Saving water everybody's business

Managing water resources to ensure their sustainability requires concerted efforts from governments, industries, communities and the individual. So says newly inaugurated President of the Water Institute of Southern Africa, Prof Fred Otieno.

Advocating the principles of integrated water resources management (IWRM), he said it was an effort which required long-term perspectives and collective will aimed at providing better lives for present and future generations of people. An especially strong commitment was needed from those serving the water sector.

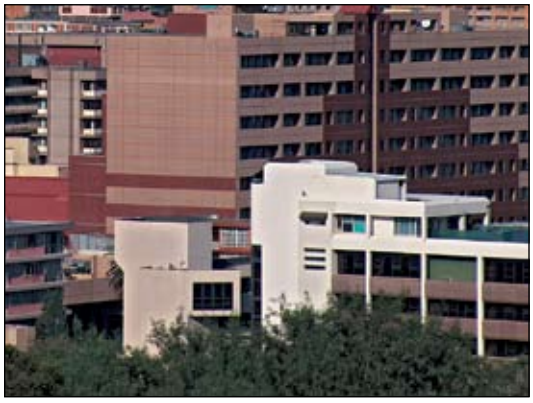
Pointing out the many water challenges faced by governments of the world, Prof Otieno said that water should be regarded as a finite resource having an economic value with significant social and economic implications reflecting the importance of meeting basic needs. "All too often, water is treated as an infinite free good, rather than as the precious water resource that it is. Even where supplies are plentiful, they are increasingly at risk from pollution and rising demand."

"To ensure the overall sustainable development of our world, continuous access to clean water is critical," he continued. "Without clean water, not only will public health suffer because of poor hygiene and sanitation, agricultural and industrial activities will also get disrupted. This may eventually lead to the disintegration of the very societies that we and our forefathers have so painstakingly built up."

According to Prof Otieno, society must take heed of the statement in the United Nations Millennium Declaration to stop unsustainable exploitation of water resources by developing appropriate water management strategies at all levels.

Newly elected WISA Vice President Dr Heidi Snyman with WISA President Prof Fred Otieno.

City promises improved services



The City of Tshwane has set aside R39,85-million for the eradication of water backlogs in its medium-term revenue and expenditure framework.

The planned expenditure forms part of the city's plan to improve service delivery, especially in areas north of Pretoria. "There will be a bulk sewer network established at Klip-Kruisfontein phase 3 to the value of R150 000," reported Dr Ndivho Lukhwareni, Head of Public Works and Infrastructure Development. "Various wards have been earmarked to benefit from new water connections." He added that R16,4-million would be spent on the Klip-Kruisfontein bulk water supply reservoir.

The City has also promised to come up with major stormwater drainage systems. This followed the floods that occurred over the past. Among the areas that will benefit from this will be Soshanguve South and Akasia.

Water tops municipal agenda

Ehlanzeni District Municipality, in Mpumalanga, has budgeted R25-million for the provision of potable water in the coming financial year.

According to Mayor Constance Mkhonto, water tops the municipality's agenda this year. She said a water and sanitation blueprint had already been developed to guide the implementation of all water projects.

In addition, R6,5-million has been budgeted towards the eradication of remaining bucket toilets in the district. The municipality also intends developed a roads and stormwater drainage system blueprint.

Gauteng moves towards basic services targets

The Department of Local Government in Gauteng has reported that it is "making great strides" towards delivering services to residents, particularly the poor.

Delivering her budget vote earlier this year, Local Government MEC Qedani Mahlangu said 96% of all households on Gauteng's indigent register receive free basic water while all the households received free basic electricity.

"Gauteng is on course to meet the 2008 target for basic water supply and 2010 target for basic sanitation," she said. The water delivery backlog has been reduced from 603 000 households in 2003 to 262 000 households in 2006, while the sanitation backlog has been reduced from 706 000 households to 438 000 households during the same period.

Mahlangu said that the province's efforts were challenged by the migration of people from other provinces and countries to Gauteng, placing "serious strain" on service delivery and resources.

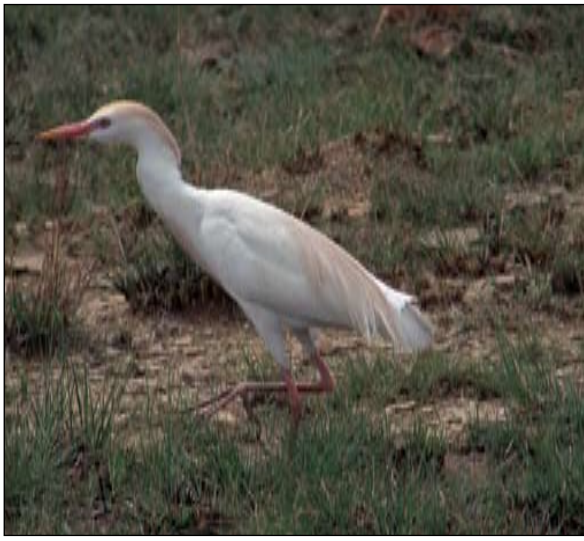
Science can help species survive

African countries will need to harness and apply science and technology to conserve and use biodiversity in a sustainable manner.

This is according to Science & Technology Minister Mosibudi Mangena, who said South Africa's biodiversity has enormous potential for transforming Africa's agricultural and industrial activities into systems which can contribute to economic change and poverty reduction. Speaking at the 21st Annual Congress of the Society for Conser-vation Biology earlier this year, the minister noted: "South Africa is home to a large number of unique species of plants and animals, as well as ecosystems constituting the continent's natural wealth."

"Cause for concern is that this biodiversity is being lost at an alarming rate, making conservation and promotion of the sustainable use of our biodiversity a pressing challenge that African countries have committed themselves to addressing." Mangena reported that conservation and sustainable use are knowledge-intensive activities, and cannot be attained without investments in the generation of new scientific knowledge and the application of technological innovation.

The minister also called on the delegates attending the summit to address the imminent threat of global climate change, which in South Africa is predicted to have the potential of driving thousands of species to extinction.



Its 'business unusual' as target nears to eradicate buckets

With only a few months remaining to the bucket eradication target date, provincial and local governments need to adopt a 'business unusual approach' in order to deal with remaining backlogs, according to Minister of Water Affairs & Forestry, Lindiwe Hendricks.

An estimated 109 000 households in established formal settlements still make use of the bucket sanitation system. The Free State continues to retain the largest sum of buckets (74% of total backlog), followed by the Eastern Cape (16%). The remainder of the backlog is shared between the Northern Cape (6%), the North West (3%), and the Western Cape (1%).

"As there are other significant development projects underway, such as preparations for the 2010 Soccer World Cup, housing delivery, as well as other significant water and sanitation targets, we must appreciate the tremendous pressure and competition on the limited resources across the delivery chain," said Hendricks. She raised some of the challenges faced by provincial and local government in eradicating the remaining bucket toilets, including lack of skills and finance, challenges around procurement and community buy-in, as well as the demand for waterborne sanitation despite the availability of cheaper alternative technologies, such as urine diversion toilets.

With regards to the latter challenge, the Minister said: "Communication and the use of appropriate communication methods are critical in addressing this challenge. Some municipalities have effectively implemented alternative solutions which could be upgraded at a later stage. However, any solution must be based on clear feasibility studies to ensure its appropriateness and sustainability. My department is ready with technical expertise around this matter and alternative technology options."

Water Diary (continued)

MINING
OCTOBER 17 & 18
The Chamber of Mines is hosting a Sustainable Development Conference with the theme 'Delivering on Our Commitments'. The conference will be held at the Intercontinental Sun & Towers Hotel in Sandton, Gauteng. *Enquiries: Liz Mbatha, Tel: (011) 498-7424; Fax: 086 050 24751; E-mail: imbatha@bullion.org.za*

DESALINATION
OCTOBER 21-26
The International Desalination Association is hosting a World Congress on Desalination and Water Reuse in Gran Canaria, Spain. Themes include thermal desalination design improvements; alternative desalination techniques; and desalination and the environment. *Enquiries: Tel: +1-978-8870-410; E-mail: info@idadesal.org; Visit: www.idadesal.org/t-worldcongress_001.aspx*

AQUACULTURE
OCTOBER 22-25
The Eighth Conference of the Aquaculture Association of Southern Africa will be held at the Cape Town International Convention Centre. The theme is 'Linking Resources to Markets Through Technology'. Enquiries: Tel: (012) 807-6720; Fax: (012) 807-4946; E-mail: info@aasa-aqua.co.za

MUNICIPAL ENGINEERING
OCTOBER 24-26
The 2007 Conference of the Institute of Municipal Engineering of South Africa (IMESA) will take place at the International Convention Centre, in Durban, KwaZulu-Natal. The theme is 'Sustainable Municipal Engineering 2010 and Beyond'. *Enquiries: Cilla Taylor, Tel: (012) 667-3681; Fax: (012) 667-3680; E-mail: confplan@iafrica.com*

No more bottled water for city staff

Municipal staff in San Francisco, US, have been banned from drinking bottled water by Mayor Gavin Newsom.

Newsom, who said "it cost too much" has barred city departments, agencies and contractors from using city funds to serve water in plastic bottles and in larger dispensers when tap water is available. It is estimated that San Fransisco could save US$500 000 a year under this directive.

Study puts rainwater tanks ahead of desalination

Rainwater tanks are not only cost competitive with desalination, it is five times more energy efficient.

This is according to a report commissioned by the Nature Conservation Council, Australian Conservation Foundation (ACF) and Environment Victoria. The report, *The Economics of Rainwater Tanks and Alternative Water Supply Options*, prepared by economics Marsden Jacob Associates, focused on the cost effectiveness and ability of rainwater tanks to provide water in the urban centres of Sydney, Melbourne and South-east Queensland.

The study compared the yield and levelised cost (i.e. the cost per kilolitre supplied) of various long-term water source options against the potential yield and cost of rainwater tanks. Prof Ian Lower of the ACF said that governments should seriously consider rainwater tanks as an alternative source of water. "There is a very big saving in putting in rainwater tanks instead of infrastructure."

Olive pips help clean water

The Department of Chemical Engineering of the University of Granada has found a new application for 'useless' olive pips, usually left over after olives are processed – the elimination of chrome from industrial wastewater.

The process uses biosorption, a physical and chemical process which enables certain types of biomass, in this case olive pips or stones, to retain the hard metals found in industrial wastewater. According to Dr Germán Tenorio Rivas, a member of the research group, olive stones have the capacity to retain metallic ions on their surface. "This is due to the difference in electrical charges. Olive stones are negatively charged, whereas metal is positively charged. That is the reason why they come together, thanks to ionic attraction."

It is believed that biosorption can be a good substitute for conventional processes such as precipitation, which are far more complex and expensive. Dr Rivas explains: "Unlike these processes, the use of olive stones as a biosorption mechanism produces no subproducts which are then difficult to deal with, for example, metal concentrated mud." Two products are obtained during this process: water free of pollutants and the olive stones with the retained metal.

Get over the 'poo taboo' – expert warns

Capturing urine for recycling phosphorus and treating solid human waste for recycling can greatly assist in preserving dwindling water supplies, according to Associate Professor Cynthia Mitchell of the University of Technology Sydney's Institute for Sustainable Futures, in Australia.

Addressing a gathering of water and waste stakeholders earlier this year she said it was time for people to put their 'poo taboo' aside and adopt radical new approaches to sanitation. "Not enough is being done to manage human waste sustainably or to save taxpayers dollars on maintaining ineffective infrastructure. It is money down the toilet."

Urine is high in phosphorus, a finite resource that is essential to life and continued food production and traditionally has been mined from the ground. The world is fast running out of mined phosphorus, bad news for areas which need fertilisers to grow food.

Urine may be the answer. Cities are becoming phosphorus 'hotspots' because of urine in sewage, and rapidly increasing urban populations, while global ground reserves of phosphorus are unlikely to last more than 50 to 100 years.

"Urine will soon be too precious to flush down the loo," noted Prof Mitchell. "Already in parts of Europe urine separating toilets are being introduced. Sweden has set a national target that 605 of phosphorus in organic waste, including sewage, must be recycled. At least 30% of that goes to fertilise agricultural land."

China-Australia unite on climate research

Australian and Chinese research institutions have signed a two-year collaboration agreement to investigate climate and rainfall linkages between the two countries.

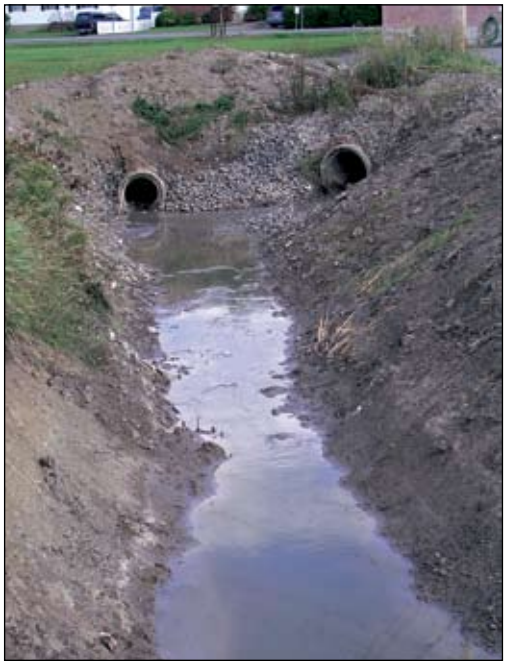
The agreement was signed by CSIRO, the Australian Greenhouse office and the

Institute of Atmospheric Physics of the Chinese Academy of Science.

"The objective of this project is to improve understanding of the interaction of the Australian and East Asian monsoon systems," reports CSIRO Environmental Statistician Dr Bronwyn Harch. "This research will give us more information about the impacts of climate change, especially in the areas of agriculture and water resource management."

The East Asian summer monsoon carries moist air from the Indian and Pacific Oceans to East Asia. The monsoonal flow interacts with the Australian winter monsoon.

Protect water, protect lives



More than 13 million lives can be saved annually by reducing environmental risks such as pollution, unsafe water, ultraviolet radiation and climate change.

So says the World Health Organisation (WHO) in its first country-by-country analysis of the impact of environmental factors on health. The organisation reports that in some countries, more than a third of the disease burden could be prevented through environmental improvements. The worst affected countries include Angola, Burkina Faso, Mali and Afghanistan.

In 23 countries worldwide, more than 10% of deaths are due to just two environmental factors: unsafe water, including poor sanitation and hygiene; and indoor air pollution due to solid fuel use for cooking. Around the world, children under five are the main victims and make up 74% of deaths due to diarrhoeal disease and lower respiratory infections.

Low-income countries suffer the most from environmental health factors, losing about 20 times for healthy years of life per person per year than high-income countries. However, the data show that no country is immune from the environmental impact on health. Even in countries with better environmental conditions, almost one sixth of the disease burden could be prevented.

"These country estimates are a first step towards assisting national decision-makers in the sectors of health and environment to set priorities for preventative action," said Susanne Weber-Mosdorf, WHO Assistant Director-General for Sustainable Development and Healthy Environments.

Zambezi fish disease mystery cracked

Scientists have identified the mystery disease that killed fish in parts of the Zambezi River last year, online news agency SciDev.Net reports.

The disease has been identified as Epizootic Ulcerative Syndrome (EUS), caused by a fungal pathogen. Infected fish develop large sores and die from secondary infections. This is reportedly the first known outbreak of the disease in Africa. However, it is still uncertain how the pathogen landed up in the Zambezi, which flows through eight southern African countries. EUS also affects fish in Australia, the US, and countries in Asia. When EUS broke out in Asia in the 1970s, about 80% of the fish population died.

Water by numbers

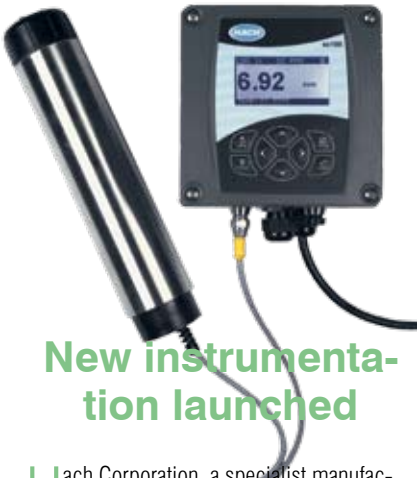
- **350 000 ha** – The number of hectares the government of Zimbabwe is planning to put under irrigation as part of its Accelerated National Irrigation Development Programme, *the Herald* reports.
- **33 ℓ** – The average volume of water consumed through the washing of clothes in a top loader machine using 130 ℓ per wash cycle (family of four).
- **200** – The estimated number of fish species wiped out in East Africa's Lake Victoria by the introduction of the predatory Nile Perch.
- **47,9 million** – The latest estimate of South Africa's total population. According to Statistics South Africa, population growth has slowed to 6,4% since 2001. KwaZulu-Natal still has the largest share of the total population (20,9%), followed by Gauteng (20,2%).
- **R5,3-billion** – The budget of the Department of Water Affairs & Forestry (DWAF).
- **500 kℓ/day** – The planned capacity of the pilot desalination plant to be constructed at Cape Town's V&A Waterfront.
- **16 000** – The number of staff employed by DWAF.
- **3,2 million** – The estimated number of toilets which need to be constructed over the next four years for government to meet its sanitation target.
- **163** – The number of boreholes handed over to the Zambian government by Japan to improve access to safe water in the African country's Northern Province.
- **US$2,2-million** – The funds donated by Sweden to the Okavango River Basin Water Commission to set up its Secretariat in Maun, Botswana. The Commission, formed through an agreement between Angola, Botswana and Namibia, is aimed at managing the Okavango River basin in a coordinated and sustainable manner.
- **2 068** – The number of sites at which DWAF has established an electronic system for monitoring drinking water quality to date. According to Minister Lindiwe Hendricks, 55% of municipalities are reporting on their water quality to DWAF every month.

Power station to have new water plant soon

Arnot Power Station's new multimillion Rand cooling water treatment plant will be completed by October.

The new plant, designed, constructed and commissioned by VWS Envig, is part of a general upgrade of the 31-year-old Mpumalanga power station, situated near Middelburg. The water treatment solutions service provider announced that it had won an R18-million contract from Eskom earlier this year.

According to VWS Envig manager: project management Steve Lawrence, the plant will remove hardness, alkalinity and turbidity from the process water used in the power station's cooling towers. "We are employing our patented Multiflo process to ensure that this plant performs efficiently and reliably," he said. "Cooling tower water will be clarified and softened by undergoing coagulation and flocculation prior to clarification and settling. The system has a small footprint, and requires lower capital and operational cost than conventional clarifiers."



New instrumentation launched

Hach Corporation, a specialist manufacturer of instrumentation and kits for the municipal and industrial markets, launched its new LDO dissolved oxygen technology in August.

In a statement the company reports that this technology will provide cost savings to wastewater treatment plant power usage by enabling the optimisation of the aeration process, a large power cost to treatment plant operators. The instrumentation and kits manufactured by the company globally are used for the analysis of water, whether it be for field, laboratory or process measurement in wastewater, drinking water or groundwater.

WSP Africa manager retires

Piers Cross has retired as manager of the Water and Sanitation Program – Africa in Nairobi, Kenya.

Cross served in various capacities and locations of the WSP, including programme manager at its head office in Washington, regional team leader of WSP South Asia in Delhi and global coordinator of the International Network for Water and Waste Management. In 1993, he was the founder and first CE of Mvula Trust.

SRK Consulting has been awarded the ISO 9001:2000 certification for quality management. Brian Middleton, MD of the company, and Sue King, SRK quality manager and information specialist, pose with the certificate.

Chlorine tank extended at Heidelberg works

A multimillion Rand project to extend the chlorine contact tank at ERWAT's Heidelberg Wastewater Treatment Plant, was to be completed in August.

The project comprised extensions to the existing chlorine contact tank to increase its disinfection capabilities and capacity from 23 m^2 to 88 m^2. This modification allows for better chlorine mixing with the final effluent while increasing the retention time to 30 minutes on average weather flow.

The modifications included pipe work connections, sumps, sluice valves, operational gate valves and concrete chamber boxes.

Bringing research to rural communities

CSIR is participating in an international research consortium aimed at enabling people in rural areas to participate fully in the research and technology development activities that potentially affect their lives.

Funded by the European Union's Framework Programme 6, the consortium comprises 30 partners from 15 countries. Titled 'Collaboration@Rural: a Collaborative Platform for Working and Living in Rural Areas', the three-year project provides a collaborative programme for research institutions and rural communities. It aims to develop effective methodologies for the implementation of rural living laboratories within rural economies.

"Rural living labs are user-centric, real-life research and development contexts, involving people, businesses and public players in the co-creation of services enhancing rural development," explained CSIR researcher Johan Maritz. "The concept is about research institutions setting up long-term relationships with the inhabitants of the real-world context in a way that will ensure active participation by the latter in the research and development process."

New water booklet makes a mark

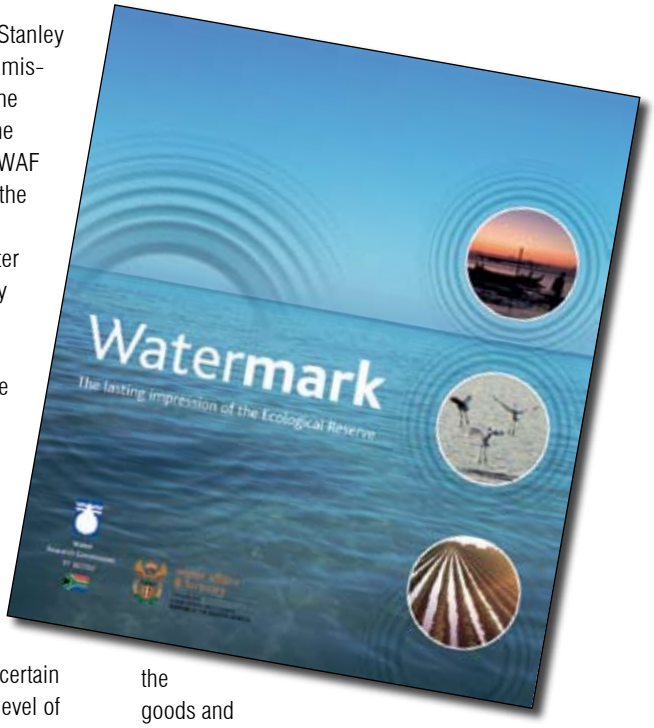
The Water Research Commission (WRC), in partnership with the Department of Water Affairs & Forestry (DWAF), have published a new, user-friendly booklet to raise awareness of the importance of maintaining a balance between using water for social and economic development and protecting water for healthy ecosystem functioning.

Watermark: the Lasting Impression of the Ecological Reserve, explores the rationale behind the Ecological Reserve, the volume of water required by the natural system to function adequately. The Ecological Reserve forms one part of the Reserve, the other being the Basic Human Needs Reserve or the water allocated for human consumption before any other water can be assigned. The booklet illustrates in simple language how defining and implementing the Ecological Reserve will help to ensure the adequate supply of water in the years to come.

"Just as a human being would eventually dehydrate and die without this basic fluid, so would the country's water resources without an Ecological Reserve."

South African water policy and the concepts around water allocation are explained. Other topics covered include the role of water in the economy; water quality and environmental flow; the link between flow and biodiversity; pollution and waste disposal; as well as balancing use with sustainability.

WRC research manager Dr Stanley Liphadzi explains that enduring misconceptions over the need for the Ecological Reserve prompted the development of the booklet. "DWAF and WRC were concerned over the perception among members of the public that setting aside water for ecological needs necessarily means less water for people for the sake of *goggas* and fish."



While the Ecological Reserve is not intended to protect the aquatic ecosystem at the expense of development, it does ensure that water resources are afforded a level of protection that will ensure sustainable development. Like the human body, South Africa's water resources need to retain a certain amount of water for a sustained level of ecological function. Just as a human being would eventually dehydrate and die without this basic fluid, so would the country's water resources without an Ecological Reserve.

Easy-to-read *Watermark* lays a good foundation for beginners to the concept of environmental water allocation and how it supports government's priorities of poverty alleviation and job creation. "The booklet portrays the relationship between the health of an aquatic ecosystem and economic and social prosperity," notes Dr Liphadzi. "It illustrates how we can achieve sustainable development (in harmony with social, economic and environmental expectations) if we take care of our water resources in such a way that they can keep on providing the goods and services we require."

The booklet is aimed at the general public, provincial and local decision-makers, non-governmental and community-based organisations. It is hoped that the booklet will assist in the making of better informed development decisions in the future. "Maintaining a healthy aquatic ecosystem is the only way in which we can ensure a long-lasting development and supply of goods and services that will be enjoyed by generations to come," concludes Dr Liphadzi.

- Copies of *Watermark* (WRC Report No **TT 307/07**) can be obtained by contacting WRC Publications at Tel: (012) 330-0340 or E-mail: orders@wrc.org.za

Water on the Web

www.didyouknow.org
The 'Did You Know' website offers interesting and fun facts on anything under the sun, from sports to inventions to war and disputes. The website also offers a water category. Find out more about the availability of water in the world, hydropolitics, desertification and other water-related topics.

www.schools.watsan.net
The WASH in Schools website comes from the joint School Sanitation & Hygiene Foundation website of IRC and UNICEF, which was launched in 1999. This website serves as an information exchange platform for sector professionals working in the field of water, sanitation & hygiene in schools. There are projects, case studies, and other resources materials available on the site.

www.splash.bradford.ac.uk/home/
This website presents the outputs from recent research on water governance and related topics by members of the Water Research Group at Bradford University, in the UK. It seeks to inform users, researchers and policymakers of current understanding around the key issues in water governance and to point the way ahead for future research and application.