TERRAVIVA
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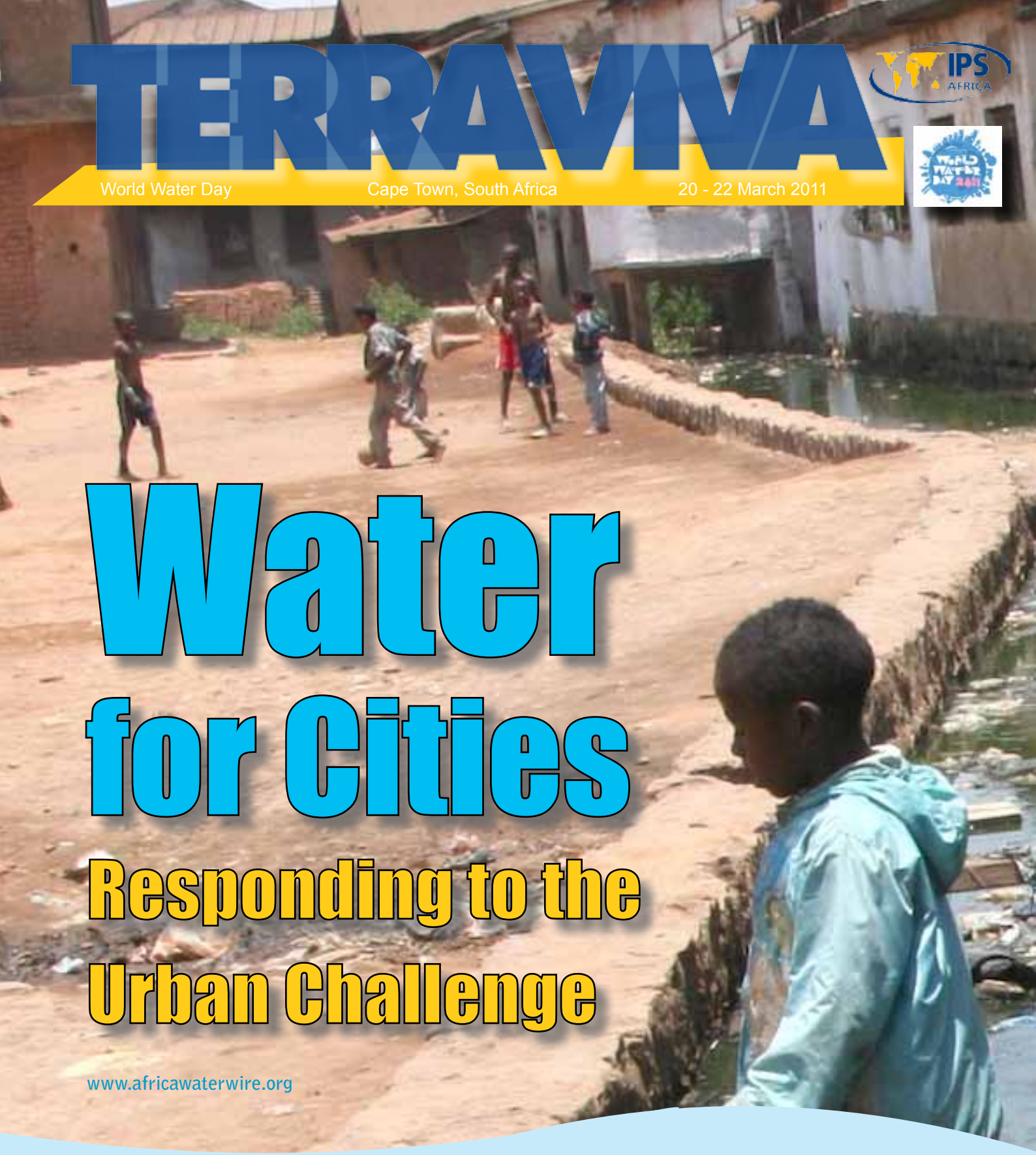

Water for Cities

Responding to the Urban Challenge

www.africawaterwire.org

TERRAVIVA

IPS AFRICA

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Front page photo caption: Children cross over sewage water in a suburb of Antananarivo, Madagascar.
Credit: Lovasoa Rabasary/IPS

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Water and Urbanisation

watering our engines of growth

By Phera Ramoeli
Senior Programme Officer, SADC WaterDivision

This year World Water Day - which is celebrated annually on March 22 to focus attention on the importance of freshwater and advocating for the sustainable management of freshwater resources - marks the theme "Water and Urbanisation".

The Southern African Development Community's (SADC) Water policy emphasises that water is a social and economic good and, as such, should be developed and managed in a manner that provides economic benefits, human dignity and social well-being for all our over 200 Million Citizens.

Nowhere is this clearer than in the urban environments of the SADC. In the Region's cities, domestic water consumption competes with industrial and development needs.

Our industrial heartlands are engines of growth and development for respective countries but their water demand must be offset by their contribution to the community in a way that improves overall livelihoods. These demands must always be carefully managed to make sure that we can sustain the supply through adopting water conserving strategies and reducing water losses in our systems.

Water and sanitation are critical factors to alleviate poverty and hunger, for sustainable development, environmental integrity, and human health. Yet, in the SADC region - where 70% of water resources are shared across national boundaries – access to proper water supply and sanitation remains a major challenge.

This is despite the fact that only four years remain before the target of 2015 as per the Millenium Development Goals. There is therefore a need to deepen our efforts to improve the status of access to both water supply and Sanitation in our respective countries particularly our urban areas.

SADC's commitment to providing a framework for developing, utilizing and protecting water resources in the Region makes the Integrated Water Resources Management framework all the more critical in order to represent the aspirations and interests of the southern African countries. This approach of doing water business in the region assures us success in the development and management of the finite and otherwise highly shared water resources.

Today, one in two people around the world live in a city. Urbanisation is continuing unabated; while investment in infrastructure has struggled to keep up with rate of urban migration and new challenges continue to emerge.

These modern challenges call on us to find sustainable solutions to providing equitable access to water and urban sanitation provision as well as balance competing needs of the cities' dwellers.

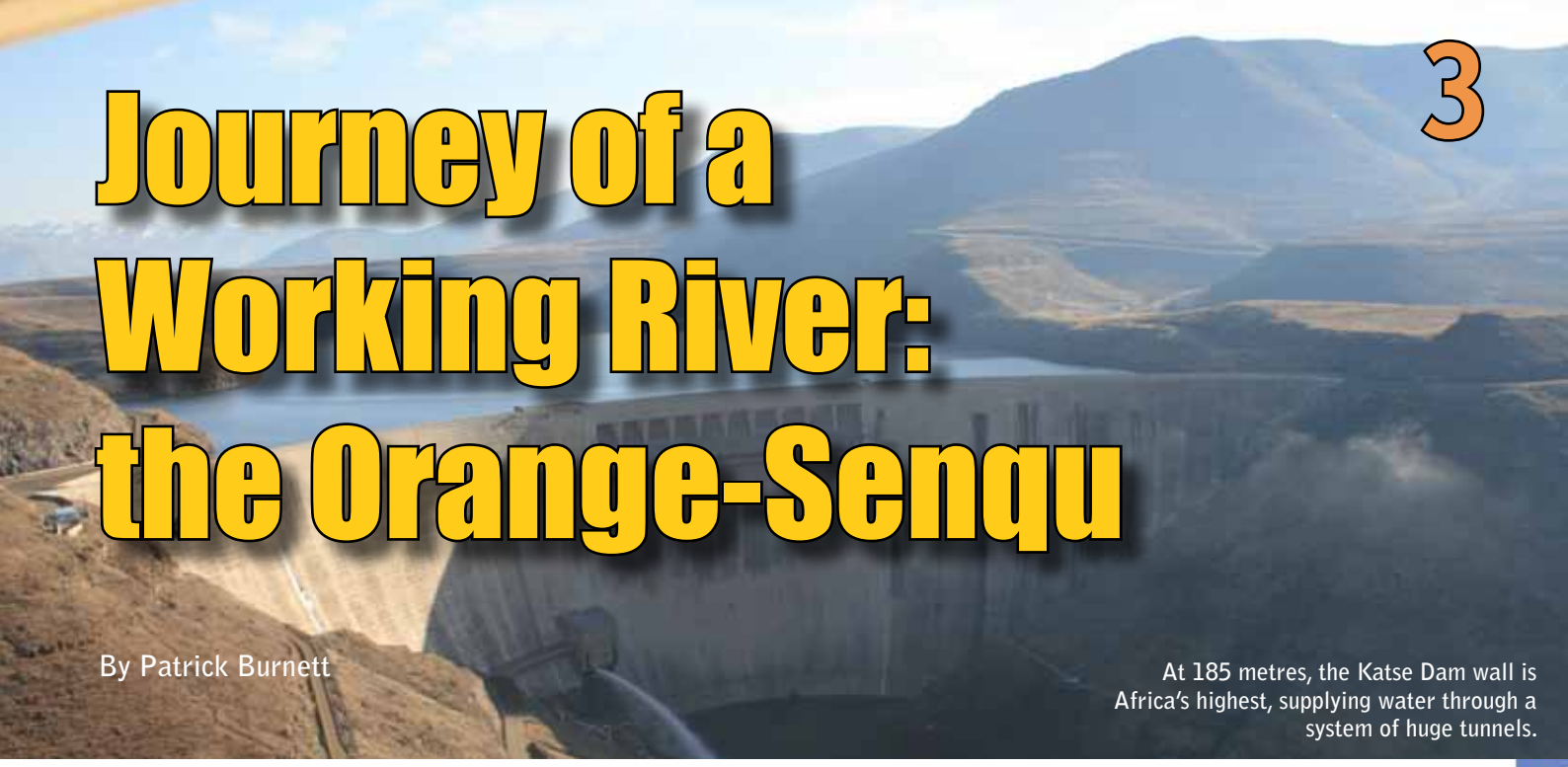
All these challenges must be tackled in the light of growing evidence that climate change will affect our water resources in both quantity and quality - especially in Sub-Saharan Africa into which SADC falls.

As the African Ministers' Council on Water (AMCOW) joins UN-HABITAT and UN-Water in co-organizing World Water Day (WWD) 2011 in South Africa, it is an apt time for SADC's Water Division to reflect on how the management of urban water challenges us in the SADC region to continue to work together for the good of our citizens.

An overhaul of Harare's water infrastructure was stalled in 2009. Credit: Vusumuzi Sifile/IPS

Journey of a Working River: the Orange-Senqu

By Patrick Burnett



At 185 metres, the Katse Dam wall is Africa's highest, supplying water through a system of huge tunnels.

KATSE - In the valleys of Lesotho's Maluti mountains, women carry yellow plastic buckets of water across fields of dark-brown earth; a group of men form a human chain to pass rocks between them to build a small dam wall across a mountain stream; clothes are being washed in rivers; and men draped in blankets ride donkeys or horses along the roadside.

The road to the Katse Dam winds steeply upwards through the mountains and whips around a final hairpin bend to reach a height of 3,000 metres. From the peak, the road twists through mountain valleys alongside a 36 square kilometre reservoir held back by the dam.

Completed in 1997, the dam's wall is 185 metres high, making it the highest in Africa, and it is 60 metres thick at its base.

Built under a joint partnership between South Africa and Lesotho, the Katse Dam forms part of the first phase of the Lesotho Highlands Water Project (LHWP). Through the LHWP, water is transferred from water-rich Lesotho through a system of huge underground tunnels from whence it is discharged into rivers that feed water-scarce South Africa, keeping its water guzzling economy alive.

Water earns the mountain kingdom hundreds of millions of dollars in royalty payments, its biggest source of foreign exchange.

From Katse Dam, the waters of the Orange-Senqu river make a 2,300 kilometre journey to the sea through some of southern Africa's most striking geography.

The journey passes through the deserts of southern Namibia, through the semi-arid landscapes of South Africa's Karoo and up onto the highveld, home to the biggest industrial complex in Africa.

Along the way are some of the biggest users of water in Africa, each raising complex issues about the management of the resource.

A working river: petrol

Four-hundred kilometres from Lesotho, in South Africa's economic powerhouse of Gauteng, lies the town of Secunda, it's car dealerships, fast-food outlets and garish casino hotel dominated by a vast petro-chemicals plant that covers an area equivalent to 2,900 soccer fields.

It's a factory of pipes that would stretch around the world if laid end to end, two skyscraping smoke stacks and eight cooling towers belching steam into the sky. Water might not be uppermost in the minds of South Africa's car owners when they fill up with petrol, but it's crucial to South Africa's fuel economy.

A working river: electricity

At the Optimum Colliery, situated 30 kilometres south-east of Middleburg, a giant excavator known as a dragline labours in the earth, scraping out 60 tonnes of earth at a time and dropping it on a nearby pile with a rumble of rocks and a cloud of dust.

In the background of this grey and brown landscape is the Hendrina Power Station, to which the colliery feeds millions of tonnes of coal a year.

To extract the approximately 11 million tonnes of coal a year it supplies to Eskom and export markets, 90 to 120 million cubic meters of earth is removed per annum to expose the coal to a depth of 60-80 metres - leading to the collection of run-off water.

A working river: irrigation

Even though the lower reaches of the Orange River, stretching from where the Vaal River meets the Orange River to the mouth in Alexander Bay, is a dry area, crops such as grapes, pistachios, citrus, pecans and vegetables are grown in a green strip irrigated by the river.

In this section of the river, commercial agricultural accounts for 94 percent of the current total water use, according to figures from South Africa's water affairs department.

Farmers around Kakamas are allocated and charged for water based on a quota system, which allocates a certain amount of water per hectare to each farmer.

The issues raised by three of the biggest users of water in the Orange-Senqu system - industry, mining and agriculture – speak to the challenge of managing the resource in a water-scarce environment. Having enough water to support development needs, while also tackling environmental concerns, issues of access to water and future threats posed by climate change are all factors that need to be balanced.

With the Orange-Senqu river basin home to nearly 16-million people spread across Lesotho, South Africa, Botswana and Namibia, the effective management of the resource is crucial to the well-being of the region.

SOUTHERN AFRICA

Sharing the Okavango

By Meekaeel Siphambili

GABORONE - Each January, a giant pulse of water from heavy summer rains over the south of Angola enters the Okavango River system and begins a five-month journey through Namibia to a richly biodiverse swamp in Botswana's Kalahari desert. The river is a rarity, scarcely disturbed by human development along its 1,100 kilometre length: shaping its future is the delicate task of the Okavango River Basin Commission.

The Okavango Delta, which expands to three times its permanent size when the water arrives between June and August, is home to a tremendous concentration of wildlife.

There are just under 600,000 people living in the basin's 323,000 square kilometre area, relying on its waters for small-scale agriculture and livestock, fishing, and household use. But aside from evaporation, a few sips drawn off to supply the Namibian town of Rundu and 1100 hectares of irrigation nearby, the water that falls in Angola at the turn of the year arrives in Botswana in mid-winter to recharge the Delta.

"Water usage in Angola and Namibia is minimal, 99.2 percent of Okavango river water still reaches the delta in Botswana where it is used for tourism," says Chaminda Rajapakse, of the Environmental Protection and Sustainable Management of the Okavango River Basin (GEF-EPSMO) project.

But there is continuous, even growing, pressure on the river. When Namibia faced severe drought in the late 1990s, it considered drawing water off the Okavango to supply its capital, Windhoek, hundreds of kilometres away. Namibia also has a long-standing desire to build a hydroelectric dam on the river at Popa Falls, 50 kilometres upstream of the border with Botswana.

Further north, the consolidation of peace in Angola means a growing population around the river's headwaters and the government in Luanda - flush with oil wealth - is turning its attention to long-delayed rural development.

But Botswana opposes any additional use of the water, arguing that it will disturb the fragile ecology of the Delta, leading to lost biodiversity and revenue from tourism.

Rajapakse's project is to analyse the potential harmful impacts to the health of the river and draw up a strategic programme for joint management of the river basin's water that will protect its diversity. He works closely with the Okavango River Basin Water Commission (OKACOM), which was set up in 1994 to, in its own words, "anticipate and reduce those unintended, unacceptable and often unnecessary impacts that occur due to uncoordinated resources development."

OKACOM, one of five river basin commissions and joint water authorities which met in the Botswana capital, Gaborone, for the 4th Annual 'Regional Workshop on Strengthening River Basin Organisations' during April 2010, is charged with establishing the safe long-term yield of the Okavango basin, estimating demand on its water resources, investigating the feasibility of water infrastructure and recommend measures against pollution, and designing schemes to deal with challenges like temporary droughts.

OKACOM executive secretary Ebenizario Chonguica said the Commission has overcome several obstacles as it mediates potential conflicts between the three countries over water use.

"The challenges are joint fact-finding. The three countries will find trends and opportunities through trans-boundary diagnostic analysis of the Okavango. There should then be a strategic action plan put in place to address the issues of all the three countries."

At first glance, this would seem to unfairly restrict use of the water by Angola and Namibia, to the benefit of Botswana alone. But in the context of the benefit-sharing approach that the Gaborone workshop was built around, the idea would be to negotiate over shared water resources in terms of how to optimise and share benefits, rather than simply competing over allocation of limited water. This might include joint investments where all three countries would reap the rewards of productive investments at a basin rather than national level.

The concept is an ambitious one which would require real commitment to regional integration in order to exploit the comparative advantages of each segment of the river, but OKACOM's Chonguica believes the Commission will be equal to the task.

"There have been shortcomings, but we have overcome them by means of complex working arrangements. People are now thinking on a trans-boundary scale. Thinking across borders is a major challenge and encouraging people to be transparent is not an overnight thing."

Credit: Mantoe Phakathi/IPS

SOUTHERN AFRICA

Securing Safe Water for a Million More

Drawing water from Calueque Canal, Namibia. Credit: Servaas van den Bosch/IPS

By Servaas van den Bosch

WINDHOEK – Long years of armed conflict have obstructed development in the areas on either side of the Angola-Namibia border. Now a 45 million dollar infrastructure upgrade is set to improve access to clean drinking water and decent sanitation for one million people.

Most people in this former conflict zone lack adequate access to clean drinking water and sanitation. The existing water supply system – several hundred kilometres of pipeline and an open canal – has been damaged by decades of civil war as well as the illegal off-take of water.

“For many years, the area around the Calueque dam in Angola was the theatre of wars between governments and various guerilla movements,” says the Kunene Transboundary Water Supply Project (KTWSP) co-chair, Dr Kuiri Tjipangandjara of Namibia Water Corporation, Namwater.

The system runs from the Calueque Dam in Southern Angola to the northern Namibian business hub of Oshakati and then back up into Angola again, all the way to the town of Ondjiva.

Drawing its water from the Cunene River in Angola, it is an essential lifeline for the arid border area and supplies water for farming, some industry and domestic use for over a million people.

The water supply on the Angolan side of the border still bears the scars of a devastating civil war and a colonial past.

“Under the Portuguese occupation, holes of 50 by 60 metres were dug to capture floodwater. These so-called chimpacas are still the main water source for the population,” says Thomas Kellner, technical advisor of GIZ (German International Cooperation), which will help local engineers with the overhaul.

But these pools are far from safe.

“Cattle drink from the chimpacas, but 25 metres further you see people washing themselves and doing their laundry, while at the other side people are drawing water for drinking. The water typically has a brown-reddish colour, but several months after the rainy season it will turn green, because it is filled with algae.”

This part of Angola has no piped water, no treatment plants and no sewage systems. While the levels of water-borne diseases are not well-documented, experts stress that child mortality is far above the African average.

In the area’s few towns, the situation is not much better, says Kellner. “A person with a borehole will make water his business. He drives around in a bowser and sells it for as much as $20 per cubic metre.”

But many of the boreholes are old and dilapidated. Angola has embarked on a programme called ‘Water for Everyone’, that will see the rehabilitation of 524 boreholes in Cunene province and the drilling of 600 new ones.

In Namibia the water from Calueque runs through an open canal for 150 kilometres from the Angolan border to Oshakati, where it is treated and pumped through a network to major communities between Oshakati and Oshikango border post. The canal is the only fresh water supply for over 700,000 people and is often damaged by floods and illegal off-take.

Many people along the canal use the water for household purposes or to irrigate their fields,” explains water management expert Andreas Shilomboleni who runs a Global Environmental Facility-funded project that helps farmers in the area adapt to climate change.

The course followed by the two-metre wide, concrete-lined ditch is not ideal.

“In Namibia the canal is not perpendicular to the flow of the water in the rainy season. Flood waters cause damage to the canal resulting in maintenance issues,” says Shilomboleni. The canal rapidly fills with sediment as floodwaters cross it.”

These are among the many challenges the KTWSP will have to take into consideration when embarking on a complete overhaul of water infrastructure in the border area. The project will see substantial repairs to infrastructure at the dam and the pipeline, upgrading of the power supply to the motors that pump the water southwards and refurbishing of the pumps itself.

About 300,000 people in Southern Angola will now for the first time have access to safe and clean drinking water.

DR CONGO

Small Is Beautiful - And Electrifying

By Badylon K. Bakiman

KIKWIT - While discussion of hydro-electric power on the Congo River is dominated by the massive Grand Inga project and the dream of power for the entire continent, construction of a series of smaller dams to benefit local communities may produce tangible results much more quickly.

Grand Inga could generate as much as 39,000 megawatts of power. Earlier in February, a two-year, 13.4 million dollar contract was awarded to Aecom Technology Company and Éléctricité de France to carry out feasibility studies for the hydroelectric generation complex and transmission lines to carry power as far as Egypt, Nigeria and South Africa.

Too big to succeed?

But the Grand Inga project has already encountered setbacks and attracted criticism.

Westcor, a consortium of state-owned power companies from five Southern African states, had a proposed 10 billion dollar, 4,000 megawatt project for a site known as Inga 3 rejected by the Democratic Republic of Congo government in February 2010. The DRC authorities instead agreed to a smaller project with mining giant BHP Billiton on the same site that would principally supply a new aluminium smelter being constructed the company 150 kilometres away.

This project has been criticised by environmental justice groups such as International Rivers. Just six percent of Congolese have access to electricity, says International Rivers, and the BHP Billiton project would prioritise supplying energy-intensive industry rather than the needs of the population.

The environmentalists are also sceptical of the promise of the larger plans Aecom is now studying as well, arguing that the continent lacks a distribution network to carry power from a single mega-project to the majority of those who need it; they argue that the estimated 80 billion dollar price tag would be better spent on de-centralised generation, including wind, solar and micro-hydro plants.

They also cite the risk of corruption and mismanagement, a warning given teeth by the 2008 disappearance of $6.5 million intended to rehabilitate one of the two aging power stations already in place at the Inga site.

A more modest solution

While the debate swirls around the larger projects, February finds work under way on a dam at Kakobola, one of the first of up to 315 much smaller dams planned for sites around the country.

The Kakobola dam will provide electricity for three built-up areas in the southwestern DRC province of Bandundu. V. K. Sharma, head of the Indian company Angelique International Limited, which will construct the dam, says the dam will have a generating capacity of 9.3 megawatts.

“We are working on this project for the well-being of the population in Gungu, Idiofa and Kikwit,” says Sharma. His company will draw on the experience of building similar projects in Afghanistan, Rwanda and Sudan.

“It’s easier to build a dam on a river where there are falls such as this one,” Sharma told IPS in an interview at the

Kikwit student Mave Kube studies by the light from a paraffin lamp. Credit: Badylon K. Bakiman

dam site at Gungu, some 200 kilometres from Kikwit, the provincial capital.

The dam is being built at a waterfall on the Lufuku river which has a height of 29 metres, according to Sharma. The Kakobola dam will have a reservoir just four metres deep, and its turbines will not eliminate the natural falls on the river.

"The dam will cost 53 million dollars," says Remy Matala, from the DRC's energy ministry, which is collaborating on the project. "The Indian government, through that country's Export-Import Bank, will put in 42 million. The Congolese contribution of 10 million dollars comes from the 2011 budget."

Serving local needs

Completion of the dam is eagerly awaited in the region. "I want the electricity supply to come quickly. It's not normal for a city the size of Kikwit (around a million inhabitants) to be without electricity," complains Mave Kupe, one of the many students in the city who must study by the light of storm lantern.

The project is scheduled for completion in January 2014. The more than three million residents of this area presently rely on paraffin lamps, candles or custom-rigged systems that power light bulbs from torches with a box containing a set of batteries.

The Kakobola dam will also contribute towards securing regular access to drinking water, particularly in Kikwit, where 800,000 people lack access to safe water.

When the contract for the dam was signed in Kinshasa in October 2010, the Congolese energy minister, Gilbert Thilongo, noted that the Kakobola project was first proposed in 1980.

The installation is the first of an extensive series of small dams planned for the country. It will be followed by another dam in Katende, in Kasaï Occidental province, according to the minister.

"I hope that the work on this dam won't stop mid-way," said Emery Raphaël Mikolo, a nurse in Idiofa. "We have seen it many times in our country - the work starts briskly, but then a gloomy silence takes over."

Louis Kasende, an opposition member of parliament who is the vice president of the Commission for Reconstruction and Development in Bandundu's provincial assembly, wants the DRC government to state clearly when the money from India's Import-Export Bank will be repaid.

Wire reports state the DRC will begin repaying the loan in 2016, and will then pay 1.75 percent interest over a 20 year period.

Maxime Pakumu, the director of the Gungu administrative zone, said the construction of the project will help to reduce employment in the region, as well as improving the quality of life, purchasing power, and even health outcomes thanks to electricity for health facilities in the area.

Though small-scale dams such as this one at Kakobola do not answer the question of powering energy-intensive industry in DRC and beyond, if the dam delivers the expected benefits for the region it sits in, it may create alternatives to a development path that relies so heavily on resource extraction.

ZAMBIA

If There Is No Water, There Is No Life

By Brian Moonga

LUSAKA - Officials say illegal connections are hampering efforts to provide water to some 200,000 people in the John Laing neighbourhood of Lusaka.

Two in three residents of Lusaka live in informal settlements like John Laing. Monitoring water use is close to impossible and this is leading to sanitation problems and water scarcity. The city is also struggling to derive any income from the water it does delivers to townships.

John Laing is criss-crossed with dusty, unpaved roads in the dry season which turn into muddy trenches when it rains. The stench from poorly-dug pit latrines hangs closely over street boys like an invisible cloud as they roast meat and eat corn on the street corners.

The Lusaka Water and Sewerage Company (LWSC), one of a collection of utility companies set up to manage Zambia's water supply on a commercial basis, says it is owed a lot of money from arrears in places like this, so it has introduced prepaid meters.

But the LWSC is struggling to close the tap on illegal connections, as the water supply manager, Kennedy Mayumbila, explains: "The problem with water, unlike electricity, is that you can have a prepaid unit there and people just make an illegal bypass around the meter.

Mayumbila says indications are that some of the illegal users are now starting to pay for their water. "I know that somewhere close to 60 percent of all new accounts we open in peri-urban areas are stemming from people that have had illegal connections before."

To make it more attractive, Lusaka Water has scrapped the application fee for new connections and the company is not prosecuting those who are give up illegal water use.

But families living in the township spend up to 20% of their incomes on legal water, which makes illegal connections more than an option. John Laing residents say they want to use legal water, but they simply do not have the money to pay the current rates.

Jackson Lungu has been living in John Laing for five years. He says water is too expensive and that is why residents opt for the only alternative: connecting themselves to the network.

"There is some areas where they have connected water for free, without paying anything, so on our side, I can't accept a prepaid tap. If there is no water, there is no life."

WaterAid, a humanitarian organisation, says Lusaka's poor must have access to water as part of their human rights. Communications manager Nancy Bwalya Mukumbuta, says commercial interests cannot top the right to water.

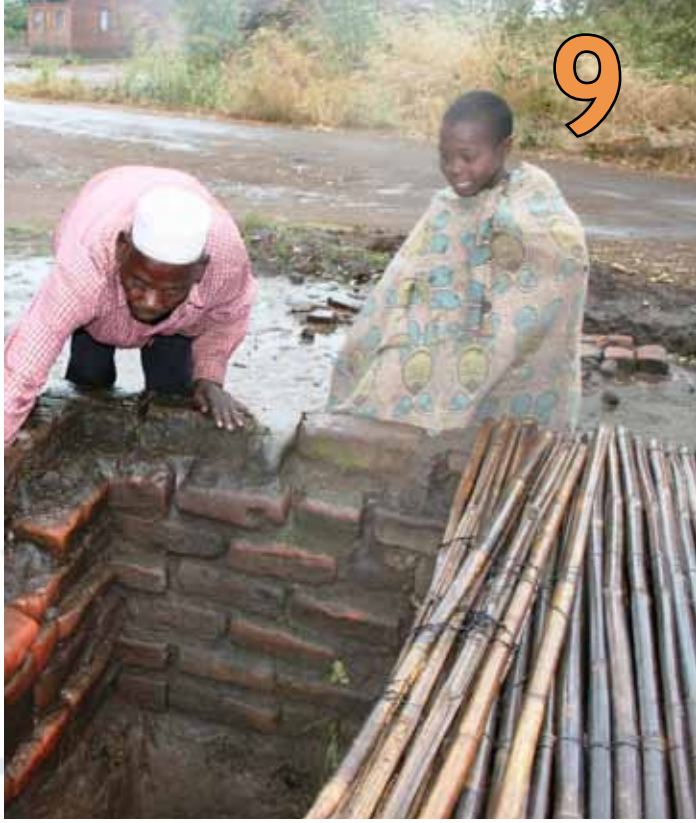
"People have the right to access water which means that basically government has a duty to provide water to people. But then again you are looking at the commercialisation of water utility companies which were previously owned by the government, and these are private sector companies which want to make profits."

Zambia spends close to 35 million dollars a year on water and sanitation. It needs to spend 19 million dollar more to achieve its Millennium Development Goal. In total, only 57 percent of Zambians have clean water and less than half have access to sanitation infrastructure.

Officials say illegal connections are hampering efforts to provide water to some 200 000 people in the John Laing township of Lusaka. Credit: Brian Moonga/IPS

MALAWI

In Praise of Dry Sanitation



Repairing a latrine in Mgona, Lilongwe. Credit: Claire Ngozo/IPS

By Claire Ngozo

LILONGWE - At its best it is waterless, odorless, eminently affordable and has a rich fertiliser as byproduct, yet for residents of Malawi's informal settlements, dry sanitation retains a whiff of the unwanted.

As much as two-thirds of Malawi's two-million strong urban population live in slum conditions without proper toilets. In densely-crowded Lilongwe townships like Mtsiriza, Mgona, or Senti, dozens of people often share a single convenience.

Monalissa Nkhonjera, a communications and learning officer for international NGO WaterAid, explains that an average compound in the shanty townships has eight households, but there is usually only one pit latrine.

WaterAid is working in Lilongwe's slums, implementing an appropriate, water-sensible solution. "We are promoting the construction of eco-san latrines with slabs as a cover for the pit and with either a tin or grass-thatched roof. The walls are made of baked or unbaked bricks."

The eco-sanitation latrines have two pits. Household ash is scattered into the latrine after every visit to the toilet to minimise smell and speed up decomposition. After one pit fills, use switches to the other, and the waste in the full pit is given time to fully decompose into a rich, safe manure.

Unloved facilities

But Manesi Phiri of Senti, another informal settlement on the outskirts of Lilongwe where WaterAid is promoting them, remains unsatisfied.

"Flush toilets are more convenient. All you need is to flush out the excreta after a visit to the toilet. Pit latrines compound the low status of us poor people. They are very demeaning," she told IPS.

Should anyone flush?

The poor have limited choice. But with climate change threatening the water supplies of cities not only in Malawi but across the Southern Africa region, a comprehensive plan for urban areas might need to see wealthy people adopt composting toilets.

A toilet uses anywhere from six to 11 litres per flush - the fortunate 640,000 who have access to flush toilets in Malawi each represent a much greater strain on aging water systems than their counterparts in the slums.

Millions - hundreds of millions of litres of water are effectively squandered flushing waste into a sewage network, at the end of which it needs further treatment before it can be safely released into the country's waterways.

In Area 43, one of Lilongwe's most affluent neighbourhoods, IPS found Richard Gulumba has an eco-san latrine in his backyard. He had it constructed for use during Lilongwe's frequent water outages.

"But my family and I still find it hard to use a latrine. It reminds me of life in the village and that is not desirable. I grew up poor and I do not want to be reminded the experiences I went through and using a pit latrine is one thing I do not want to do now that I can afford better things like a flush toilet," said Gulumba.

Stylish latrines

The South African company ECOSAN manufactures a self-contained dry sanitation unit that cleverly uses the action of opening and closing the lid to drive a screw that moves waste into a cleverly ventilated chamber where it turns into compost without further ado.

Australia's Nature Loo provides a system with exchangeable composting chambers and a fan that ensures proper oxygen flow to speed the breakdown.

Inside the house: a "warm white" pedestal with a "honey oak" seat... even the fussiest guests won't panic until they can't find a handle to flush.

WaterAid's Nkhonjera says composting latrines, which prevent pollution of groundwater, are the best option for slum dwellers and rural communities. "These areas are informal settlements and they do not have access to running water. Putting up flush toilets will not be realistic."

If Southern Africa's wealthier city dwellers also considered the best use of available water, dry sanitation could take up a more exalted place as a solution to growing water stress.

ZIMBABWE

Filtering Fact From Fiction About D.I.Y. Water Treatment

By Ignatius Banda

BULAWAYO - The Zimbabwean city of Bulawayo has not been spared the heavy rains that have fallen across Southern Africa; the water is welcome in this semi-arid, southern part of the country, but the coming of the rainy season has provoked fresh memories of the 2008 cholera epidemic.

The city's water and sewage infrastructure is still in poor condition. Though Bulawayo mayor Thaba Moyo insists the frequently brown water from the city's taps is safe to drink, many Bulawayo residents are falling back on their own resources to protect themselves against waterborne diseases.

Sikhulekile Banda lives in Tshabalala, a crowded low-income township, and uses makeshift sand filters for both the rainwater she harvests and the brown water she gets sporadically from her kitchen tap.

"This is what we used when we were growing up in the rural areas, way before independence [in 1980]," she says as she filled a bucket with a perforated bottom with sand.

"What I want is clean water, if it looks clean I assume it is not contaminated," she says.

Jennifer Zvenyika is another resident worried about the quality of her water. Where Banda relies on earth, the 49-year-old Zvenyika looks to the sun.

She places harvested rainwater and tap water alike in a large metal dish that she leaves out in the scorching sun from sunrise to sunset.

Necessity is the mother of invention, but do either of these methods offer protection?

Properly constructed sand filters can reduce the risk of waterborne disease, says Eric Fewster, of the NGO BioSand Filter. Fewster's organisation promotes the use of such filters in developing countries.

"[Bio-sand filters] are great and provide a great intermediary step between people drinking directly from ponds and some better services such as piped supply," Fewster said.

Sand filters are commonly used as part of the treatment process in bulk-water plants. Bio-sand filters for use at the domestic level filter water far more slowly, reducing the level of potentially harmful pathogens by a combination of the action of various single-celled organisms in the top 40 cm of filter and the physical barrier of the very fine sand.

"There are health impact studies showing reduction of diarrhoea with the use bio-sand filters," Fewster told IPS.

Comparing Banda's system to the specifications from Fewster, a very significant difference could be that slow sand filtration is most effectively if there is always water passing through it; this is to allow the formation and maintenance of what's called a schmutzdecke - German for "dirty layer" - where most of the biological action that cleans the water occurs.

Mavis Chizulu, a senior municipality nurse who works on an anti-diarrhoea drive among children under five says even if mothers have other water-treatment methods like sand filters, they must not neglect to boil the water.

"They must have the water boiling vigorously for between three and five minutes to ensure it is safe to drink," Chizulu said. But boiling all drinking water can be difficult in a city faced by frequent power outages: it takes a lot of firewood to boil drinking water for a large family.

Up to a billion people across the world are without access to clean water, and home-based treatment methods offer an important, cost-effective way to help fight waterborne ailments. Bulawayo City Council Water engineer Garfield Nyoni believes water purification technologies must be made available at domestic level.

"There is no doubt a need to introduce water purification at household level as residents continue to complain about unclean water, and the rains have only made it worse," Nyoni said."Sand filters could help if people were taught how to build them."

TANZANIA
Who Pays the Piper?

By George Mwita

Drawing well water in Dar. Credit: George Mwita/IPS

DAR ES SALAAM - When John Rubara* and his family moved into their new house in Dar es Salaam's Tabata Kimanga, a fast-growing middle-income neighbourhood in Temeke district, the water company disconnected their supply because the previous owner was in arrears.

Rubara actually had little idea what his monthly water bill might turn out to be, so despite paying off the former owner's bill - more than 200 dollars - he turned to a pirate plumber to reconnect the property to the water system illegally.

But in 2008, the Dar es Salaam Water and Sewerage Company (DAWASCO) launching a scorched-earth campaign - or perhaps a dry-taps campaign - to improve revenue collection and cut ilegal connections. Government offices, cabinet ministers, even Tanzanian military headquarters were among the high profile casualties.

Rubara decided to get reconnected. So far he's happy with his monthly bill - a flat rate equivalent to $10 a month. "We really utilise it whenever it flows. We water our flowers and the planted grass, have tanks to store for future use and occasionally sell to those who are not yet connected."

The Rubara household illustrates the challenges facing the Dar es Salaam Water Company in managing revenue collection for water in Tanzania's commercial capital: many residents don't understand the rates or billing system; rich and poor alike frequently delay settling bills; and illegal connections are a routine fact of life.

Illegal water connections - especially on the main pipeline supplying the Ubungo water tanks from Upper Ruvu, one of the city's main treatment plants - have contributed significantly to the erratic water provision in many parts of the city.

DAWASCO public relations officer Mary Jovin Lyimo says the company discovered that the new steel pipeline from the Upper Ruvu plant is more vulnerable to do-it-yourself plumbers than the concrete pipe that leads from the larger treatment plant at Lower Ruvu to the areas it serves.

The illegal connections give the company a headache, as it represents a significant financial loss. The Energy and Water Utility Regulatory Authority (EWURA) estimates that 53 percent of the water it treats is lost to vandalism and leakage before it gets to paying customers.

To help eradicate problems, DAWASCO has continued its campaign to disconnect illegal connections. During June and July of 2009, the company discovered and disconnected more than 597 illegally-connected households along a five kilometre pipeline in the Kimara area.

Kimara is notorious for many illegal connections, as is Kibaha, 45 kilometres outside the city, not far from the Upper Ruvu plant.

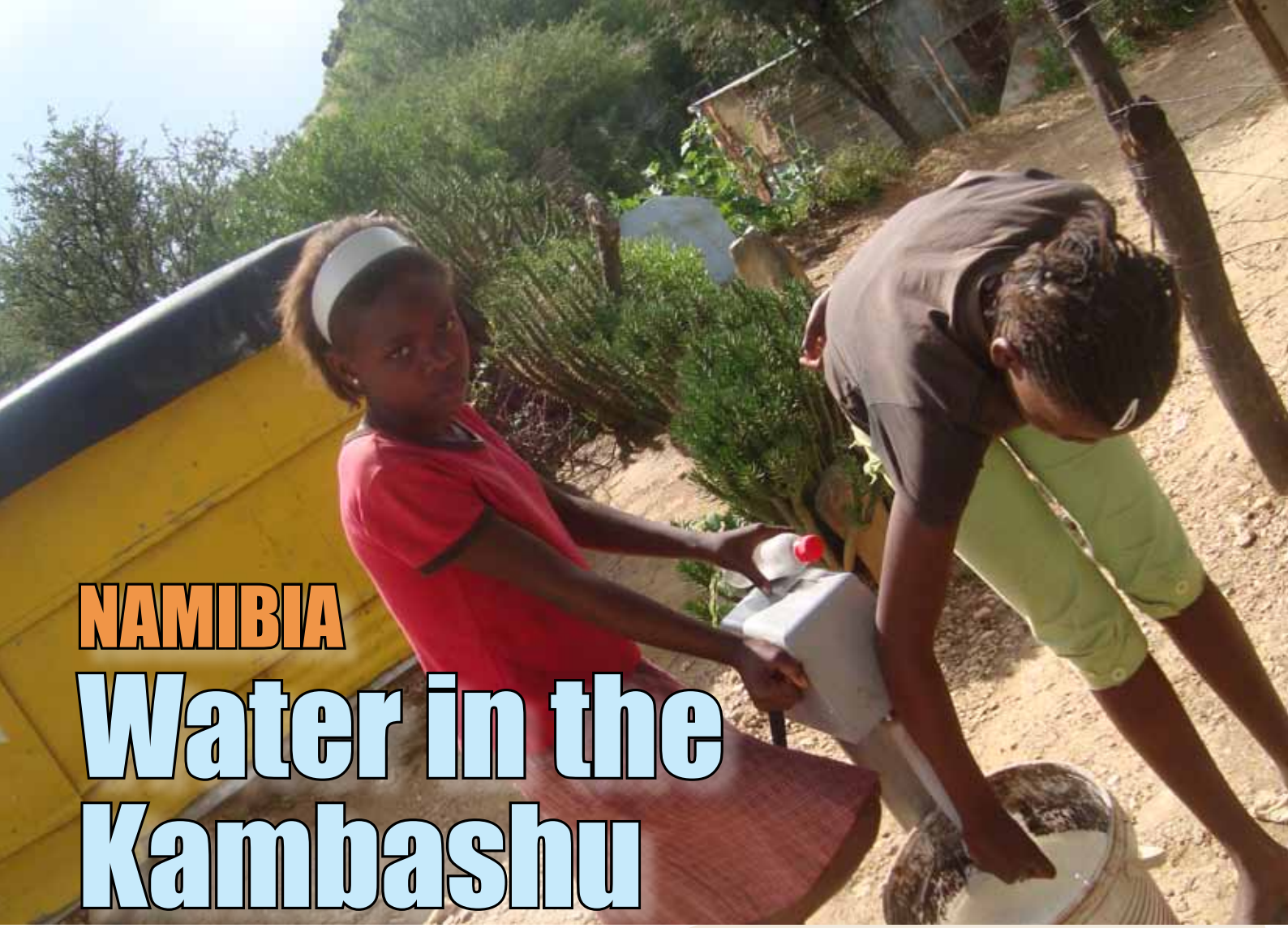
DAWASCO says that before the disconnection of illegal pipeline networks, the Ubungo water tanks were never more than 17 percent full. "Since the campaign began, more than twice as much water has been reaching the Ubungo tanks - which now reach 37 percent capacity." And that is expected to improve further as more illegal connections are being discovered.

"However, it is not only vandalism that has been a factor behind poor collection of water revenues but also the billing system itself," says Richard Peter, DAWASCO's commercial manager.

He says the water billing system (known as Sheer Water System) which his company inherited from the previous managers, City Water, has been a root cause of all the problems. "It was an incomplete system that made control of revenues poor and opened room to widespread fraud."

Alliance with privatisation

Dar es Salaam's water services were privatised in 2003, on the advice of the World Bank and the International Monetary Fund. A consortium known as City Water took over the utility, but the contract was cancelled two years later. City Water made little headway in easing water shortages, improving revenue collection or stamping out illegal connections.The dispute between City Water and the Tanzanian government was eventually settled in a London tribunal, which awarded government six million dollars in damages.



NAMIBIA
Water in the Kambashu

By Rebecca Munetsi

Credit: Rebecca Munetsi/IPS

WINDHOEK -- For Namibia's capital city, the goal of sustainable water and sanitation, is a major challenge for the 21st century.

Windhoek had just 140,000 inhabitants at independence in 1990. In 20 years, the population has more than doubled to 300,000 people, according to the city government, with between 20 and 30 percent living in informal settlements.

These unplanned areas have grown at a rate of 9.4 percent each year, making the provision of water and sanitation a serious challenge.

Geraldine van Rooi, Head of the Sustainable Development Section of the city's planning department, says the City has come up with a multi-pronged response.

There is policy to regulate orderly, environmental urban development, and a statutory document that governs land use rights, as well as a strategy for informal settlement upgrading and management.

The Development and Upgrading Strategy, drawn up in 1999, has led to construction of ablution services and the installation of prepaid water taps in Windhoek's informal settlements. Four major upgrading projects have been completed at Havana Extension 1 and Havana Proper, at Ongulumbashe, and Okahandja Park.

Reviews from residents are mixed.

"It has improved," says Paulus Siwombe, a resident of the Babylon Informal settlement. "I am happy at least I can collect water using my card, keep it in my 25 litre container and go for even a week. And our toilet is nice because we keep it clean," the 29-year-old says.

"You see, we used to go in the bush for the toilet and we used to have old taps for water, but now things are changed for the better. You just recharge your card, fetch your water or if you don't have the card you can borrow and pay the owner something."

Elizabeth Upapa, also from Babylon is not satisfied. "They built us toilets, but they are dirty and not enough. One toilet for more than 100 people? It is not fair. We also need our privacy."

The cost of water from the public taps using a prepaid card is also an issue for her. "Yes, we have the water, but I am not happy because it is expensive," said Elizabeth Upapa, also a resident of Bablyon.

"The recharge card starts at 10 Namibian dollars ($1.50 U.S.) upwards: where do we get the money? They should give us the water for free."

Siwombe laughs at this. "No, nowadays you cannot go without water here in the lokas (the location). It is cheap and we can also use our spoons and other keys if the money finishes..."

He says the toilets in his section of Babylon are clean because he and other youth take turns to clean it in the morning and evening.

Confronting the challenge of servicing all its residents' needs, accounting for both population growth and the water-poor climate, the city of Windhoek has called for central and regional governments as well as the private sector to get involved in helping the municipality to provide proper water and sanitation services.