.

Introduced faecal sludge management as an issue and discussed some of the latest developments in the sector — not only in removing and treating sludge from pits but discussing broader developments in sanitation approaches that will influence the shape of FSM approach in the years to come.

### Session 2: Inside the pit

Talked about what happens inside pits and how sludge accumulate and degrade. It also discussed the pathogenic nature of the contents and the consequences of this for managing the waste streams generated. It discussed whether current 'pit additives' on the market offer potential in addressing the problem inside the pit, reducing the need to extract and treat waste.

### Session 3: Getting what's inside outside

Talked of innovations in pit emptying — both in the technology used to do so and also in the operational approaches followed. Showcased new experience both in South Africa and further afield that offers great potential of better ways to get waste from pits and ensure that it is dealt with appropriately.

### Session 4: Mechanised emptying for SMMEs

Discussed existing practice and options regarding the mechanised emptying of latrines as well as more recent developments. The session also showcased recent innovation in emptying techniques, then trialling of new machines and their potential. In doing so it highlighted applied research in South Africa and elsewhere (including Cambodia).

### Session 5: Grasping the nettle — eThekweni's Pit Emptying Programme

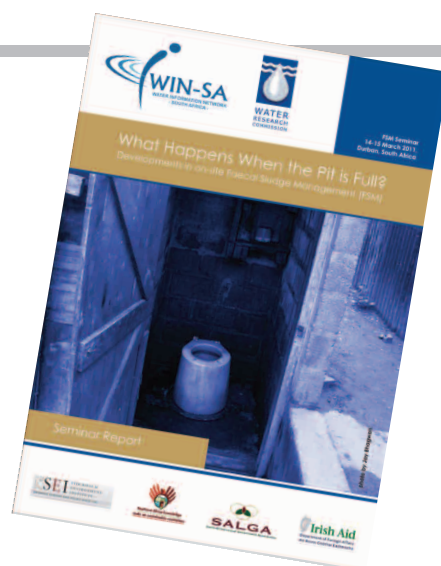
Addressed the lessons eThekweni's Pit Emptying Programme, one of the largest in the world, where a lot of thought, learning and experimentation has gone into developing a full scale pit emptying programme. This programme has led to a large accumulation of sludge and hence research into how to appropriately and safely dispose of pit sludge, including mechanical processing and deep-row entrenchment. An important issue discussed was how to protect manual pit emptier and the public.

### Session 6: The sludge disposal issue

Looked at new developments including the decentralised treatment of household sanitation wastes. Reuse is a viable option being explored, particularly in light of depleting phosphorus reserves and the potential of recycling the nutrients within the waste. Existing experience in transporting waste once excavated was showcased and the various consequences thereof debated.

**For more information and the detailed report on the Faecal Sludge Management seminar, please contact WIN-SA on 012 3300340 or 0832690458 or [ditshego@win-sa.org.za](mailto:ditshego@win-sa.org.za) / [www.afrisan.org](http://www.afrisan.org).**

**To know more about faecal sludge management contact Director Water Use and Waste Management: Mr Jay Bhagwan Tel: 012 330 9042 or Cell: 083 290 7232: email [jayb@wrc.org.za](mailto:jayb@wrc.org.za)**



# ASSESSING

## SANITATION SERVICE LEVELS

### – A New Approach

**Alana Potter, IRC  
International Water and  
Sanitation Centre.<sup>1</sup>**

Sanitation improvement is not as straightforward as the concept of “a ladder” with incremental improvements from open defecation to full flush, might suggest.

The ranking of appropriate technical options is highly context and settlement specific and dependent on the availability of water, soil and groundwater conditions, supply chain realities, settlement densities, types of housing and/or size of plot, and so on. In reality, ‘higher’ or more sophisticated technology options that are not well operated or maintained represent a substantially graver public health and environmental risk than options lower down the traditional sanitation technology ladder.

In the WASH Cost<sup>2</sup> Working Paper 3,<sup>3</sup> the research team set out to provide a common framework to analyse and compare water and sanitation cost data being collected across different country contexts with different service delivery norms and standards.

The emphasis in WASH Cost is on collecting and understanding full life cycle service costs, including operational, capital maintenance and direct and indirect support costs. This represents a fundamental shift away from a focus on capital investment costs for water or sanitation facilities<sup>4</sup> or technologies, to the costs of sustainable water and sanitation services. The Working Paper reviews the use of the concept of a sanitation ladder as a tool for participatory

decision making (e.g. PHAST, PRA, etc), and as a tool for global monitoring of the achievement of the sanitation MDGs (JMP 2008, 2010). As noted by Kvarnström et al (2008), the JMP approach has been

criticised within the sector because it does not deal with service indicators such as quality, reliability and sustainability of water and sanitation. Kvarnström also notes that by definition, a technology-based approach restricts options to the technologies listed and is not open to other options developed through sector innovation.

“ In reality, ‘higher’ or more sophisticated technology options that are not well operated or maintained represent a substantially graver public health and environmental risk than options lower down the traditional sanitation technology ladder”.

Building on Kvarnström’s concept of functional areas across the sanitation service delivery chain, the team proposed parameters and indicators for sustainable sanitation services across each functional area. It is suggested that this approach is not only useful for the WASHCost research, but could also be considered more broadly by those involved in planning and monitoring sanitation service delivery.

The contribution of WASHCost’s approach to assessing sanitation service levels is a set of globally comparable sanitation service levels comprising service indicators, rather than sanitation technology options as set out in sanitation ladders most commonly used today.

Sanitation services are defined as the (i) containment, (ii) collection, (iii) treatment, (iv) disposal and (v) re-use of excreta and solid and liquid waste.

It was proposed that service levels be assigned separately for excreta and urine management, for grey water, and for solid waste, which are all parts of a sanitation service.



## Proposed parameters<sup>5</sup> and indicators for WASHCost sanitation ladder

Service Parameters <sup>6</sup>	Service Indicators
Accessibility	Distance from users, effort required for use, safety, privacy <sup>7</sup> , dignity, minimises flies and bad odours, waiting time in the case of communal facilities.
Use	Safe and hygienic use by all members of the household, day and night and in all seasons, and infant faeces disposed in the latrine.
Reliability	Effort required for operation and maintenance of the toilet, e.g. pit desludging (mechanical) or emptying (manual).  Operation and maintenance safe for users and service providers.  Longevity and robustness of top and 'underground' structures.
Environmental protection	Environmentally safe containment, collection, treatment, disposal and re-use of excreta and urine. Productive re-use of safe by-products.

Based on these four service parameters and taking into account the reality of sanitation services in the focus countries and considering all the functional areas of the sanitation service delivery chain, a sanitation service ladder of five broad categories or levels was proposed, three of which represent different types of acceptable service and two represent a limited or below standard service, which do not meet basic norms and do not properly merit the description of a service. The three levels of acceptable services can be described as follows:

### Basic service:

At this level all households have reasonable access to a safe, relatively robust, private sanitation facility, available hand washing facilities, relatively weak desludging and other long term maintenance provisions, and non problematic environmental impact or safe disposal of sludge. This is typical of most acceptable rural and peri-urban sanitation services.

### Improved service:

At this level, all users have easy access at all times to a convenient, private, safe, robust sanitation facility which seals against flies and bad odours, has nearby hand washing facilities, where minimal effort is required for desludging and long term maintenance, and there is non-problematic environmental impact or safe disposal of sludge.

### Highly improved service:

At this level, users have immediate access at all times to a convenient, private, safe, robust, secure sanitation facility which seals against flies and bad odours, as well as having immediate access to hand, anal and latrine cleansing facilities with soap, where minimal or no effort required for desludging or long term maintenance, and there is positive environmental impact, e.g. productive re-use of safe by-products.

The full Working Paper (and composite ladder) is available online ([www.washcost.info/redir/content/.../file/WASHCost\\_brochure\\_2011.pdf](http://www.washcost.info/redir/content/.../file/WASHCost_brochure_2011.pdf).) and it is hoped that the water and sanitation service ladders developed for WASHCost research purposes can be used as part of the process of setting norms and targets with respect to ongoing service delivery and will also serve an advocacy function. ■

1. To contact the authors: [potter@irc.nl](mailto:potter@irc.nl)
2. WASHCost is a five year action research project investigating the costs of providing water, sanitation and hygiene services to rural and peri-urban communities in Ghana, Burkina-Faso, Mozambique and India (Andhra Pradesh). The objectives of collecting and disaggregating cost data over the full life-cycle of WASH services are to be able to analyse costs per infrastructure and by service level, and to better understand the cost drivers and through this understanding to enable more cost effective and equitable service delivery. WASHCost is focused on exploring and sharing an understanding of the true costs of sustainable services (see [www.washcost.info](http://www.washcost.info)).
3. Assessing sanitation service levels – A New Approach, Potter et al 2010, [www.washcost.info/redir/content/.../file/WASHCost\\_brochure\\_2011.pdf](http://www.washcost.info/redir/content/.../file/WASHCost_brochure_2011.pdf).
4. The terms "latrine", "toilet" and "facility" are used

interchangeably in this paper.

5. Scale and affordability are also crucial important service parameters, addressed in the research through data aggregation and analysis.
6. Service parameters can be thought of as being composite service indicators.
7. This indicator does not refer only to individual household latrines. Privacy is also possible with communal facilities and refers to having a door and walls for privacy and safety.

### References:

- Kvarnström, E. et al., 2008. The Sanitation Ladder – Need for a Revamp? Presentation at 2009 IWA Development Congress.
- Moriarty, P. et al., April 2010. Working Paper 2: Ladders for assessing and costing water service delivery. WASHCost.
- SuSanA (2007) SuSanA Vision Statement Towards More Sustainable Sanitation Solutions. Sustainable Sanitation Alliance. Available at [http://esa.un.org/lys/docs/Susana\\_backgroundunder.pdf](http://esa.un.org/lys/docs/Susana_backgroundunder.pdf) [Accessed 22 August 2010]
- World Health Organization and United Nations Children's Fund Joint Monitoring Programme for Water Supply and Sanitation (JMP). 2008. Progress on Drinking Water and Sanitation: Special Focus on Sanitation. UNICEF, New York and WHO, Geneva. Available at: <http://www.wssinfo.org/resources/documents.html> [Accessed 22 August 2010]
- World Health Organization and United Nations Children's Fund Joint Monitoring Programme for Water Supply and Sanitation (JMP). 2010. Progress on Sanitation and Drinking-water: 2010 Update. UNICEF, New York and WHO, Geneva. Available at: <http://www.wssinfo.org/> [Accessed 22 August 2010]

# Tokologo Municipality

pilots closed circuit wastewater treatment and recycling sanitation system for a small urban community in Seretse Township, South Africa.

Nozi Mjoli - Hlathi Development Services



## ABOUT TOKOLOGO

Tokologo LM falls under Lejweleputswa District Municipality, its average population density is estimated at 3 per square km thus making it the most sparsely populated municipality in the District and about 57% of the population is classified as urban.

The population has decreased from 32 455 to 21 323 between 2001 and 2007 (STATS-SA, 2007) and the number of households decreased from 8847 to 7477 during the same period. The majority of households have two to four people per household. The majority of the households are poor. The majority of people that were earning income received less than R2000 per month, therefore, most households would qualify for indigent status.



Two manholes that receive wastewater from households

In February 2006 the National Government of South Africa set a target of December 2007 for the elimination of 252 254 bucket toilets; this sanitation system was considered unhygienic and a violation of the human dignity for the users and those responsible for collecting and disposing of human waste from the bucket toilets.

Tokologo Municipality which is located in Free State Province, South Africa, took a decision to replace 1446 bucket toilets with Ventilated Improved Pit (VIP)

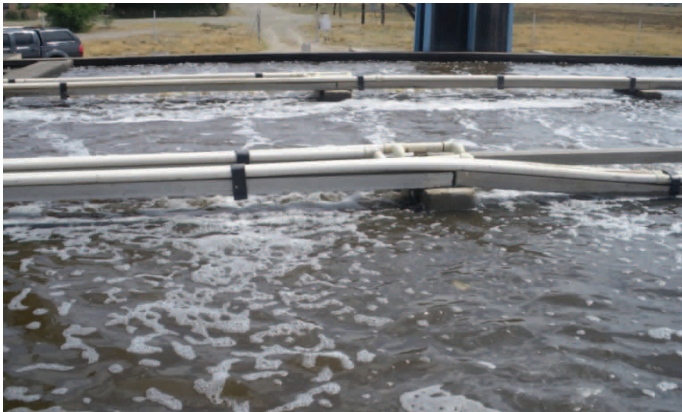
latrines without consulting the beneficiary community of Seretse Township. However, this decision backfired when the community protested against the provision of VIP toilets which they considered to be inferior to waterborne sanitation.

Tokologo Municipality which is located in Free State Province, South Africa, took a decision to replace 1446 bucket toilets with Ventilated Improved Pit (VIP) latrines without consulting the beneficiary community of Seretse Township. However, this decision backfired when the

community protested against the provision of VIP toilets which they considered to be inferior to waterborne sanitation.

The municipality was forced to engage the community in the selection of an acceptable sanitation technology option. A joint decision was taken to install the closed circuit wastewater treatment and recycling sanitation system which met the community demand for waterborne sanitation without a need for huge investments in the development of new water supply infrastructure.

“ *The most distinctive advantage of this process is that it is aerobic, this reduces the odour problems, the layout is compact and requires less space than other systems, there is minimum use of mechanical equipment, operation and maintenance is simple.* ”



A rectangular shaped wastewater treatment tank



The sieve which prevents solids from passing into the reactor

Tokologo municipality was selected as a case study for the Bucket Eradication Programme (BEP) Water Research project No.2016: Programme Evaluation of the bucket eradication, led by Dr Nozi Mjoli, Hlathi Development Services. The municipality’s intervention is seen as an innovative approach towards meeting the demand for waterborne sanitation without investing in the development of new water supply infrastructure to provide water for waterborne sanitation system in this water scarce area. The study evaluated the pilot sanitation system from a technical, social, environmental, health and financial perspectives. The study evaluated the pilot sanitation system from a technical, social, environmental, health and financial perspectives. Methods used to collect data included interviews, focus group discussions, review of the relevant municipal documents and physical inspection of the close circuit wastewater treatment plant. The study found that the households were generally satisfied with the sanitation service provided but there were concerns about the reliability of the sanitation system. The adaptation of the

Rapid Reactor Activated Sludge System originally developed for treatment of wastewater for use in irrigation of lawns provided Seretse Township with the convenience of a waterborne sanitation service. The closed circuit wastewater treatment and recycling sanitation system has a potential to provide small communities with a higher level of sanitation service while also contributing to water conservation but there is a need to conduct research to assess the potential public health risks associated with the use of grey water for flushing toilets. Research is also needed to understand the long-term impact of grit ingress into the wastewater treatment system and the high salinity on the biological treatment processes. It is capable of removing nitrogen by allowing anoxic zones to develop, phosphate concentration is reduced by 40%, and grit might possibly only build up over a period of 20 years thus eliminating grit removal facilities in the immediate future. Go to [www.afrisan.org](http://www.afrisan.org) to download the full case study. For more information contact [nozimjoli@mweb.co.za](mailto:nozimjoli@mweb.co.za) ■



Treated grey water storage tank



The clarifier

# The story of ECOSAN TOILETS in Malawi

*A seven year old boy strolls towards an Ecosan public toilet in a Malawian densely populated informal settlement of Chinsapo, situated six kilometres outside of Lilongwe City the Malawian Capital. The child meets a toilet supervisor.*

## Wonderful Hunga

**H**e unexpectedly fumbles for a 10 Malawi Kwacha coin from his pocket and drops it into the hand of the supervisor, a woman in gumboots and green overalls. "I would like to use the toilet," he tells her. And she leads him into one of the toilet cubicles. A few months ago, this scene was almost unimaginable. The youngster and the woman would not have met here; he would have gone to relieve himself in the nearby graveyard.

## Weary of dreaded conditions

Sanitation conditions at Chinsapo market have been extremely nauseating. The market, which services over 50,000 people had one toilet, abandoned and in an appalling shape. Faeces were a common sight, and a haven for flies. Even more shocking and repulsive, people bought their foodstuffs just around the corner from it.

People dreaded using this toilet and resorted to using a nearby graveyard as a 'makeshift toilet' notwithstanding the health cost. Unfortunately the situation was no better for a sea of households across the tarmac road from the market. In this South Eastern outskirts of Lilongwe city, one has to walk in narrow footpaths that zigzag around the township. The houses are closely knit, and the area is characterised by an exploding human population. One



An Ecosan toilet at Chinsapo market

is welcomed by a stench from a horde of pit latrines that are conveniently built. The pit latrines are a tell-tale of poverty; cheaply carved out of cardboards, old clothes, blankets, heifer sacks, sticks, mud and grass. They have weak base and are a danger to human lives, especially during the rainy season.

These toilets are literally a health hazard and threat to human lives. Adults have fallen into these toilets; in 2010 a man fell into one of these cheaply constructed latrines and drowned in human excreta.

In the African setting, characterised by extended families, pit latrines barely last. One toilet is shared among several families as landlords construct a single toilet for their fleet of tenants.

## Community response

The community of poor areas such as Chinsapo are tired of their poor living conditions, and have decided to fight the perilous conditions of their environment. Troops of people were recruited to join a network of the poor in Malawi, called the Malawi Homeless People's Federation, fondly referred to as the Federation. The Federation works in alliance with the Centre for Community Organisation and Development, CCODE - a local Non-Governmental Organisation. Members of the Federation run community savings-credit schemes and these are supported by CCODE. Through its Water and Sanitation Programme, CCODE, also promotes Ecological Sanitation. Some selected members of the Federation were trained

in the management of the ecological sanitation (Ecosan) toilets and how they can use them to their benefit. In order to incite interest, demonstration Ecosan toilets were constructed at selected households. When the demand for the toilets started to develop, CCODE started offering sanitation loans to groups in order to allow individual members to construct Ecosan toilets. The sanitation loans are administered under the Mchenga Fund, and beneficiaries have to apply for a loan as a group of at least 10 people. The application process includes the scrutiny of the group's savings by a Vetting Team under the Federation.

The application procedure also requires that the group have in savings up to 10 percent of the total amount of the loan being applied for. A sanitation loan for an individual toilet facility can go as high as up to MK 30,000<sup>1</sup> per household. Therefore a group applying for a K 300,000 sanitation loan has to save up to MK 30,000 to qualify for the loan. The group has to choose a secretary, a treasurer and a loan officer to monitor repayments. A savings account with one of the local banks is thus has to opened to this end. The group enforces the repayment of the loan among its members. Applying for the loans in groups ensures that the materials for construction are bought in bulk and thus costs are reduced substantially. The loan repayment period is up to two years with interest of 2 per cent. Community buy-ins is ensured during this process when more and more people adopt the Ecosan innovation at once.

## Diffusing the Innovation through leadership

The Ecosan innovative practice is widespread in Malawi; CCODE and the Federation have so far distributed over 2,000 brochures and posters. The diffusion of the message has been through leadership adoption and advocacy such as chiefs, demonstration toilets and community-to-community knowledge exchanges.

In the Malawian context, the involvement of chiefs ensured agreeable community participation, when demonstration toilets strategically built at the chiefs' residences. Communities followed their chiefs' actions and adopted the ecosan toilets; traditionally, chiefs are regarded as a credible source of information. Over 40 chiefs across Malawi have been offered training on Ecosan toilets so far, and they in turn are multipliers of change in their communities.

Most of the chiefs organise meetings with their subjects, and sensitise them on the importance of Ecosan toilets. New applications for sanitation loans are received by CCODE on a daily basis, and the Mchenga Fund team is kept busy. "I want everyone in my area to have these modern toilets because that way, we will have enough food from the manure [after harvesting the crops grown using

the manure from the toilet]," Traditional Authority Kwataine from Ntcheu District recently remarked after an Ecosan toilet training.<sup>2</sup>

## Research dimension

Ecosan toilets in Malawi were not always well received; about four years ago, a Health Officer in Blantyre, Malawi's commercial City also bursting with urbanisation, 'spelt doom' when 497 toilets were constructed at Angelo Goveya using a loan from CCODE. As a low cost housing area, Angelo Goveya was expected to be inundated by a cholera break out. However, three years down the line, there has not been a single Cholera case in this area.

Bunda College of Agriculture, a constituent college of the University of Malawi has been conducting research on Ecosan toilet products, involving Federation members in Lilongwe. Preliminary results have shown that the products are not harmful, but rather highly nutritious and produce a better yield than some artificial fertilisers. Maize was grown using Ecosan products at Bunda College of Agriculture campus and Mtandire, in a community-provided maize field, to assess their nutritive value and health effects in the last growing season.

## The Economics of Waste

Women in the informal settlements of Malawi are running businesses that never were before. Women are running Ecosan public toilets in Blantyre and Lilongwe, and charge a fee for the use of the facilities.

The Chinsapo toilet facility in the anecdote is run by women. These women got a sanitation loan from CCODE under the Mchenga Fund and constructed the toilet. The women were mainly unskilled in this trade and were stay-at-home housewives. However, with these public toilets, they can now earn up to MK 45,000 per month. This salary is comparable to that of a graduate civil servant in Malawi. This money is used for personal use, to service the loan, to pay salaries for fellow tradesmen, maintenance costs and to employ a guard. Apart from

avoiding diarrhoeal infections and medical costs, beneficiaries of the Ecosan toilets are selling their manure or using it in their gardens.

At Angelo Goveya, people are already using and selling their manure from Ecosan toilets to Blantyre City Assembly. Fertilisers in Malawi are expensive such that the government runs a subsidy programme. The programme faces a stormy future in terms of sustainability. It benefits a few out of millions of the needy and affects women who have to walk longer distances to maize selling points, where they have had time to get through. Ecosan could be an alternative.

The Ecosan toilets have two vaults; when one vault is full, the users shift to use the other. During this time the first vault is closed for six months to allow for complete decomposition and elimination of pathogens.

In the case of Chinsapo market, since the installation of the Ecosan public toilet, the quality of the Lilongwe River has improved. The river, a mere 300 metres from the market, used to carry human waste from the graveyard. Comparatively, conventional pit latrines involved K 12,000 per year spent on the construction of a new pit latrine since the majority of the Malawians are poor and cannot afford commercial pit emptying services. The situation was made worse by lack of access to the pit latrines in the squatter settlements with poor road networks.

The Ecosan toilets are in Malawi to stay.

\*Communications and Advocacy Officer, CCODE; Malawi. ■

1. \$1 = MK151
2. Traditional Authority Kwataine, (2010, March 5). Ecosan Community Leaders Training Feedback. (C. W. Tabbie Mnolo, Interviewer)

“The pit latrines are a tell-tale of poverty; cheaply carved out of cardboards, old clothes, blankets, heifer sacks, sticks, mud and grass. They have weak base and are a danger to human lives, especially during the rainy season”

# Safe use of greywater

## for urban food production

By Hlengiwe Cele

**T**he potential contribution of household and urban food gardens to food security is limited by a shortage of water which can be used to supplement rainfall. Greywater may help to overcome this limitation by providing a dependable source of water that is under the control of the household gardener. Although more than half of indoor household water use can normally be intercepted as greywater, potential users are uncertain about the risks and local authorities are also uncertain as to what

their approach should be. A solicited research project, initiated and funded by the Water Research Commission (WRC) and led by Dr Nicola Rodda of the University of KwaZulu-Natal clarifies the benefits as well as the risks associated with the use of greywater.

Active promotion of greywater use for irrigation in gardens and small-scale agriculture has the potential, not only to maximise use of limited water supplies, but also to improve food security in low-income settlements. However,

before this practice can be promoted through government structures and local authorities in South Africa, the legal status of greywater use for irrigation needs to be clarified and guidance needs to be formulated for users so that small-scale irrigation use of greywater is performed in a way that is safe for humans, plants and the environment.

### What is greywater?

According to Dr Rodda, greywater can be defined as the untreated household effluent from baths, showers, kitchen and hand-wash basins, and laundry (i.e. all non-toilet uses). More than half of indoor household water use is normally used for these purposes – estimates range from approximately 50% to 80%.

This percentage represents a large fraction of household wastewater which can potentially be intercepted by the householder and used for additional beneficial uses. However, the amount of greywater generated per household varies greatly. The variation is affected by factors such as dynamics of the family, water usage patterns, age distribution of occupants and lifestyle characteristics. Greywater generated in low-income, unsewered areas can be as low as 20 to 30 litres per person per day, whereas it can be about 90 to 120 litres per person



Interception of greywater, Photo - WRC



per day in sewered houses. In general, in sewered areas greywater represents about 65% of the total wastewater stream whereas in unsewered areas the production of greywater could reach 100%.

## Concerns about the use of greywater

The WRC study highlights concerns about human health, which could be threatened in the process of using greywater for food production. This is due to the fact that greywater contains micro-organisms from skin surfaces and dirt, from small amounts of urine and faeces (e.g. from washing of soiled nappies or bedclothes), and from the washing and preparation of food. Standing greywater also provides an environment in which micro-organisms can survive and proliferate.

As a result, greywater usually contains significant numbers of micro-organisms, some of which may be capable of causing disease in those who come in contact with the greywater or with plants and crops irrigated with greywater.

In addition to containing substances which are beneficial to plants (mainly nitrogen and phosphorus), greywater also contains substances that can reduce plant growth or crop yield if present at sufficiently high concentrations, such as salts, sodium and boron. Extreme pH can also be damaging to plants.

Some constituents of greywater can change soil properties so that it becomes progressively less productive (i.e. less able to support plant growth). Because soil properties change slowly, these tend to be long-term effects, while effects on plant growth and yield are more short-term. The major concerns with regard to soil are salinity and sodicity, both of which are related to the increased concentration of sodium in greywater. Other greywater constituents which may affect soil adversely are oil and grease, and suspended solids. Many of these

concerns can be overcome by adequate management of greywater irrigation in terms of measures taken to reduce risks, and to control the quality and quantity of greywater applied.

The biggest problem lies with non-sewered informal shack settlements in South Africa where there are limited waterborne services and drainage. In these areas greywater often merges with toilet water and other effluent flows thus creating a toxic mix of contaminated water that poses a danger to human health and the environment. Although the per capita volume of greywater disposed of on the ground in the vicinity of shack dwellings is low, greywater runoff often carries solid and liquid waste contaminants that collect in ponds and are frequently discharged via stormwater systems into wetlands and rivers.

Dr Gerhard Backeberg, Director for Water Utilisation in Agriculture at the WRC says "Current legislation pertaining to disposal and use of water and waste falls short in that a definition of greywater as a separate wastewater stream is lacking. Clarity is needed for the future by explicit definition of greywater and the beneficial uses to which it may be put". "The existing legislation does not specifically exclude use of greywater for irrigation, but there are inconsistencies which arise from the absence of a clear definition of greywater as a subset of domestic wastewater which differs in character and hazards from blackwater (wastewater including toilet waste). These need to be resolved to clarify the legal position of use of greywater for irrigation" adds Dr Backeberg.

## Conclusion

The project produced a Guidance Report to assist potential greywater users in identifying measures to reduce the risks highlighted above. The following were listed amongst many recommendations made by the study: Potential greywater users need to be involved in planned

greywater implementations from the planning stages, informing them of the benefits and risks of greywater use for irrigation, allowing them to express their views and concerns, and providing a mechanism for them to be involved in decision-making. Potential irrigation users of greywater also need information in order to practise greywater irrigation in a safe and sustainable manner. Once greywater implementation has been planned and initiated, greywater users need ongoing monitoring and support. This should be tailored to meet the different information and support needs of low-income rural and peri-urban settlements and middle- to higher-income urban settlements.

Two products were generated by the WRC study, in order to help guide the wise use of greywater: a user-friendly guide and a supporting technical background document capturing the scientific information on which the guide is based. It is envisaged that the outcomes of this project will provide municipalities, NGOs and householders with greater certainty about how to minimise the health risks and optimise the benefits associated with the use of greywater, specifically in peri-urban or urban food gardens.

The Guidance report (WRC Report No. TT469/10) entitled **Sustainable Use of Greywater in Small-Scale Agriculture and Gardens in South Africa** and the Technical report (WRC Report No.1639/1/10 (with the same title) are available from the Water Research Commission, Publications – Tel: (012) 330-0340, Fax (012) 330-2565, email:orders@wrc.org.za or visit [www.wrc.org.za](http://www.wrc.org.za). ■



Food garden, Photo - WRC

# The role of capacity development in rehabilitation of water and sanitation systems: Lessons from Zimbabwe

By Loreen Katiyo

Before the meltdown, during and after. Until the localised economic meltdown and the accelerated inflationary period that spanned the decade 2000 to 2010, Zimbabwe was enjoying its status as one of the leading SADC countries to champion progress towards delivery of proper sanitation and hygiene facilities to its citizens. The country has had a rural water supplies and sanitation programme running since the late 80s. At its peak in 1997 it was estimated that rural water supplies coverage was at 75% while sanitation was at 60%. Urban water supplies used to be at almost 99% coverage due to legislative requirements that all households be connected to a treated water supply. Urban sanitation was equally pegged at 90% again due to legislation that required all households to be connected to a sewer.

However, with a hyperinflationary period that peaked at 230 million percent, the water supply and sanitation systems and infrastructure was a soft target for the inevitable budget cuts.

By June 2009, it was estimated that coverage of rural water supplies was at 37% and given that at any given time 40% of the boreholes were down, then effective coverage was even lower at about 23%. Rural sanitation coverage was estimated to be between 25% and 30%.

On the urban front, some Harare suburbs sometimes went for several months without water (e.g. Budiriro and Mabvuku).

This collapse in the country's infrastructure rendered it susceptible to WASH related disease outbreaks such as cholera which has become an endemic disease since the 90s. By June 2009, the cholera outbreak had affected all the provinces of the country with an estimated 98,444 people affected. Given an estimated population of 13,200,000 this meant that 0,7% were affected. The cumulative deaths by the same date were at 4,282, in other words, 0,03% of the population. The cholera outbreak prompted a massive response from Humanitarian aid agencies in terms

of material, support, human resources and financial assistance. The WASH cluster in Zimbabwe, which is a grouping of all major and minor non-governmental agencies working in Water, Sanitation and Hygiene issues, became actively involved in the 'cholera emergency response program', which covered all areas from software to hardware issues in both rural and urban settings.

Developmental efforts in Zimbabwe had mostly focused on rural WASH. The decade presented an unprecedented scenario, whole sections of towns were disconnected from the water supply networks and urban dwellers had to develop on-site water supply systems including shallow wells in the suburbs of Budiriro and



Children playing in sewage

Dzivarasekwa. Overloaded or blocked sewers resulted in sewage overflows onto the street, the community complained at first but quickly became desensitised to the smells and scenes, until it became 'normal' for children to play near sewage effluent, as people learnt to live with the stench and the flies.

There were piles of uncollected solid waste which were again a consequence of the economic meltdown as waste management systems collapsed. The uncollected waste also served as dumping sites for faecal matter.

Given that toilets were non-functional due to lack of water, faeces were thrown into these dump sites which also provide livelihoods for scavengers seeking items for re-use and sale.

## Capacity development as a mitigation measure

A lot of avenues were explored by the WASH cluster in mitigation. Capacity development was one of the innovations in the cholera response program. Training of WASH sector personnel, chiefly water operators working at water and wastewater treatment plants, was a measure to deal with the symptoms in skills decay, arising from brain drain as experienced personnel left for better prospects in neighbouring countries, but also arising from the blunting of personnel skills due to spending several years at dysfunctional plants.

The cluster organised capacity building for different levels. At the national level, training on emergencies was recommended as essential before cholera outbreak, as part of the preparedness plan. This is because during an outbreak, organisations are too busy treating the symptoms of a problem to deal with the causes. Capacity gaps were also identified with extension workers and volunteers, at municipal and plant level.

In the end, UNICEF, with support from UK Aid, the EU, and AusAID and in collaboration with the government of Zimbabwe, embarked on a nationwide capacity building for water and wastewater plant operators. The Institute of Water and Sanitation (IWS), one of the pioneers of WASH capacity development in Zimbabwe, was responsible for the

program roll-out. At first, attempts were made to train the plant operators under the IWS's water and sanitation career path, which trains personnel from National Certificate level up to a Postgraduate diploma in Water Supplies and Sanitation, inclusive of the levels in between. However, it soon became evident that the situation on the ground with respect to the personnel in the frontline of the battle with WASH related issues in communities did not necessarily fit the profile of candidature to official, mainstream educational programs. Most of the plant operators on site did not have the pre-requisite qualifications to be eligible for the National Certificate or National Diploma in Water and Waste Management. In the end the resolution to do a tailor-made program was passed. Thus, IWS ran a year-

long National Plant Operator (NPO) project, funded by UNICEF under the support of various bilateral organisations. The goal of the project was to establish a nationwide year long sponsored training program for water and wastewater plant operators so as to improve the Operation and Maintenance of the treatment plants and safeguard the health of the public in urban centres. The Engineers' Forum (a Zimbabwean Engineering body) was involved and appraised all stages of the training and was also consulted on the findings and subsequent design of the tailor-made course content. Updates were regularly given to the urban rehabilitation technical coordination committee of the WASH cluster.

The treatment plant supervisors were actively involved in the preparation, implementation and evaluation of the project. During project implementation all the host municipalities were involved in facilitation and practical evaluation of the participants after the training. There were also asked to prepare training materials and these will contribute to a final water operators guidebook.

## Lessons in capacity development

The training program yielded some useful insights into how capacity development can be tailored to be the oil that drives the engine of water and sanitation service provision. Most water and wastewater operators expressed the view that the course was relevant for their day to day operations, some of them confessing that they had previously just 'stumbled' through their duties, as no-one had really told them the 'why' part of how operations were carried out at the plant. The training also became a platform where operators from different places/plants shared problems, ideas and/or solutions.

All participants were eager to learn and get a qualification or some certification of sorts and were grateful for the support availed by the WASH cluster. The training did much to boost employee morale, as at some of the stations the problem had morphed from being one of resource constraint to being one of decay of process and procedure. The participants expressed the view that the sponsored training

program should not be a once off event but be repeated on a periodic basis. Participants actually wrote a letter to UNICEF to that effect. In African culture, women are in the frontline of health and sanitation issues. However, females were not well represented in the plant operator family. There is still need to encourage the participation of females in both the operator work and in facilitation of capacity development programs. Participatory and visual teaching methods were very popular with the participants. This was mainly because of the level of education of some of the participants, which was quite minimal in some cases.

However, another aspect that came out clearly in the project is that training of plant operators alone is not sufficient. A local authorities engineering practitioners' capacity building program that looks at the holistic on-the-job training of all levels from operators through plant attendants to junior engineers is necessary to facilitate ease of interaction between engineers and the plant operators that they manage. One of the key factors that caused the Zimbabwean system to collapse is poor management and communication breakdown between the different levels responsible for sanitation delivery, also a rigid system which was not adaptable to the inevitable perturbations that accompanied the economic meltdown. It emerged that non-engineering departments did not appreciate the work that plant operators do. A complementary capacity building program targeting non-engineering disciplines related to water and sanitation service delivery such as accounting departments, health and the policy makers themselves is also necessary if general service delivery and the welfare of plant operators is to be improved.

There was also little regularization at treatment plants and lack of a formal body to regularize qualifications and serve as an advocacy platform for the water and sanitation (plant operators) career path. Other career paths like engineers and medical doctors have professional bodies in Zimbabwe, and by the same token plant operators should also have an association as a platform to share views and also regulate practitioners. Organisations like GWOPA (Global Water Operators Association) founded by UN Habitat could go a long way in providing some of the required enabling platforms. The fundamental lesson learnt from the capacity

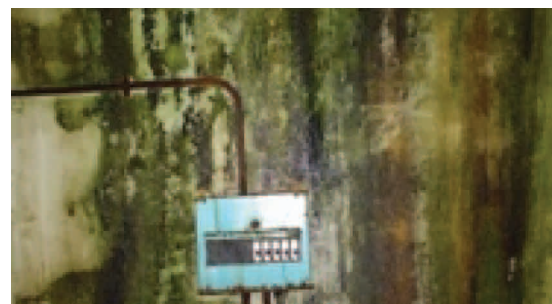
development exercise with respect to the plant operator at a treatment plant is: plant operators are in the frontline of the battle for proper urban water supply and sanitation service delivery. The fact has to be recognized and investments have to be made to ensure that these individuals are adequately trained, if the millennium development goals are to be realised. A one-size fits all approach will likely not address the real issues, so programs have to be tailored to the specific needs of operators in a given context. ■



Dysfunctional pump room



Waste Stabilisation ponds overgrown with vegetation



The effects of zero operation and maintenance at plants

“ *The fundamental lesson learnt from the capacity development exercise with respect to the plant operator at a treatment plant is: plant operators are in the frontline of the battle for proper urban water supply and sanitation service delivery* ”

The Southern Africa knowledge node on sustainable sanitation aims to fast track and accelerate the delivery of sanitation through sustainable solutions. The node aims to facilitate and coordinate capacity and skills development, knowledge sharing and collaboration.



**Southern Africa knowledge node on sustainable sanitation**



The website aims to facilitate collaboration and information sharing among stakeholders in the SADC region. It serves as a SADC gateway to sustainable sanitation information. The website is the first regional website with dedicated on sustainable sanitation information. We encourage our stakeholders to register on the website and share with us any documents that will contribute to knowledge sharing and capacity building in the region.

**The SAKNSS website consists of:  
Document management system**

The SAKNSS document management system is a user friendly component that allows users to search documents by Document Type, theme, country, keyword and advanced search

**Benefits for members:**

- Link and exchange information with peers
- Access to new information and experience
- Practical support and capacity building
- Lessons learned
- Analysis of policies and sector trends
- Documentation and sharing of best practice
- Facilitating platforms for sustainable sanitation dialogue
- Awareness raising and Networking

[www.afrisan.org](http://www.afrisan.org)

**How to access SAKNSS items?**

Users should first register their details before they can have full access to the SAKNSS items.

**Contact management module**

The contact management module provides an opportunity for the stakeholders to access their peers, contractors, suppliers, NGOs and government officials. It further allows stakeholders to advertise their own organisations/companies on the website.

**Links database**

The Links database provides access to organisations, private companies and government ministries working with the water and sanitation field.

**SADC country information on sanitation**

The country information page presents the status of sanitation in SADC countries with links to the responsible ministries and their contact details.

