Inept management threatening good target progress

South Africa's significant progress towards water and sanitation infrastructure delivery is being threatened by the lack of effective and sustainable management.

This is according to former Department of Water Affairs & Forestry DG Jabu Sindane. Speaking at the Water Management Excellence Conference held in Sandton earlier this year, he said that while the country's infrastructure development was well developed compared to the rest of Africa, indications were that already the water services backlog was being impacted negatively by project failures and comebacks. "This is reflected in the backlog figures where poor management and service delivery represents up to 40% of the total backlog in some provinces."

Sindane added that a recent audit initiated by the department on the functionality of completed water services projects revealed that a major portion of projects did not comply with minimum delivery standards. This concern not only applied to access to basic services, but was also reflected in poor service quality and customer care, in poor drinking water quality, high water losses, ineffective wastewater management with associated environmental impacts, interruptions and inadequate asset management, with associated financial losses.

Highlighting achievements by the sector to improve the situation, such as recent interventions in the Free State which has seen a dramatic improvement in drinking water quality, Sindane noted that there was a need to bring back ownership and pride within the public services sector with the focus on service excellence.

This has to be accompanied by the adoption of a business management approach. "This is quite a deviation from the typical engineering approach that focuses mainly on technical solutions. It is crucial for water services authorities to realise that the service they are offering communities is a non-stop never-ending business which requires ongoing planning, management, service delivery, and appropriate governance."

This placed more emphasis on the role and purpose of the Water Sector Development Plans as well as business planning in the sector. "I do think that there is an opportunity for improvement and that we have to place a higher priority on sustainable management," concluded Sindane.

Water system investment to save millions

The eThekwini metropolitan municipality could save about R64-million a year in water that is currently being lost through leaking pipes once its latest project to replace the city's ageing water system is completed.

The R550-million project, which kicked off earlier this year, will see the removal of many of the city's concealed water mains and pipes which have reached the end of their lifecycle. According to project executive Alan Kee, the project will also put systems in place that "would be strong, flexible, long lasting and would mean less water interruptions." At present, water leaks account for about 8% of the city's water use.

The first phase of the project involves the revitalisation of the water systems in the KwaMashu, Phoenix, Chatsworth, Mobeni and eMoyeni Grange districts. Special opportunities have been created for small, medium and micro enterprises to benefit from the project.

WATER BY NUMBERS

- **160** – The number of large dams owned by the Department of Water Affairs & Forestry which do no comply with modern safety standards, according to Minister of Water Affairs & Forestry Lindiwe Hendricks. The department owns a total of 294 dams.
- **2** – The number of taps being shared by 189 households in Mabopane's bloc EW, according to a report by *Pretoria News*.
- **83** – The number of years ago that water in Lake Victoria was at its current low level. At the time of writing water levels were at 1 133,4 m above sea level. This is the lowest since 1923, when the lake dropped to 1 123,9 m.
- **790 000 ha** – The land treated for invasive alien plants by the Working for Water programme during 2006/07.
- **88** – The reported number of dams Iran wishes to start constructing in the next 12 months. Another 176 dam projects are being studied to develop the surface water resources of the country, according to international magazine, *International Water Power and Dam Construction.*
- **285 m** – The height of the Grande Dixence Dam, on the Dixence River in Switzerland, the highest concrete dam in the world, according to the Guinness World of Records. The dam, completed in 1961, has a crest length of 700 m, and was constructed using about 6 million m^3 of concrete.
- **150 billion litres** – The annual capacity of the desalination plant to be built outside Melbourne, Australia. The multibillion Dollar plant, expected to be Australia's largest, could start producing water by 2011.
- **R22-million** – The monies lost by the City of Cape Town due to the theft of non-ferrous metals contained in items such as water meters, taps and manhole covers.
- **3,69** – The size of the average South African household, down from 4,48 ten years ago, according to research conducted by the University of South Africa.

War over water 'unlikely'

Transboundary rivers shared by two or more countries are more likely to be catalysts for peace than the causes of conflict. This is according to Dr Jaroslav Tir, Associate Professor from the Department of International Affairs at the University of Georgia, in the US. Speaking at a seminar hosted by the Human Sciences Research Council in Pretoria, he said that the common belief that future wars would be fought over water appeared to be exaggerated.

"Much of the extant literature has focused on the conflict-generating potential of transboundary river use disputes, predicting international-level armed confrontations and even the so-called water wars. In contrast, research of past interstate disputes has shown that at most water has been a strategic goal in military campaigns. Water has never been the root cause of a war between two countries."

Instead there are many more examples of countries brokering deals to share international rivers equitably. Even hostile states have shown to more often than not seek cooperative, peaceful solutions to their disagreements over the uses of common rivers. Dr Tir's research has focused on identifying the major determinants of whether riparian countries will enter into river-managing treaties. His investigations into about 140 river treaties signed between 1948 and 2000 indicated that security concerns have little bearing on river cooperation. In comparison, economic interdependence increases the chances for formalised river cooperation. Perhaps most importantly, water scarcity, rather than increasing the potential for conflict, boosts the chances that water treaties will be signed. "The scarcer the resource, the more likely countries are to collectively investigate ways in which to share the resource equitably," said Dr Tir.

Dr Tir also found that the role of upstream/downstream river flow had been exaggerated, as this allegedly important cooperation-inhibiting factor was not significant in any of his analyses. His findings sound a cautiously optimistic note regarding the future of river relations in Africa.

R222-m bulk sewer completed

The largest bulk sewer pipeline to be constructed by the City of Cape Town in the last decade is now officially in use.

The Delft sewer system was commissioned two years ago at a cost of R222-million. The new 15,5-km pipeline starts on the boundary of Delft and Cape Town International Airport, and discharges into the municipality's wastewater treatment works (WWTW) at Zandvliet, near Khayelitsha. Besides serving the 22 000 houses in the N2 Gateway housing project, the bulk sewer will ultimately provide capacity for 2,2 million residents in the Zandvliet WWTW catchment area, which includes Mfuleni, Blue Downs and Eerste River.

The project was executed by a consortium comprising Sobambisana Community Development, Asla, Power Construction, Kwezi V3, Bergstan, and Chand Environmental Management. To handle a peak flowrate of more than 4 600 ℓ/s, the diameter of the pipeline varies from 600 mm to almost 2 000 mm.

Desalination market on the up

The growing demand for potable and industry-quality water as well as high quantities of available salt and brackish water are leading to an upsurge in the desalination market in Southern and East Africa as well as the Indian Ocean Islands.

This is according to market research by global growth consulting company Frost & Sullivan. "Each of these water markets has substantial coastlines and in some cases groundwater supply, which is why these countries have and are considering desalination technology," reported research analyst David Winter. "Some industrial end users have installed their own desalination plants to ensure adequate process water supply, while municipalities have also turned to this technology."

The company noted that despite a reduction in membrane costs, desalination remained an expensive water supply option. However, it believed that growth opportunities existed for companies that could overcome the financial restraints. "The water supply issues present in these markets have reached a point where end users need to solve their potable water issues and desalination may be able to provide the answer."

WATER ON THE WEB

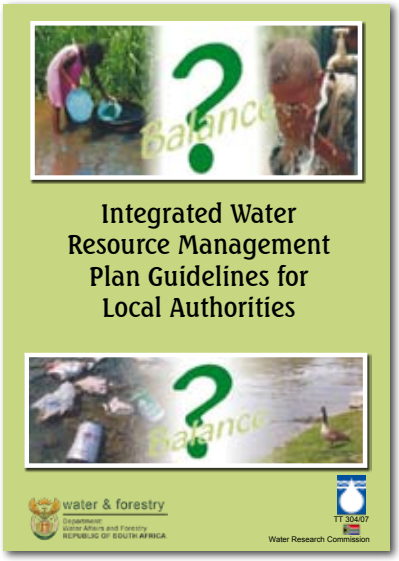
www.unesco.org/water/wwap/wwdr/index.shtml
This is the official website of the UNESCO World Water Assessment Programme, which focuses on assessing the developing situation as regards freshwater throughout the world. The primary output of the programme is the World Water Development Report, which is published every three years.

www.water-pollution.org.uk
While aimed at a British audience, this is still a very educational website, especially for learners and educators. The site contains useful, easy-to-read information about the sources of water pollution and how they can be treated.

Guideline helps municipalities find the balance

The Water Research Commission has published a new guideline to assist municipalities in establishing integrated water resource management (IWRM) plans.

By developing these plans local authorities could be one step closer in striking the right balance between social and economic infrastructure development and preserving economic integrity. The *IWRM Plan Guideline for Local Authorities* assists local authorities to meet present challenges, such as the lack of financial and human resources, while aligning themselves with their water management area's catchment management strategy and applying for the necessary water use authorisations. In instances where a catchment management strategy has not yet been developed, it is envisaged that the IWRM plan will provide valuable input into the development of such a strategy.



Waterwise farming

The Western Cape Department of Agriculture launched its waterwise and biodiversity campaign earlier this year.

The campaign was kicked off with an information session with students from the Cape Institute for Agricultural Training: Elsenburg. "The protection and optimal use of agricultural water is one of the top priorities of the department," reports department head Joyene Isaacs. "the waterwise and biodiversity campaign is one of our key deliverables to promote the efficient use of our province's agricultural resources."

The department is extending existing projects, such as the promotion of efficient water use by commercial and emerging farmers. It is also focusing on the protection of water resources from pollution with animal waste by providing planning and design services for animal husbandry. The campaign will run to the end of the year.

Golf courses the new wildlife refuge?

The development of more water guzzling golf courses, especially in water scarce areas, has received increasing criticism.

Now researchers from the US, believe that, if managed properly, these centres for human recreation could also be important wildlife sanctuaries. Prof Ray Semlitsch of the University of Missouri-Columbia and his colleagues have several recommendations to improve golf course habitats for especially amphibian populations. This includes buffering aquatic habitats from chemical runoff, surrounding wetland areas with 150 m to 300 m of forest or natural grassland, and creating a diversity of pond types that mimic natural wetlands.

"There are more than 17 000 golf courses in the US, and about 70% of that land is not used for playing," said Prof Semlitsch. "These managed green spaces are not surrogates for protected land and ecosystems, but can include suitable habitat for species native to the area."

WATER DIARY

WATER & SANITATION
NOVEMBER 20-23
The WISA Water & Sanitation Conference will be held at the Zambezi Sun Hotel, at the Victoria Falls in Zambia. Conference themes include mitigating extreme events, integrated water quality, managing transboundary water resources, and meeting the UN Millennium Development Goals. *Enquiries: Taryn van Rooyen (Conference Secretariat); Tel: (011) 463-5085; Fax: (011) 463-3265; E-mail: conference@soafrica.com*

BIOFILM
JANUARY 8-10
The (International Water Association (IWA) Biofilm Technologies Conference will take place in Singapore. Conference discussions will cover biofilm-based technologies and reactors, biofilm processes, microbiology, biofouling and biocorrosion. *Enquiries: Marianne Yee (Conference Secretariat); Tel: +65 6339 8687; Fax: +65 6339 9536; E-mail: biofilm2008@orient-explorer.com; Visit: www.biofilmtechnologies.com*

SMALL WATER SYSTEMS
FEBRUARY 6-9
The 8th Specialised Conference on Small Water and Wastewater Systems will take place in Coimbatore, Tamil Nadu, India. The event is being organised by the IWA, together with the Centre for Water and Environmental Studies of the Kumaraguru College of Technology, India, and the Laboratory for Environmental Biotechnology of the National Institute of Agronomic Research, France. *Enquiries: Organising Secretary, E-mail: small2008org@kct.ac.in; Visit: www.kct.ac.in/small2008*

Guidelines to reusing water available

Volume One of the new World Health Organisation guidelines for the safe use of wastewater, excreta and greywater is now available.

This volume focuses on policy and regulatory aspects. It provides guidance on policy formulation, harmonisation and mainstreaming, on regulatory mechanisms and on establishing institutional links between the various interested sectors and parties. It also presents an overview of the nature and scope of options for protecting public health.

To download, go to www.who.int/water_sanitation_health/wastewater/gsuweg1/en/index.html

Fog help crops thrive in Chile

Chilean scientists have germinated the seeds of two important Andean crops using water collected from fog on a hilltop in the semi-arid coastal region of La Serena, in northern Chile.

According to SciDev.Net, they also recorded fog and dew frequency, and found that fog is three times more abundant than previously reported. The group hail from the Centre of Advanced Studies in Arid Zones at Chile's University of La Serena.

The researchers captured fog with metre-long nylon nets attached by a hose to pots sown with quinoa and chañar seeds. Fog passes through the mesh of the net and deposits droplets that drip down into the pots. Connecting the pots directly to the mesh allows for direct irrigation – and means less intervention is necessary.

Climate change goes underground

Scientists with CSIRO in Australia and the US Department of Agriculture's Agricultural Research Service (ARS) have taken climate change research underground.

While much research has been undertaken worldwide to unravel the climate change phenomenon, little is still known about how soil, subsurface waters, and groundwater are responding to climate change. The US-Australian team used simulated interactions between soil and plants. They generated daily weather patterns that match historical records and predicted climates with double the carbon dioxide using a general circulation model of the atmosphere. The daily weather that resulted was entered into a soil-water-vegetation model that represented soil absorbed water, water flow, and storage in soil, surface evaporation, plant uptake, transpiration of water, and deep drainage below the roots of trees and grasses that becomes groundwater recharge.

The simulation models reportedly showed that changes in the temperatures and rainfall affected growth rates and leaf size of plants which impacts groundwater recharge. In some areas, the vegetation response to climate change would cause the average recharge to decrease, however, in other areas, recharge to groundwater would more than double.

WATER DIARY (continued)

WATER & SANITATION
FEBRUARY 25-29

The 14th African Water Association Congress will be held in Cotonou, Benin. The main theme centres around partnerships and good governance for achieving the UN Millennium Development Goals in the water and sanitation sector in Africa. *Enquiries – E-mail: susher.uade@aviso.ci; or kfofana.uade@aviso.ci; Visit: www.uade.org*

SERVICE DELIVERY
MARCH 19-20

WISA is hosting a conference on Innovative Service Delivery Solutions (Franchising for the Water Sector) at Helderfontein Estates, Gauteng. *Enquiries: Taryn van Rooyen, Tel: (011) 463-5085; E-mail: conference@soafrica.com or Deon Nel at E-mail: deon@biwater.co.za*

Drug use bust with sewage chemicals

A new screening test developed in the US seeks out evidence of illicit drug abuse in drug residues and metabolites excreted in urine and flushed towards municipal sewage treatment plants.

According to developers at the Oregon State University, the approach could provide a fast, reliable and inexpensive way to track trends in drug use at local, regional or state levels while preserving the anonymity of individuals. Preliminary tests conducted in ten US cities show the method can simultaneously quantify methamphetamine and metabolites of cocaine and marijuana as well as legal drugs such as methadone, oxycodone, and ephedrine.

Satellites used to predict floods and drought

The European Space Agency (ESA) has produced maps of soil moisture levels in southern Africa to help countries predict droughts and floods.

The agency's ENVISAT satellite measures soil moisture levels by emitting radar waves and measuring the energy bounced back by the soil, SciDev.Net reports. High levels of soil moisture can lead to flooding and erosion, and low levels cause crops to wilt and die. The maps have been produced as part of the SHARE project (Soil Moisture for Hydrometeorological Applications in the Southern African Development Community). The SHARE project is part of ESA's TIGER initiative, which aims to assist African countries in managing water-related problems by using satellite data.

Annett Bartsch, project coordinator at Vienna University of Technology, Austria, explained how the maps are used. "Areas of saturated upper soil can be identified. These areas are those at risk of flooding. The maps can also help predict droughts by looking at past trends in soil moisture."

The maps have reportedly been published online and are available to governmental and independent organisations free of charge.

NEW WATER WEB RESOURCE

The US Academy of Sciences has launched a new web resource, aimed at solving some of the world's drinking water problems.

SciDev.Net reports that the 'Safe Drinking Water Is Essential' initiative, launched earlier this year, aims to help international decision-makers improve drinking water supplies in their countries by providing reliable scientific information. Funded by the Global Health and Education Foundation, the web resource provides information on how clean water can be protected and the different types of contamination and available treatments.

To access the resource go to www.drinking-water.org

Mine-water clean-up goes organic

A locally-developed organic technology is offering a solution to South Africa's enormous polluted mine-water challenge.

SupaZorb, a patented natural, organic hydrocarbon and chemical absorbent, was originally developed to remediate oil spills. Mixed from Casuarina needles and pine bark, the material is now proving its efficiency in the removal of heavy metals and salts from acid mine drainage. This is achieved through ion exchange, microbiological metabolism and organic reactions.

Traditional mine-water cleaning methods use chemicals which, in addition to being expensive, could be hazardous to the environment. "SupaZorb is the only non-chemical treatment of AMD in the world," reports Dr Olaf Pollmann of the School of Science & Development and North West University, who has been researching the product. "It uses no chemical ingredients – only those processes provided by nature."

A series of steps are used to clean the polluted mine-water. First, the organic material intended to clean the water is moistened to open the plant cells in preparation for the process. After a few days the mine-water is run through the different bags filled with bark and needles. The precipitation is then visible on top of the bags.

Following successful laboratory tests, the product has been tested in field conditions using polluted mine-water from a Randfontein gold mine. A test bed of cascades filled with different materials was used. The first cascade was filled with SupaZorb, the second with pine bark only and the third with Casuarina only – both mixed with sand by 50% of weight. Finally, the water passed cascade of dolomite.

The SupaZorb has proven to be most efficient, reports Dr Pollmann. The first phase, which saw the treatment of 6 000 m^3/day of water indicated a saving of more than 60% on the amount and cost of chemicals traditionally used to clean the water. The pH of the water was raised from 2.8 to 7.8 while more than 90% of the heavy metals were removed.

At the time of writing, plans were being finalised to use the treated water to irrigate 20 ha of lucerne. Dr Pollmann reports that, following the positive results achieved during field trials, there has been an increase of interest in the use of this product for AMD treatment.

'Greener' water plant for chemical firm

Chemical manufacture company Chemical Initiatives is completing a new water treatment plant at its Amanzimtoti site, in KwaZulu-Natal.

The demineralisation plant, designed and constructed by VWS Envig, replaces the existing 25-year-old treatment facility, which serves in the manufacture of sulphuric acid. According to VWS Envig project manager: Engineered Systems Gareth Kearns, one of the main requirements of the new plant is to minimise the impact on the environment. "The existing plant with its aged technology is producing 200 m^3 of effluent a day. The new plant, comprising new technology and advanced processes, will cut that amount dramatically to a mere 40 m^3/day, yielding both environmental and cost benefits."

The plant will be completed before the end of the year. "The new water treatment plant will have a capacity of 32 m^3/hour of high-quality water for use in several processes, but mainly as boiler feed water," explained Kearns. "The water will undergo sand filtration to remove solids, carbon filtration to remove organic particles, and degasifying to remove carbon dioxide. The water will also flow through cation and anion removal vessels."

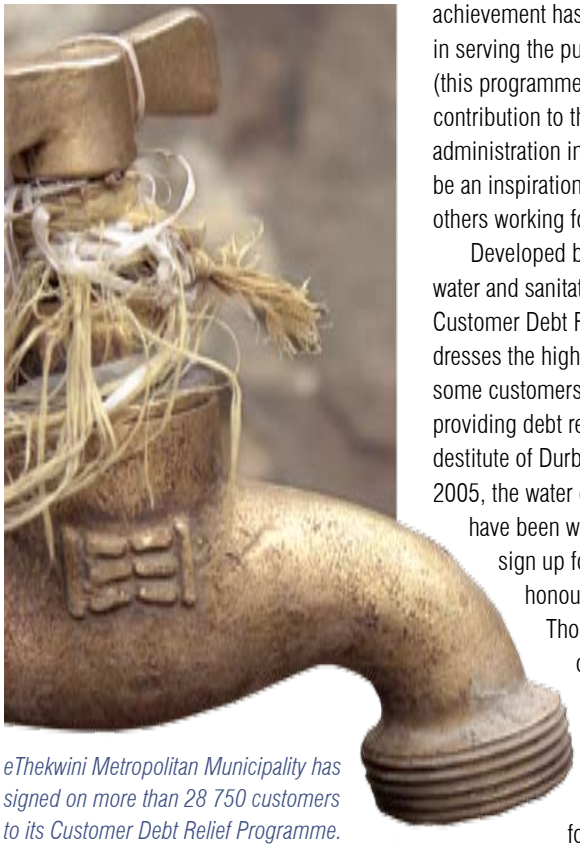
Part of the plant will be pre-assembled at the contractor's factory in Isando, Gauteng, however, the majority of the construction and installation will take place on-site. A raw water tank is also being supplied.

"As part of the commissioning process, we will be training operators in both plant operation and maintenance aspects. Once the new plant is ready, Chemical Initiatives will literally change over from the old plant to the new, thus ensuring no downtime," concluded Kearns.

Innovative Debt Relief Earns Durban

International Award

The eThekwini Metropolitan Municipality's water and sanitation department has received international recognition for its debt relief programme.



eThekwini Metropolitan Municipality has signed on more than 28 750 customers to its Customer Debt Relief Programme.

The municipality won the United Nations (UN) Public Service Award in the category of Improving Transparency and the Delivery of Services. This award is considered the most prestigious international recognition of excellence in public service. It rewards the creative achievements and contributions of public service institutions to a more effective and responsive public administration in countries worldwide.

According to Guido Bertucci, Director: Division of Public Administration & Development Management at the UN Department of Economic and Social Affairs, the municipality's outstanding achievement has demonstrated excellence in serving the public interest. "I am sure (this programme) has made a significant contribution to the improvement of public administration in South Africa. It should be an inspiration and encouragement for others working for the public service."

Developed by eThekwini's head of water and sanitation Neil Macleod, the Customer Debt Relief Programme addresses the high levels of non-payment of some customers while, at the same time, providing debt relief to the poor and destitute of Durban and surrounds. Since 2005, the water debts of the city's poor have been written off provided they sign up for a programme and honour their future debts.

Those who qualify must comply with conditions designed to encourage a culture of payment. Customers in poorer areas who are in arrears for more than 90 days are targeted by the programme. This includes pensioner-headed households, child-headed households, and those living in houses valued less than R100 000.

Customers' debt is gradually written off over 50 months provided that they make regular payments of their current account. In contrast to the conventional blanket debt write-off approach, this credit programme rewards good payment behaviour, reported eThekwini spokesperson Teddy Gounden. If customers default on their monthly payments, their debt is reinstated.

Customer service agents visit customers in their homes to explain the programme, identify reasons for high bills and explains the consequences of non-payment. The key reasons for high bills include leaks, high consumption behaviour, consistent non-payment and rental business activities. Customers are assisted to address these issues before applying for debt relief, for example, chronic leaks are attended to by the municipality for a nominal fee. Destitute customers are further assisted through social workers.

The municipality reports that, since the implementation of the programme, more than R13-million worth of debt has been written off from 28 750 signed up customers. This write-off has been offset by R15,5-million of new income. Furthermore, over 70% of the customers have made regular monthly payments.

Importantly, water consumption savings of up to R270 000 per month have been achieved through improved consumption behaviour and repair of leaks. Water consumption of all debt relief customers has reduced from an average of 0,63 kℓ per day to 0,55 kℓ per day.

Gounden explained why this strategy is considered unique: "While targeting customers in arrears, the programme provides an option that takes into account difficult financial circumstances but, at the same time, brings people who can afford to pay into the net through credit control. Customers who have fallen behind in payment are provided the opportunity to be able to get back into a positive payment cycle and credit rating."

There have been a number of spill-over effects due to the programme, including a dramatic increase in general payment levels and consequently an increase in revenue for the municipality. In addition, eThekwini has become a learning centre for other municipalities who are experiencing low payment levels and consequent financial difficulties.