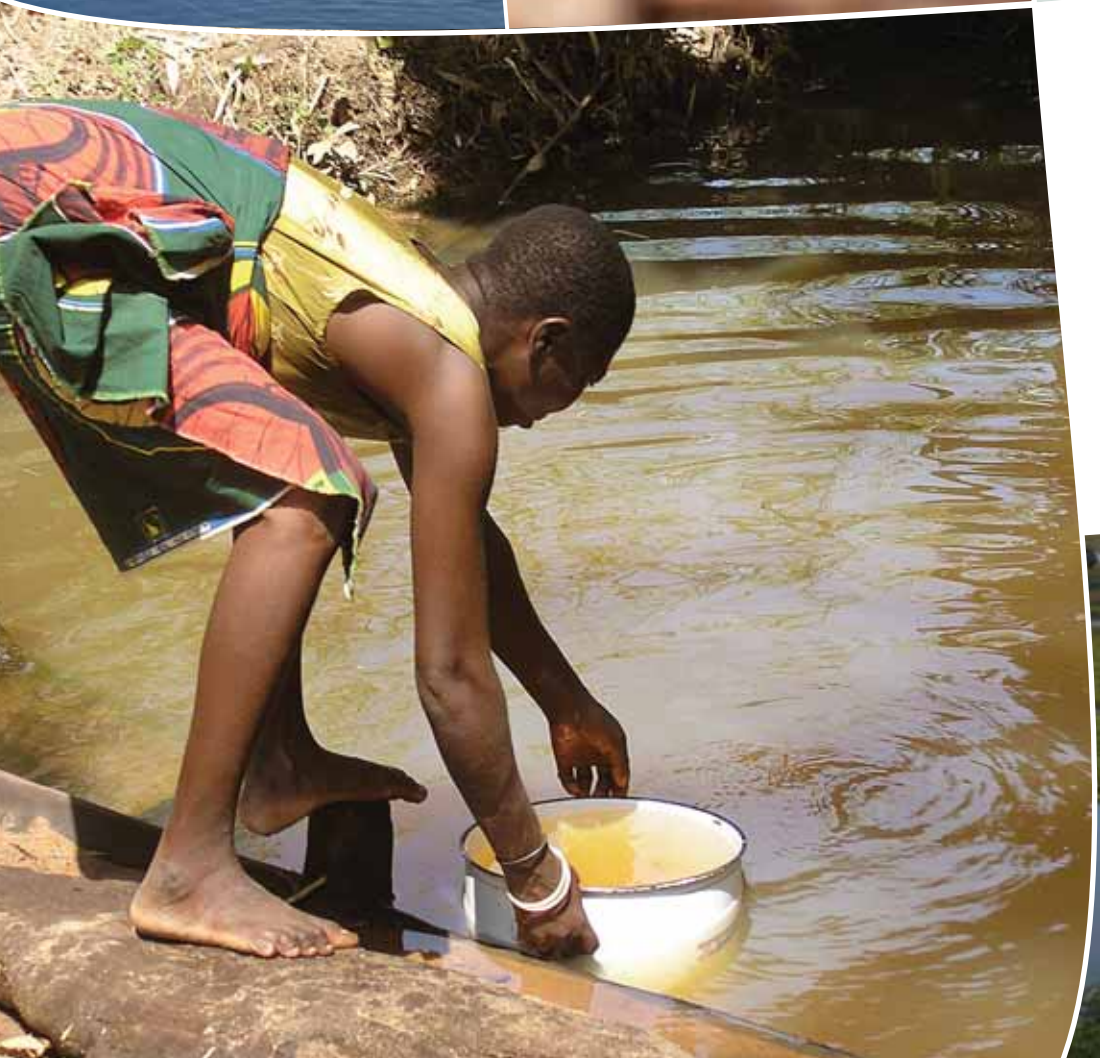

The Story of Water:

Reporting from the Southern African Water Wire

IPS AFRICA

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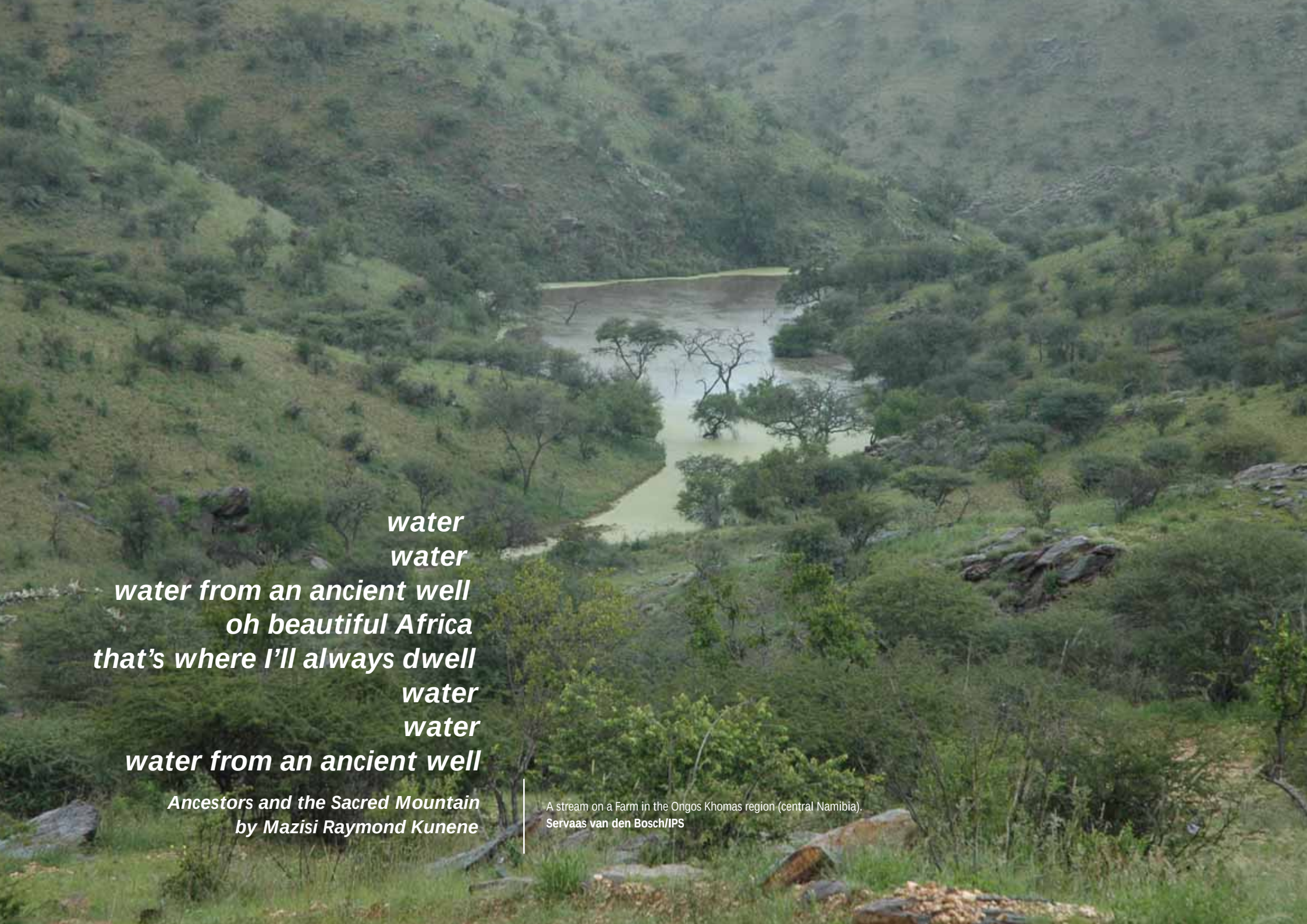

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oh beautiful Africa
that's where I'll always dwell
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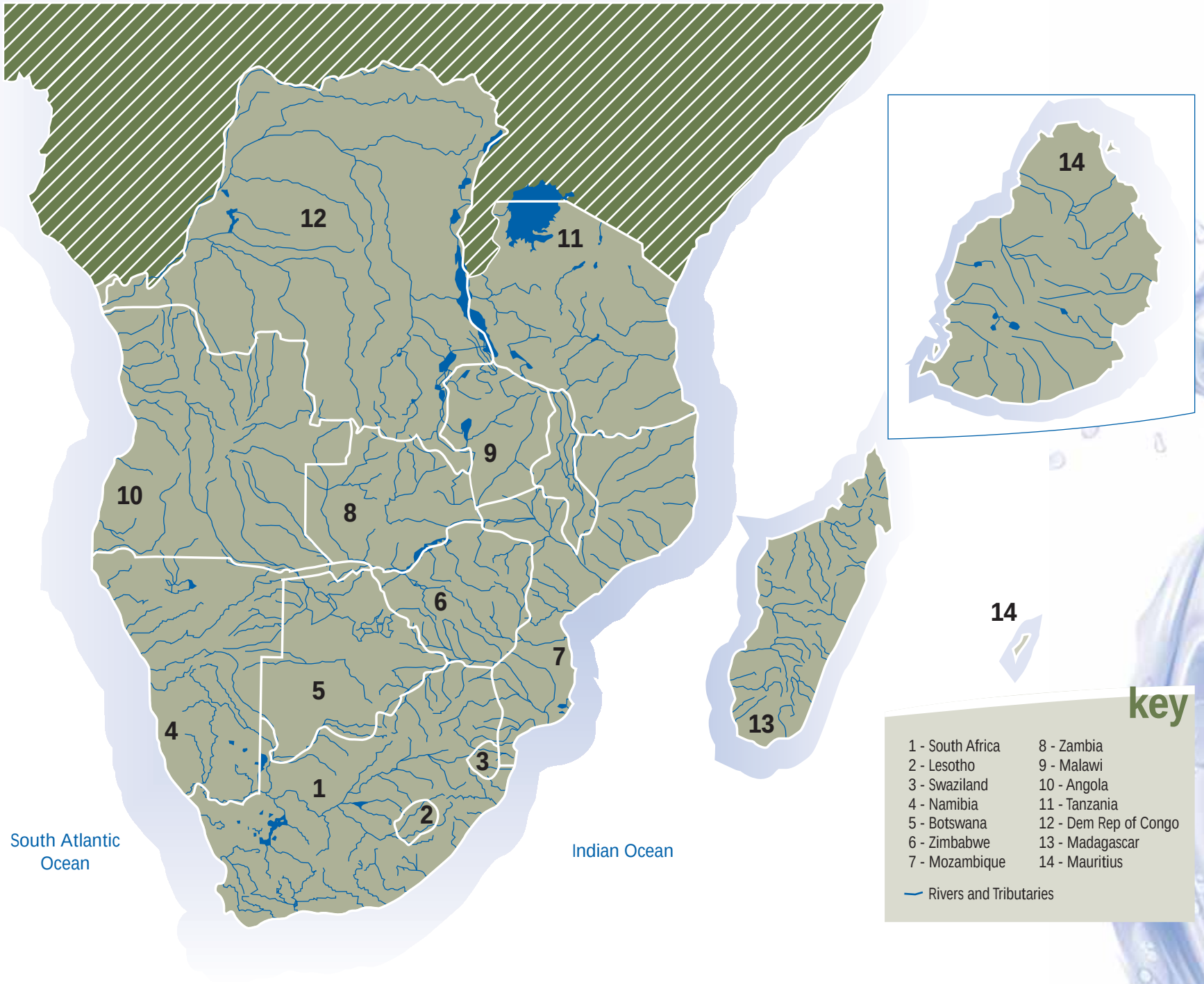
Ancestors and the Sacred Mountain
by Mazisi Raymond Kunene

A stream on a Farm in the Ongos Khomas region (central Namibia).
Servaas van den Bosch/IPS

River systems of Southern Africa



Foreword

Large parts of the Southern African Development Community are arid or drought prone and the region is vulnerable to recurrent floods and drought. Notwithstanding the impact of climatic change, the SADC region has recorded increased water demand and resultant water stress.

Water is more than just a basic need: it is a catalyst for our development and a critical input for all our development initiatives. We must therefore create an enabling environment for effective integrated water resources management and development so that the sustainability of our water resources can be maintained.

Clearly water, the most shared resource in the SADC region, is not the responsibility of the water sector alone.

There are 15 major shared watercourses in the SADC Regions between the 12 continental member states and over 70 percent of renewable water resources in the region occur in these shared watercourses including groundwater aquifers. How we use those resources affects not only those who live alongside our watercourses but all those who benefit from its life-giving advantages.

With this multiplicity of shared watercourses in SADC, it is imperative that there is a collective and collaborative approach to water development and management. And, at a regional level, our interventions should be strategic and add value to ongoing member states initiatives. In this way, the region's water resources can be seized as an opportunity for co-operation and peace rather than cause for conflict.

To guide the process of co-operation and regional integration, a number of protocols based on the principles of the SADC treaty have been negotiated, agreed and adopted. The Protocol on Shared Watercourses was adopted in 1995, came into force in 1998 and a

A mother and her daughter wash their family's clothes by hand next to a stream in Harare, Zimbabwe.
mediapix

revised protocol came into force in September 2003. The main objective of this Protocol is to "foster closer co-operation for judicious, sustainable and co-ordinated management, protection and utilization of shared watercourses and advance the SADC agenda of regional integration and poverty alleviation."

This vision is supported by numerous regional initiatives including the Regional Strategic Action Plan on Integrated Water Resources Management and Development which envisions an effective and dependable framework contributing to poverty eradication, regional integration and socio-economic development in a sustainable manner.

This is only possible if all sectors appreciate the value of water and work together. The RSAP envisions the participation of all stakeholders – including women, youth and other disadvantaged groups – in effective water resource development and management.

Water is a life-giving resource. It waters our development, sustains our livelihoods and binds the region together as it flows through SADC countries.

Understanding the impact of water is critical. Which is why this handbook serves such an important need: telling the story of water, its impact on our region and its life-changing potential for our people. It gives a voice to the multiplicity of users of water in the SADC region and aptly demonstrates why water – and its sustainable management - is everyone's responsibility. It is my hope that this handbook will be a useful tool for the media in the region and internationally.

Phera S. Ramoeli
Senior Program Officer – Water SADC Secretariat
Gaborone, Botswana

Contents

Watering our development

Water, whether we collect it from a tap, a well or a nearby river, is a central necessity for all our lives. We drink it. We cook and clean with it. We use it to grow our food, generate electricity and drive our industry... It is necessary for life and living.

The story of water is about more than just providing access to an essential resource. The effective distribution and use of water resources relies on its management in ways that recognize its interconnected uses.

The story of water is central to the story of development – it is closely linked to our success or failure in meeting the Millennium Development Goals, in particular reducing by half the number of people living in extreme poverty and hunger by 2015.

The Southern Africa Water Wire seeks to provide in-depth coverage of a diverse range of water-related issues in Southern Africa, carefully connecting water to economic development, social harmony and environmental protection.

But as our journalists across the region explore the challenges, failures and successes of managing this vital resource, they uncover that this is not simply about rivers and dams and pipelines.

The story of water is also the story of our people

In the drought stricken area of Siteki, Swazi women's lives revolve around the necessity of accessing water. They walk many kilometres each day to dried-out wells, wait hours in a queue until finally it is their turn. They collect whatever water they can carry and make the journey home where the water is used for essential activities.

George Mwita
Drawing well water: the water utility in Tanzabia is struggling to bring order to water supply, but most residents must fend for themselves.
IPS

When a killer fungal disease surfaced in the Zambezi, the great river that provides over 700,000 people with sustenance, fishing communities found that already decreasing fish stocks were depleted further. Not only were their livelihoods now at stake, but the food security of millions of people living in the Zambezi River Valley were also at stake. And when heavy rains fell in Zimbabwe in 2008, more than 2,700 lives were claimed by cholera.

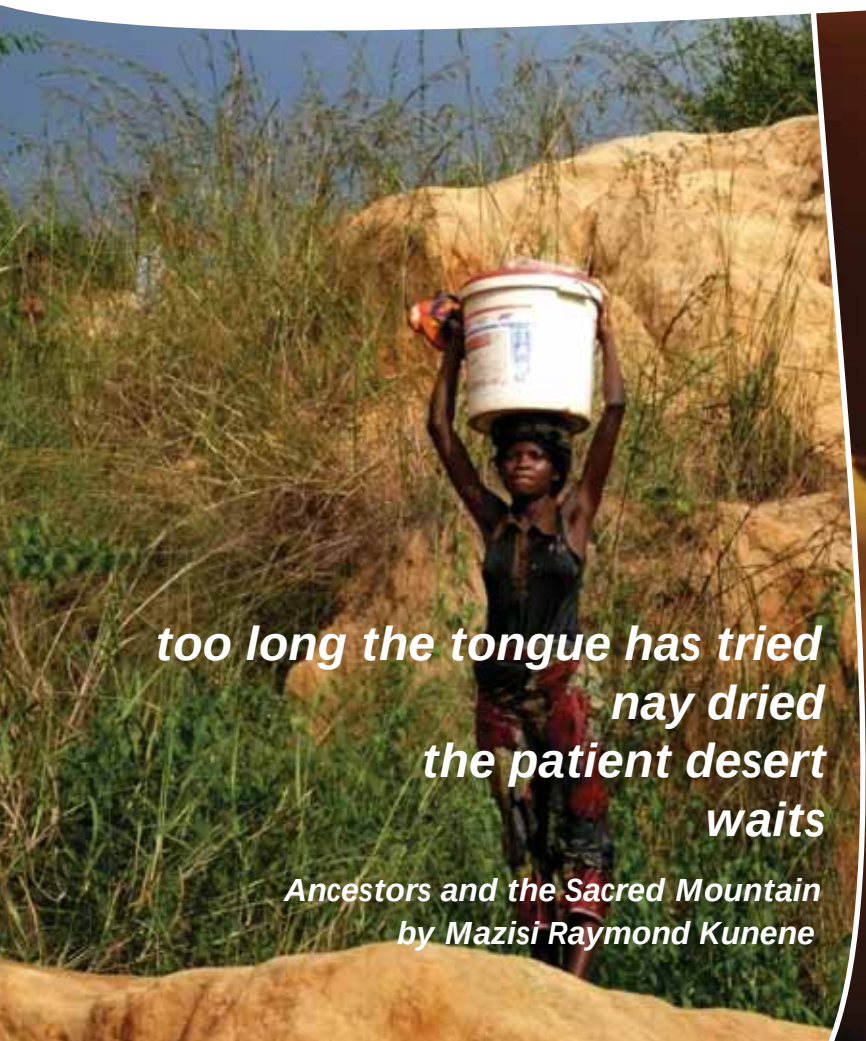
We cannot ignore the impact water has on our lives. It waters our development and nourishes our hopes and aspirations.

Water stories are the stories of people - this is how our lives are linked.

To find these human stories, journalists across the SADC region explore the challenges, failures and successes of managing this vital resource. The Southern Africa Water Wire is commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ) in delegated cooperation with the UK Department for International Development (DFID) on behalf of the SADC Secretariat. The Deutsche Gesellschaft für Technische Zusammenarbeit (gtz) is implementing the partnership programme.

Paula Fray
Inter Press Service (IPS) Africa
Regional Director

The Okavango River on the border between Kavango and Caprivi regions.
Servaas van den Bosch/IPS



too long the tongue has tried
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Ancestors and the Sacred Mountain
by Mazisi Raymond Kunene

Chapter 1

Our stories are the Story of the Water

A young boy stands for a photographer while others collect water at a natural spring outside Kinshasa, the capital of the Democratic Republic of Congo.
mediapix

Mozambique: Remote Villages Out of Sight, Out of Mind?

Jessie Boylan
The River at Mtwepe.
IPS

By Jessie Boylan

MCONDECE, Mozambique – "This is where we get our water from," says a villager on the footpath leading out of Mcondece. Branches and other debris float on the surface of the sluggish, murky brown creek.

Some baboons are drinking from one end of the pool and a few kids run down to chase them away, then squat by the water's edge, cup their hands and drink noisy mouthfuls.

The road leading to Mcondece, a small community tucked in among the burnt-back bush and cassava fields, in a remote corner of northwest Mozambique, is sandy and a challenge for standard cars in the dry season – impassable in the wet. Everyone travels on foot or by bicycle.

The village has a population of around 400; its original inhabitants moved here many generations ago in search of fertile land. It is one of several settlements in the region which lacks a borehole or water pump, and therefore has no access to clean and safe drinking water. "The major problem we have with water is that the whole village is using the same small river that you just saw earlier," says Agnes Kapondela.

"The same river is used for bathing, washing plates and for drinking, so the water is not clean."

She is sitting on a pile of mud bricks next to the new school under construction. "If kids are thirsty at school they have to run down to the river to drink the same water, which is not very hygienic."

Bad water, bad health

Villagers complain of stomach aches, diarrhoea, and vomiting as a result of drinking the water. Some even believe the water causes influenza. The closest clinic is a day's walk away, so they're not sure of the exact nature of their ailments.

The option of boiling water to purify it is not popular with villagers. "People don't like boiling water," says Nema Mswachi, a woman from Mandambuzi, another village in the area lucky enough to have a deep well with a water pump.

"Because of tradition, people are used to drinking water straight from the river. Sometimes people use tablets like Water Guard, or sometimes they'll boil water just for the small babies." Boiling water also means using precious firewood.

Women do most of the farming, firewood collection, cooking, cleaning and also take care of children in rural communities like this one. Felo Mtela, from Mtepwe village, a four-hour walk north of Mcondece, says not having clean water to drink affects women's ability to work.

"Sometimes I feel my body becomes very weak, because I do a lot of work," she said. "And when we don't drink good water, it makes it harder to work when we're sick ..."

The water source makes the work difficult even when villagers are healthy. To irrigate their fields, women often dig a shallow well near the river, and transfer water to their farms one bucket at a time.

"We have had no help in getting water pumps yet," said Mtela, "and it would help a lot because we wouldn't have to carry water on our heads so much. We would just pump it to our farms.

"Some villagers dig small wells closer to home for drinking water, but according to Mtela these wells aren't covered against insects and other contaminants."

No outside help

Villagers in the region say they have been asking for assistance for a long time.

WaterAid is an international NGO that works with communities to install wells, water pumps, and composting latrines. They have a range of basic hand pumps which are cheap enough for communities to afford, and quick and easy to fix.

Most communities already have survival strategies that can simply be reinforced.

The NGO claims to have helped 270,000 people gain access to water across Mozambique, and has been working in Niassa Province since 1995.

There are several factors which contribute to water, hygiene and sanitation headaches in the province, says Heike Gloeckner, WaterAid's southern Africa regional programme officer.

"Broadly I would say that the issues we are facing are: water tables are decreasing, population is increasing (in some areas) and topography is making it very hard for our partners to access the aquifer for drilling a borehole," she says.

WaterAid's technical support manager, Erik Harvey, says the sinking water table means communities are forced to rely on outside support to reach deeper, more reliable water reserves.

"Most communities already have survival strategies that can simply be reinforced. Most have basic

A young girl carries two jerrycans of water from a natural spring outside Kinshasa, the capital of the Democratic Republic of Congo.
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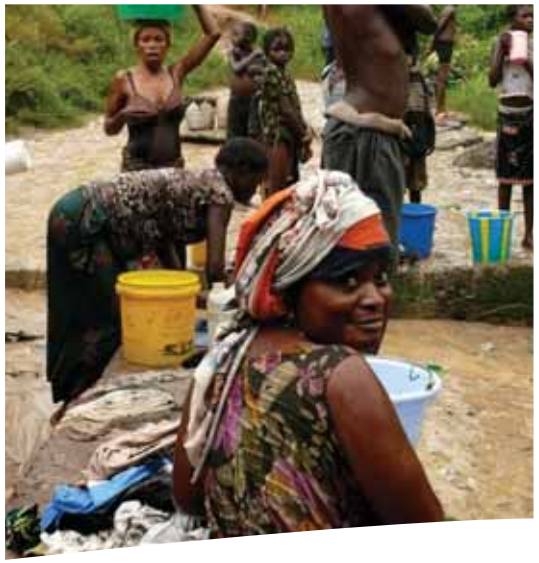


A woman looks up from doing her washing at a natural spring outside Kinshasa, the capital of the Democratic Republic of Congo.
mediapix

wells that, with very little effort, can be protected (lined with bricks, raised above ground level, closed with a lid, and used with a single bucket and rope as opposed to many)."

"In the absence of this, basic filters can be made with layered cloth, or drinking water, particularly for babies, elderly and the ill, can be boiled," said Harvey.

When asked why no one has yet reached villages like Mcondece, Mtepwe and Magachi, Harvey responded; "The process of prioritisation and community selection is normally undertaken by the government, with some assistance from WaterAid staff.

"WaterAid's funding is limited," says Harvey, "and we have, where possible, focused on choosing districts that have historically had the lowest coverage levels.

"The key here is to get government to take up our learning, to combine the efforts of all role-players and funds in the sector to reach the unreached villages. WaterAid alone just does not have the resources to reach everywhere."

Alexis Tove, community manager for the Manda Wilderness Community Trust, an NGO which works with 16 communities in this part of Niassa province building schools and clinics, says the reason no one has come to inland villages like Mcondece is simply their inaccessibility.

"NGOs are the same as government," he says. "They work within the accessible areas. If villages are so remote, it's much less likely that they'll be visited. You're unlikely to see government officials or NGOs trekking over mountains to visit villages.

"The WaterAid website states that for as little as 1,800 dollars a well can be hand-dug, and a rope pump installed – and 2,280 dollars will pay for the training of a water committee and six months of education on hygiene."

"If the money is the main problem with implementing the systems," says Tove, "and if it's relatively inexpensive, then we should be able to find funds for it. But we will need the resources and help from those NGOs and from government who have experience in this area."

Sinking water table means communities are forced to rely on outside support to reach deeper, more reliable water reserves.

"It seems ridiculous that the solutions seem so simple and easy to implement, yet nothing has been done for those communities who have been drinking dirty water for years," he said.

Young boys perform a balancing game for the camera on the beach where they were fishing as the sun set over Lake Malawi in Mangotchi, a holiday resort town in Malawi.
mediapix

Zambia: Fishing in Troubled Waters

Lewis Mwanangombe
Luanshya stream on the Copperbelt flows close to Luanshya Mine managed by Roan Antelope Mining Company of Zambia (RAMCOZ).
IPS

*By Zarina Geloo**

LUSAKA – In two decades of fishing on the Zambezi, Darius Wamulume has never seen anything like this. With deep ulcerations and tissue decay, the fish he has caught lately are too unsightly to sell and too suspect to eat.

"The first time I saw this fish I was afraid even to touch it. I had never seen a fish rot while it was still alive in the water. I was scared of its appearance and prayed that it was just a one-off."

But It wasn't.

Wamalume is not the only fisherman to have caught contaminated fish. More than 700,000 people depend on the Zambezi for sustenance. Fishing communities along the river have seen a depletion of fish stocks over the years, due to improper fishing methods, but the appearance of the killer fungal disease epizootic ulcerative syndrome (EUS) is a fresh threat to life along the 2,700km river.

Wamalume, father of 10, earned up to 20 dollars on a good day, before EUS appeared in Zambia in 2008. In a country where over 70 percent of the population lives on less than a dollar a day, he was wealthy.

The situation changed this year. With fish stocks already diminishing, the contamination saw him fail to earn enough to send four of his children to secondary school. He sent his three youngest children to his relatives to be looked after. For the first time in his life, his family "knew hunger".

"Firstly, I have noticed that I have to go further afield and deeper in the water to catch any fish. The fish are also getting smaller, I understand that over-fishing and climate change is the cause, but this (disease) is a curse".

Epizootic ulcerative syndrome

EUS is thought to be as a result of warmer waters caused by climate change. It was first seen in Namibia in 2006, and has since crept into the Zambezi River Basin, killing fish and threatening to decimate as many as 20 varieties, including tilapia, a staple food in Zambia. The disease also poses a threat in another seven SADC countries in the basin, Angola, Namibia,

But this is speculation. We are now thinking it is a result of global warming, but we have yet to ascertain this. So if we cannot even identify the cause, how can we hope for a treatment?

Botswana, Zimbabwe, Tanzania, Malawi and Mozambique.

Zambia, where two-thirds of the Zambezi River Basin lies, is most affected by EUS. The Food and Agriculture Organisation (FAO) has warned that millions of people inhabiting the Zambezi River Valley are at risk of food insecurity, because fish is not only a source of revenue in many rural districts, it is also the cheapest available source of protein.

The fisheries sector contributes 3.8 percent to the national economy, and is the fourth-largest employer in Zambia, after mining, agriculture and forestry.

According to a recent report on the fisheries sector published by the Jesuit Centre for Theological Research (JCTR), the demand for fish has long outstripped supply. Annual fish production from 2000 to 2007 ranged between 80,000 and 85,000 metric tons, far below the estimated national fish demand of 120,000 metric tons a year.

The report states that the devastating impact of the EUS will drive the gap between supply and demand even wider, and urges quick intervention by government.

Limited response

But the prognosis is not good. Firstly, research is hamstrung by the small budgetary allocation given to the fishing industry. Officials in the department of fisheries say despite their repeated and urgent requests for funding, this has not been forthcoming. Allocations to the Department of Fisheries were reduced from 1.9 million dollars in 2008 to 851,000 dollars in 2009.

"The fishing industry, despite its huge potential in overcoming poverty and hunger, is sadly ignored. There is never enough money to enforce policies and legislation to protect fish stocks, no money to mitigate the effects of climate change," says Peter Mhango, a recently retired fisheries officer in the Ministry of Agriculture, who now operates a fishing vessel on the Zambezi in the North Western province of Zambia.

Livestock professor and permanent secretary in the Ministry of Fisheries, Isaac Phiri, has even grimmer news. He says controlling EUS in natural waters such as rivers is near impossible.

"We have tried to experiment with treatments, but even if we find a treatment, how can we treat this massive water body? If it were in fish-farming operations, it would have been simpler to minimise or prevent its spread, because then you can confine the water bodies and improve the quality of water, but we are talking about the Zambezi Basin here."

He said EUS was seasonal, usually occurring during the rainy season, so fishermen should brace for another round of the outbreak. Scientists have been unable to establish precisely what causes the fungus in the waters. When the first outbreak occurred, it was thought EUS formed in cold weather, when fish were in deeper water, where there was less oxygen.

"But this is speculation. We are now thinking it is a result of global warming, but we have yet to ascertain this. So if we cannot even identify the cause, how can we hope for a treatment?"

When EUS surfaced in 2007, fish biologist Ben van der Waal, of the integrated management of the Zambezi/Chobe River System Fishery Resource Project, said eradication of disease was impossible "now that it was in a natural setting".

He warned that it would take many years to adapt to the disease, and meanwhile fish losses would be "colossal". He gave the example of Asia, where it took about 20 years for the outbreak to subside to endemic levels.

Lessening the impact

Phiri explains that experts in the SADC region are trying to formulate fish disease-monitoring programmes and mitigate the effects of the disease, in line with SADC protocols on shared waters.

Zambia has the potential of becoming a huge fish exporter. We need to harness this.

"We are working with our colleagues in Namibia and neighbouring countries affected by EUS to find solutions or at least mitigate impact."

Martha Ngumbo, a veterinary researcher, says there are other reasons for a failing fishing industry.

"EUS is just one (problem). We have more serious trouble with over-fishing, bad practices, climate change and a failure to enforce existing legislation that governs fisheries. What we need to do is shift focus. Let's wait out this disease, but in the meantime, find other ways of fishing."

She explains that 15 million hectares of Zambia's surface area is covered by lakes, rivers, swamps and streams; the country accounts for more than 45 percent of the SADC's total water resources.

With such a massive natural resource, Ngumbo suggests raising investment in aquaculture, strengthening marketing infrastructure to meet local demand for fish, and improving the technical skills of artisanal fish farmers in aquaculture and pond construction.

"Zambia has the potential of becoming a huge fish exporter. We need to harness this."

Wamalume says fishermen like him should be given loans, grants or credit to enable them to establish fish ponds and survive during the fishing bans expected ahead.

"I can't wait until a solution to this disease is found, I need to eat now. My children need education now."

*This story is part of a series of features on sustainable development by IPS – Inter Press Service and IFEJ - International Federation of Environmental Journalists, for the Alliance of Communicators for Sustainable Development (www.complusalliance.org).

Young boys fish as the sun sets over Lake Malawi in Mangotchi, a holiday resort town in Malawi. *mediapix*

A young girl helps with the household chores by washing the dishes outside her home in Luanda, the capital of Angola.
mediapix

Democratic Republic of Congo: Urban Water Supply Needs Attention

A student fills a mug with water at a local primary school. *mediapix*

By Emmanuel Chaco

KINSHASA – Kinshasa's population needs an estimated 700,000 cubic metres of water a day. The Régie de distribution des eaux (Regideso) produces only 425,000 cubic metres, and vast neighbourhoods like Kitokimosi and Mpasa receive almost none of this water. The situation in other parts of the country is similar if not worse.

"In total, only 22 percent of Congolese have access to drinking water, while the average in sub-Saharan Africa is around 60 percent," says Frank Bousquet, of the World Bank's Urban Potable Water Supply Project (known by its French acronym, Pemu).

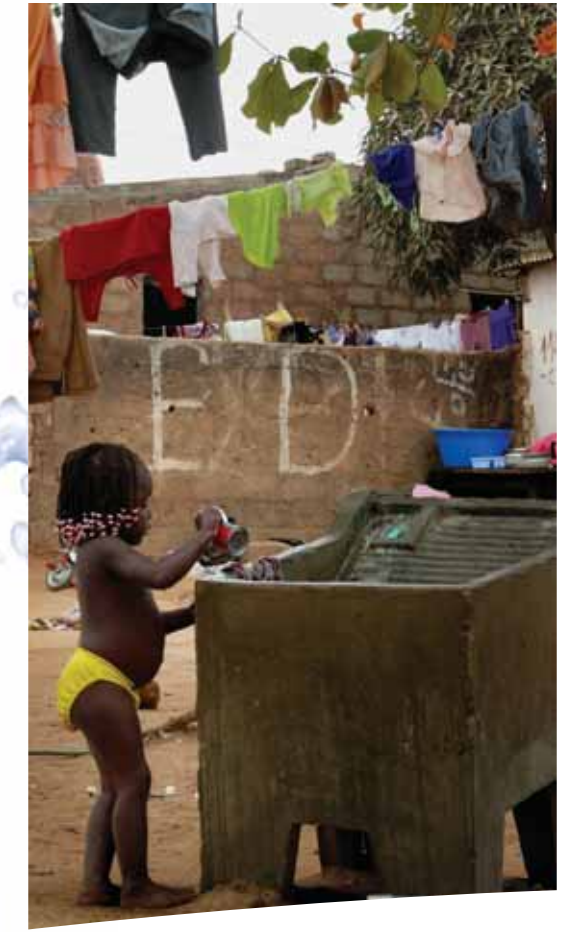
"The lack of drinking water poses a significant threat to public health, and it is the poor who pay the heaviest price for this inefficient service. They pay seven times more for a litre of water than they would if water services operated properly."

Jean-Pierre Kajangu, of the health economics programme at the School of Public Health at the University of Kinshasa, says the situation is serious. "It's not just the health of residents of Kitokimosi and Mpasa, but the whole population of Kinshasa is at risk," he said.

"The water from wells and rivers gives rise to many health problems for us as women," says Sophie Nkeyi, who sells fish in the Kitokimosi market, "because we use it to bathe, to cook and, to wash our clothes – which we cannot even iron for lack of electricity."

She and her 10-year-old daughter have to visit the doctor regularly. "The doctor prescribes antibiotics and de-worming medicine against infections and intestinal parasites we are exposed to by the water in rivers and pools," she told IPS.

Lydia Panzu, 16, says because of the physical strain of fetching water, she has suffered back trouble for the past three years. "Back problems, neck problems, because I go back and forth two or three times a day, down into the valley to



A young girl plays a game and imitates older woman in the family by washing clothes at the laundry basin outside her family's home.
mediapix

the river and back, each time with around 20 litres of water on my head."

Short of resources

Regideso's technical and finance departments say the utility's poor performance is linked to its ageing infrastructure.

"A key example is the Lukunga waterworks, with a capacity of 48,000 cubic metres a day, and which serves a million residents in two districts of Kinshasa. It was built in 1939 by the colonial powers, and has not been substantially refurbished to this day," says David Ekwanza, director of exploitation at Regideso.

The lack of maintenance is a direct consequence of a shortage of financial resources. "And this lack of finances is principally due to the fact that government departments – who are the largest consumers – do not pay their monthly water bills," says Polycarpe Kabangu, head of finance at Regideso.

"These departments include government offices, the official residences of certain highly-placed politicians, public enterprises – who owe around 3.5 million dollars each month, representing 40 percent of the businesses' accounts – causing enormous financial difficulties, and making it impossible to rebuild the infrastructure and supply water across the city of Kinshasa, as well as delaying the payment of staff."

The lack of maintenance is a direct consequence of a shortage of financial resources.

Pemu proposes to sustainably increase access to water in urban areas, and improve the water company's technical and financial effectiveness.

The project will focus on three things: restoration of financial viability, the facilitation of good management to transform this public enterprise and gain increased managerial autonomy, and to renew or upgade facilities in the three centres most likely to generate the revenue to restore balance, and help support secondary centres.

Louise Yemba is tired of hearing promises about bringing water to Mpasa. "I think we need a project better than the others launched by the World Bank in DRC, and whose effects have been limited to the bank's publicity."

The human rights activist from Mpasa doubts the project will be executed. "Or it will be badly carried out, because of the poor quality of governance in the country, and the paralysis of Congolese civil society – which must become aware of the role it has to play in putting pressure on the World Bank, and the government, to support all Congolese who don't have access to water," Yemba says.

Patrice Musoko, coordinator of the Congolese Association of Consumers of Food Products, agrees that the key is for citizens to act.

"Civil society must put effective pressure on the government to reduce these arrears and pay their bills, and allow Regideso to maintain its infrastructure, and supply the neighbour-hoods not yet served in Kinshasa. Civil society must also follow up to be sure the money paid is effectively used to these ends."

But in a country still struggling with the effects of a series of armed conflicts, and the breakdown of effective government, it will not be an easy task.

The lack of drinking water poses a significant threat to public health, and it is the poor who pay the heaviest price for this inefficient service. They pay seven times more for a litre of water than they would if services operated properly.

A young girl helps wiht household chores by washing the dishes in the kitchen of her family's home.
mediapix

One of thousands of Mozambican women looking for a way to feed her family.
Zahira Kharsany/IPS

Nambia: Garden Project Grants Modest Independence

Servaas van den Bosch
Mumbwangela: "If the garden is quiet, we sell wood".
IPS

By Servaas van den Bosch

OMARURU, Namibia – How is life in Omaruru? Put it this way: even the river that gives the town its name might not flow at all in a year. In this semi-desert part of Namibia, existence is a daily battle against poverty, but a women's gardening project is trying to change this.

The Omaruru River runs down from its source in central Namibia, high up in Mount Etjo, for only three months a year, or – in a particularly bad rain season – not at all.

But even when the water is absent, the dry riverbed is a sharp demarcation between the 'haves' in Omaruru proper on the north bank, and the have-nots in Hakahana, its shanty-town on the other side.

Once a missionary settlement, Omaruru (population 6,500) now serves mainly as a hub for surrounding game farms, and as a popular tourist stopover. Hakahana, by contrast, is the area's reservoir of cheap labour.

In a part of town referred to as 'single quarters', because of its one-room dwellings, a group of women and men gather under a tree for a Swapo party rally. Music streaming from an unseen radio guides their singing about Sam Nujoma and the war, punctuated by intermittent cries of "A luta continua!"

The struggle on this August Sunday afternoon has continued well beyond the end of the programme, judging by the number of empty bottles on the table in the middle of the gathering.

For Swapo district coordinator Philip Nghipandulwa it is a welcome break from his work as manager of a women's gardening scheme on the banks of the mostly dry river.

The Netumbo Nandi-Ndaitwah project – named after a Swapo stalwart who was minister of Women's Affairs and Child Welfare at inception of the project in 2001 – started with 20 women. "There are 16 left now," says Nghipandulwa, en route to the garden. "In this world diseases take people away from us."

To change entrenched views it is important that female role models are identified and upheld.

Elina Elago is one of those remaining, and is secretary of the six-member committee that is the women's voice on the project.

"The committee meets with the management regularly, and we discuss the way forward," she says, sitting on a low bench in front of her house. "Like what we want to plant that season, or how we deal with water issues."

Water is a key concern. The grounds look dry at this time of year. In the middle of the cultivated area is the communal garden that generates income for the project, about half a hectare of green where carrots, sweet potatoes, garlic, onions and other vegetables fight a losing battle against rabbits, birds and drought.

The surrounding plots, the women's private gardens, look barren and sandy. "We lost a lot of crops and new seedlings due to frost this year," says Elago. She estimates that in the best months, just after harvest, she makes about 25 dollars a month from the project.

"I put the vegetables on the table in my garden, and neighbours come and buy them." In itself it's not enough to sustain her five children aged 10, six (twins), five and three.

"So we make money where we can," adds fellow committee member Claudia Mumbwangela, herself mother of four aged between 16 and 23. "If the garden is quiet, we sell wood."

She points to the tree under which the two women are sitting: "Or we collect the seeds of this tree and sell them as cattle feed."

In the rainy season, Mumbwangela spends up to half the day in the garden, whereas now she is there for an hour or two at most. Both women have been with the project from the start.

"I like it. The garden not only puts food on the table, but it gives me independence," says Elago. "It beats begging."

During downtimes she teaches the other women to read and write. "Many are illiterate. I went to school up till grade 10, and would have loved to finish, but my mother and father both were out of work, so I couldn't go."

According to Rachel Coomer, of the Gender Research and Advocacy Desk at the Legal Assistance Centre (LAC) in Windhoek, this is not unusual. "The dropout rate of Namibian girls compared to that of boys increases significantly after grade seven."

Education is one of many factors that contribute to gender inequality in Namibia, like most countries in the region still a deeply patriarchal society.

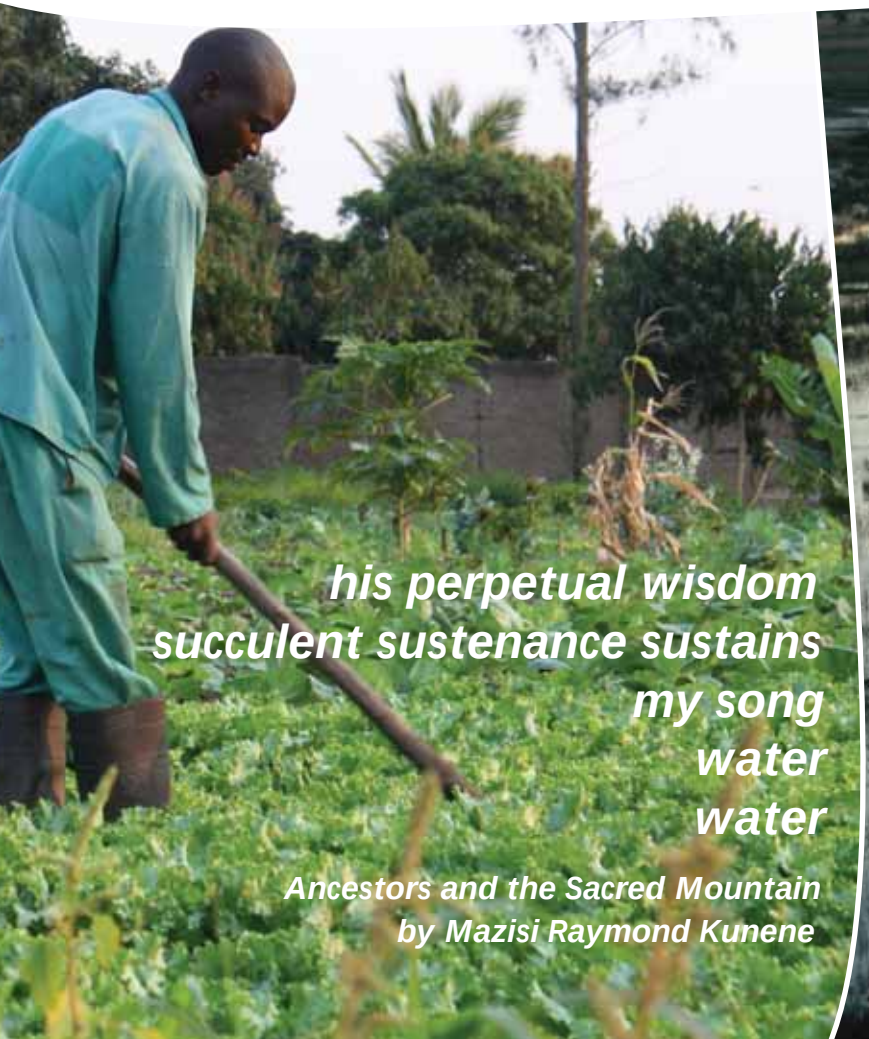
"We are supposed to lead," says Nghipan-dulwa. "Although the women are motivated, they need a man there as the driving force."

"To change such entrenched views it is important that female role models are identi-fied and upheld," emphasises Coomer. "There are some great female politicians in this country. Naming the project after one of them is a good thing."

For one, it has brought the women much-needed exposure. As part of a Southern African Development Community regional water project, the scheme received a solar pump and 2,000-litre storage tank.

"But when it's dry, it's dry," exclaims Nghipan-dulwa, looking at the river bed. "Every time we pump up water we need to wait a while before the groundwater level is restored. What we really need is a dam so we can irrigate all year round."

He puts the cost of cementing a single well at around 6,200 dollars, money the project doesn't have.



his perpetual wisdom
succulent sustenance sustains
my song
water
water

Ancestors and the Sacred Mountain
by Mazisi Raymond Kunene

Chapter 2

The Story of a Working River

Children gather to collect water at the local water supply in Kayelekera, Malawi.
Jessie Boylan/IPS

Southern Africa: Journey of a Working River: the Orange-Senqu

Patrick Burnett
At 185 metres, the Katse Dam walls is Africa's highest. The dam is part of the Lesotho Highlands Water Project supplying water to South Africa through a system of huge underground tunnels.
IPS

By Patrick Burnett

KATSE, Lesotho – In the steep valleys of Lesotho's Maluti mountains, women carry yellow plastic buckets of water across fields of dark-brown earth; men form a human chain and pass along rocks 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 road.

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, then 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 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 questions about 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. Its car dealerships, fast-food outlets and garish casino hotel are dominated by a vast petro-chemicals plant that covers an area equivalent to 2,900 soccer fields.

It's a factory of pipes, which if laid end to end would stretch halfway around the world. Tall chimneys belch smoke and cooling towers send clouds of steam into the sky.

Water might not be uppermost in the minds of South African car owners when they fill up with petrol, but it's crucial to South Africa's fuel economy.

Sasol's petro-chemicals plant at Secunda turns coal into liquid fuel, using 120,000 tons of coal to produce 160,000 barrels of fuel a day.

Cooling is crucial to a production process requiring 12 litres of water to produce one litre of fuel. Sasol goes through 270 million litres daily, accounting for about 4 percent of water use in the Vaal River system. The Vaal is a tributary of the Orange River, which is backed up by water from the Lesotho highlands.

The plant is crucial to the South African economy – fuel produced by Sasol constitutes about 30 percent of what the country uses for transport, while Sasol's domestic turnover stands at more than 7 billion dollars – or 1.73 percent of national turnover, according to company figures.

But Sasol's Secunda plant is the focus of environmental concerns, both for the large amounts of carbon dioxide it emits and for the water it draws from a water-scarce system.

This is the development conundrum: to keep its economy ticking, SA needs companies like Sasol.

Polluted mine water, and its implications for health and agriculture, is a major headache for those who manage South Africa's scarce water resources.

But it also has limited supplies of water, competed for by an ever-increasing number of users.

A working river: electricity

At the Optimum Colliery, situated 30 kilometres south-east of Middelburg, a giant excavator known as a dragline labours in the earth, scraping out 60 tons 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 tons of coal a year.

To extract about 11 million tons of coal a year, which it supplies to Eskom and export markets, between 90 and 120 million cubic metres of earth are removed each year to expose the coal to a depth of 60 to 80 metres – leading to the collection of run-off water.

Because only a limited amount of the untreated mine water – which has a high sulphur content – can be discharged into the water courses, the mine has to do something about accumulated water.

Three children wash clothes in a river in a rural area near Lusikisiki in the Eastern Cape in South Africa.
mediapix

Previously it exercised controlled release into water courses, and stored the remainder in old dams and storage facilities, but space is now running out – making water treatment the only option.

As a result a 15 megalitre desalination plant has been built at the mine at a cost of more than 74 million dollars, to be ready by April this year. The idea is to recover 98 percent of water as clean, with some cost recovery through supply of water to the local municipality.

Polluted mine water, and its implications for health and agriculture, is a major headache for those who manage South Africa's scarce water resources.

Because open-cast coal mining often extends below the water table, water must be pumped out of the open pit. When mining ends, the pit floods, leading to oxidation of sulphide minerals such as pyrite, and the formation of sulphuric acid.

This is known as acid mine drainage, and when it decants into water sources, as it has in parts of South Africa, it seriously damages the environment.

With South Africa planning to fire up new coal-burning power stations to meet energy demands, the danger of polluted mine water is likely to persist.

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.

The biggest users of water in the Orange-Senqu system are industry, mining and agriculture.

In this section of the river, commercial agriculture accounts for 94 percent of total water use, according to figures from South Africa's Water Affairs Department.

Farmers around Kakamas are allocated and charged for water in a quota system, which determines the amount of water per hectare available to each farmer.

This places the onus on the farmer not to exceed his allocation, and while it can be roughly determined whether farmers are abusing the system – the amount of electricity used indicates the amount of water pumped – insiders concede the system is hard to monitor and open to abuse.

South Africa constantly faces the difficulty of dealing with illegal water extraction for irrigation, as the equivalent of 200 million cubic metres a year are unaccounted for.

Despite jobs being involved, the SA government is moving to shut down these illegal irrigation operations, because there isn't enough water in the system to allow it.

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. In order to have enough water to support development needs, while also tackling environmental concerns, access to water and future threats posed by climate change need to be balanced against each other.

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

Farming in the river bed at Okombahe.
Servaas van den Bosch/IPS

Southern Africa: Orange River Wetlands Need a Lifetime to Recover

Patrick Burnett
Mining and other heavy water use upstream has badly damaged marshes at the mouth of the Orange River.
IPS

By Patrick Burnett

ALEXANDER BAY, South Africa – Much of the internationally recognised wetland surrounding the Orange River mouth has lost its rich green colour. Situated close to long-standing diamond mining operations, the river mouth has been maltreated in total disregard of the environment for decades.

Roads criss-cross dried-out salt marshes, cutting them off from the main river channel and essential supplies of fresh water. Mounds of rubble are strewn on the ground. Rusted barbed wire lies next to a gravel road adjoining the marshes.

In the background, mine dumps hulk over the scene. Later, when the wind begins to blow, clouds of sand and dust will cast a haze over the area.

The mouth of the Orange River, with South Africa on the south side and Namibia on the north, is the end point of a river that starts 2,300 kilometres away in Lesotho. The estuary provides a variety of habitats, and supports large numbers of birds, who use it for feeding and breeding on migration routes.

Covering 500 hectares, the South African side of the river was declared a Ramsar site in 1991, one of 1,855 wetlands worldwide recognised as being of international importance.

A meeting held in 1971 in the town of Ramsar, Iran, resulted in the Ramsar Convention, an inter-governmental treaty that commits member countries to maintaining the ecological character of precious wetlands.

The Namibian side was added to the Ramsar list in 1995 – ironically the same year that South Africa's Ramsar zone was placed on a watch list due to the collapse of its salt marshes.

Restoring the southern marshes is given additional urgency by a successful land claim by the Richtersveld community. The community has identified the mouth area as having eco-

The rehabilitation efforts acknowledge that due to the establishment of large upstream dams, the natural flow of the river will never be restored.

tourism potential if successful rehabilitation can take place.

But undoing environmental degradation requires managing the estuary of a heavily dammed river system that provides water to South Africa's industrial and agricultural sector.

The river is the lifeblood of industrial, agriculture and domestic users along its length, and in addition sophisticated transfer systems supply water consumers far from its banks.

Of the main users of water, irrigation uses 47 percent in the basin, while urban and industrial users account for 25 percent.

Dewald Badenhorst, deputy director for protected areas in the Northern Cape Conservation Department, said historically the main reasons for the deterioration of the wetlands were the adjacent diamond mining activities, large volumes of dust and nearby oxidation ponds.

The construction of a raised causeway across the salt marshes in the 1960s to allow for beach access cut the wetlands into sections, preventing natural water flows.

Further upstream, a series of dams constructed from the 1960s onwards reduced the amount of water reaching the mouth.

A proposal to proclaim the area a provincial protected area acknowledges that many of the changes to the mouth region are irreversible, but that some aspects can be tackled. For instance, Badenhorst says as much as possible of the causeway will be removed, to enable water flow back to marshland areas.

Carmen Cloete, secretary of the Richtersveld Community Property Association (CPA), which represents 3,200 members who settled a land claim with the government in 2007 under the Land Restitution Act, said the CPA was on an advisory committee dealing with rehabilitation.

She said the land claimants were a "relatively poor community" who relied on jobs in mining, guest houses and parks in the area.

Cloete said the community had a land-use plan for all land under the restitution deal, which included the development of the Orange River mouth for tourism.

"My opinion is that the government must look at the area and rehabilitate it, so we can use it for our economic benefit. If it is well rehabilitated then it can create work, and we can see there can be a balance between mining and the mouth."

But to fulfil the area's tourism potential, important constraints will have to be overcome.

The region already hosts established eco-tourist attractions in the Richtersveld National Park and the Kalahari Gemsbok National Park. Further potential has been identified based on the desert, mountain and ocean scenery, as well as the birdlife hosted in the estuary, but a major marketing campaign would have to be mounted.

Other constraints, according to the provincial proposal, are a lack of infrastructure and services for tourists in the form of accommo-dation, restaurants, curio shops, tours and trails.

The rehabilitation efforts acknowledge that due to the establishment of large upstream dams, the natural flow of the river will never be restored.

But because South Africa is a signatory to the Ramsar Convention, it has an obligation to ensure that the ecological integrity of the mouth is maintained through environmental flow requirements. But large dams have irrevocably altered the flow, and there is no accurate gauging of how much water actually reaches the mouth.

Badenhorst said policies and strategies for agreeing and implementing required environmental flows should be developed, and a detailed study to improve understanding of environmental water requirements of the river and estuary was required.

Peter Pyke, a technical task team member for the Orange-Senqu River Commission (Orasecom), says a basin-wide study to determine flow requirements is under way, and if necessary water could be allocated to fulfil flow requirements.

Even once this is done, if additional water is released into the river, managing flow requirements is problematic because the nearest dam from which water can be released is the Vanderkloof Dam, 1,400 kilometres away. This makes it difficult to manage flow, because water released from the dam has spread by the time it reaches the mouth.

With rehabilitation plans going ahead, stakeholders accept that there are no quick fixes.

A development plan prepared for the area says the first 10 years should be considered a rehabilitation and establishment phase, with history in other areas of South Africa showing that it takes 20 to 30 years to establish a conservation area, or reserve.

With rehabilitation plans going ahead, stake-holders accept that there are no quick fixes.

"It will take a lifetime," said Klaas van Zyl, future reserve manager for the area. "All we can do is open up the channels (through the causeway) and then let nature take its course."

The Umzimvubu river is seen the rural area of Lutshaya near Lusikisiki in the Eastern Cape of South Africa.
mediapix

Sarga Cattle at a water point.
Servaas van den Bosch/IPS

Southern Africa: Can South Africa Afford to Export Virtual Water?

Patrick Burnett
The wisdom of exporting water-intensive crops from water-scarce regions is under consideration.
IPS

By Patrick Burnett

KAKAMAS, South Africa – Near the banks of the Orange River, farm manager Le Roux Viljoen sends off an SMS to a weather station, and receives an almost instantaneous response telling him the temperature, wind direction and estimated evaporation index.

On either side of him stretch vineyards baking in the hot spring sun, with the first signs of grape bunches beginning to grow.

In two months' time harvest will begin, and the table grapes will fetch top prices as they arrive in European markets during the northern hemisphere winter.

But the Kakamas area in South Africa's Northern Cape Province, where the grapes are grown, receives minimal rainfall and farmers depend on water drawn from the Orange River, which in turn receives water from the Lesotho highlands, via the bi-national Highlands Water Project.

On either side of the irrigated vineyards the land is brown and dry, vegetated only by low scrub.

Though the lower reaches of the Orange River, from where the Vaal River meets the Orange and stretching to its mouth in Alexander Bay, are semi-arid, water-intensive crops such as grapes, pistachios, citrus, pecans and vegetables are grown in a green strip irrigated by the river.

On the other side of the river, in Namibia, similar vineyards can be found around Assenkehr. These are also irrigated from water pumped out of the river.

In the lower sections of the river, commercial agricultural accounts for 94 percent of the total water requirement, according to figures from South Africa's Water Affairs Department. Irrigation is the biggest user of water in the Orange-Senqu river basin, and with increased pressure on the resource, water extracted for this purpose is likely to come under increased focus.

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

Much of the water saved locally could be re-allocated to other uses.

This places the onus on the farmers not to exceed their quota, and insiders acknowledge that the system is open to abuse.

Speaking off the record, one water official said it was inevitable that the system would eventually have to move to a metered system, as this would more effectively control the amount of water used and what was charged for it.

But changing to a metered system is a highly emotive issue among farmers, and installing and monitoring metering would be difficult.

The question now being asked is: in a water-scarce system, does the growth of water-intensive crops for export make sense?

With plans in place for further construction phases of the Lesotho Highlands Water Project, which transfers water to South Africa, a World Wide Fund for Nature report warned of the danger of water-transfer schemes, arguing that they cause "disproportional damage to freshwater ecosystems", and unacceptable social and economic effects on both the donor area and the recipient basin.

The report says in many cases there has been little examination of options to these schemes, such as managing demand and promoting efficient water use.

Virtual water

The concept of virtual water is an attempt to assess trade in terms of the amount of water used in producing a commodity. Viewed through this lens, the farmers along the Orange River are exporting vast amounts of water from a system that can ill-afford this.

Delegates on an Orange Senqu River Commission (Orasecom) field trip in September were told by commission technical task team member Peter Pyke that as water scarcity increased, the most value possible had to be obtained from water supplies.

The idea is that instead of exporting 'virtual water' out of the region ('embedded' in boxes of grapes from commercial farms), water-scarce regions should instead import crops from water-rich areas, saving water for other uses within the region.

"Much of the water saved locally could be reallocated to other uses and to environmental flows," says an awareness kit produced for Orasecom, but it adds that this would have to be balanced against harmful economic effects throughout the South African agricultural sector.

Orasecom executive secretary Lenka Thamae said the point was not to shrink the agriculture sector, which was a large employer of unskilled labour in the region, but to look at which crops were most suited to specific regions.

In the context of the Orange River, applying the concept of virtual water would imply that once an economic analysis of land and water had been done, farmers could be encouraged to adopt crops more suitable to their area.

"Within the framework of regional co-operation like the SADC, areas with water and rainfall such as the Zambezi region and parts of Angola could be encouraged to produce more crops," Thamae suggests.

Zahira Kharsany
Local produce being sold at community markets.
IPS

The concept of virtual water is fast gaining ground as a way of understanding water use and management.

The question of where to allocate water saved by such changes would have to be closely examined.

"Once you conserve water in one area, does industry qualify for additional water. or does it become part of a bigger pot that can be used across countries?" asked Thamae. Mediating between conflicting demands from other countries in the Orange-Senqu basin and South Africa's mining and industrial users could be difficult.

But before that, argues Thamae, it would be necessary to overcome the strong desire of individual countries to be self-sufficient in food, to reduce the risk of relying on sources outside their borders.

The concept of virtual water is fast gaining ground as a way of understanding water use and management. But applying it to make concrete changes to trade patterns in the region is unlikely to take off soon.

In addition to the political questions, and the potential for economic dislocation, southern Africa's agriculture sector is poorly developed, and the water-rich countries that might be expected to become food exporters to drier regions are themselves reliant on food imports, says the Orasecom awareness kit.

Long-term adaptation strategies are needed to protect the food security and livelihoods of Southern African farmers.
Kristin Palitza/IPS

Southern Africa: Neglected Land Washing Away

Patrick Burnett
Sediment washed down from the highlands is filling up dams and rivers along the Orange river.
IPS

By Patrick Burnett

MASERU – Damage to wetlands high in Lesotho's Maluti Mountains seriously affects the health of the whole Orange-Senqu river system.

The wetlands in this mountainous region stabilise soil, retain sediment and contribute to river flow from this area of high rainfall.

They thus support the Lesotho Highlands Water Project (LHWP), which captures water in dams and supplies it to water-thirsty South African industry and agriculture. The water Lesotho sells to South Africa is the mountain kingdom's largest source of foreign income.

But a study has shown that the wetlands have been degraded to varying degrees, due to a number of factors such as infrastructure development, overgrazing and encroaching cultivation, with resultant erosion.

The study, undertaken in 2008 for the Orange Senqu River Commission (Orasecom), and titled 'The Protection of Orange-Senqu River Water Sources', said some wetlands were dissected by deep gullies, indicating increased erosion rates. The study focused on the catchment area of the Khubelu River, a major tributary of the Orange-Senqu.

"The degradation of the wetlands' vegetative cover may reduce the ability of the soil to dissipate the erosive water forces. Rills and channels have formed, resulting in gullies with extended soil scouring."

With wetlands crucial for retaining water, purifying it and also regulating the flow of water, degradation affected the water supply to the LHWP, the study said.

In addition, the erosion had contributed to increased sedimentation of water downstream of the wetlands, and thus in the Orange-Senqu river system.

The Caledon River flows from Lesotho into South Africa. Silt build-up in the river has seriously affected the lives of communities on its banks.

Sedimentation in the river, which joins the Orange River and flows into the Gariep Dam in South Africa's Free State province, is the worst in South Africa – and possibly the worst in the world, said Peter Pyke, a member of the Orasecom task team.

Founded in 2000, Orasecom was set up under the SADC Shared Watercourses Protocol, with a focus on the use of shared water resources to deal with poverty and food security.

Pyke, who was briefing Orasecom delegates touring the southern African region, said sedimentation was caused by natural factors such as easily eroded sandstone and rain, but aggravated by human factors such as a growing population.

Pyke, who is also a chief engineer for options analysis with South Africa's Water Affairs Department, said the silt build-up had in some areas added at least six metres to the river bed. In one area a weir which used to have a three-metre waterfall had now been buried by sand.

Further downstream a new bridge had been built, as the older one had been flooded even in periods of minor rainfall increases. Because the bed of the river is now much higher, farmland on either side of the river has become subject to flooding.

Pyke said the problem was worse upstream of the Welbedacht Dam, built in the 1970s, because when the velocity of the water slowed as it approached the dam, sediment was more heavily deposited upstream.

Tenure in the area was communal, and this made it more difficult to ensure the land was taken care of.

Silt build up in the dam means it now stores less water. Initially built to hold 115 million cubic metres, the reservoir now holds only between seven and 15 million cubic metres.

Lesotho's Sechoocha Makhoalibe, who has worked as a regional project manager for previous Orasecom studies, said the situation had been aggravated by obstacles to good land-use management.

He said land tenure in the area was communal, and this made it more difficult to ensure the land was taken care of. Land disputes between local chiefs and community councils were detrimental, as they could mean land was meanwhile not taken care of.

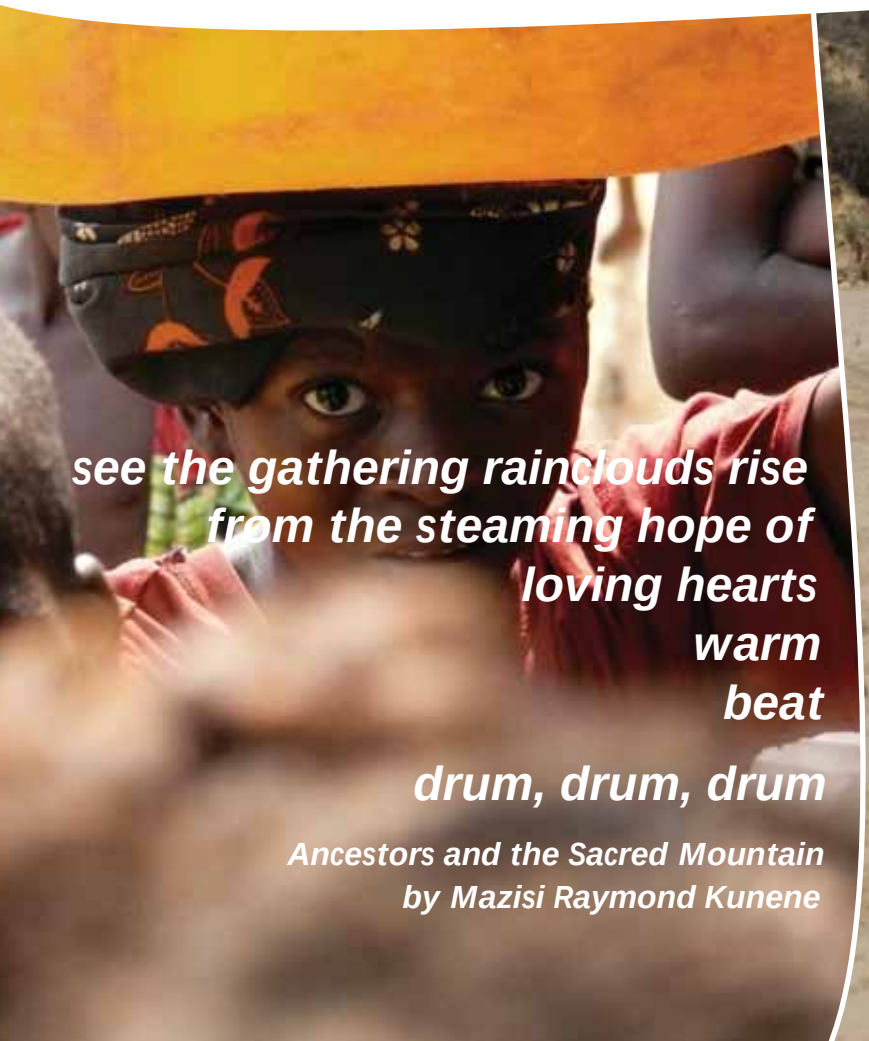
The 2008 report produced for Orasecom recommends that a programme for conservation, rehabilitation and protection of the wetlands in the Lesotho highlands would need action by communities and local government.

This would have to encompass range management, rehabilitation of degraded wetlands, informing the populace and increasing the monitoring capacity.

The study proposed four main interventions, which have been incorporated into rehabilitation work by the government of Lesotho, and are to be implemented by community, water, road and soil stakeholders.

These include range management to improve the livelihood of the 20,000 who live in the area, rehabilitation of degraded wetlands, prevention of erosion from road drainage, and the monitoring of results – so that lessons learnt can benefit other areas.

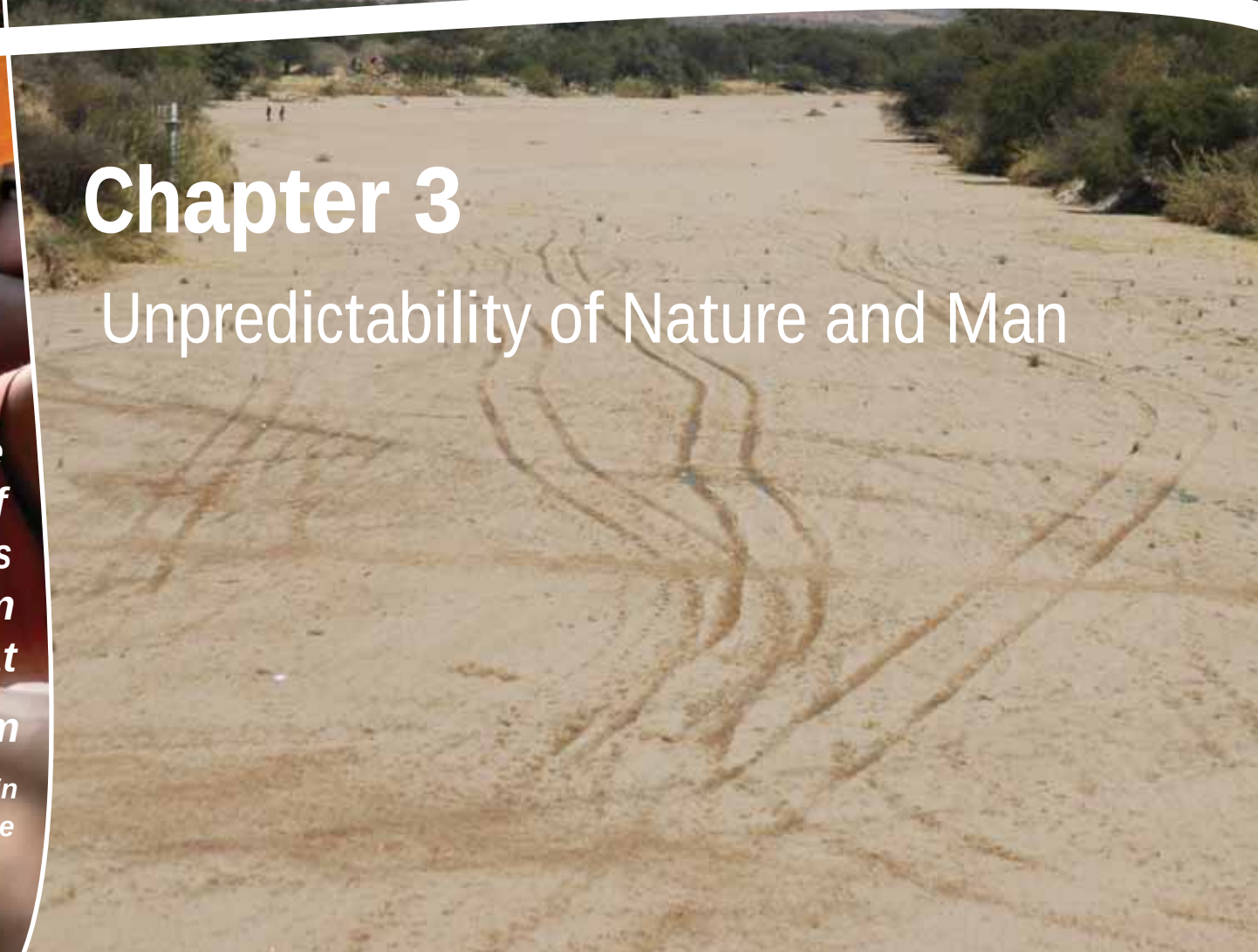
A woman carries a jerrycan of water from a natural spring outside Kinshasa, the capital of the Democratic Republic of Congo.
mediapix



see the gathering rainclouds rise
from the steaming hope of
loving hearts
warm
beat

drum, drum, drum

Ancestors and the Sacred Mountain
by Mazisi Raymond Kunene



Chapter 3

Unpredictability of Nature and Man

Mauritius gets about 50 percent of its water supply from surface reservoirs that collect the rains and the running water from nearby mountains, like here at La Nicoliére, in the north of the island.
Nasseem Ackbarally/IPS

Southern Africa: Breaking the Flood Cycle

A Namibian Red Cross volunteer talks to flood-displaced people.
IFRC/IPS

By Louise Redvers

LUANDA, ANGOLA – The fourth-largest river in Africa, the mighty Zambezi, is lifeblood to 32 million people, from land-locked Zambia to Mozambique on the Indian Ocean. But its blessing is also a curse.

Climate change is blamed for an increase in rainfall and flooding along the 2,574 kilometre river running through Angola, Zambia, Botswana, Namibia, Zimbabwe and Mozambique.

In recent years hundreds of thousands have lost their homes, livestock and livelihoods, leading to a serious shortage of food, an increase in water-borne diseases and long-term environmental degradation in an area already steeped in poverty and high levels of HIV.

Counting the cost

The start of 2009 saw some of the worst flooding in the area's history.

In Namibia more than 100 people were killed, 55,000 displaced and more than 350,000 lost their livelihoods, prompting the government to declare the floods a national disaster.

In Zambia, where annual rainfall has risen from 900mm to 1,300mm in recent years, communities who used to be able to judge when to vacate the flood plains each year are now being caught unaware. This year tens of thousands have been left homeless, and the floods, which have destroyed harvests, are the worst in 150 years.

And in Angola, still recovering from a three-decade-long civil war which ended in 2002, more than 222,000 families were left homeless by flooding, which swept away houses, destroyed roads, ruined 228 hectares of crops and killed thousands of goats, cows and other livestock.

Vulnerable communities

A British Red Cross team dispatched to Moxico province in southwest Angola found people living in desperate straits, with little access to food or medical supplies, having lost all their crops in floods, and with little hope of getting back on their feet without external assistance.

Linda Hitchcox told IPS: "This is a province still very affected by the war. It's a wild environment, people existing by gathering and subsistence, relying on basic fishing just to get through each

day. Now they have lost their homes, their livelihoods and their livestock."

"It's not that people don't know it's dangerous to live by the river – of course they do. But they choose to live there because their livelihood is so vulnerable. They need to be close to the fertile soil to grow food and be close to water to fish."

As monitored in Zambia, for example, traditional rain and dry season cycles are no longer predictable, and community warning systems are no longer enough to protect those living in the Zambezi basin area.

Finding solutions

In a bid to counter the effects of climate change on these communities, the International Federation of Red Cross (IFRC) and Red Crescent Societies have created the cross-border Zambezi River Basin Initiative (ZRBI).

Conceived in 2008 and launched last month, the ZRBI aims to bring long-term disaster management to the region.

The initiative will include the six countries in which the Zambezi runs, plus Malawi, whose Shire River, one of the Zambezi's largest tributaries, is regularly subject to backflow and subsequent flooding.

A similar cross-border initiative involving the Red Cross Society in Kenya, Uganda and Tanzania has been tried and tested since 2003 on the shores of Lake Victoria in East Africa

"In recent years, we have witnessed a dramatic increase in the number of floods along the river

This year tens of thousands have been left homeless, and the floods, which have destroyed harvests, are the worst in 150 years.

basin," explained Farid Abdulkadir, the IFRC's disaster management coordinator for southern Africa.

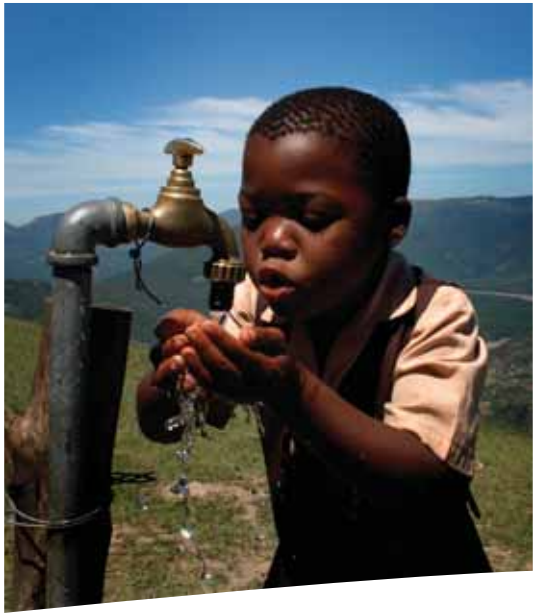
Breaking the cycle

"For many communities, these events are now annual crises, leaving them in an almost perpetual cycle of disaster, displacement and recovery."

"The Zambezi Initiative aims to break this cycle; to help communities be prepared for disasters, and to encourage them to take steps to reduce the devastating impact these have on their lives."

One strand of the initiative is longer-term planning, the implementation of robust early-warning systems, and creating a more integrated approach across the region between Red Cross volunteers and branches.

Karen Hvid, IFRC's Angola representative, said: "The important thing is to give the communities tools to be able to react in time to the hazards, and teach them what action to take in those first



A schoolgirl drinks water from a tap that supplies water harvested from fog and rain at the Luvuyo Junior Secondary School in the rural area of Lutshaya near Lusikisiki in the Eastern Cape.
mediapix

48 hours before help arrives. If a community knows its vulnerabilities and its capacity, it can learn to support itself."

She added that even basic tools such as drums and coloured flags could help people communicate risk, and save lives.

Surveys by Red Cross branches in the area had found flooding, subsequent displacement and the loss of harvests led to extreme health, social, economic and psychological danger or damage.

This was due to a number of factors, such as a lack of safe water supplies and sanitation, stagnant water increasing water-borne diseases like cholera and being breeding pools for mosquitoes, leading to more malaria; dependency on maize and having limited other sources of income, food shortages, high levels of HIV and AIDS, a large number of women-led households, and even hippo and crocodile incursions due to higher water levels.

The idea now is to deal with these issues together, not in isolation, and before, not after the floods had struck each year.

This begins with the creation of community hazard maps to better understand risks, disaster management to know how to react to floods, and health and sanitation training to reduce disease spread by high water levels.

Then there is better post-harvest food storage for crops that do survive, advice on soil maintenance, seed nurseries, crop diversification and nutritional training.

Environmental consideration is also key and the intention is to work towards preventing long-term degradation by promoting tree planting to reduce deforestation, and subsequent soil erosion.

The biggest users of water in the Orange-Senqu system are industry, mining and agriculture.

The ZRBI aims to directly benefit 235,800 people over three years – mostly women and children.

A further 464,000 people who live near the most affected districts are also expected to gain indirectly from training in early-warning systems, disaster preparation and measures to prevent malaria and HIV, taking the scope to 700,000.

Such initiatives don't come cheap, of course, and the IFRC is appealing for close to eight million dollars to fund its work.

It claims that aid money has four times as much humanitarian benefit if spent before a disaster, rather than on knee-jerk relief operations.

It also hopes that one day the Zambezi can fulfil its potential for tourism, arts and crafts, cultural exchange, cross-border trade, electricity generation and environmental conservation.

Carn McGrath
Industry is one of the largest users of water in the Orange-Senqu river system.
IPS

Rundu-Kavango region - Angolan Border area.
Servaas van den Bosch/IPS

Southern Africa: Strengthening River Basin Management

Fidelis Zvomuya
A young woman collects water from a borehole.
IPS

By IPS Correspondent

GABORONE – Many of the disastrous effects of floods which swamped northwest Botswana in early March could have been avoided if the Okavango River Basin Commission (Okacom) had put an early-warning system in place.

"I have just returned from northwest Botswana, where I inspected damage from flooding – the heaviest on record," Gabaake Gabaake, Permanent Secretary in Botswana's Ministry of Minerals, Energy and Water Resources, told delegates at the opening of a two-day regional conference in Gaborone on strengthening trans-boundary water management.

"We could have minimised the adverse impacts of this event if Okacom had used its flow and water level data to develop and implement an early warning system," Gabaake said.

"Those of us from Okacom sitting here, and maybe even the SADC, should be asking ourselves why it is that we have so many workshops like these, and commission meetings, yet we cannot even deal with relatively simple issues like the one I have just mentioned."

The Southern African Development Community (SADC) region has 15 major river basins shared by two or more nations. Co-operation on trans-boundary water management is considered essential for development of the region's manufacturing, energy, mining and transport sectors.

The workshop in Gaborone provided an opportunity for river basin organisations (RBOs) to consider proposed guidelines for the management of more than 70 percent of the region's surface water resources. This was expected to strengthen regional information sharing, strategic thinking, co-operation and co-ordination among RBOs, SADC, technical experts and international co-operating partners (ICP).

"While a number of the river basins have some form of institutional framework, we are still faced

with challenges. These include effective implementation of the basin agreements signed – some a number of years ago – and the strengthening of institutions once established," said Remigious Makumbe, director of Infrastructure and Services in the SADC secretariat.

"We also have agreements which still need to be ratified by the respective riparian states, in order to come into legal force and begin to be implemented. For example, Limpopo River Commission (Limcom) and the Zambezi River Commission (Zamcom)."

The region faces many challenges in water management, with climate change and variability the most important. Evidence of this is the high frequency and intensity of floods and droughts, such as those that hit the Cuvelai, Okavango and Zambezi River basins.

U.N. country teams report more than 600,000 people were affected by floods this year in Zambia, with 31 killed. In Angola 24 deaths have been reported, 78,000 people were displaced, and plantations covering hundreds of thousands of hectares were destroyed.

"It doesn't take much to collaborate. All it takes is the recognition that working together pays. And when two or more partners are working together they become something greater than they were individually, something more substantial," said Dr. Horst Michael Vogel, programme coordinator

It doesn't take much to collaborate. All it takes is the recognition that working together pays.

with GTZ (Deutsche Gesellschaft für Technische Zusammenarbeit), the German agency for technical cooperation.

More than 120 professionals from SADC member states met in Gaborone for the third annual workshop on strengthening river basin organisations, hosted by the SADC secretariat and jointly funded by GTZ and the United States Agency for International Development.

Servaas van den Bosch
Women washing whilst their children play at the river's edge.
IPS

Women working together to collect water for their families.
Pilirani Semu-Banda/IPS

Young men take a refreshing swim in Lake Malawi.
Jessie Boylan/IPS

Malawi: Rains Expose Poor Sanitation

Pilirani Semu Banda
Authorities have set up tents to treat cholera victims in Lilongwe.
IPS

By Pilirani Semu-Banda

LILONGWE – Zimbabwe, where cholera has claimed more than 2,700 lives according to the Red Cross, is not the only southern African country facing increased disease as rains set in across the region. Malawi was also battling a cholera outbreak which had killed 19 since the start of the rainy season – an unusually high death toll.

Up to 485 cases of the epidemic have since been registered and treated. World Health Organisation records from the 2007/2008 rainy season indicate not even a single cholera case was registered in the country's capital, Lilongwe, last year, although up to 20 deaths and 1,022 cases were documented in nine of Malawi's 27 districts.

Apart from the current outbreak in Lilongwe, one other cholera case was treated in the country's commercial capital, Blantyre, but this was imported from Zimbabwe, according to Malawi's principal secretary for health Chris Kang'ombe.

"Queen Elizabeth Central Hospital in Blantyre treated a Zimbabwean truck driver who had cholera. He recovered and has since returned to Zimbabwe," said Kang'ombe.

There is a lot of cross-border trade and movement between Malawi and neighbouring Zimbabwe, and Malawi health authorities have been on alert and intensifying civic education on cholera to ensure that the serious Zimbabwe cholera situation does not spread into the country, according to Kang'ombe.

But cholera is not primarily spread directly from person to person. The country's health experts have attributed the scourge to lack of safe water, combined with poor sanitation and poor hygiene.

The outbreak has hit Lilongwe and surrounding communities hardest. Kang'ombe said all the fatalities lived in Malawi's fastest-growing city, which has large populations living in slums, with little access to safe water. Cholera is transmitted through contaminated water or food.

"We encounter cholera outbreaks almost every rainy season, when people who have little or no access to safe water resort to using untreated water from swamps," Kang'ombe told IPS.

The Banda clan, living on the outskirts of Lilongwe city, has lost two family members to the disease within two weeks. Another member of the family was also infected, but recovered after treatment.

There are more fears of cholera outbreaks in other parts of Malawi – health officials are vigilant in the flood-prone areas of the country.

Clan member Jabu Banda said his aunt became ill with cholera two weeks ago, and was admitted to one of the tents erected in Likuni, one of Lilongwe's high-density areas, by the Ministry of Health to care for cholera victims. "She died two days after being taken to the health centre," said Banda.

He said his niece also started showing signs of cholera a week after the death in the family. "We took her to the health centre, but she also died a day later," Banda said.

His cousin, who was guardian of the two victims, was also diagnosed with cholera last week. "She has just been discharged from the clinic, but she is yet to recover fully. She is very weak," Banda told IPS.

In managing the outbreak, Malawi's Ministry of Health has erected special tents near local hospitals, and within areas that have been badly affected.

"The idea is to avoid mixing cholera patients with others admitted to hospitals for other less contagious illnesses," said Kang'ombe.

He said the outbreak would have been contained quickly if people had improved their hygiene. Kang'ombe said a lot of people in townships and surrounding areas ate fresh foods such as fruit without washing them. Fruits such as mangos, bananas and pineapples are in abundance during the rainy season in Malawi.

"We are providing chlorine to households for them to treat their water. We are also stopping communities from preparing food at gatherings such as funerals, and advising them to avoid buying cooked food from streets to avoid contamination," he said.

The ministry has cautioned people who handle the corpses of cholera cases to be extra careful. Culturally, most communities in Malawi bathe the dead before burial.

Meanwhile, there are more fears of cholera outbreaks in other parts of Malawi – health officials are vigilant in the flood-prone areas of the country, which include the southern districts of Chikwawa and Nsanje, lowest-lying areas of Malawi. These areas suffer floods every year, and are prone to cholera in the rainy season.

Floods have already affected 2,100 households in 21 villages in Nsanje district, and 1,573 other families

Zahira Kharsany
Many of the fresh fruit sold at the community markets is not washed before consumption.
IPS

Fidelis Zvomuya
A young boy drinks directly from the Musengezi river.
IPS

in Chikwawa district since the beginning of the New Year, according to government statistics from district commissioners' offices.

The ministry has cautioned people who handle the corpses of cholera cases to be extra careful. Culturally, most communities in Malawi bathe the dead before burial.

A task force comprising the Ministry of Health, United Nations Children's Fund, World Health Organisation and the United Kingdom's Department For International Development is providing civic education on hygiene and chlorination of water sources, to control further cholera outbreaks.

Malawi's rainy season runs from November to May.

Heavy rain caused wide-spread damage to homes in Cunene Province, Angola.
IFRC/IPS

Zambia: Worries Ahead of Flood Season

Lewis Mwanangombe
Communities living along the Zambezi river fear flooding as the rainy season begins.
IPS

By Lloyd Himaambo

SHANGOMBO DISTRICT, Zambia – The Zambezi is home to the fishing community on Mbeta Island. But after the river rose and swallowed their homes 2008, they have learned to fear it as well.

Mulemwa Kalaluka is a renowned fisherman on the island. He says he prefers catching fish the traditional way, using a spear and fish trap as he expertly navigates the river in his fishing boat.

He is happy and says this season the fish are plentiful. He has managed to catch enough to feed his family as well as sell to fishmongers from bigger towns.

Mbeta is mainly a fishing community, but residents do a little farming as well, especially during periods of high water levels, or when there is a government closure of fishing to allow fish to breed.

The 2008 floods – which entirely submerged this large island, forcing people to flee – are still fresh in the minds of people as the rainy season begins again.

"Those were particularly hard times," said Kalaluka when asked what he remembered about the 2008/2009 floods, the worst since 1958 according to locals.

"At first we ignored the announcement by local leaders that we had to move. We thought it was normal rain and would pass like it did every year."

Kalaluka lamented that by the time they realised something unusual was happening, it was too late to prepare. Hundreds of people had been sheltering at Mbeta Basic School, but after two days the school itself was flooding.

People were evacuated from the island in fishing boats and on rafts as the water rose, seemingly by the second. In the rush livestock was lost, and very little of the maize, rice and other staples villagers had stored was saved.

The whole district of Shangombo, where Mbeta Island is found, was heavily flooded and completely cut off from the rest of the country as bridges were washed away. Residents were evacuated to higher ground such as the former refugee camp at Namgweshi.

But the relief measures were temporary, lasting only about a month.

The communities have returned to their old homes, but the chances of the disaster repeating itself are very high.

Mubika Mubika, Member of Parliament for the area, asked what measures had been taken to ensure communities would not be badly affected should there be flooding again this year, said it was extremely likely there would be floods again.

"Only God knows what will happen," responded Mubika when pressed on what would befall these communities if the river rose to the same levels next year.

But the relief measures were temporary, lasting only about a month.

Mubika, who is also an under-minister in the national government, claims there is a resettlement scheme for those willing to relocate permanently.

But most people interviewed in the district said they had heard nothing about the scheme, beyond claims by politicians at election time.

Misheck Kabayo is district administrator for Shangombo. He insists no previously affected person has returned to flood-prone areas. According to him, all victims have been integrated into villages on higher ground. He says the people who returned to dangerous areas did so only for fishing, but will return to higher ground.

Yet Kabayo concedes that the idea of resettlement has not yet taken off.

"We have identified land where those who are willing can move, and we hope that very soon we will start giving out plots of land to such people," he says.

His version is at odds with the realities in the district. "We have no choice but to come back here," says Mbeta island farmer Mundia Kabutu testily. "What do you expect us to do? Even if we wanted to shift, where shall we go?"

Kabutu says the type of help they receive is transient, and cannot sustain people to start a new life in a different environment.

"Which government are you referring to?" he asks. "They can't even construct a proper road to connect this place to the rest of the country, and you expect them to build us new homes?"

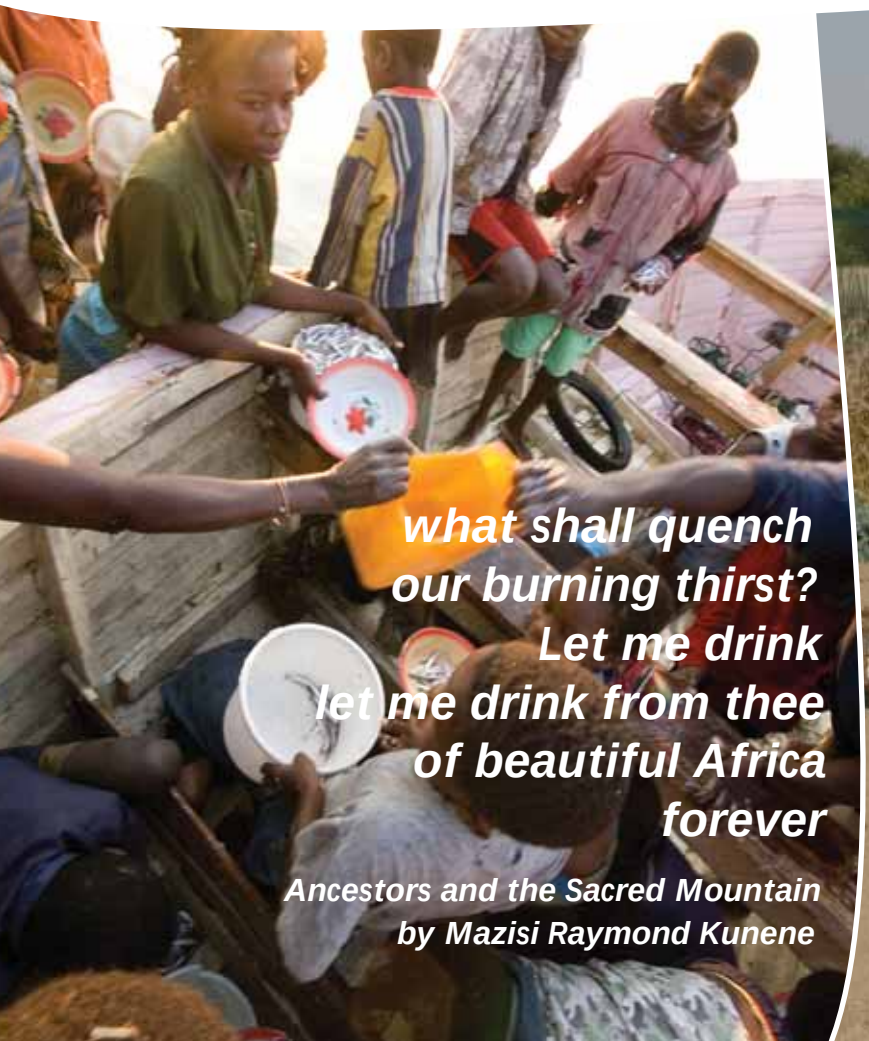
"When the water comes again," says 61-year-old Sibeso Nasilele, "we will move to that place (higher land), but we will come back to continue life here as we know it."

Nasilele said she did not envisage starting a new life away from Mbeta at her age. She said maybe younger people would be more willing to go, and start life afresh.

"I was born here and will die here, since my life is already in the afternoon," she says.

And this year's rains begin to fall.

Jessie Boylan
People gather at Monkey Bay, Malawi to buy the morning's catch.
IPS

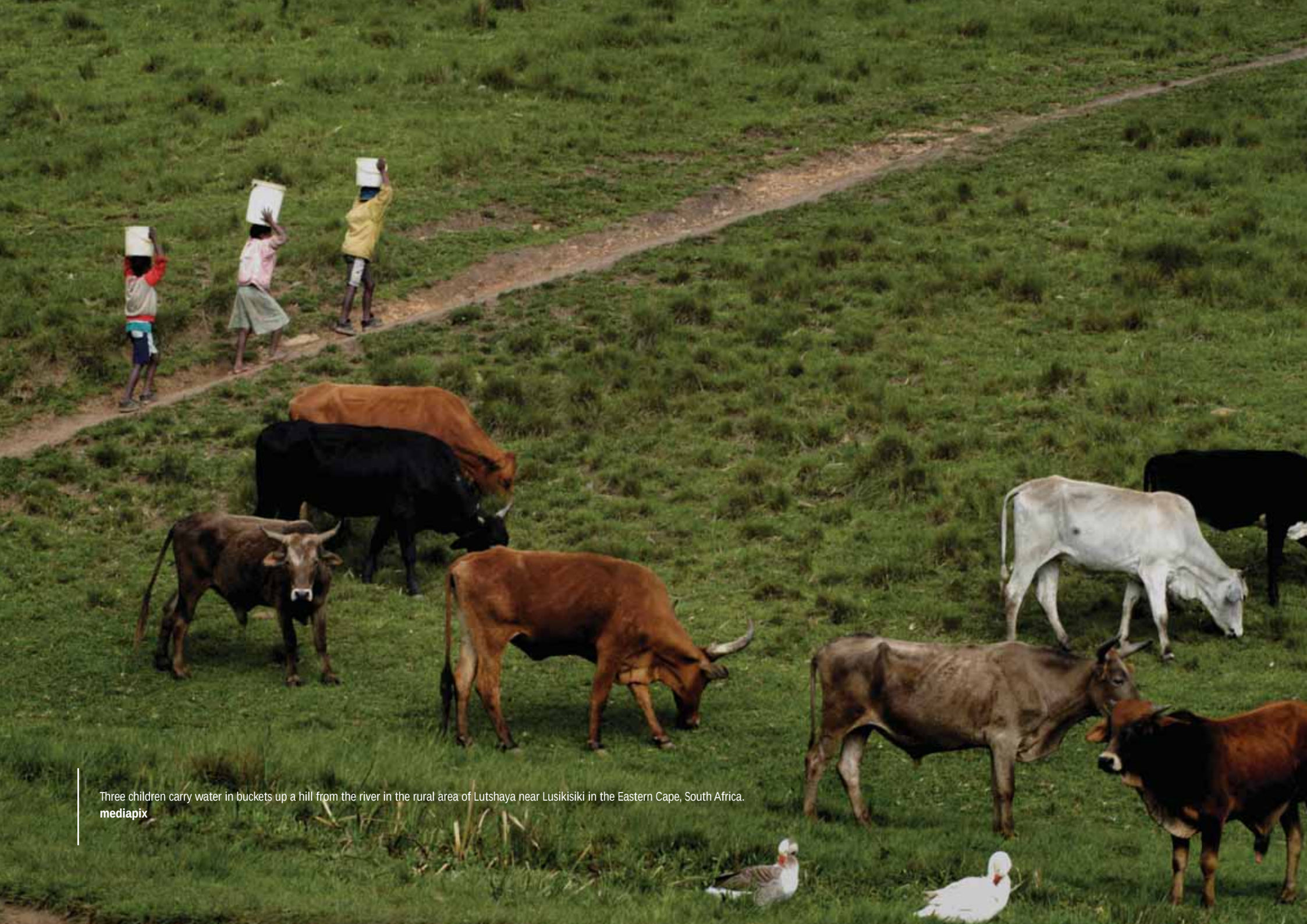


what shall quench
our burning thirst?
Let me drink
let me drink from thee
of beautiful Africa
forever

Ancestors and the Sacred Mountain
by Mazisi Raymond Kunene

Chapter 4

The Water Issues



Three children carry water in buckets up a hill from the river in the rural area of Lutshaya near Lusikisiki in the Eastern Cape, South Africa.
mediapix

South Africa: We Have Land Rights but No Water Rights

Fidelis Zvomuya
Thandi Sihadi feeds one of her dairy cows.
IPS

By Fedelis Zvomuya

JOHANNESBURG – Thandi Sihadi stands next to a dry tap. As a maize and dairy farmer in one of South Africa's driest districts, the lack of running water is nothing new to her.

In fact, she says, she is one of many new black farmers now fortunate enough to have land, but who still have trouble gaining access to water for farming.

Sihadi, a beneficiary of the Hereford land-reform project aimed at assisting small-scale black farmers, is from Sekhukhune in Limpopo.

She says despite the launching of government's Water for Growth and Development Framework in March, things have not changed much. The government programme aims to ensure sufficient water to support the country's economic growth.

But for many smallholder black farmers who benefited from land reform, the distribution of water still remains a concern. Water rights remain a most contentious issue, as they are not linked to land rights.

"Like many aspects of our lives, particularly in the agricultural sector, we are still very far from achieving equity on the use of water," Sihadi says. It is her and other farmers' hope that this eagerly awaited water reform framework will come into operation soon. "It promises to be a painkiller for what, to us, is a barrier in our field – the access to water rights," she explains.

According to Water Affairs and Forestry Minister Buyelwa Sonjica, the framework offers a long-term perspective of how to achieve 2030 water security, quantity and quality. Sonjica says the strategy puts water at the centre of all decision-making. Ensuring basic access for all citizens is a non-negotiable issue, she adds.

"Changes to the weather and an increasing population are placing fresh water resources under increasing stress, resulting in unequal distribution of water rights," the minister says.

There are no legal remedies to protect small-scale farmers such as Sihadi from existing laws

that make it difficult to access water. The Hereford land reform beneficiaries have had difficulty accessing water, as the present legal framework means water and land rights are still sold separately.

The people who control water are the people who bought it a long time ago, Sihadi says. "It is still the same as in the past, that land is sold separately from water rights. Unsuspecting buyers, particularly we land-reform beneficiaries, fall in the trap and invest in a farm without water being part of land rights," Sihadi explains.

According to Mpumalanga farmer Motsepe Matlala, in the former homeland areas the irrigation schemes do not have affirmed water rights.

Matlala, former president of the National African Farmers' Union, says in Limpopo alone there are 126 irrigation schemes – about 48,000 hectares of land – that operate without licences.

But for many smallholder black farmers who benefited from land reform, the distribution of water still remains a concern.

"The water boards are dominated by industry, organised farmers and mines. There is a limited and weak participation by black people," he says. This undermines all efforts towards transformation, Matlala maintains.

In addition to water rights barriers, Sihadi says another challenge the agricultural sector faces is the increasingly declining quantity and quality of water.

A recent study by the Water Research Commission says the country's water resources have declined, and the country has four percent less water than was estimated in a 1995 study. The research also showed that the quality of water in the country's rivers was deteriorating due to pollutants.

Less water, declining water quality, and growing water demand are creating immense challenges to most sectors, not only to agriculture, the Department of Water Affairs and Forestry points out.

"We understand the smallholder farmers' concern, but also other sectors such as electricity production – a major user of water – are being compromised," Sonjica adds.

The Water for Growth and Development Framework, among other things, is set on delivering clean drinking water, and providing safe sewerage and waste water treatment systems to an increasing population.

The minister says a very important part of water security is infrastructure development.

Her department aims to spend about four billion dollars over the next five to eight years on the continued construction and establishment of 15 water-resource infrastructure projects.

The minister says a very important part of water security is infrastructure development.

"This would increase the capacity of the water resources infrastructure to provide water to strategic installations such as Eskom, Sasol, the mining sector and for domestic needs," Sonjica says.

Other programmes government would embark on to ensure the water resources are managed to meet future needs include promoting public awareness of the value of water, as well as curbing water losses by at least 20 percent in 2014.

Meanwhile, smallholder farmers are finding that decreasing water availability, declining water quality, and growing water demand are obstacles that must be overcome before they can farm efficiently.

"This is creating immense challenges to our businesses and investors, who have historically taken clean, reliable and inexpensive water for granted. These trends are causing us to depend on rain water, and it is the duty of government to examine and act on this," Sihadi says.

Abdurrahman Warsameh
A donkey cart is used to distribute water in areas without adequate infrastructure.
IPS

In Siteki where the borehole hand pumps do not work, getting drinking water is a daily chore.
Mantoe Phakathi/IPS

Swaziland: More Boreholes, No Water

Fidelis Zvomuya
In some regions people have to queue for hours at their community borehole just to fill a bucket of water.
IPS

By Mantoe Phakathi

MBABANE – In the drought-stricken area of Siteki, Tibuyile Maziya has been trying to fill her four 20-litre buckets at a community borehole for four hours. With a baby on her back and two more buckets to fill up, 19-year-old Maziya says she walks to this well at least three times a week to get water for her family of 15.

Siteki, a small town in eastern Swaziland, has not had water for decades.

"Sometimes I spend the whole day waiting for the water to surface," said Maziya. "You have to get here very early in the morning, otherwise you can go back home empty-handed." Sometimes when she comes to the well, there are more people than water available.

Besides spending so much time waiting for water and walking for three kilometres to the well, she has to pull up the heavy water-filled bucket by hand.

Surprisingly, Maziya is standing next to a hand-pump borehole, and two hundred metres away there is another. "All these boreholes are not working because they have broken down," she said. The hand-pump boreholes stopped working because of mechanical failure, usually hastened by lack of maintenance. And there was no one around who could fix the pumps.

"For about two years now, the community has been relying on this spring for water."

It is almost noon and six more people are still queuing with buckets behind her. The residents of Siteki are not the only ones suffering this ordeal.

A lot of people in rural Swaziland, especially in the Lubombo region, still travel long distances and have to compete with livestock drinking at the streams. Others rely on springs and wells.

But hand pumps and electrically powered boreholes are a common sight throughout the lowveld and dry middleveld.

According to the director of the Department of Water Affairs, Obed Ngwenya, more than 3,000 boreholes have been drilled in the country since 1986, but more than 40 percent of the one million population still does not have access to clean water.

In fact, said Ngwenya, about 90 percent of the community water projects were not functioning, because many boreholes had broken down and nobody wanted to take responsibility.

He said the idea was that once the government or a development agency had sunk a borehole, the community should maintain it. "Government and development agencies have tried to drill boreholes in many places to make water more accessible, but we haven't been very successful so far," said Ngwenya. "Communities fail to repair the equipment at boreholes."

The reasons for this varied. But mostly communities said they did not know how to repair the borehole equipment or maintain the head of the well. And they were too poor to pay a trained mechanic.

Ngwenya said the country had tapped into only 10 percent of its ground water, although 90 percent of its people, the majority of which were from rural areas, depended on groundwater.

Many communities using electrical pumps failed to pay the electricity bills, and the Swaziland Electricity Company cut them off, so they remained without water.

"A lot of community boreholes have run dry after yielding water for only a few months. It is a sign that no proper assessment of available underground water at those places was done," said Water Sanitation and Hygiene Forum (WASH) chairperson Jameson Mkhonta.

He admitted said the country's groundwater was poorly managed. "Until a year ago, when the WASH Forum was established, there had been a lot of duplication of activities regarding the supply of groundwater in rural areas," said Mkhonta, "Non-governmental organi-sations have been drilling boreholes in the same areas a very short distance away without coordination, which is why some boreholes have run dry."

The haphazard manner at which boreholes are drilled in the country could mean we'll find ourselves depleting the water table.

The WASH Forum, comprised of non-governmental organisations, United Nations agencies, the government and companies that provide water services, has received about 1.5 million dollars. The money will be used to repair damaged borehole equipment and drill more boreholes in the dry areas, so that people like Maziya can have water.

The forum has realised that besides the fact that a lot of boreholes are out of operation, some were not installed properly in the first place –a blame Mkhonta attributed to some private companies whom he said cut corners when installing the pumps.

Another identified defect, according to Natacha Terrot, communications officer at Yonge Nawe Environmental Conservation Group, is that some companies drill beyond the stipulated six-inch diameter.

"The haphazard manner at which boreholes are drilled in the country could mean we'll find ourselves depleting the water table," warned Terrot. "We need proper monitoring to ensure that people adhere to legislation and the stipulated guidelines."

There is very little awareness of the importance of ground-water, because it is not visible.

Meanwhile, the management of groundwater resources is a challenge not only for Swaziland, but for all members of the Southern African Development Community (SADC). According to Barbara Lopi, communications specialist for the SADC Groundwater and Drought Management Project, civil society and government have very little awareness of the importance of groundwater, because it is not visible.

"The real value of groundwater is not visible enough to influence policy decisions and resource allocation, that could lead to improved use, development and management of the resource within the region," said Lopi.

As a result the SADC is establishing a regional Groundwater Management Institute in South Africa, to begin operating this year.

Back home, Maziya might have to make do with the well until the WASH Forum gets to revive the two boreholes at Siteki.

Three children carry water in buckets, from the river to their homes, in the rural area of Lutshaya near Lusikisiki in the Eastern Cape of South Africa.
mediapix

Women gather water from the Sere River, near the Kaylekera Uranium Mine in Malawi.
Jessie Boylan/IPS

Zimbabwe: Neglect Sanitation at Your Peril

Ignatius Banda
Community-led initiatives have so far not extended to maintaining public toilets like this one.
IPS

By Ignatius Banda

BULAWAYO – A functioning public toilet has become a rare sight in Bulawayo. Across this southern Zimbabwean city of about two million residents, public toilets have all but stopped functioning, the buildings now more useful as platforms for graffiti and campaign posters than as public conveniences.

Some disgruntled members of the public relieve themselves outside the locked doors of the colonial-era facilities, in what some see as a form of protest against the city authorities, who have for years claimed the closure of the toilets is due to a lack of funds to maintain them.

Human waste can be seen drying on the doorsteps of most public toilets in the city's poor, high-density townships. The remaining few not padlocked have turned into health hazards, and emanate a warning reek of human waste as you approach.

In the city's central business district alleys have been turned into open latrines, with no sign that the local authorities are making any effort to deal with the threats posed by poor hygiene and sanitation.

This has become unacceptable, says resident David Sibanda, who admits he is one of the many forced to use the alleys to relieve himself.

"Toilets stopped functioning more than a decade ago, and the health hazard posed by people relieving themselves in the open has been immense," Sibanda told IPS.

Despite community-sponsored initiatives to assist Bulawayo's cash-strapped council to rehabilitate social amenities, the efforts have not extended to public toilets.

Sibanda himself is part of a group of unemployed young men who have been repairing roads pitted with potholes, and demanding payment from motorists. But he wouldn't think of extending this scheme to any of the estimated 100 public toilets scattered across the city.

"Toilets carry with them a stigma, and people just do not want to be seen working there, cleaning up other people's mess," he says.

Health threat

The United Nations Development Programme says a staggering two million tons of human waste is deposited in water courses each day across the world, and half the population of the developing world is exposed to polluted water that causes disease.

Health experts say the absence of functioning public toilets in African cities like Bulawayo provides a springboard for the spread of diseases.

Sihle Mthombeni, of the city's Health Services Department, is concerned.

"People use alleys, and because there are obviously no taps or running water at these makeshift toilets, people expose themselves to a whole lot of diseases – from dysentery to acute watery diarrhoea and even cholera," Mthombeni told IPS.

"With the few resources we have, it is difficult for us to even start campaigns about public health safety when the council is broke," she said.

The cholera outbreak that hit Zimbabwe at the beginning of August 2008, claiming more than 4,000 lives, has been blamed on poor sanitation. Residents failed to practise basic hygiene, like washing their hands after using the toilet. The absence of toilets to provide running water has promoted the spread of the disease.

Council agenda

Thaba Moyo, Bulawayo's mayor, recognises that there is a dire threat to public health: Zimbabwe is on cholera alert with the approach of every rainy season.

The cholera outbreak and continuing problems with water-borne diseases like diarrhoea, have been blamed on local authorities failing to take measures to ensure safe hygiene and sanitation.

Moyo says it has been difficult to rehabilitate public toilets and other amenities that stopped working before the turn of the millennium, as the municipal council lacks resources.

"We are aware of the problem, but there appears to be consensus that the council has more pressing matters than to discuss the state of public toilets," said Moyo.

According to Winos Dube, chairman of the Bulawayo Residents' Association, the threat has been tabled in the past but found no takers.

"This was once one of the best urban councils, with clean public toilets, but no one has taken care of these facilities for years now, and residents are left with no choice but to relieve themselves anywhere," Dube told IPS.

Health experts say the absence of functioning public toilets in African cities like Bulawayo provides a springboard for the spread of diseases.

Women, with their heads covered against the rain, collect water from a natural spring outside Kinshasa, the capital of the Democratic Republic of Congo.
mediapix

"We as an organisation have lobbied the council to rehabilitate all social amenities that were fully functioning as far back as 1980 (when the country got independence), but we are always told the same thing that the council does not have money," he said.

"The municipal public toilets in the city centre, where people paid a fee, have also been closed without any explanation from the municipality."

For many here, the dilapidation of these colonial structures illustrates the failure of post-independence administrators, who have failed to allocate adequate budgets for essential services – albeit as part of efforts to streamline public spending, under the instruction of international lending institutions.

There is a dire threat to public health: Zimbabwe is on cholera alert with the approach of every rainy season.

Now the country is in the grip of a severe economic crisis, and toilets must compete with other urgent needs like agriculture or education for scarce resources. But in the long term the city and the country neglect sanitation at great human cost.

A woman takes a break from drawing water in Buyungule, near Buakavu, eastern Democratic Republic of Congo.
mediapix

Madagascar: Education Hampered by Lack of Clean Water

Fanja Saholiarisoa
Lack of access to running water means these Malagasy children bathe in the local river.
IPS

By Fanja Saholiarisoa

ANTANANARIVO, MADAGASCAR – Because most schools in Madagascar have no access to running water, lack of hygiene and sanitation have become a big worry for children on the island off southern Africa. Many pupils fall ill regularly, are unable to attend classes and so don't perform well at school.

Although the government has promised to improve sanitation at schools, programmes are yet to be implemented. To speed up the process, a national network of more than 150 non-governmental organisations, Diorano Wash, has launched a clean-water initiative in 400 Malagasy schools that enables children to wash their hands at least once a day.

"[The water shortage] results from the fact that the country's school construction programme did not take into account the infrastructure required. Funding for new schools did not include money to install running water," said Diorano Wash national coordinator Herivelo Rakotondrainibe.

Lack of clean water is a headache in both urban and rural areas on the island, according to Rakotondrainibe, but in the remote rural areas sanitary conditions at schools are rare. In many rural schools children are therefore told to bring a bottle of water each morning, which they drink and use for ablutions.

The deficiency directly affects children's health. According to a 2002 study by the Antananarivo-based National Institute of Statistics, more than half the children under five die of diarrhoea in Madagascar, caused mainly by lack of sanitation. More-over, skin infections and respiratory diseases are common results of contaminated water sources.

"Many water sources are unclean in Madagascar, and few people have access to clean water at their homes," said Dr Emile Rasoanirainy, chief physician at the Paediatric Hospital in the capital, Antananarivo.

According to an official survey of hygiene at Malagasy schools in February 2009, only 18 percent of the country's 111 school districts have

access to drinking water at their schools. Only 30 percent have toilets, and pupils in the rest of the schools have to defecate in natural surroundings.

One school particularly badly affected by the lack of sanitation is Ilafy Primary School, in a rural area about 20km from Antananarivo. It has been operating without running water for 90 years. Asking pupils to bring their own water has been the teachers' only resort in dealing with the water shortage and resultant poor hygiene.

"Students bring drinking water in a bottle. It is mainly used to wash their hands after they use the toilet," explained teacher Aimée Rasoanirina. But one bottle of water is not enough to ensure hygiene and sanitation throughout the day, says Rasoanirina, nor is the water the children bring necessarily safe to drink. Many of her pupils miss school due to illness, and struggle to keep up with the schoolwork.

"I draw from a river close to our house. I drink it when I am thirsty, even if it is not clean," said Hasinanirina (9), one of the pupils who regularly suffers from diarrhoea.

A 2009 National Institute of Statistics study confirmed that lack of access to drinking water directly relates to the percentage of children missing school, particularly due to diarrhoea. About 3.5 million school hours are lost each year in Madagascar, the study found, calculating that of the 2.5 million school-going pupils those who fall ill need about three days to recover.

Many schools in Madagascar now educate their pupils on the importance of hygiene and sanitation. Ilafy Primary School, for example, introduces instruction on basic hygiene, such as washing hands before meals, from Grade One.

But not having soap to clean their hands properly is another obstacle. "The school district provides some soap, but it is never enough for all schools," lamented Rasoanirina.

Teachers and parents are now calling on the government to fulfil promises to improve the country's water and sanitation systems, prioritising schools.

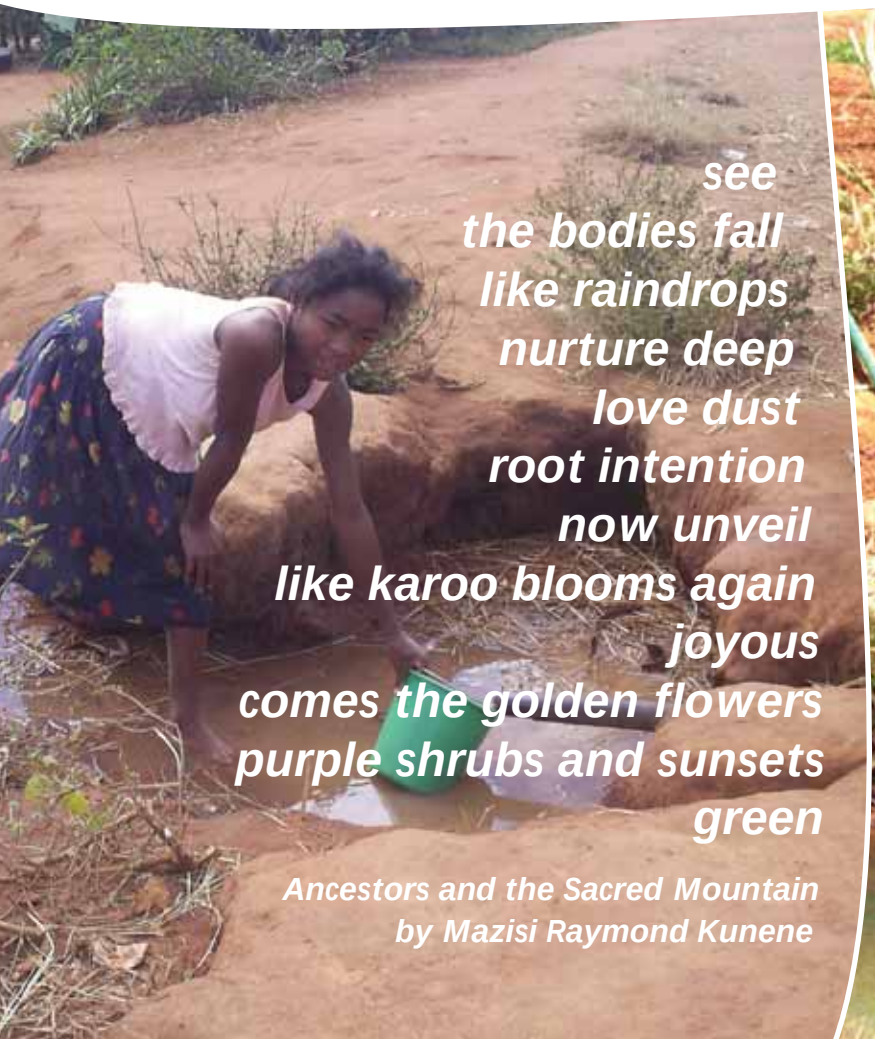
Many of her pupils miss school due to illness, and struggle to keep up with the schoolwork.

"Elected political representatives have promised us a system of water supply, but so far their promises have not been kept," said Landy Rasoatavy, a mother of three from Ilafy. She says she boils water for her children every morning, because their only source of water is a polluted river.

Until the government implements sanitation systems in the country's schools, teachers and pupils will continue to rely on initiatives such as Diorano Wash, which are dependent on funding from international donors. United Nations Children's Fund and USAID have so far spent $four million dollars on school hygiene programmes in Madagascar.

But the country's political troubles might be an obstacle to swift implementation of existing sanitation policies. Madagascar has been led by a transitional government under ex-Antananarivo mayor and former disc jockey Andry Rajoelina since March 17, after former president Marc Ravalomanana was toppled.

Newly appointed Minister of Water, Niry Lanto Randriamahazo, is yet to announce a strategy to improve the supply of clean drinking water in schools.



see
the bodies fall
like raindrops
nurture deep
love dust
root intention
now unveil
like karoo blooms again
joyous
comes the golden flowers
purple shrubs and sunsets
green

Ancestors and the Sacred Mountain
by Mazisi Raymond Kunene

Chapter 5

Moving Forward – The Future, the Solutions and our Role

A young man holds out his hands under the running water from a natural spring outside Kinshasa, the capital of the Democratic Republic of Congo.
mediapix

Malawi: Water Makes the Difference

Pilirani Semu-Banda
Irrigation and cooperative farming have improved the livelihoods for the Ngolowindo Horticultural Cooperative Society.
IPS

By Pilirani Semu-Banda

LILONGWE – Water has become the very essence of economic development for a rural community of Ngolowindo, in Malawi's lake district of Salima, where households are using irrigation to reduce poverty.

Ninety per cent of Malawi's agriculture is rain-fed, but government is now pushing for more diversification into irrigation farming, which allows farmers to grow crops even in the dry season, and benefit from additional harvests.

Taking advantage of the fresh water from Lake Malawi, the people of Ngolowindo are using simple irrigation methods to grow produce such as tomatoes, cabbages, mustard, onions, okra, green pepper, green beans, lettuce and maize on 17 hectares of land.

A vibrant agricultural cooperative, the Ngolowindo Horticultural Cooperative Society, has emerged in the area and boasts 159 members. Each farmer is allocated a small piece of communal land, and assigned a specific crop. The produce is collected into one lot and marketed.

Eluby Tsekwe, the cooperative's chairperson, proudly told IPS her community had become the largest supplier of fresh produce to the residents of the capital city, Lilongwe.

"We supply all the main supermarkets and individual vendors in the capital city with fresh produce. We make a substantial sum from there, and this sustains our livelihoods," she said.

Tsekwe said members had to be 18 or older. "We don't want to get children into the cooperative, as we believe they should be in school and not involved in any type of child labour," said Tsekwe.

For Tsekwe, a single mother of five, the financial benefits of this collective are evident. All her children, aged between four and 19, are in school. Despite a divorce leaving her head of her household, she is also able to feed her children three meals a day in a country where,according to the United Nations, seven out of 10 households typically run out of food before every harvesting season.

Tsekwe has also managed to build a house of bricks, with a sheet-iron roof and cement floors. "A typical house here is one with mud walls and floors, and a grass-thatched roof, but I can

afford to live better, and I am very proud of myself," she said.

But it has not all been rosy for the Ngolowindo project, according to the Coordinator of Ngolowindo Horticultural Cooperative Society, Mercy Butao.

The cooperative is also working towards diversifying into livestock farming, so that excess produce can feed the animals.

She recounts that the agricultural initiative started at Ngolowindo in 1985 as an irrigation scheme, and became a cooperative only in 2001. The project was initially driven by the government's departments of Water and Agriculture, through traditional leaders and community members.

"As a scheme, individual farmers worked in their own fields. They could benefit only from communal irrigation, but they were each other's competitors when it came to marketing produce," Butao told IPS. During this time the maintenance of irrigation structures such as channels and canals was neglected.

The scheme was turned into a cooperative to improve the marketing of produce, and for better organised management of the project, according to Butao, but this also took care of the maintenance question.

"The farmers applied for funding from the European Union soon after forming the cooperative, and they used the money to upgrade their agricultural skills in irrigation farming, and modern ways of crop production," said Butao.

The Ngolowindo farmers have also been trained in marketing fundamentals, financial management, organisation management and agro-processing.

The Cooperation for the Development of Emerging Countries (Cospe), an Italian non-governmental organisation, assisted the Ngolowindo Horticultural Cooperative Society in constructing irrigation structures and in human resources. Butao, for instance, is an agricultural expert employed by Cospe since 2002, to support the cooperative technically.

"The Ngolowindo project has grown so much, and it is now moving into agro-processing," Butao told IPS. She said in the absence of a processing project there had been a lot of wastage of produce, since the crops were perishables.

"The cooperative has now diversified into the production of tomato juice and tomato sauce," said Butao.

The project has 18 people working in agro-processing, using hand-powered machines to process the agricultural products. "We are yet to make it big in the agro-processing business. Our products are not developed enough to compete

Mantoe Phakathi
The sale of produce like these chillies from a collective garden will pay maintenance costs for a water supply scheme.
IPS

on the market, but we are working hard towards advancing," said Butao.

The cooperative is also working towards diversifying into livestock farming, so that excess produce can feed the animals. "We also want to promote the use of animal manure in our farm," Butao said.

Taking advantage of the fresh water from Lake Malawi, the people of Ngolowindo are using simple irrigation methods to grow produce.

Another member of the cooperative, Ginacio Kamoto, said he had benefited a lot from the cooperative. "I am able to provide employment to some people in my area. I employ them as casual labourers to assist me with farming. I employ up to six people per growing season."

But people like Tsekwe and Kamoto are still the exception in Malawi, where up to 65 percent of the 13.1 million people live below the poverty line of less than a dollar a day.

According to the Ministry of Agriculture, the country is irrigating only 72,000 of 400,000 hectares of irrigable land. The country is yet to make full use of Lake Malawi, ninth largest lake in the world, the fresh water of which stretches the full length of the country.

Nasseem Ackbarally
Simple irrigation methods are used to irrigate small farms.
IPS

Problem half-solved: a solar-powered pump supplies these children water at school, but at home, they still go long distances to draw water of dubious quality.
Mantoe Phakathi/IPS

Zimbabwe: Researchers Developing New Ways to Purify Water

Fidelis Zvomuya
A boy fetches water from the river.
IPS

By Busani Bafana and Zahira Kharsany

BULAWAYO – Scientists at Bulawayo's National University of Science and Technology (Nust) are busy developing simple and affordable water-purification methods, as more than a billion people live without safe drinking water in developing countries.

Water and sanitation experts are investigating whether a powder made from the seeds of the Moringa Oleifera, commonly known as the drumstick or horseradish tree, can be used to purify water.

In Sub-Saharan Africa only a third of the population has access to clean drinking water, according to the United Nations Children's Fund. Water-borne diseases kill an estimated five million people a year, many of them children.

The situation is particularly dire in Zimbabwe, where the economic meltdown has led to the disintegration of water services and infrastructure. Water contamination as a result of poor water treatment has caused serious health hazards.

A cholera outbreak, first reported in mid-2008, has claimed the lives of more than 4,000 people, with more than 80,000 reported cholera cases countrywide, according to the World Health Organisation (WHO).

Without access to safe drinking water, WHO says Zimbabwe is highly unlikely to meet the Millennium Development Goal (MDG) One of halving the number of people suffering from poverty and hunger by 2015. This is because of inadequate infrastructure, poor sanitation and lack of investment in water treatment systems.

Poor water quality and sanitation will also make it difficult for the country to reach MDG3, reducing child mortality, and MDG4, increasing maternal health.

A combination of chemical and bacteriological pollution of water is a particular problem in Zimbabwe, says Theresa Mkandawire, researcher at the University of Malawi, and a regional

water expert. "Deep wells and boreholes are often subject to chemical contamination, while in shallow wells bacteriological and physical contamination dominates," she told IPS.

"The proportion of pollution that goes unmonitored is quite high, and people living downstream [of rivers] are particularly affected," agreed executive director of the Harare-based Institute of Water and Sanitation Development (IWSD), Noma Neseni.

"Pollution within the [SADC] region and in Zimbabwe is caused by industry, domestic users and agriculture. At the moment fines for pollution are quite low in Zimbabwe." Neseni notes that in Zimbabwe the national rural water supplies and sanitation programme has not effectively promoted household water treatment, although researchers find this could be an important entry point for bettering water quality.

The Moringa tree seed is pounded or used whole to purify water. Moringa Oleifera is a small tree whose leaves are popularly used to make salad, while its elongated fruit is eaten as a vegetable.

"Although there have been fears that water is contaminated through poor distribution methods and storage, we have failed to invest in developing technologies for water treatment at household level until now," she said.

Preventing water pollution is a cornerstone in the Southern African Development Community (SADC) regional water policy of 2005, which aims to rectify weak regulatory and legal frameworks, inadequate national water authorities, poor water resources management, and the lack of infrastructure.

To make clean water more accessible and affordable to Zimbabweans in urban as well as rural areas, Nust in Bulawayo has started research aimed at developing low-cost water treatment, such as the use of Moringa seed powder.

"Water quality is a problem in Zimbabwe, and this is not confined to urban areas, but happens in rural areas too," says Nust civil engineer Ellen Mangore.

She told IPS the research project was modelled on water treatment practices in Sudan, where the seed is pounded or used whole to purify water. Moringa Oleifera is a small tree whose leaves are popularly used to make salad, while its elongated fruit is eaten as a vegetable.

Researchers place their hopes in the Moringa tree seed for water purification, as the tree is widely found in Zimbabwe. It is drought-resistant, and grows in locations with as little as 500mm of annual rainfall.

Nust also investigates other simple water treatment methods, such as purification with household bleach and sand filtration columns.

Treating water with Moringa seed powder has proved as effective.

So far treating water with Moringa seed powder has proved as effective in reducing water-borne diseases, and correcting pH, as have the other tested methods, Mangore says.

"Our tests also showed that household bleach is a very strong disinfectant, and raises the levels of free and total chlorine in the water, while the simple filtration columns resulted in an almost 85 percent reduction in total suspended solids."

Mangore said research would continue, as aspects of the different purification methods still had to be investigated. For example dosages and contact times.

She confided that the results of the study were still under wraps, pending assessment of the toxicity of Moringa powder and household bleach.

Mantoe Phakathi
Women buying - and selling - seeds.
IPS

Children play around in the flooded alleys.
Nasseem Ackbarally/IPS

Mauritius: Waste Not, Want Not

Nasseem Ackbarally
The UNDP projects: Mauritius will experience water scarcity by 2020.
IPS

By Nasseem Ackbarally

PORT-LOUIS – The 1.2 million population of Mauritius enjoys plentiful piped portable water from the 2000mm average annual rainfall on the island, but a lot of water is wasted, and with the growing demand of development the island's water security may soon be threatened.

Mauritians get their water supply from five big reservoirs and five underground aquifers that have already reached their exploitation limit.

Of the 920 million cubic metres of water used annually, 46 percent goes to irrigation, 32 percent to producing electricity and 22 percent for domestic use, hotels and industries.

Vast amounts of water – an estimated 46 percent of the daily water production of 500,000 cubic metres by the Central Water Authority (CWA) – are wasted as a result of aged and leaking distribution pipes. Mauritius also suffers from a rapid evacuation and evaporation of water because of the topography of the island.

Public Utilities Minister Abu Kasenally told IPS the threat to water security in Mauritius did not spring solely from evident deficiencies in water distribution. "Climate change is also affecting us more than we can imagine, as rainfall has started decreasing in our region," he observed.

In its Human Development Report for 2006, the United Nations Development Programme classified Mauritius as a water-stressed country, as it was able to provide less than 1,700 cubic metres of water per person per year to its population. And despite warnings that the island may suffer water scarcity by 2020, Mauritians show little consciousness of a need to conserve water. A number of awareness-raising programmes by government have made little impression.

"I don't think we'll have any problem with our water supply, because this is a God-given gift and it'll always rain," is the carefree attitude of Adil Latarrh, resident in the capital, Port-Louis. Adil was washing the family car with a hosepipe as he spoke to this correspondent, and he didn't bother to switch it off.

At home people waste water, for instance in watering lawns, without any concern about bills. Mauritians pay only 4.5 rupees – less than two cents – for 1,000 litres.

Mauritius gets so much rain every year, but most of it flows to the sea down the rivers as they do not have enough reservoirs to collect and store it.

Mauritius recently started repairing its ageing distribution system, with a 45 million dollar loan from the European Investment Bank. The condition of pipes is being checked, and leaks repaired.

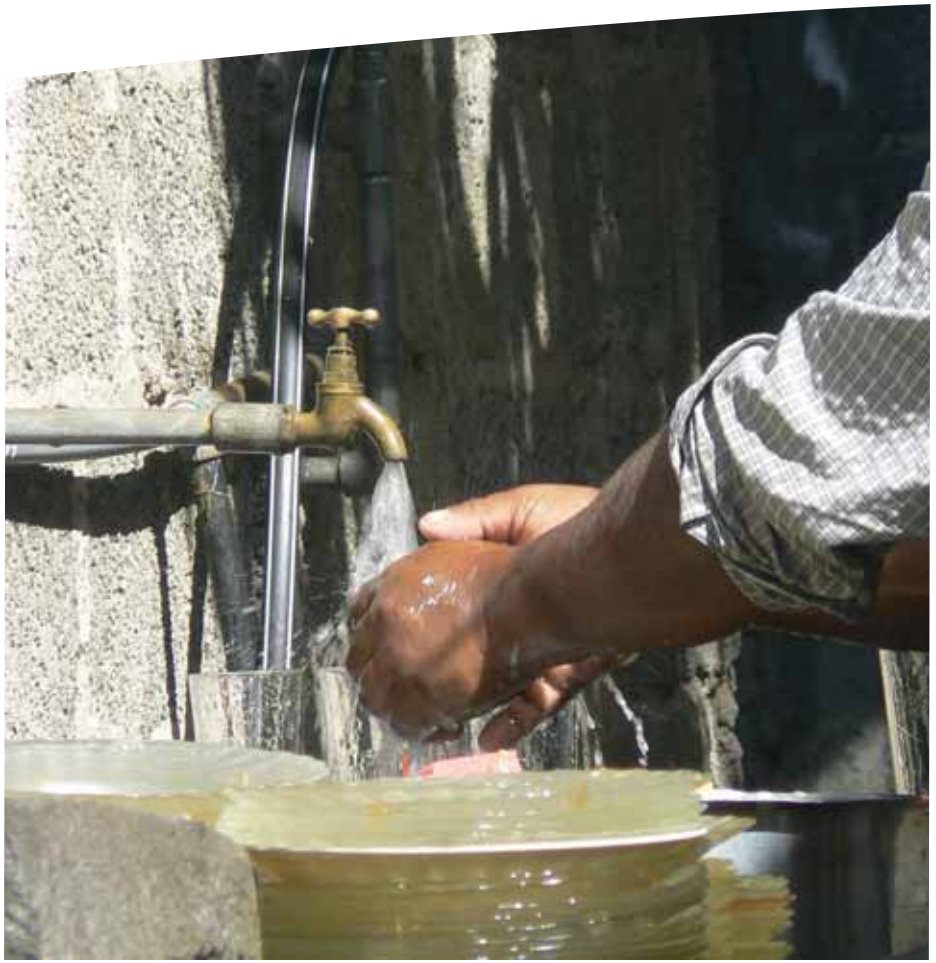
"We have also started changing the old pipes in the centre of the island, where quite a big number of our consumers live. Eventually, we'll cover all the island," Harry Booluck, director-general of the CWA, told IPS.

But it is clear to Water Minister Kasenally that it will be impossible to completely eliminate the water loss from leaks, as about 20 percent is the international norm.

Master plan

Mauritius has devised a master plan for a sustainable water supply, with the aim of harnessing additional water resources to meet future requirements of all sectors of the economy up to 2040. Many new hotels and industrial parks are being built as the economy develops. They all require water, and all possible solutions are being

Nasseem Ackbarally
Mauritians use too much water – between 200 to 220 litres daily – which is quite high.
IPS



investigated, including seeding clouds and desalination of sea water.

"These are all new sources of water, and they require new technology. That means higher costs. The most feasible action, I think, is to prepare ourselves to face an emergency well armed," Booluck stressed.

Mauritians use too much water - between 200 to 220 litres daily – which is quite high.

Completed in February 2008, this document will serve, according to the minister, as a guide to decision makers for years to come. A national water policy, the first since independence in March 1968, is being formulated. In this plan new reservoirs are being built, waste water is being treated for irrigation purposes and the hotel industry is now desalinating water to encourage tourism.

Work has started on several projects – one reservoir with a capacity of 9 million cubic metres at Bagatelle, in the centre of the island, will supply the capital, Port-Louis. Others are planned for the south and north of the island.

Waste water is no longer being pumped into the lagoon. Since March 2006, Mauritius has been reusing waste water for irrigation purposes. About 40,000 cubic metres of waste water is treated daily, then mixed with fresh water and used to irrigate sugar cane and vegetables on 600 hectares of land at La Ferme, in western Mauritius. This is expected to rise to 70,000 cubic metres soon.

Desalinated water is also being produced by a few hotels that invested in it a few years back. The Beachcomber Hotel Group invested about 3 million dollars last year to produce some 800 cubic metres of water daily for its two hotels.

The Naïade Group is planning to equip all its hotels with desalination plants by the end of the year.

Dhaneshwar Deepchand, director of the Water Resources Unit, does not think Mauritius is a water-stressed country, though the island collects only about 29 percent of its rain.

"(Mauritius gets) so much rain every year, but most of it flows to the sea down the rivers. The problem is that we do not have enough reservoirs to collect and store it," he said.

Only one new reservoir, with a capacity of 27 million cubic metres, has been built in Mauritius since independence in 1968. Until new ones were completed several years from now, Deepchand said, it was better to manage demand by sensitising the population to avoid wasting this precious commodity.

"Mauritians use too much water – between 200 to 220 litres daily – which is quite high. If we can reduce that by 40 to 50 litres, we can easily service the new demands from the different sectors of the economy," Deepchand said.

Collecting water from the Musengezi river.
Fidelis Zvomuya/IPS

Swaziland: Simple Solution: Save Rainwater

Water runs out of a tap and into a bucket to wash household dishes on the yard of a home.
mediapix

By Mantoe Phakathi

MBABANE – It's so early the frogs are still croaking, as women push forward holding onto their buckets while dodging cattle also scrambling for water in the pond at Gebeni. It has rained only a few times since the wet season began in October, and competing for water begins as early as 5am.

But aloof from the struggle is Anna Hlophe, a 68-year-old resident in this drought-stricken community 55 kilometres outside Swaziland's capital, in the dry centre of the Kingdom.

"It hardly rains in this area, but when it does I make sure I harvest as much rainwater as possible," says Hlophe.

Hlophe's neighbour Neli Mkhabela (50) points at a cylindrical grey structure attached to her cooking hut. She says it is saving her – for the moment – from the early morning scramble at the pond. Mkhabela says rainwater is a precious resource to her community, which they capture using cement cisterns.

"I've used this (cistern) for five years, and it does relieve me for at least a month after rain," says Mkhabela, member of a family of 11. "Save for the pond, there is no source of water in this place."

But for Hlophe, who lives with only her two grandchildren, the water lasts for more than two months.

The cisterns are called ludziwo (water jar) in the community, a SiSwati word for the clay pots used in every household for fetching and storing water. The latter-day ludziwo are helping many families save rainwater for domestic use in dry parts of Swaziland.

"We use the water only for drinking and cooking," says Hlophe.

The water jars, now prominent at almost every homestead at Egebeni and surrounding communities, store up to 500 litres of water. Schools, clinics and community centres have bigger versions of the cisterns, with a storage capacity of 40,000 litres.

According to Meketane Mazibuko, Lutheran Development Services (LDS) gender coordinator,

water jars are benefiting up to 60,000 people in areas where water is a serious challenge.

"We discourage people from using this water for washing and bathing, because it will not last for long," says Mazibuko.

In the absence of rain, communities in the lowveld, which is the driest part of the country's four geographic regions, frequently go for days without water for drinking.

LDS has helped with the construction of water jars by providing communities with building materials, and training them to make the water harvesters for themselves. For a 500-litre cistern one needs three 50kg bags of cement, three wheelbarrows of river sand, a sieve to sift sticks, grass and stones out of the sand (an old mesh bag for oranges also works) and a tap.

"The water jars are easily replicated, which is why every homestead in this community has a water jar. After LDS trained a few community members on how to make the jars, people started teaching one another, which is why almost every homestead has this facility, although LDS stopped constructing them two years ago," said Mazibuko.

For houses with corrugated iron roofs, a gutter leading to the water jar is attached to channel runoff directly into the container.

"For those who cannot afford to buy a gutter, they can still use old bent corrugated iron sheets," says Mazibuko.

Thatched roofs can also harvest water, he says. A kite-like shape is made using hard plastic and logs. A gutter or bent corrugated iron sheet is attached to the roof to lead water to the jar.

"We've trained rural health motivators on how to treat water in the jars using bleach," says Mazibuko.

In the absence of rain, communities in the lowveld, which is the driest part of the country's four geographic regions, frequently go for days without water for drinking.

The Swazi Vulnerability Assessment Committee (VAC), a body that evaluates the extent of poverty in the country, documented the poor state of water and sanitation services in lowland Shiselweni and Lubombo in its 2007 report.

The report noted widespread difficulties with both the nature of the water source – such as crocodile-infested rivers and muddy streams – and the distance to the water point. Longer distances means it takes more time to bring water to the home. Both factors hindered a household's access to water.

According to the report households with chronically ill adults face hardship, as their water needs may increase, but they may be too ill to fetch enough water, if any at all. Children then have to shoulder this burden.

Women and young girls who have to walk long distances to fetch water risk getting raped.

This puts Swaziland in a difficult position in achieving goal seven of the eight United Nations Millennium Development Goals, which is to halve, by 2015, the proportion of the population without sustainable access to safe drinking water and sanitation.

But the 2007 Swazi VAC report notes "a remarkable improvement in access to water in the Lubombo region, where 56 percent of households have access to improved sources as compared to just 19 percent in 2006."

But the headache of limited access to water is far from over, because once it stops raining, communities in dry areas go for days without this basic necessity. As observed by Matsanjeni Member of Parliament Cedusizi Ndlovu, in the southern part of Swaziland, the government needs to build dams.

"We sometimes receive substantial rain in this place, but because there are no dams built across the rivers that run through here, we watch helplessly as the water runs to South Africa's Jozini Dam," says Ndlovu.

Image Credits

Chapter 1

Top Left: A young girl helps with the household chores by washing the dishes outside the back door of her home in Luanda, the capital of Angola.
mediapix

Bottom Left: A woman takes a break as she carries a jerrycan of water from a natural spring outside Kinshasa, the capital of the Democratic Republic of Congo.
mediapix

Right: Sunrise over the Goreangab dam in Katutura township near Windhoek. Heavily polluted and as such not useable for drink water reclamation, although there is a purifying plant.
Servaas van den Bosch/IPS

Chapter 2

Top Left: A mother and her sons wash their family's clothes by hand next to a stream in Harare, Zimbabwe.
mediapix

Bottom Left: A gardener tends the vegetables at the General Union of Cooperatives in Maputa, Mozambique. The farming cooperative was founded by women looking for ways to feed their families.
Zahira Kharsany/IPS

Right: Rundu-Kavango region - Angolan border area.
Servaas van den Bosch/IPS

Chapter 3

Top Left: A woman sits on a swing on the beach as the sun sets over Lake Malawi in Mangotchi, a holiday resort town in Malawi.
mediapix

Bottom Left: A young boy carries a jerrycan of water from a natural spring outside Kinshasa, the capital of the Democratic Republic of Congo.
mediapix

Right: The Omaruru river runs dry for much of the year, but along the aquifers it feeds is a vital source of water for a wide area.
Servaas van den Bosch/IPS

Chapter 4

Top Left: Fresh produce at a local market in Maputo, Mozambique.
Zahira Kharsany/IPS

Bottom Left: People gather at Monkey Bay, Malawi to buy the morning's catch.
Jessie Boylan/IPS

Right: The communal garden of a women's gardening project in Omaruru, a semi-desert part of Namibia. The grounds look dry at this time of year but in the middle of the cultivated area is the communal garden that generates income for the project.
Servaas van den Bosch/IPS

Chapter 5

Top Left: Young children at Teun en Noor, Namibia use a communal borehole to access water.
Servaas van den Bosch/IPS

Bottom Left: Lack of adequate water supply means this young Malagasy girl is forced to collect water from an unclean well.
Fanja Saholiarisoa/IPS

Right: Water is the very essence of economic development in Malawi's agricultural regions.
Pilirani Semu-Banda/IPS

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