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INTERNATIONAL

ANALYSIS

FEATURES

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Consultancy report highlights performance damage from reactive water management

A new report from global management consultancy Arthur D Little warns businesses that a reactive response to water management can damage business performance.

The report gives a number of illustrations of the way in which water affects businesses' financial performance. These include Electricité de France (EDF), which was hit by losses of approximately €300 million ($385 million) when it had to close a quarter of its 58 plants due to water shortages, and brewer Anheuser-Busch, which suffered increased production costs due to water shortages in the supply chain.

According to the report, companies must assess their water footprint, broken down by product and service, by value chain position and by geographic region. A proactive approach to water management then assesses value drivers that include water security, regulation and stakeholder expectations.

These value drivers can be used to dictate the optimum water footprint of each asset by calculating potential immediate cost savings, future cost savings and additional, more abstract benefits gained from water efficiency improvements.

This analysis can be incorporated into a comprehensive global water management strategy that is optimised locally while maintaining minimum standards – companies that apply a global 'one size fits all' policy across all operations in all regions are exposed to significant risk, the report notes.

Companies can then develop a response that adds value to their business models whilst simultaneously protecting water as a local resource.

The report also highlights that water and carbon have quite different characteristics and impacts. Addressing a company's water and carbon issues requires a balancing act, it explains, recognising the differences but also the synergies that can be derived from addressing both in a strategic, coordinated way.

Melissa Barrett, a manager in Arthur D Little's Sustainability and Risk practice said: 'Dealing with the challenges of water management will be a top priority for businesses and global policy makers over the next ten to 20 years. However, it will only be possible to make meaningful changes through a whole-business approach starting at the board level.

'Those who assess their portfolio of risks and potential opportunities now to choose and prioritise actions will get first mover advantage in what is rapidly emerging as a dominant global issue.' ●

The Water margin can be downloaded at www.adl.com/watermargin.

World Bank approves water and sanitation loan for Dhaka

The World Bank has approved a $149 million International Development Association (IDA) credit to Bangladesh, to support the improvement of water supply and sanitation services to the population of the city of Dhaka in Bangladesh.

Dhaka is of the fastest growing megacities in the world, whose population is expected to reach nearly 22 million by 2025, up from 12 million today. This rate of growth is seriously stretching the city's ability to provide basic water, sanitation and drainage services, and their delivery throughout the city is inadequate and uneven, but particularly poor in slum areas.

The Dhaka water supply and sanitation project is designed to improve sustainable delivery of storm water drainage, wastewater, and water services by the Dhaka Water Supply and Sewerage Authority (DWASA), which has sole responsibility for providing these services in Dhaka.

This will be achieved by rehabilitating, repairing and expanding the city's sewerage network and treatment plants, installing stormwater pumping stations and rehabilitating canals to help improve drainage and minimise urban flooding.

The project will also support DWASA's pilot expansion of water and sanitation services into some of Dhaka's slum areas to help increase services to the urban poor, and finance training to improve hygiene practice in the slums.

Fook Chuan Eng, World Bank senior financial analyst and the task team leader for the project, said: 'Currently DWASA only supplies water to 70% of the population of the Dhaka Metropolitan Area and its suburbs. The quality and quantity of service varies significantly even inside Dhaka. There are no piped distribution networks available in slum areas, where approximately four million people live. This project will help DWASA to bring water and sanitation services to about 305,000 poor people living in slums.' ●

water utility management
INTERNATIONAL

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Water Utility Management International focuses on the interests of utility executives, policy makers and advisors around the world engaged with the key management issues faced by water and wastewater utilities. As well as senior utility managers, the publication will be of interest to regulators, consultants, contractors, academics, and financial, technical and legal professionals.

Utility reform and achieving efficiency are central themes of the publication, encompassing topics such as benchmarking, investment planning, consolidation, public / private sector roles, leadership, IT, and human resources. Other regular themes include financing, regulation, charging policies, procurement, corporate governance and customer issues.

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AfDB funding for Zanzibar supply, sanitation and resources management

The African Development Bank (AfDB) Group has approved a combined loan and grant equivalent to $41.8 million, to finance Zanzibar's water and sanitation project.

The $37.2 million loan from the African Development Fund, which is the concessionary arm of the AfDB Group, with €3.14 million ($3.96 million) from the Rural Water Supply and Sanitation Initiative (RWSSI) trust fund, will be used to finance institutional development support, rural and urban water supply and sanitation as well as water resources management elements of the project over a four year period.

The project aims to improve water supply and sanitation services in rural and urban communities through integrated water resources management, aiming to improving health and social wellbeing through 'equitable provision of adequate water and sanitation services at affordable cost and on a sustainable basis'.

The targets for the proposed project will be the urban areas of Chake Chake, Wete and Mkoani, which have a total urban population of 70,832, and nine rural areas in Ugunja and Pemba that contain 95,214 people. In addition, 276,000 students from rural schools in Ugunja and Pemba will benefit from the related water and sanitation activities.

On completion, the project is expected to bring a general improvement in public health within the project areas, reduce water-borne diseases and ensure environmental sustainability. It will also help in the eradication of poverty and contribute towards meeting the water and sanitation Millennium Development Goal.

The project is in line with Zanzibar's Vision 2020 and its poverty reduction plan, which focuses on providing social services and improving livelihoods through increased access to clean, safe and affordable water, sanitation and a sustainable environment. ●

Loans And Tenders

SRI LANKA: ADB funds provincial watsan upgrades
Main urban centres in Sri Lanka's Northern and Northwestern provinces are using Asian Development Bank (ADB) funds to upgrade neglected and overstretched water and sanitation systems. ADB is providing a 32-year loan of $59.78 million and a grant of $23.22 million from the Asian Development Fund for the Dry Zone Urban Water and Sanitation project, which will rehabilitate and expand water and anitation services in the towns of Chilaw, Mannar, Puttalam, and Vavuniya.

AUSTRALIA: Government inaugurates project fund
Australia's Federal government has inaugurated an AUD$1 billion ($655.1 million) fund for local governments, councils and private operators to help 'worthwhile' urban water supply projects. The government has pledged to contribute up to AUD$100 million ($65.5 million) or 10% of the costs to projects it feels fall into this category. The guidelines for the programme suggest conditions could include conforming to various national water initiative requirements such as improved water planning, and a requirement to publish minimum performance standards.

COLOMBIA: IADB aids private sector infrastructure participation initiative
Colombia is seeking to improve various infrastructure services including water and sanitation by boosting private sector participation in infrastructure projects with the help of a $14.2 million loan from the Inter-American Development Bank (IADB). The loan is the third stage of a programme launched in 1996 to support private participation and concessions in infrastructure at national, departmental and municipal levels in the country.

LATIN AMERICA: IADB announces Aquafund
The Inter-American Development Bank (IADB) has announced a new Aquafund to finance project preparation and technical assistance to develop solutions for pressing water and sanitation problems. Latin American and Caribbean governments wanting to improve water and sanitation services will be able to apply for grants. The fund is described as a fast-disbursing vehicle intended to accelerate water sector project development.

MOROCCO: AfDB loan for drinking water supply project
The African Development Bank (AfDB) has approved $97.2 million loan to finance Morocco's tenth drinking water supply project. This aims to reinforce drinking water production and supply systems in the towns of Khénifra, Taounate, Settat, Marrakech and Tamesna (in the Rabat-Casablanca coastal zone), as well as neighbouring rural centres. The project will enhance and improve the quantity and quality of water supply for around three million people from 2010 and enable the National Drinking Water Authority, ONEP, as producer and distributor, and the autonomous state-owned companies as distributors, to meet an area demand that is projected to reach five million by 2030.

ASIA: ADB partners with Korea to promote infrastructure PPPs
Korea and the ADB are promoting public-private partnerships (PPPs) for infrastructure investments in developing member-countries through sharing of knowledge and experiences from successful PPP projects. The activities will be funded by a $500,000 grant from the Republic of Korea e-Asia and Knowledge Partnership fund, which the ADB administers. The assistance is expected to help formulate and strengthen PPP policies as well as legal, institutional, and financial frameworks for the development and implementation of PPP infrastructure projects.

KYRGYZ REPUBLIC: Extra finding for watsan project
The ADB is granting an additional $30 million to a project that will provide cleaner drinking water and better sanitation for 1.5 million people in the provinces of Chui, Jalal-Abad, Osh, and Batken in the Kyrgyz Republic. The community-based infrastructure services sector project was initially approved in 2000, with ADB extending a $36 million loan. The additional Asian Development Fund grant will ensure completion of the project following sharp increases in the prices of various basic commodities such as steel and cement during project implementation.

IADB supports Colombia's water and sanitation reforms

Colombia will consolidate its water and sanitation service delivery model and seek to accelerate service expansion efforts as part of a policy-based loan for $250 million approved by the Inter-American Development Bank (IADB).

This operation is the first in a tranche of up to three loans to support policy reforms intended to help Colombia implement more effective and equitable social policies in the water and sanitation sectors. Colombia intends to meet goals regarding the equity, efficiency, quality and sustainability of its water and sanitation services, and to reach universal coverage in urban areas and make significant progress in rural areas by 2019.

Under the current operation, Colombia intends to increase urban water service coverage from 94.5 percent to 97.8 percent in 2011, and in sanitation from 90.1 percent to 93.2 percent. This would mean that 3.2 million and 3 million additional people, respectively, will have water and sanitation services as a result of the reforms.

The policy reforms are also intended to improve the efficiency of investments in service expansion by at least 33 percent, which would generate benefits in increased service coverage whose net present value would exceed $320 million. ●

Business

SOUTH AFRICA: Second phase of Lesotho Highlands project gains approval
South Africa has approved the second phase of the Lesotho Highlands water project, one of the world's largest infrastructure projects under construction. The project has an estimated cost of $710 million and includes construction of the Polihali dam in Lesotho. The aim is to ensure a secure future water supply to the Vaal river system. The Vaal system is critical to South Africa, feeding the fast-growing economic province, Gauteng.

DUBAI: Moody's assigns rating to DEWA
Moody's Investor Service has issued an updated credit analysis report on the Dubai Electricity and Water Authority that assigns it an A1 rating to reflect 'the central role that the company plays in Dubai's growth strategy and the strong support it would expect to receive from local and federal governments', as the report notes. Ratings are constrained by an expectation of rising debt on the back of a large-scale capacity expansion programme.

MIDDLE EAST: Bank warns of huge spend on water infrastructure
The Islamic Development Bank's president, Dr Ahmed Mohamed Ali, told a recent meeting of the UN Secretary General's Advisory Board on Water and Sanitation that Middle Eastern countries may need to spend as much as $200 billion on water-related infrastructure over the next ten years to meet soaring demand. Dr Ali added that the bank believes the private sector can play a larger role in water and sanitation services.

UK: Water companies report depressed profits
Thames Water Utilities' profits were sharply down at £142.5 million ($214 million) against £216.3 million ($325 million) in the same period last year. Northumbrian Water reported profits down 1.8%, partly because of steep rises in energy costs. Dee Valley Group reported a 13.6% fall in first-half pretax profit due to pension scheme and operating costs, but said it would not be noticeably affected by the economic downturn. However, Pennon Group, which owns South West Water, said underlying pretax profits grew 3.2%. Both Pennon and Northumbrian noted that the economic downturn was affecting both domestic and commercial water usage and therefore profits. Severn Trent Water pretax profits also feel from £149.5 million ($224.7 million) to £138 million ($207.5 million). Despite a 21% hike in pretax profits, United Utilities warned that it may struggle to finance pipe network upgrades if regulators do not adjust water prices in recognition of the credit crisis.

FRANCE: Suez Environnement set to bid for Paris contract
Suez Environnement has announced it is to bid for the drinking water supply contract from Syndicat des Eaux d'Ile-de-France – Sedif – the regional water administrator for the Paris greater metropolitan area. Suez Environnement Chief Executive Jean-Louis Chaussade told a press conference last week that his company was proposing dividing the water services contract between several bidders. M. Chaussade said: 'Dividing up the contract is the best way to ensure competition between several operators.' The contract is worth around €350 million ($443 million) a year and has been in the hands of Veolia Environnement since 1923. The contract is up for renewal at the end of 2010. Sedif covers water services for 144 communes in the Paris region, which equates to 1M.m^3 of water a day for four million consumers, or nearly 40% of the Paris metropolitan area.

IRELAND: Veolia wins DBO contracts
Veolia Water has been awarded two design, build and operate contracts for major wastewater treatment plants in Mullingar and Castlebar in Ireland. The two contracts are worth an estimated cumulative turnover of around €74 million ($95 million) for Veolia Water over 22 years. The first contract, awarded by Westmeath County Council, is worth around €48 million ($61.6 million) in total for Veolia Water, and is for the upgrade of the existing wastewater treatment works in Mullingar, near Dublin in County Westmeath. The second contract, awarded by Mayo County Council in Castlebar on the west coast, is worth around €26 million ($33.4 million). The project scope includes upgrading the Castlebar wastewater treatment plant from an existing 20,000 population equivalent (PE) to 35,000PE, including 10,000PE from an industrial stream.

US: Insituform announces major sewer contract
Trenchless technology specialist Insituform Technologies has won a $10 million sewer contract from the Metropolitan Development Commission (MDC) in Connecticut to rehabilitate 270,000 linear feet (82,300m) of sewers. Work is due to begin in December and will last a year. The MDC provides sewer and drinking water services to the municipalities of Bloomfield, East Hartford, Hartford, Newington, Rocky Hill, West Hartford, Wethersfield and Windsor, as well as parts of other towns in the region. Insituform will undertake sewer pipe rehabilitation in all eight municipalities within the MDC jurisdiction.

US: Nuclear fuel company announces water use reductions
Global Nuclear Fuel (GNF), a joint venture of GE, Toshiba and Hitachi, has announced that it has spearheaded wastewater plant changes that reduced water usage across its Wilmington, North Carolina, headquarters site. Using a ZeeWeed membrane bioreactor as a make-up water source for the cooling towers saved 25 million gallons annually at the facility, which includes GNF's US-based fuel manufacturing operations. The plant has been working to optimise its operations and contribute towards GE's overall 'ecomagination' commitment to reduce its water footprint 20% by 2012. GNF's new energy efficient wastewater system avoids nearly 80 tons per year of carbon dioxide emissions, and achieves annual savings of $160,000 in water and energy use charges.

ISLE OF MAN: Faber Maunsell Aecom wins new wastewater strategy contract
Faber Maunsell Aecom has been awarded a commission to deliver a sewage treatment strategy and sewage sludge disposal strategy for the Isle of Man's Department of Transport, the island's key infrastructure provider. The IRIS regional sewage treatment strategy will create an £85 million ($125.6 million) upgrade to parts of the island's sewerage network, sewage treatment works and sludge disposal facilities. Faber Maunsell Aecom has been appointed as technical manager to deliver the regional strategy for sewage treatment and sewage sludge disposal, and associated environmental services.

Changes in the water market

Pinsent Masons, an international law firm, has brought out its annual yearbook, which analyses the current state of the water market and predicts what changes may occur in the future. **LIS STEDMAN** reviews the key points.

Pinsent Masons' tenth annual yearbook starts with an introductory swipe at the UK water industry and government culpability for development on flood plains, calling the stop-start nature of spending during the five-year AMP draft business plans period a 'recipe for serial havoc'.

It castigates the 'wilful and dangerously negligent' and 'cavalier' approach to building on flood plains, noting that while this might be unavoidable in some countries, in England 'a government has ridden roughshod over urban planning guidelines that were once the archetype for the world'.

Moving to the business of water, author Dr David Lloyd Owen notes that the outlook for the global market is said to be becoming one of more diverse participation with an upward trend in private sector participation. The yearbook notes that 'the entire nature of the market has changed over the past half decade' and that while the 'big two' (Veolia Environnement (VE) and Suez Environnement (SE)) remain clear market leaders, the perceived global domination of the former 'big five' is 'rapidly becoming a memory'.

Of the other three, Agbar and Saur are developing more focused strategies, he notes, and Rheinisch-Westfälisches Elektrizitätswerk (RWE) is winding up its interests outside Germany and central and eastern Europe. The market share of the big five is set to slip from its peak of 73% in 2001 to 39% by the end of 2008. Once RWE reduces its holding in American Water Works to below 50%, the report adds, this will fall 'to a pro forma 37%'. Dr Lloyd Owen notes: 'The return of American Water Works has been most welcome, especially due to the improved information flow about the leading player in the US.'

The 'big five' is becoming an increasingly fluid concept, the introduction explains, as Suez takes control of Agbar and RWE continues to shrink. He suggests a new member of this elite group may emerge from one of the major Chinese or Brazilian companies.

The impact of the financial sector's acquisition strategy can be seen – 16 companies are now held by financial investors: one in France, two in the US, five in Chile and eight in the UK, including three of the 'big ten' water service companies, a net increase of five since 2006.

There has been a steady rise in VE and SE's stable, long-term international contracts since 2006, the yearbook notes, but at the same time the stated numbers served by the global giants in their home country, France, has been trimmed back since 1995 due to the elimination of double counting of jointly-held contracts.

By the next edition, the author predicts that there will be a proper idea about what the changes in Eau de Paris will mean for the companies – to what extent the original contract will be replaced by a variety of outsourcing and other sub-contracts.

Despite the surface appearance of improvement, the yearbook notes that since 1997, contracts involving 64 million people have ended, around 10% of all identified contracts, representing a high attrition rate. This rate has stabilised since 1996, but World Bank data show that 29% of contracts in terms of total investment were either cancelled or in distress in 2006, compared to 4%-9% for telecoms, electricity and transport – nevertheless representing an improvement from the 35% reported in 2005.

The author notes: 'Water will never be a simple sector to operate in and communicating its complexities remains an urgent priority.' Since 2006 the sector has suffered a dearth of new initiatives providing serious, engaged research into its role, Dr Lloyd Owen adds. He notes: 'Working with UNCTAD (United Nations Conference on Trade and Development) on this year's World Investment Report was sometimes an exercise in firefighting, as myths about the sector (just one million people connected by PSP (private sector participation) since 1993 for example) have taken hold due to the absence of accessible evidence to the contrary.'

He notes that 'the grim progress' being made towards the Millennium Development Goal (MDG), particularly in sub-Saharan Africa and South Asia, is a direct result of water and sanitation 'not being taken seriously by politicians, companies and civic society as a direct result of their being de-commoditised'.

Expecting informal operators to fill the gap is missing the point, Dr Lloyd Owen suggests, noting that 'they exist because there is nothing being provided by the incumbent utilities.' He says informal operators 'exploit underinvestment' in effect, by forcing the poor to pay more for an even poorer service, adding: 'That people are willing to pay should not be a question – the challenge is to informal services within the formal sector to boost the level of people with adequate water and sanitation services at affordable prices.'

Climate change and demographic change impacts are also seen as concerns. He notes the combination in the UK of predicted high population growth and up to 50% lower summer river levels by 2050, calling the development and imposition of water efficiency and management targets as being as 'urgent and challenging' as those being put forward in response to rising carbon emissions.

Looking at the US, he notes the sale and splitting up of Earth Tech's water outsourcing activities as marking 'the effective ending of companies in the US operating in a number of countries globally'. There is also uncertainty about the future direction of GE, he notes, where concern has been expressed about the pace and profitability of its move into the water utility, CleanTech and environmental services sectors. 'Niche companies such as Han's Water continue to develop a contrary view,' he adds.

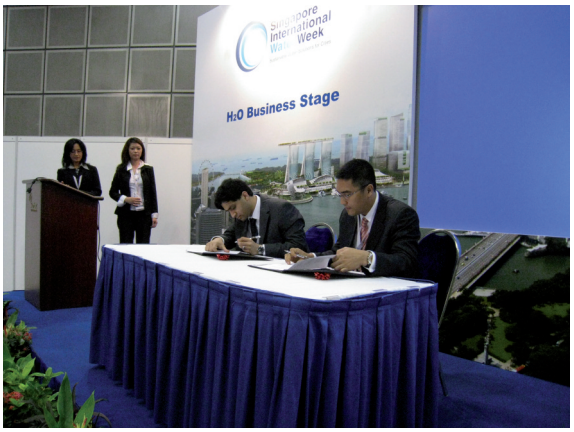
Dr Lloyd Owen also heralds the demise of the power and water multi-utility, with United Utilities in the UK no longer being an asset-owning power provider and Suez Environnement being stripped away from parent Suez in its merger with Gaz de France (which he praises as returning SE to its roots). 'Amongst the major players, the multi utility strategy for the time being is becoming very much the exception rather than the norm it appeared to be becoming a few years ago,' he adds.

While water and power utility management, like water and waste management, appear on the surface to have similarities, 'deeper differences endure', he suggests. As the regulatory and market climate moves on again, Dr Lloyd Owen says 'it is fascinating to see how water and waste management alliances are developing again,' typified by Remondis in Germany, Séché in France and industrial wastewater outsourcing projects around the world.

The four sections of the substantial yearbook look at trends in water and wastewater services worldwide over the past year and how they are set to evolve, countries of interest in Asia and the Americas, wholly or partly private sector companies, and a set of appendices giving background data, and a glossary of terms and abbreviations. ●

WHO-standard potable drinking water for the Indonesian public

The construction of Indonesia's first WHO-standard water treatment plant will facilitate the supply of potable water to several developments in Jakarta. **JEREMEY NGOW** explains the role of water treatment specialist ATC in this public-private partnership venture.



MOU signing: ATC's Omar Shahzad and Abudullah Mansoer of Acuatico during Singapore International Water Week.

Singapore-based water treatment specialist Ayser-Technische Corporation (ATC) is proving that potable water can be made available to the public in Indonesia by initiating the first WHO-standard water treatment works via a public-private partnership.

On a trip to Jakarta, drop by the plush shopping mall or the hotel at Emporium Pluit, or sit, relax and capture Jakarta's hustles in the brand-new lifestyle arcade of Pluit Junction, then turn on any of the taps at these developments to enjoy instant access to clean drinking water adhering to World Health Organization standards.

Come December 2008, the general impression that Jakarta's tap water is of non-potable standard will be substantially eliminated with the installation of Indonesia's first WHO-standard water treatment plant at Pluit, in north Jakarta, which will supply potable water to these developments. This advance has been achieved at an economic advantage – the tariff is lower than that of the current government rate.

ATC, with PT Jakarta Manejaman Estatindo, a subsidiary of Jakarta Propertindo, DKI Jakarta, is constructing Jakarta's first WHO-enabled potable water plant, which will supply the potable water needs of CBD Pluit (condominiums, residential shops, houses and office complexes), Emporium Pluit (a shopping mall and hotel), as well as Pluit Junction (a lifestyle and entertainment arcade).

In addition, ATC recently entered into a Memorandum of Understanding (MOU) with a Singapore-based company, Acuatico, which will involve the duo jointly investing up to $200 million in various private water infrastructure projects in Indonesia over the next three years. The jv also intends to design, build, operate and maintain central water treatment facilities for the largest publicly-listed real estate developer in Indonesia, PT Bakrieland Development.

Responding to an Indonesian press audience during the recent Singapore International Water Week, Omar Shahzad, a director of ATC, described the Indonesian water utilities market as 'one which has tremendous growth potential. The opportunities we are focusing on will not only provide attractive returns on our investment but at the same time provide the general public with greater accessibility to drinkable water.'

Drawing on its specialist engineering expertise and coupled with strong local partnerships, ATC aims to provide potable water for up to 35% of all future real estate developments in Jakarta. 'The coming year will be a watershed for us,' says Mr Shahzad. 'The company has successfully built itself a solid platform over the last two years in Jakarta, and after surviving the early uncertainties we are now looking ahead to consolidate our position in Jakarta whilst also expanding our presence to other parts of the country.'

The Central Pluit water plant is ATC's pilot in Jakarta, and it puts into perspective the necessity of having clean water for both business and public requirements, laying to rest the popular misconception that it is not viable, both economically and technically, for real estate developments in Indonesia to offer international standard drinking water to its occupants.

'We are excited to be able to draw upon our experience, gained from the successful creation of this plant, to provide our clients and in turn the general public with economically-viable yet sustainable clean water solutions through our continued construction of water plants in collaboration with our partners Jakarta Propertindo and Acuatico,' says Mr Shahzad.

The approach that ATC uses in Jakarta is fairly straightforward, successfully integrating conventional water-treatment technology with business and community sense, Mr Shahzad adds. 'It is not simply sufficient to be thinking of economically-viable approaches in a project alone; we strongly believe and advocate that clean, drinkable water should be made easily available – and affordable – to the general public, and it is through adhering to this principle that ATC is able to integrate technology with a human touch.'

The company is also currently constructing a similar, albeit larger-capacity water treatment works to serve the 75ha Rasuna Epicentrium, the largest integrated CBD project in Indonesia, and Bakrieland's flagship development in Kuningan, Jakarta. When completed in late 2008, this water treatment facility will be able to provide sufficient WHO-standard drinking water for all dwellings and offices in this mixed development, signalling a serious intention on the part of ATC and its partners to ensure that non-potable water begins to become a thing of the past in Jakarta. ●

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Financing in the field of communal water supply and sewage disposal services in Austria

Austria's water utilities are financed to ensure cost recovery. **STEFAN HEIDLER** and **CHRISTOPH PRANDSTETTEN** explain the detail of how this is achieved.

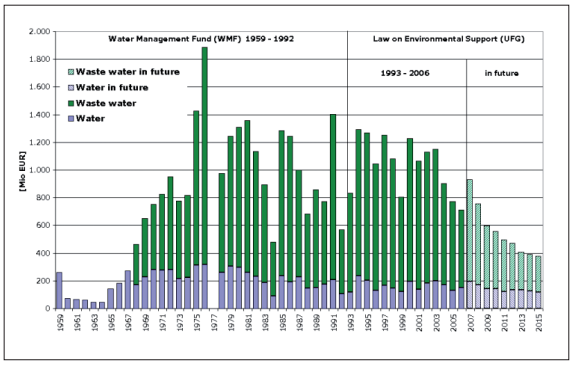


Figure 1: Annual distribution of investment costs for water services

Austria's environmental support scheme for water management ensures and aids the efficient implementation of measures to ensure proper waste-water disposal, including industrial wastewaters, as well as guaranteeing a sufficient local water supply.

Past efforts have already led to immense improvements in the quality of waters in our lakes and rivers. Nevertheless, it is essential to take further appropriate measures to dispose of municipal and industrial wastewaters properly and to provide a sufficient supply of top-quality drinking water.

Between 1959 and 1993 a federal support scheme provided low-interest loans from a water management fund for these purposes. This scheme was focused on water supply and wastewater disposal in cities and other urban areas.

In 1993 the scheme was restructured to ensure an increased focus on developing wastewater disposal systems in rural areas. The support is provided in the form of subsidies on annuities or capital investment grants, and in 2001 the annuity subsidies were changed into financing subsidies.

Since 1959 around €40 billion ($50.6 billion) has been invested in community water services, around €31 billion ($39.2 billion) of the total amount being for wastewater treatment systems. From 1993 to 2006 around €4 billion ($5.06 billion) was spent on water supplies and €12 billion ($15.2 billion) on wastewater disposal to meet legal obligations.

Most of the investments – around 99% – have gone into public utility water and wastewater projects, with just 1% assigned to private services, mostly operated by cooperatives.

Between 1993 and 2006 around €413 million ($523.2 million) was spent on subsidies for water supply services, and €3.96 million ($5.02 million) was spent on wastewater disposal. Over this period, the sources of the average project financing for communal wastewater disposal projects is divided as 33% federal subsidy, 10% federal state subsidy, 35% external funds, 9% equity capital and 13% from connection fees.

For water supply projects the division is 18% federal subsidy, 12% federal state subsidy, 43% external funds, 20% equity capital and 7% connection fees.

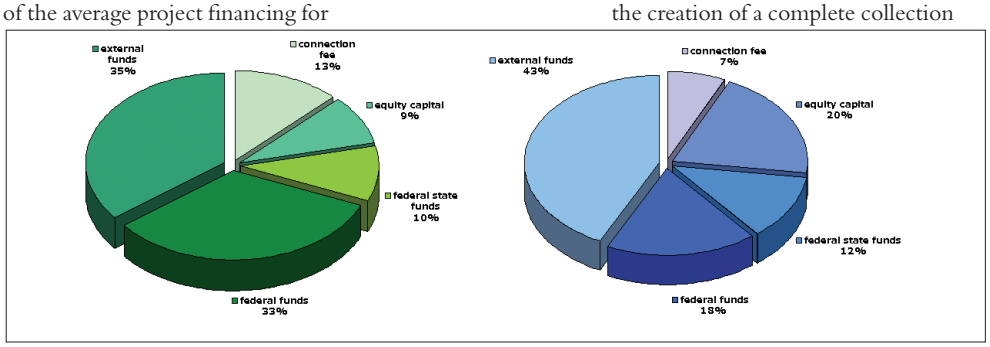


Figure 2: Financing structure of water management

Figure 3: Distribution of future investments for water management

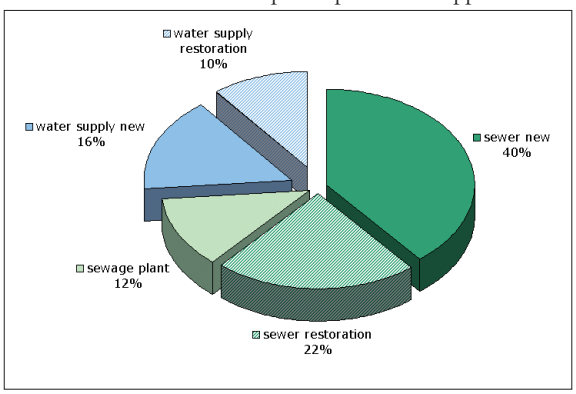
Future investments in water management measures

An investment of around €5 billion ($6.3 billion) has been identified for water supply and wastewater disposal measures to 2015. Around €1.3 billion ($1.65 billion) of this will be for water supply projects and €3.7 billion ($4.69 billion) for wastewater disposal projects. Over this period it is predicted that some 62% of the total investment will be for sewer construction and rehabilitation, and 12% for construction, adaptation or rehabilitation of wastewater treatment plants. The remaining 26% of the investment is required for water supply measures.

Asset inventory of water management facilities

A database installed in 1993 enabled the creation of a complete collection of the established asset inventory of water management facilities. All of the plants constructed before this time can only be valued roughly in line with well-known costs.

Between 1993 and 2006 over 42,000km of sewers and some 10,000km of water pipelines were constructed. The present connection rate to public plants and supplies



will be increased by the proposed investments to around 91%. Most of the capital outlay is for sewer and water pipeline construction, with just 20% of investment on the wastewater disposal side for constructing treatment works.

Fee analysis

The federal regulatory framework for setting rates and charges in Austria is based on two main national laws, the Finanzverfassungsgesetz (F-VG) and the Finanzausgleichsgesetz (FAG). The former authorises municipalities to levy charges, for which federal and regional legislators specify the maximum amount. The latter regulates the scope of municipality action on fees. Municipalities are authorised to cover the investment and operational costs for all their facilities operated for public administration purposes by the collection of charges.

In accordance with the FAG, the total annual charge may not exceed the double annual requirement for maintaining and operating the facilities, interest charges and repayment of the operation's costs.

Municipalities can use the collection of fees as an environmental instrument, particularly for communal water supply and wastewater disposal facilities (the polluter-pays principle). Fee collection as an environmental instrument is limited to the principle of equivalence, and total fees are bound by the principle of cost recovery. In addition, municipalities are bound by further principles: thrift, economy and appropriateness.

In water management, fees are divided between one-off charges such as connection fees and current or operational fees such as water and wastewater tariffs. The scale used for assessing fees is determined by local or regional government regulations. The scale is based on, for instance, annual requirements, water consumption or wastewater disposed of, property size and so on.

Analysis of charges

In Austria there is no unitary system for water and wastewater fees because of the federal structure and the municipalities' sovereignty in fee charging. Tariffs therefore vary both from state to state and within one federal state, from municipality to municipality. The municipalities specify the size and basis for assessing connection fees and operational fees, minimum or basic charges and the exemption clauses in their charging regulations.

The only thing that the fee systems have in common is that they all contain one-off and current fees. One-off fees are unique amounts paid for connection to the infrastructure. The sum involved depends mainly on an 'area for calculation' which is usually based on the amount of developed and undeveloped area, but there are also common flat rates or minimum charges. Current fees are regular payments for water service provision and relate either directly or indirectly to water consumption or the amount of wastewater discharged.

In some areas, there is a heavy polluter surcharge for wastewater discharges with high loadings of pollutants, on top of the current fees. Wastewater and stormwater are calculated differently and connection fees may be raised for discharge of both storm and wastewaters.

Analysis of current levels of cost recovery

Cost recovery results from the quotient of the annual operational and capital costs and the fee revenues. Annual revenues are mostly obtained from fees and charges, with the communal fees constituting the largest element of the charges. Therefore comparing average water and wastewater prices is the best way of representing water services revenues.

The average price of water in Austria is about €1.5/m³ ($1.89/m³), and the price for wastewater is around €2/m³ ($2.53/m³).

Annual costs are the sum of capital, operational and external costs. The capital costs are the sum of cost-accounting depreciation and attributed interest. Operational costs consist of personnel costs, energy and material costs, and the costs of disposing of

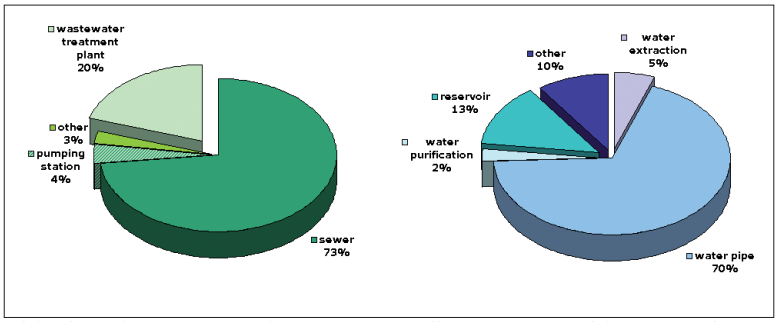


Figure 4: Distribution of investment costs for established asset inventory of water management facilities

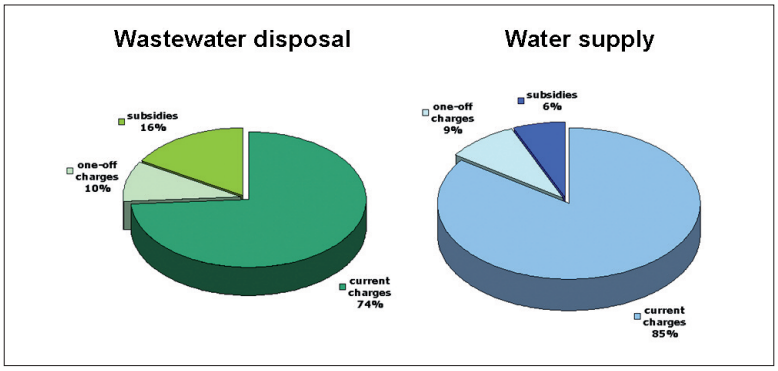
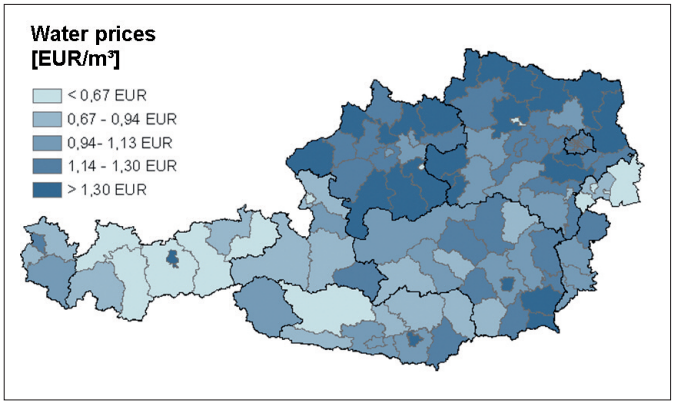


Figure 5: Structure of rates and charges in the Austrian water management



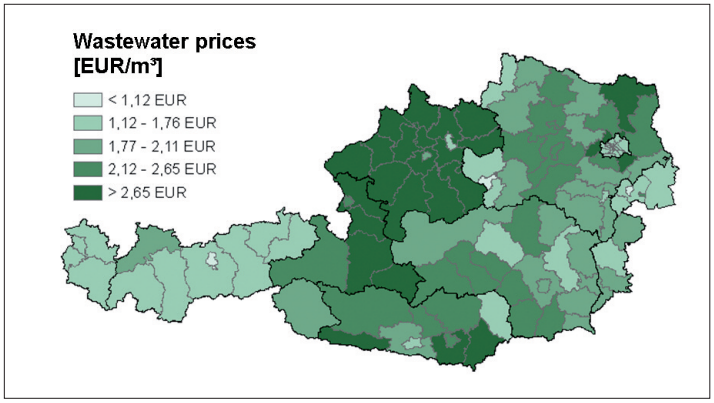


Figure 6: Average water and wastewater prices in the Austrian districts

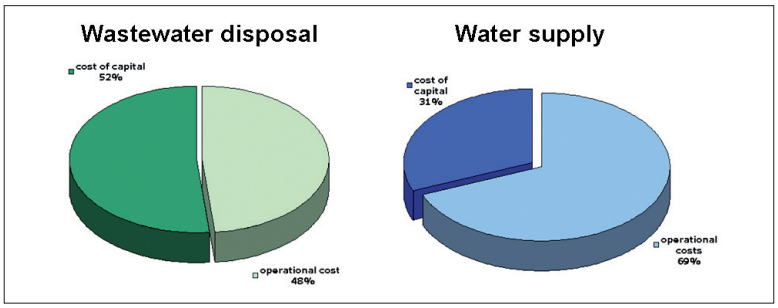
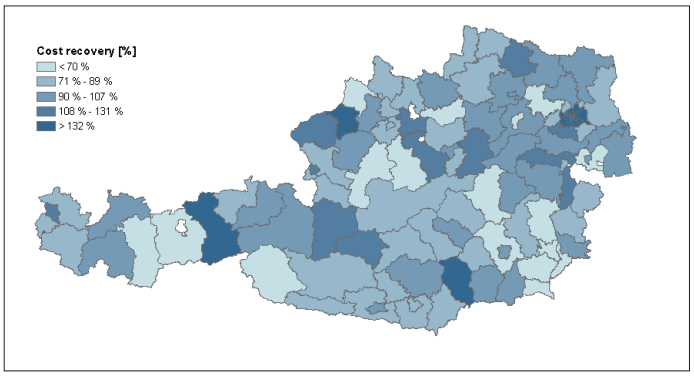
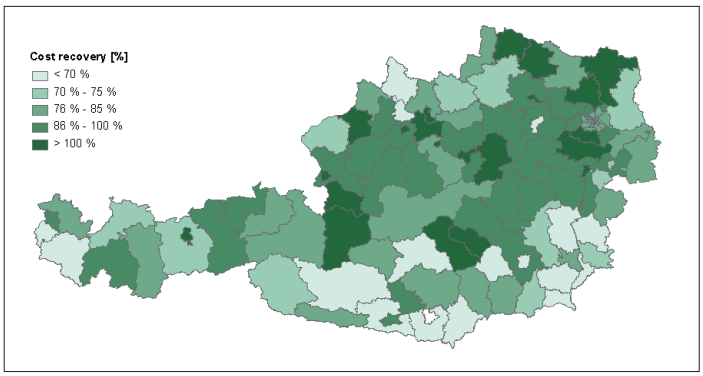


Figure 7: Structure of annual costs for water services





Left - Figure 8: Average cost recovery for water supply services in the different districts of Austria
Right - Figure 9: Average cost recovery for wastewater disposal services in the different districts of Austria

residuals. In wastewater disposal, capital costs predominate (52% of the annual costs) whereas water supply costs are dominated by operational costs (69% of annual costs).

Cost recovery

Cost recovery estimation depends on a number of restrictions and limitations:

- the database reflects the cost-income structure from a short period of time (2002 to 2005)
- the databases do not allow unambiguous estimation of cost-recovery for water services. The data come from municipalities' accounting systems, which partly consider income and expenditures or costs and revenues. The former type does not take into account returns on equity capital and write-offs.

Bearing in mind these limitations, cost-recovery is calculated as a ratio of municipalities' annual income and costs. Cost-recovery for communal water services is around 83% for wastewater disposal and 84% for water supply services (without considering data from Vienna).

One main objective of the support scheme is to guarantee affordable charges for users. Therefore the amount of aid depends on the total costs of investment for wastewater disposal. If the investment over a 25-year period is less than €5.5 ($6.96) per household, a subsidy of 8% is provided. Above €5.5, the subsidy rises to 50% of the investment costs exceed €15 ($18.98) per household. With the aid of the environmental support scheme the required cost-recovery principle can generally be guaranteed.

Prospects and development

With the investments in water management that have been undertaken, most of Austria's population is already connected to a public water supply and wastewater treatment facilities. In future, outlying areas will have to be connected to public systems. Apart from these remaining investments in new water supply and wastewater disposal facilities, reorganisations and changes to existing facilities will become even more important.

New instruments such as the digital cadastral register, a requirement for proper accounting of costs and activities to ensure efficient operation of water facilities and a need to conserve value will come to the fore. To set fees and charges for water management it is necessary to undertake a comprehensive overview of the technical and economic condition of the facilities concerned. Water supply and wastewater treatment facilities are mainly complex, with extensive networks, and should be operated like a private business although they are mostly in public ownership. ●

Kommunalkredit Public Consulting – analysing investment spending in the Austrian water sector

Kommunalkredit Public Consulting (KPC) acts as a partner for public sector clients in Austria and many other countries around the world offering consultancy services for state and local authorities, publicly owned enterprises and international institutions.

KPC supports its clients in identifying and implementing projects, programmes and public support instruments in the infrastructure sector and specialises in offering economic and financial consultancy services during the pre-investment stage of projects. KPC's most important services include:

- needs assessment and project identification
- preparation and review of feasibility studies, project contracts and financing schemes
- appraisal of infrastructure investment projects
- advice on preparation and implementation of PPP-projects
- project management support throughout the project cycle

In Austria, KPC is responsible for the management and implementation of the state environmental grant scheme on behalf of the Federal Ministry for Agriculture, Forestry, Environment and Water Management. Kommunalkredit manages the entire programme including receipt of grant applications, appraisal of project proposals (technical, economic and financial appraisal), concluding grant contracts and fiduciary management (disbursement of the grant funds).

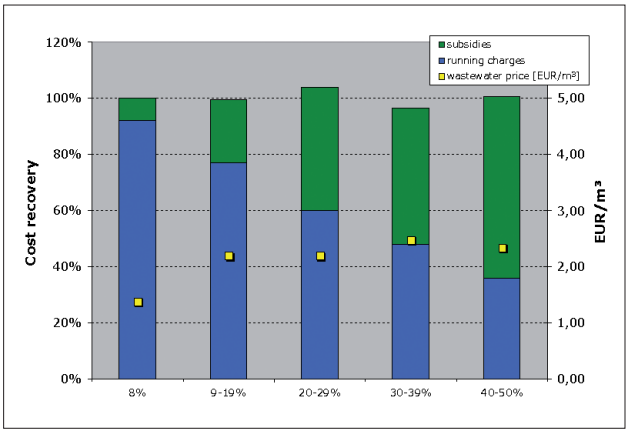


Figure 10: Effect of support schemes to the cost recovery dependent on aid intensity of municipalities

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Teaching the message of being Water Wise

The Water Wise Backpack from Rand Water is a collection of materials, workshops and educational activities aimed at teaching both children and teachers about the importance of protecting and managing water resources in South Africa, with the idea of a backpack representing the range of items necessary for the journey towards conserving water resources for the future, i.e. becoming Water Wise. **GRANT PEARSON**, head of Rand Water's Water Wise Education Team, discusses the Water Wise ethic, and the importance of recognising the value of water.

Water means different things to different people, but all will agree that without water no life on Earth would exist. For millions of years, life has been dependent on water for survival, and today, water holds the key to our survival in the future. Whether water is used for food production, clothing production, shelter, cleanliness and health, enjoyment, art and tradition, or for faith and beliefs, water has value. Many people in South Africa do not value water, and thus do not see the need to conserve this precious resource.

When human activities have an impact on the natural environment it is reflected in the water situation, quantity and/or quality. South Africa has, in general, a limited supply of water. As the South African human population increases, the greater is the demand for water. As a direct result there is an increase in pollution and catchment destruction and a decrease in the quality of river water and the natural environment.

If this is the water situation in the year 2008, what of the future? South Africa can build more dams and water transfer schemes but this type of infrastructure is expensive and not financially viable for the South African population. These dams and schemes also have a negative impact on the natural environment. In terms of water quality, pollution affects the aquatic life that lives in rivers and can spread disease in communities that drink raw water from a river. It also costs more money for water purification stations to clean polluted water. South Africans can clean up rivers and impose fines on those people/companies that pollute them, but these solutions address the symptoms of the problem. The cause of the problem needs to be addressed, that is, people's attitude towards water, as they do not value it.

The future of South Africa lies in the hands of the youth of today, as they will be the leaders of tomorrow. They will be the ones who will be able to make a difference, especially in terms of the water environment. This can be achieved by instilling in young people an awareness of the water situation within South Africa and providing each learner with the resources, be they material or human, that will assist them to take action in order to solve environmental problems, i.e. action learning. Therefore a Water Wise ethic needs to be instilled in all South African youth.

What does it mean to be Water Wise?

To be wise means to take the knowledge you have gained and use it to benefit yourself and other life without causing harm. There are six meanings to be Water Wise:

Respect water, respect life

All life on Earth needs water in order to survive. As water is life, we must respect it and must use it wisely.

Don't waste water

The Earth's average rainfall is 985 mm per year, whereas South Africa receives 492 mm per year. This is nearly half of what the rest of the world receives. Added to this, South Africa has a very high evaporation rate, and has fluctuating periods of floods and droughts. A further problem is water management, as it is expensive to manage the dams and water transfer schemes. Many people in South Africa also do not have access to enough clean water, and have to walk many kilometres to collect water from a river. It also costs a great deal for purification stations, like Rand Water, to purify raw water so that it is safe to drink.

South Africa is presently classified by

Examples of the educational activities used

Experiments: learners are given step by step instructions to conduct a range of experiments that deal with water purification, the water cycle, the properties of water, water pollution, wetlands, wastewater treatment, etc. These experiments are used for primary and secondary school learners.

Games: learners play fun games, involving physical exercise, which deal with water purification and supply, wastewater treatment, water use through the ages, etc. These games are used for primary and secondary school learners.

Puppet Shows: that use fun animal characters that portray the value of water. These shows are used for nursery and lower primary school learners.

Manzi, the TapDuck: Manzi is Rand Water's mascot and he is used to portray the Water Wise message in an entertaining way.

The Water Wise song and dance: the meanings of being Water Wise have been incorporated into a catchy song and dance. At the end of all workshops the facilitators, and Manzi, perform this dance in order to conclude the workshops on a great high.

Water Wise Promise: At the end of each workshop learners and educators are asked to promise to be Water Wise through an illustrated action and a flyer where they sign their name.

Water Quantity Auditing: learners undertake to measure how much water they use on a daily basis. This activity helps them with measuring volumes of water and mathematics. After the activity they must come up with ways in which they can reduce their water usage at school and at home, and then go and practise them. This activity is used for higher primary and secondary school learners.

Water Quality Auditing: learners determine the water quality of a river by using different methods: observation of the catchment upstream of the site that is being investigated;investigation of the water life in the river; determination of the physical properties of the river water using a microchemistry test kit; and determination of the chemical properties of the river water using a microchemistry test kit.

Learners must then work out where the problems in the catchment are and determine whether they can solve them. Some learners undertake a water quality audit for a school project. This activity is used for higher primary and secondary school learners.

Drama: A story called 'For the Love of Water' and 'Water is Life and Life is Water' is acted out for learners, and during the show they interact with the actors. In another activity using drama, learners have to act out the water cycle. This activity is mainly used for primary school and lower secondary school learners, but this depends on the drama and the theme.

Water and Music: learners perform musical instruments that sound like water. This activity is used for lower primary school learners.

Water and Culture: this activity sees the learners having to work out clues in order to find different items that are found within a Sotho-Tswana Iron Age ruin. This activity is aimed at higher primary and secondary school learners.

Nature Walks: taking learners for a walk in nature is a wonderful method of portraying the Water Wise message. To expand on the nature walk activity a treasure hunt has been developed. This activity is aimed at primary and secondary school learners.

Water Wise Roadshow: a script that leads into the Water Wise Dance has been developed in order to be performed at schools and special events. This method is a great way to portray the Water Wise message to very large groups.

the United Nations Economic Commission for Africa (UNECA) as a water-stressed country. 'Water stress is defined internationally as that condition which occurs when water availability per person, per year lies in a band ranging from 1000 to 1700 cubic metres' (Turton, 2006). This commission predicts that in the year 2025, South Africa will be a water scarce country, which occurs when there is less than 1000 cubic metres per person, per year. We must all learn to not waste water.

Don't pollute water

In South Africa the scarce fresh water is decreasing in quality because of an increase in pollution and the destruction of river catchments, caused by urbanisation, deforestation, damming of rivers, destruction of wetlands, industry, mining, agriculture, energy use, and accidental water pollution. It also costs more money for purification stations, like Rand Water, to clean polluted water. We must all learn to reduce the pollution entering rivers.

Pay for water services

Water comes freely from the sky so why do we need to pay for water? Yes, water is free but in order for everyone to receive enough clean water from our taps we have to pay for it. We have to pay for the infrastructure and people that bring this clean water to the taps.

Environmental action

Action means to do something. If we see an environmental problem we must do something about it in order to solve the problem, for example fix a leaking tap, report a leaking pipe and clean up rivers. Many people know the answers to being Water Wise, but people must remember to practice being Water Wise in their daily lives. Take environmental action!

Conserve water, conserve the environment

Water is important, and that is why we need to conserve it. By conserving water we are conserving our environment and ensuring the survival of all life on Earth. All life on Earth is connected. Water is life and life is water, and something that needs to be valued.

Who is Rand Water?

Rand Water is a South African not-for-profit public utility, established in 1903, that has been supplying water in bulk to an area of 18,000 km^2 (Figure 2). Rand Water buys the raw water from the Department of Water Affairs and Forestry, who owns the main source – the Vaal Dam and other dams. This water is then purified at Rand Water's two purification stations in Vereeniging and then distributed to mines, industries and local authorities. The local authorities supply the clean, healthy drinking water to individual homes, businesses and schools in Gauteng and parts of Mpumalanga, North West and the Free State. Rand Water supplies approximately 3550 Megalitres of water per day to approximately 11 million people. In addition, Rand Water is dedicated to improving the natural environment, as well as increasing water awareness and environmental action in South Africa. A number of years ago, Rand Water introduced the 'Water Wise' brand, which is Rand Water's environmental brand, and all environmental projects and programmes within the organisation fall under this brand. How does Rand Water encourage its future customers, i.e. the youth, to be 'Water Wise'? This is done through education, namely the Water Wise Education Team.

What is the Water Wise Education Team?

The Water Wise Education Team consists of dynamic trained staff who are eager to mould the youth (learners), and their teachers, to be Water Wise in an 'edutaining' (educational and entertaining) way. Learners do not learn what it means to be Water Wise by just telling them. They must understand the reasons behind the six meanings of Water Wise, which is achieved through the use of fun, interactive environmental education methodology. The team offers 'edutaining' workshops and education material for nursery schools, schools and tertiary institutions in which a number of hands-on methods are used to impart the Water Wise message. The ultimate goal of this service is for teachers and learners to become ambassadors of the Water Wise message and live a Water Wise lifestyle.

Unpacking the Water Wise Backpack

The path to becoming Water Wise, and thus valuing water, is an expedition (or journey) as human behaviour and attitude needs to be moulded over a period of time. When one goes on an expedition one needs to pack a backpack with necessary items. When one wants consumers, especially young people, to understand the true value of water and become Water Wise, one needs to pack the Water Wise Backpack. Over the past ten years, Rand Water's Water Wise Education Team has had to learn what needs to be packed into the Water Wise Backpack, be it 'edutaining' activities; education material; uniforms; characters; music; etc., that are applicable to learners and teachers.

Water Wise Education Centres

The Water Wise Education Team has four Water Wise Education Centres within the Gauteng Province, which learners and teachers can visit and learn to be Water Wise (Figure 3). At these centres, the learners and teachers interact with the facilitators, in the form of an interactive workshop and the centre itself, in order to be exposed to the Water Wise message.

Delta Environmental Centre is

Water Wise Education Team attributes

Passion for the water environment and education: the passion needs to be inside every person in order for them to portray the Water Wise message to learners. When one is passionate about a topic it is easier to portray that message;

Practice what you preach: one cannot convince learners to change their attitude towards the water environment without practicing Water Wise activities in one's daily life;

Knowledgeable: one needs to have information about all the facets of being Water Wise in order to assist learners on their journey to becoming Water Wise. Staff need to have studied, or have experience in water environmental issues, as well as education. A great deal of training is given to each staff member in order to assist them with gaining this knowledge. Staff are also encouraged to study further for themselves in order to gain the knowledge;

Responsibility: each staff member needs to take responsibility for the workshop programme, and their actions within the programme;

Dynamic: staff need to be able to facilitate workshops in a dynamic manner. Being in 'edutainment', one needs to educate in an entertaining way. One needs to be an actor, as it is through this method that learners will have fun and learn at the same time;

Facilitation Skills: staff need to be able to facilitate the activities, instead of demonstrate or present. Facilitation means that the learners are guided through an activity, with them undertaking the activities and the facilitator there to assist them through the process;

Innovative: staff need to be innovative in two situations:

- Workshops: when facilitating workshops staff may notice that a planned activity is not working. They will have to be innovative in order to change the direction of the activity in order to make it work;
- Resource Development: staff need to be innovative when developing new activities for a workshop or developing education material for printing;

Languages: as South Africa is a diverse country with 11 languages being spoken it is very helpful if one can speak a range of languages, but this is not always possible;

Customer Service: each staff member needs to treat all learners and teachers with respect and deal with issues in a friendly, diplomatic manner;

Time Management: all staff are expected to be on time for a workshop and they need to manage their time within a workshop;

Uniform: each staff member is supplied with a Rand Water uniform and a name badge. These need to be worn at every Water Wise workshop in order to portray a professional company image. The uniforms have been designed that they are comfortable for each staff member and that the learners and teachers can relate to them. The uniform consists of:

Blue denim shirt with the Water Wise and Rand Water logos; Blue denim jeans, Rand Water drymac, Rand Water jersey, Rand Water jacket, and a Rand Water hat. This uniform is provided to the staff free of charge.

Figure 1: The six meanings of being Water Wise can be remembered by looking at the human hand, i.e. five fingers and a palm. This tool is used to portray the Water Wise message to the youth.

situated in Delta Park, one of the largest green areas north of Johannesburg, where a range of wonderful out-of-the-classroom, hands-on watery experiences are offered. Delta Environmental Centre (Delta) is an environmental education non-government organisation that offers a number of hands-on environmental activities for learners and teachers, e.g. birds, mammals, energy, waste, insects, etc. The centre used to be a wastewater treatment works and now houses a range of environmental displays and offices.

Rand Water sponsors all the Water Wise programmes at Delta. Rand Water has a 'Water Wise Room' in the centre, which depicts 'A Journey in the Water Cycle'. This journey illustrates the route that a droplet of water takes from a cloud; through the Vaal Dam catchment, through the water purification process; to the city of Johannesburg, where it is used and abused in a house; down a drain to a wastewater treatment works, where it is cleaned and eventually put back into a river, where it is evaporated back into a cloud. There is a soundtrack that takes the learners and teachers through the journey. The room has funky tables and chairs, which are used for learners and teachers to perform a range of Water Wise activities.

Further to this, Rand Water has sponsored a number of other interactive displays at Delta:

- A Water Wise garden, which is part of a sensory trail for people with disabilities.
- Water through the Ages: this display looks at the way water has been used; the amount of water that is used; and the manner in which it is stored by the San people, the Sotho-Tswana Iron Age people and modern man. This display shows how modern man is using far too much water, more than what is required for his needs.
- The Water Wise Container: in the Delta car park there is a 12 metre shipping container that is used as a garage for the Mazda Wildlife Fund vehicle and the Rotary trailer. In order to ensure that this container is dual purpose, two scenes have been painted on the outer sides, i.e. Life in a Water Wise wetland and Life in a Water Wise river. These underwater scenes are very helpful for learners doing a water quality programme.
- Retrofitting of Delta: the whole centre has been retrofitted with Water Wise toilets and taps. Dual flush toilets, aerators and low flow restrictors have been installed throughout the centre so that learners and teachers interact with the Water Wise message.
- The Water Wise bathrooms: There are two sets of bathrooms at Delta. Rand Water has painted the one bathroom an underwater freshwater scene so that learners and teachers truly experience what it feels like to be under the water in a freshwater river teeming with life that has not been affected by pollution. The second set of bathrooms is to be painted as a waterhole scene.

The Water Wise activities at Delta are co-ordinated by a Rand Water staff member who is assisted by ten Delta staff members who facilitate the workshops. Schools need not pay for a Water Wise programme at the centre, as Rand Water sponsors them. All that they need to pay for is their transport to Delta. If the team has to go to a Nursery School then R5.00 ($0.48) per child is charged in order to cover travel expenses. Fortunately the Mazda Wildlife Fund has sponsored a bakkie (pick-up) and Rotary has sponsored a trailer in order for the puppet show to visit nursery schools. Rand Water contributes finances to Delta on a six monthly basis in order to house the Rand Water staff member at the centre and for the staff that facilitate the workshops. This partnership is maintained through a Service Level Agreement between the two organisations, which is evaluated on a six monthly basis.

Rand Water Nature Centre

The Rand Water Nature Centre is situated on 170 hectares of nature reserve within the Klipriviersberg, south of Johannesburg (Rand Water's Head Office is based within this nature reserve). This nature reserve is used as an outdoor classroom where a number of hands-on activities are offered that transform a learner's day into one of exploration and fun. A thatched lapa (open air room with grass used as a roof) is used as the base for the interactive workshops, which houses recycled plastic tables, chairs and dustbins. The natural surroundings of the nature reserve are a wonderful resource for learners to conduct activities about water and nature. Within the reserve there are blesbok, impala, wildebeest, zebra, porcupines, dassies, mongooses, scrub hares, etc. On the site there are a number of Sotho-Tswana Iron Age ruins. A bridge, made out of recycled plastic, has been laid over the exit to the largest ruin on the property so that learners and teachers can gain access to the ruins without causing a negative impact on this heritage site.

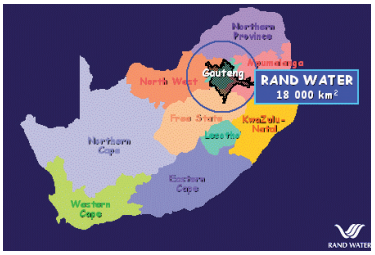

Figure 2: Rand Water's area of supply

The Water Wise activities at the Rand Water Nature Centre are co-ordinated by a Rand Water staff member and three part-time staff, who facilitate the workshops at the centre. Schools need not pay for a Water Wise programme at the centre, as Rand Water sponsors them. All that they need to pay for is their transport to the Rand Water Nature Centre. The bathrooms at the centre have Water Wise devices (dual flush toilets and aerators) installed in them so that the learners interact with them.

Vereeniging Purification Station

At the Vereeniging Purification Station, Rand Water has established a Water Wise Room where water purification activities are offered. The theme for this room is water acting like a train, with good and bad passengers. When water falls on the Earth's surface from the clouds, a lot of substances dissolve in the water, e.g. silt, minerals, bacteria, etc., just like a train picking up passengers. Water is compared to a train that moves along the tracks (the catchment) and the passengers are these substances that get on and off the train. By the time water enters the dams it has many passengers, both good and bad to humans. There is silt and minerals from the land and litter from humans.

On this journey, learners and teachers are taken through the human-made water cycle, using a map, and thereafter make up a mixture of Vaal Dam water. They then have to clean this water using simple equipment, which reflects Rand Water's purification process. Then they are taken on a tour of the water purification station, on the Water Wise express road train. The bathrooms at the centre have Water Wise devices (dual flush toilets and aerators) installed in them so that the learners interact with them. The Water Wise activities at the Vereeniging Purification Station are co-ordinated by a Rand Water staff

member and three part-time staff who facilitate the workshops. Schools need not pay for a Water Wise programme at the centre, as Rand Water sponsors them. All that they need to pay for is their transport to the Station. This centre has managed to partner with the local authority, Emfuleni, who sponsor some of the buses to the centre, which has helped a great deal in spreading the Water Wise message.

Jewish National Fund Walter Sisulu Environmental Centre in Mamelodi

In 2004, the Jewish National Fund handed over the R3 million ($287,000) JNF Walter Sisulu Environmental Centre to the Gauteng Department of Education. The Jewish National Fund raised the money from a number of different companies and private individuals. The Centre consists of one large workshop/lecture room; an administration office; a computer room; Water Wise ablution facilities; and four environmental rooms that have the following themes: waste, energy, biodiversity and water. The Centre is situated alongside the Mamelodi Teachers Centre, on the western banks of the Moretele Spruit in Mamelodi, east of Pretoria. The Water Wise Room at the centre was constructed by funding from Lotto (South African National Lottery) and the Investec Bank, and Rand Water donated the fittings, furniture and the educational content. This room is designed as an underwater river experience and the education activities are designed around the theme that if we as humans continue to waste and pollute our precious water resources then all the beautiful life, that are dependent on water for survival, will be destroyed. The bathrooms at the centre have Water Wise devices (dual flush toilets and aerators) installed in them so that the learners interact with them.

Water Wise 'Edutaining' Activities

The Water Wise Education Team uses 'edutaining' experiential activities, in line with environmental education methodology, from the Water Wise Backpack in order to expose learners and teachers to the Water Wise message (see box). Edutainment is the use of entertainment in order to educate learners. Children must have fun whilst they are learning. They must also be exposed to different experiences, as learning from experiences is the most powerful tool in order to change behaviour. All children are different when it comes to learning as every child learns in a different manner. These different learning styles need to be taken into consideration when developing activities for children (Misser, 2007).

The range of activities continues to grow as the staff develop new ways of portraying the Water Wise message to learners aimed at different age groups, and especially according to learner and educator needs. This is vitally important in order to have learners coming back to the different centres and to spread the Water Wise message.

The South African School Curriculum

Since 1994, the South African school education system has undergone a number of changes that has resulted in a shift from the traditional aims-and-objectives approach (chalk and talk), to outcome-based education (OBE) (experiential learning). OBE considers the process of learning as important as the content (Department of Education, 2002). Learners acquire knowledge, skills and values and attitudes for him/herself by participating in a range of activities, within eight Learning Areas (previously subjects), which are governed by Learning Outcomes and Assessment Standards. The new education system, namely the Revised National Curriculum Statement, builds on the vision and values of the South African Constitution. These principles include:

- Social Justice,
- a Healthy Environment,
- Human Rights, and
- Inclusivity (Department of Education, 2002).

The range of activities offered at the different Water Wise Education Centres can be used to assist teachers in the implementation of the new school curriculum. These activities are presently being aligned with the format of the Revised National Curriculum Statement. Many teachers are battling to come to terms with the new school curriculum, and there is an opportunity for the Water Wise Education Team to assist teachers in the implementation of OBE, and thus spread the Water Wise message.

Figure 3: The four Water Wise Education Centres within the Gauteng Province

Water Wise Education Material

The Water Wise Education Team has produced a range of Water Wise education material, which is found in the Water Wise Backpack, in order to:

- spread the Water Wise message;
- transfer information on water for school projects or general knowledge; and
- assist teachers with the implementation of hands-on activities in the classroom. These materials consist of:
  - Posters
  - Educator kits
  - Videos
  - Story books and comics
  - Brochures and leaflets
  - Music CD
  - Promotional items e.g. t-shirts, waterbottles, collapsible cups, keyrings, etc.

These materials are either given out freely or sold on a cost recovery basis. Many have been produced in partnership with other organisations such as Delta Environmental Centre and the Wildlife and Environment Society. The trend over the past few years is to print this education material on South African recycled paper so that the team 'practices what they preach'.

The Water Wise Education Team has also included various activities and water messages in a range of magazines, newspapers and television programmes, namely:

- National Geographic for Kids
- MiniMags
- EnviroKids
- Readright, a supplement of the Sunday Times newspaper

Table 1: The number of learners and teachers that have attended workshops at the Water Wise Education Centres from July 2000 to June 2008

	July 2000 – June 2001	July 2001 – June 2002	July 2002 – June 2003	July 2003 – June 2004	July 2004 – June 2005	July 2005 – June 2006	July 2006 – June 2007	July 2007 – June 2008
No. of Workshops	190	250	227	274	293	337	359	408
No. of Learners	12,071	15,744	14,422	18,792	19,636	18,585	20,360	36,050
No. of Teachers	825	1127	888	765	975	1199	1228	2080
Total learners and teachers	12,896	16,871	15,310	19,557	20,611	19,784	24,464	38,130

Table 2: The quality of the education service as assessed by teachers

Standard of Service measured by teachers through the use of an Evaluation Form according to financial years:	Overall service
July 2003 – June 2004	91.95%
July 2004 – June 2005	93.2%
July 2005 – June 2006	93.28%
July 2006 - June 2007	95.16%
July 2007 – June 2008	93.57%

- KTV – kids TV programme
- Take 5 TV programme, etc.

Using this media spreads the services offered by the Water Wise Education Team and spreads the Water Wise message.

Education Staff

A very important resource within the Water Wise Backpack is people. There may be a wide range of 'edutaining' experiential activities that look great on paper but they need to be facilitated in order for the Water Wise message to come alive in the learner. Thus the education staff within the Water Wise Education Team need to have particular attributes (see box).

During each Water Wise workshop an evaluation form (workshops, puppet shows, roadshows and water quality testing for school projects) is given to each teacher in order for him or her to complete. The evaluation forms cover two aspects: the facilitator and the programme. Teachers are asked to be as truthful as possible. These forms are handed back to each facilitator. If there are problems identified by the teacher then the staff member in charge at each centre needs to address the problems. Further to this the staff member in charge at each centre needs to assess the staff on a six monthly basis whilst they are facilitating a workshop. A discussion is held after the workshop in order to discuss problem areas and room for improvement and possible training.

Water Wise Holiday Programme

Rand Water has approximately 3000 staff members working at a range of sites all over the Gauteng Province, and many of them have children. These staff children are ambassadors for Rand Water and the Water Wise message. During the three main school holidays (April, July and December) the Water Wise Education Team takes a different Holiday Programme out of the Water Wise Backpack for staff children to attend. A newsletter, called 'Sploosh' is printed and distributed to all staff members in order to advertise the programme. The children then book with a respective person at each of the Rand Water sites, and pay a minimal amount in order to attend the programme.

A variety of Holiday Programmes have been organised to a number of different places, namely:

- Rand Water's Purification Station
- A Wastewater Treatment Works
- A Catchment Tour, to see the route that water takes to get to the tap
- Lethabo Power Station
- Walter Sisulu Botanical Gardens
- The Imax Theatre
- The Johannesburg Zoo
- The Boswell Wilkie Circus
- and many more

These Holiday Programmes have been a great success.

Adult Education

The Water Wise Education Team's focus is learners and teachers. Within Rand Water there a number of methods that are used in order to spread the Water Wise message to the general public, namely:

- Advertisements
- Brochures and leaflets
- Community presentations to garden clubs, rotary meetings, forums, municipalities, etc.
- Sponsorship of events with an environmental focus
- Purification tours
- All Rand Water staff are encouraged to attend an internal course on water that incorporates the Water Wise message.

What is the impact of the Water Wise Education Team?

Attendance Figures

The Water Wise Education Team has been very effective in spreading the Water Wise message to learners and teachers in Rand Water's area of supply (Table 1). The number of workshops has steadily increased, with 408 workshops at the end of June 2008. The number of learners and teachers has fluctuated over a seven year period, and has reached 38,130 in June 2008.

Teacher Satisfaction

During a workshop, each teacher who attends the workshop evaluates the quality of the facilitation and the programme. This is done through the completion of an evaluation form, which is summarised into a percentage. The results of four years of evaluation are summarised in Table 2. As can be seen from these results the service level has continued to be above 90% satisfaction for five years now.

IWA Marketing & Communications Award for 2008

Rand Water's Water Wise Education Team won the prestigious International Water Association (IWA) Marketing & Communications Award for 2008, becoming the first African winner of the award. This award was organized by the IWA's Specialist Group on Marketing & Communications, the purpose of which is twofold:

- To enhance an integrated and sustain able view on Water as the Essential Good.
- To heighten the awareness among water utilities world wide of the increasing importance of establishing professional and effective communications with users of water and water services.

There were five categories within the award, each with its own winner:

- Best popular presentation of water science: WateReuse Association (USA);
- Best promoted water protection activity or programme: Queensland Water Commission (Australia);
- School information programme: Rand Water (South Africa);
- Customer services activities: Linz AG Wasser (Austria); &
- Best water professionals recruiting programme: OVGW – Austrian Association for Gas and Water.

Rand Water's Water Wise Education Team was judged against the winners of the other four categories and were announced the overall winner of the award at a banquet in Vienna, Austria on 10 September, as part of the IWA World Water Congress. Walter Kling, Vienna Congress President and chair of the IWA Specialist Group on Marketing & Communications, commented that Rand Water's Water Wise Education Team are 'really working on a high-class level. It was an easy decision for the jury to pick the overall winner'.

The future of the Water Wise Backpack

South Africa has, in general, a limited supply of water and the quality of this water is being threatened by pollution and the destruction of river catchments. Water is a vital resource and it is up to every South African to act responsibly in their daily lives and look after the available water resources. It is imperative that everyone becomes Water Wise, and most importantly the youth who are the future of South Africa. Education in water conservation is the key to creating Water Wise South African citizens, especially through the use of 'edutaining' experiential activities from the Water Wise Backpack to achieve a behavioural change, i.e. action learning. This behavioural change is a lifelong process. This is why the Water Wise Education Team offers activities for all ages, from nursery school through to tertiary institutions. The changes in the school curriculum (methodology and

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principles) have come about at an ideal time as the education service offered by the Water Wise Education Team can assist teachers in the implementation of the school curriculum. The team is seen as a catalyst in the education process.

Over the past ten years the contents of the Water Wise Backpack have had a great impact on all the learners and teachers that have joined the expedition to become Water Wise. The number of workshops and the number of learners and teachers has increased over the years and the level of teacher satisfaction continues to reach over 90%. The Water Wise Backpack is still not empty. There are many more innovative methods that will materialise from its depths. A number of ideas that have been suggested include:

- more Water Wise Education Centres in Rand Water's area of supply.
- continually revamping the present centres in order to keep up to date with the needs of learners and educators.
- assisting other centres around the country to incorporate the Water Wise message and activities into their programmes.
- continuing to develop new activities and new interactive ways in order to portray the message.
- continue to align the present activities to the South African school curriculum.
- approaching sponsors to assist with financing.
- further partnerships with other organisations.
- the production of education material according to the needs of learners and educators.

There is still a great deal of work that needs to be done to continue to encourage the youth to incorporate the six meanings of being Water Wise into their daily lives, and live a Water Wise lifestyle. The Water Wise Education Team will continue to be a dynamic, innovative team that uses experiential edutainment from the Water Wise Backpack in order for the youth to understand the true value of water and be Water Wise. ●

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Topics of discussion at the Fifth World Water Forum

The right to water and sanitation, improving performance and the management of services are three areas being discussed at the forthcoming World Water Forum. **LIS STEDMAN** reviews what will be covered.

The Fifth World Water Forum, which will be held next March in Istanbul, is set to provide over 100 sessions on 24 topics divided between six themes. Theme four, governance and management and theme five, finance, examine a range of key issues of relevance to water utility managers.

Final session plans were due last month, although details will continue to be discussed until the date of the Forum itself. The scoping papers provide a fascinating glimpse at the diverse range of questions that are likely to be debated during this key event.

From the pre-conference drafts it can be seen that the topics themselves are divided into sub-topic areas, with the first within the fourth theme, topic 4.1, asking pertinent questions about basic human rights issues: will the human right to water and sanitation (RTWS) accelerate progress towards and beyond the Millennium Development Goals (MDGs) or is it an empty promise? What measures need to be put in place by governments to ensure that RTWS is taken into account in sector reform, budgeting and policy formulation?

The session scoping paper provides an overview of the key areas that will be explored within this topic, with the first half focusing on 'supply side' issues and the second on the 'demand-side' of the equation. One aim is to highlight the countries that have put key elements of RTWS into practice at a national level and look at how has this been achieved.

The draft also suggests the conference will look at how political will has been generated and obstacles overcome in such countries. The proposals note: 'All states have recognised RTWS as part of the right to an adequate standard of living (for example, in the Habitat Agenda) and about 20 to 30 have the right to water in national legislation or policy. However, use of RTWS to drive reforms at the national level is embryonic in most countries.'

The draft also notes that it is important to look at the evidence that does exist on use of RTWS in order to address a number of questions such as whether this emerging practice indicates that the promise of this right can be realised, the lessons that can be learned, and how resistance to RTWS was overcome within government.

The session will also look at whether it is possible for governments and other actors to move beyond the MDGs, and how transition countries – those on the brink of recognising or implementing the RTWS – can be helped to move forward, and the main obstacles to implementation. Also under examination will be the approaches taken to convince skeptics, and how utilities have overcome local authority and land ministry objections to provide water to informal settlements.

There are also plans to look at the role of the United Nations (UN) human rights system, and how governments can ensure the RTWS for those relying on small-scale provision of water and sanitation. The session will also discuss the targeted measures that water and sanitation sectors have taken to ensure they do not discriminate against or neglect socially excluded groups such as nomads or the ill.

The second session on the topic will look at the key outstanding questions about duties corresponding to the RTWS – although many have been answered in a number of publications, the answers are not well known, or sufficiently clear, or raise practical questions.

Plans include discussion of what minimum standards should be for countries with massive levels of lack of access and insufficient resources, and whether the affordability element of the RTWS, and the percentage of resources to be provided, can be expressed in precise numerical terms.

This session will involve all the actors with roles in national water and sanitation programmes, focusing on those that have set trends or are actively considering implementing RTWS, and the discussions will focus around

evidence from country programmes.

Topic 4.2 looks at improving performance through regulatory approaches. The background overview stresses the criticality of water, the increasing issue of water scarcity and the obvious crisis of increasing demand and inflexible state-assured supplies. The preamble also observes the difficult legal status of groundwater and determining its recharge rates, quality and direction of water movement, and looks at the three basic rules that cover its use.

The first of these, the so-called English rule, is one of absolute ownership, where the overlying landowner can abstract any quantity at will regardless of the effect on the water table at a neighbour's land. The American rule, or rule of reasonable use, limits these rights in relationship to the overlying land. The third rule is the appropriation principle, in which water is allocated for specific uses. Even within the US alone, all three approaches are used.

There are a number of sub-questions, one looking at the types of measures through which groundwater withdrawals could be best controlled by users to reduce groundwater mining, at what costs and for what level of efficiency. Pricing will clearly be an issue, because the additional information observes: 'If water is sensibly priced and regulated, cropping patterns for many water-intensive crops will change. Right use of pricing policies both for water and electricity will not only promote efficiency and environmental sustainability.' The draft recommends that the Forum should debate the implications of the perverse subsidies that can be seen in many water-stressed environments.

The draft notes: 'Governments often justify current subsidies for water on equity grounds. Producer subsidies for water-intensive produce such as oilseeds, sugar, wheat and beef create incentives for investment, patterns that lead to overexploitation of underground water. The under-pricing of irrigation water creates disincentives for conservation. There is a further suggestion that the Forum 'should discuss the challenge of electricity subsidies, which maintain artificially high demand for water.

Other sub-questions include discussion of the types of measures that could be used to reduce non-point source pollution of ground and surface waters, with the debate possibly focusing on the ability and sophistication of the authorities to regulate discharged pollutants under water quality standards, and what strategies can be adopted to deal with stormwater volume and pollution in the face of more extreme weather events and urbanisation. This session will also look at the policies that should govern groundwater recharge measures to ensure water quality safety and stabilisation of the water table.

Topic 4.3 looks at ethics, transparency and empowerment of stakeholders. Again the main question is formed as a preamble focusing on the problems that remain and their impact on areas such as hunger, education, gender equality and child life expectancy, suggesting this crisis is a problem of governance rather than scarcity.

It is planned that the session will look at whether the three elements of governance contribute, and to what degree and how, to tackling universal access to potable water, increased sanitation coverage, environmental enhancement and security of food supplies.

The related sub-questions include the knotty problem of what 'participation of users' really means at different geographic levels for water resources and water services management, and – with regard to costing and pricing of water services – what priority measures need to be taken to increase transparency and whether international standards should be designed to improve the situation.

The session will also look at the advantages and disadvantages of having international guidelines and standards, and how 'outcome' can be added or integrated into monitoring systems to reward a good process. It will also ask what the different models of user participation are and the different conditions for their effectiveness, and how to empower water users for water governance at grass-roots level.

Topic 4.4 looks at optimising public and private roles in water management, with the main question focusing on the finding of the UN's 2006 Human Development Report that 'polemics about the respective roles of public and private sectors in water management are a distraction from addressing the real needs of populations to access to water and sanitation services.' It goes on to observe that after a decade lost in controversies, the question for responsible public authorities is now how to take advantage of the various sectors' capabilities to address the many challenges that remain, such as universal access to safe water, to sanitation, pollution removal, water scarcity, and climate change mitigation.

The sub-questions include a look at the institutional arrangements that should be implemented to make best use of the qualities and virtues of the public and private sectors, and if water authorities should have the right to choose how to manage their water services, or whether their options should be limited by law.

This session will also look at the key elements of the relationship between the responsible water authority and its operator, whether public or private, that need to be formalised to ensure efficient delivery of services, and whether 'contractualisation' is the way forward. It will also ask whether all operators should be regulated by the same public bodies, with similar rules, and what the operational value is of opposing public and private sectors when both have key roles to play and indeed compete in open markets.

Topic 4.5 looks at a specific situation that occurs in the majority of countries, in which water supply and sanitation services are managed by local operators directed and controlled by politically-responsible water authorities or local governments. The main question looks at what kind of enabling environment the state should provide and what kind of arrangements are necessary between the responsible water authority and its operator to make water management efficient and effective, and how the resulting efficiency should be monitored.

The sub-questions ask what central government should do to enable decentralised water authorities to undertake their task, and how to structure and adjust national financial constraints to answer both national and local needs following decentralization, as well as how central governments should facilitate access to finance for local water bodies.

The scoping paper also observes that it is necessary to have clear targets and appropriate means for all operators to deliver the expected results of policy objectives and asks how governments should establish their own related commitments.

It also poses the question whether, in order to assess the efficiency and effectiveness of local drinking water management, it is more useful to compare results with other water utilities in different regions that have different constraints, or to chart the progress made by the utility itself over time.

The fifth theme focuses on another key area, finance, with topic 5.1 examining sustainable means of financing local authorities. For this session, the main question asks how local utilities should expand their overall sources of financing and financial efficiency though their relationship with local governments.

The related sub-questions look at a range of issues – for instance, in the light of the ongoing process of devolution of governmental responsibilities to state or local level,

which is a key external process affecting water utilities, how local governments can become more reliable financial stakeholders, create incentives for utility managers to make more productive investments to expand coverage and improve service, and allow utilities become more creditworthy borrowers.

Further, the paper observes that public financing in many developing countries is scarce or unavailable, and that poorer nations have significant constraints on their overall capacity to borrow that are closely linked to public utilities' financing capacities. Given these, and related financing issues such as how to expand the sources of financing available, it asks whether local water authorities should be allowed to access private finance and under what circumstances, and which financing policies can promote an easier transition from public to private sources of financing.

The preamble also examines the aftermath of decentralisation, and the fact that financing largely tends to be confined to major cities at the expense of poorer and more remote regions. It asks (on bridging the financing gap) how subsidies should be used to promote efficiency and incentives for boosting cost recovery through user tariffs.

The session will also look at when decentralisation is not the preferred institutional option for water supply and sanitation services to local communities, given the evident problems across the world where such action has not, in a number of cases, produced a noticeable improvement in local infrastructure services.

Topic 5.2 looks at pricing strategies to ensure fairness and sustainability, observing in the introduction to the main question that pricing strategies respond to multiple policy objectives, that is, the so-called 'four sustainabilities' which are financial, social, economic and environmental.

The introduction observes that it is essential to ensure sustainable financing for operating, maintaining, expanding and upgrading infrastructure, and that financing ultimately only has three sources – user tariffs, taxation and/or transfers from governments or official development assistances (ODAs), and repayable financing. Tariffs obviously play a crucial role, but policy makers have to reconcile the need for sufficient revenue with their other policy objectives. The first questions look at the need to clarify the implications of this, asking what the trade-offs are between the objectives that policymakers have to take account of when designing pricing strategies and whether these can be designed to respond simultaneously to the expectations of policymakers and society.

The main focus will be on two objectives, namely defining the characteristics of water pricing strategies that have been implemented in the field and that manage at the same time to ensure sufficient financial resources to guarantee good quality services, maintain the infrastructure and invest as needed over the long term, and how to achieve fairness between various categories of water-users and promote universal access to water services.

As with the other topics there is a range of sub-questions, starting with the issue of meeting multiple objectives and asking whether there is a pricing mechanism that simultaneously provides or adequately contributes to financial sustainability, universal access, fairness, equity and efficient water use.

Moving on to financial sustainability, the intention is to ask whether revenue requirements should be estimated to ensure the financial sustainability of water and sanitation services, and whether revenue requirements should be fully recovered through water tariffs. Or, on the other hand, whether full cost recovery should be a long term goal, and if so, how financial sustainability can be ensured in the short run.

Looking at social sustainability, the debate will focus on how different pricing strategies respond to the intended purpose of fairness and equity – for example, how to balance the cost of new expansion of water and sanitation systems fairly between those who have and those who do not have access to the service.

Another question, which is strongly linked to the financial sustainability issue and may be merged with this question ahead of the forum, relates to the link between efficiency and water pricing, asking when costs are too high and not appropriate for consumers to pay through user tariffs, and when it is necessary to focus on cost reduction.

The remaining questions will look at the current practices in pricing for sanitation and wastewater management and how to assess the fairness and efficiency of the different pricing systems, and at the political process and tariff reforms, asking how governments can implement tariff strategies that respond to their objectives and needs.

Topic 5.3 moves on to pro-poor strategies, noting that over the next two decades, the bulk of the population growth in developing countries will be concentrated in urban areas, particularly in small and medium-sized cities.

In Africa, informal settlements currently account for an estimated 50% to 60% of the urban population and many of these urban dwellers will be poor. Providing effective water supply and sanitation services to the poor generally, and the poor in informal settlements specifically involves water and sanitation providers facing a number of significant challenges, among them the fear of not recovering costs, which can have a negative effect on the water utility.

Experience indicates that services to low-income urban populations can be significantly improved through innovative management and financing mechanisms and by building on community and private sector initiatives. It notes: 'Often many assumptions are made about the poor, including that they will consume less water and sanitation services, and are unable or unwilling to pay for such services. To get the policies and instruments right to better service the poor, it is important to have a proper understanding of how the poor differ from the non-poor.'

Following on from this, the first question will look at how the poor differ from the non-poor and how this affects their demand for services.

The session will then focus on another thorny issue, the responsibility that a public utility has to meet the needs of the urban and peri-urban poor. Many utility managers struggle with the twin pressures of providing access to the poor and reaching financial targets with as little financial support as possible. The question here is how utilities can address the needs of the poor without jeopardizing their overall financial viability.

The next question focuses on small-scale providers, which can operate either independently of more formal water utilities or as an extension of them. They include private water kiosks, water vendors, private borehole operators, water tankers and latrine pit exhausters, Non-Governmental Organisations (NGOs) and community-based organisations delivering services to their own community. Given their often-vital role, the question asks what the experience of small-scale providers is in servicing the poor.

All of these scoping papers are being sent to key institutions for comment and further drafts will appear on the Forum website, with various session coordinators meeting in February to agree a range of key details such as a final list of questions and stakeholders to develop the topic ahead of the conference, and other activities being undertaken either through the website or at various interim events to firm up submissions for what looks likely to be a critical World Water Forum. ●

Practical tools for assessing accountability

A World Bank report released earlier this year aims to clarify how utilities can improve their services by addressing their accountability to users. **LIS STEDMAN** discusses the tools included in the report.

Accountability is a topic that is being increasingly discussed in the context of water and waste-water services, with the situation in the developing world in particular seen as of grave concern and a stumbling block to achieving the Millennium Development Goals (MDGs).

Earlier this year, the World Bank issued a relevant addition to its series of Water Working Notes, titled 'Ways to improve water services by making utilities more accountable to their users: a review'.

Written by Witwatersrand University professor Mike Muller, policy specialist Robin Simpson and World Bank senior water and sanitation specialist Meike van Ginneken, the report has a very specific remit – identifying a range of practical mechanisms, or tools for accountability, that have been used to make water supply and sanitation services providers more responsive and accountable to their users, and making them available through this report to developing world water utilities.

Ms van Ginneken explains: 'The report provides added value – it links what utilities in the US and Europe do with the softer side of participation that NGOs (Non-Governmental Organisations) are interested in.'

In terms of the drivers for the report, she notes that 'on one hand we all talk about accountability, but we don't document it very well, or what it means in practical terms. World Bank task managers preach about it but there are not a lot of practical examples they can give when utilities come round to their point of view and want to take up their advice. The report fills in the blanks in an area considered important by everyone, but where there is not a lot of practice.'

As the introduction to the report explains: 'After a decade of mixed results from private involvement, formal regulation, and decentralization, most water services in developing countries are provided by poorly regulated municipally-owned service providers whose performance often leaves much to be desired. But some of those utilities are now seeking to provide better services by adopting new styles of management and administration.'

Yet in seeking to improve, public utilities are often at a disadvantage compared to private ones in terms of understanding where their responsibilities lie – as the report explains, 'the public sector has an often-fuzzy mandate and is governed by a complex set of priorities, incentives, and oversight institutions. In contrast, private operators are driven by financial incentives and usually held accountable for explicit operational goals by a formal regulator. But, users expect more of private than of public organizations, and private utilities also need to systematically improve their relationships with users.'

The importance of this is emphasized in the observation that while considerable attention is placed on utilities' financial and technical governance, the voice of users is often muted. One result is that service providers do not take account of users' priorities and preferences, so the utility in turn loses the trust and cooperation of the community it is supposed to be servicing. This vicious circle causes further service deterioration and even more alienation among users.

The review aims to help those working in and with water utilities as well as organised users, regulators and policymakers to improve the quality of their services by making providers more accountable to users.

Traditionally, the note explains, there has been a 'long route' of accountability with users relying on politicians to maintain oversight of budgets and compliance with rules, and to intervene on their behalf when things went wrong. It adds: 'Modern approaches to public management seek to hold service providers more directly accountable to their users for the outcomes of their work. Providers are expected to ensure that water flows safely and reliably from taps, that blocked drains are cleared, and that services are accessible and affordable to all. Accountability in this context is about establishing a direct "short route" between users and service providers.'

Ms van Ginneken adds: 'There was a premise in the old days that the way that utilities were accountable was through the government – users had a voice through electing their representatives. But we've seen in the past decade a shift to much more direct accountability – users calling utilities more directly to account.' The basis of the new approach is in a range of ideas expounded over the last five years, developed by other organizations but given a practical edge by the new report. Ms van Ginneken notes: 'We found that where this research stops we could add specificity.'

The report identifies a range of practical tools to help achieve this 'short route' – what Ms van Ginneken calls a 'taxonomy' of 14 tools utilities can use to listen and consult with users. She notes that the tools range from 'simple information tools such as annual reports, consultation, through open meetings and surveys to participation where not only are users consulted but binding promises are made upfront, through to recourse and redress – the most famous example being utilities' customer complaints systems.'

The report notes that while there has been a great deal of theoretical and advocacy writing on this topic, there has been little structured investigation of how the tools work in practice.

Ms van Ginneken observes: 'We found that some tools have been used, but in isolation, sponsored by donors and not really embedded in the utility. Our main conclusion is that in applying tools it is not a case of finding one and spending a lot of money on implementing it, but on using a suite of tools and really embedding them in the utility.' She adds: 'I think this is the first attempt to match the tools to their environment.'

Another issue raised by the report and highlighted by Ms van Ginneken is

Success factors

These are defined as:

- a supportive environment: a reasonably supportive environment is needed beyond the water sector. Basic corporate governance and legal frameworks must be in place, with acceptance that political interests should not simply override administrative processes.
- acceptance: the broad concept of accountability needs to be accepted, not just by utilities but also by regulators and governments at different levels.
- sufficiently broad agreement: within the sector, there needs to be sufficiently broad agreement about the application of tools if they are to be useful. Accountability is a process that builds trust but a certain degree of trust is needed from the start.
- order: there is a logical sequence for the introduction of accountability tools, related to the state of the utility and its evolution. Some tools are prerequisites for others, so there are some critical paths (although not one set path) for building up a suite of accountability tools.
- public capacity: for accountability tools to be effective, their application must be accompanied by the development of public capacity among utility users. Users' ability to engage with their service providers will need to evolve as accountability moves from simple information exchange to more substantive engagement in utility management.
- strong leadership: this is required from the top, and must respect and be able to mobilise the engagement of the utility staff, and is needed to embed accountability tools effectively in a utility's day-to-day operations.

The footnote to the success factors notes that 'efforts to achieve effective accountability should not be delayed until the conditions seem right. This review finds plenty of evidence that the energetic application of the tools described here can itself help to transform the broader environment. That outcome, just as much as the provision of cost effective, reliable and safe water supply and household sanitation, needs to be kept at the forefront.'

that often where the tools are most needed they are most difficult to implement. She notes: 'If you are in a city where the utility is dysfunctional, coming in with sophisticated tools is not helpful.'

She makes a plea to 'keep things simple' – for utilities first to build a relationship and trust, and not jump in with complex, expensive tools such as sophisticated electronic surveys that they may never repeat. 'Just make sure the information is available, and know where to go to start to bridge the gap.'

As the report notes, some of the best-known tools, promoted by external actors such as donor agencies, NGOs and research institutes, may not be the most appropriate for application by a community of users or within a utility itself because they often entail a level of detail that is interesting for specialists but highly demanding in practice.

The report provides examples of country studies and personal interviews to complement the available literature and provide an overview, structured analysis, practical guidance and sources of further information for managers looking to design and apply the tools to improve the performance of their utility.

Importantly, the review also explores how the tools can fit into a utility's overall activity. It also notes that the tools will often only be effective when used as part of a broader process of institutional development, such as policymaking and legislative process. Some factors critical to the success of the tools are discussed, but broader institutional development processes are beyond its scope, as is building and supporting civil society capacity, which is seen as a separate though important issue.

Within the case studies, the report examines where they have succeeded (PUB in Singapore, for instance) and – it stresses, just as importantly – where they have failed (for instance, in Haiti), and draws lessons from this. There is, however, a basic problem of interpretation. Ms van Ginneken says: 'We found a lot of cases were documented as successes by the people implementing them – there was not a lot of objective evaluation.'

The authors found that there was very little supporting data – Ms van Ginneken adds: 'There is a need for a lot of work on individual cases over a longer period of time, looking at whether the tools are sustainable over time, whether they are cost efficient – a lot are expensive, to the user or to the utility – and whether they are inclusive. For instance, membership of a board may be captured by particular groups. There are key questions – are the tools inclusive, efficient and sustainable? There is work still to be done.'

She gives an example that illustrates the problem of data acquisition aptly – the Delhi Jal water board in India. The board implemented a complaints system and on the surface, it seemed to be working well – the number of complaints was decreasing. However, a local NGO looked more deeply into user satisfaction with the situation and it turned out that the system was very expensive to use and not effective.

'There were not many resolved complaints, even if the users were right,' she comments. 'The cost for the user if you include travel costs and time lost making the complaint at the central office – which was the only place you could make a complaint – was up to twenty times the average water bill.'

The NGO also discovered that over half of complainants waited more than six months to obtain a ruling, and that once the complainant was judged to be right, in only 45% of cases did the utility act and solve the problem. 'So you see the complaints go down, and the utility said things were going well, when the main reason they were down was that people did not bother to make complaints.' However, she adds: 'Finding out what is going on and whether the complaint system works is quite difficult.'

The report's audience will obviously include utility managers but also those involved in developing countries such as donor representatives, consultants, ministries and consumer groups. Ms van Ginneken explains: 'Although the report is not written from a consumer perspective – there are a lot written from this perspective already – it gives a nice insight into how utilities think.

Success factors, also outlined in the report (see box), are about 'applicability in context', she adds. 'When we did the work we found a lot of examples from certain countries. It might be to do with what was documented, and it might be to do with the capacity of civil society to take up the role.' Brazil, for instance, was found to have a large number of members in user groups, due largely to the governments' willingness to open to direct participation.

The wide range of factors required to enable the tools to succeed underlines the complexity of the task, and thus the soundness of the World Bank's advice to start simply and embed tools within the organisation's activities before moving on to more advanced systems. Hopefully, this report can help change the approach to accountability within developing world utilities, and increase awareness of the value that accountability tools can add both for the utility itself and for its customers. ●

Valuing and pricing water services

Impact of cost-recovery on equity, economic development and biodiversity

There are differences of opinion when it comes to paying for water for domestic use. **ALAIN MATHYS** discusses his view on the need for water pricing.

There are intense debates on water pricing. Development institutions and many professional associations involved in water management have explained that without cost recovery of water services, at least for operation and maintenance cost and preferably the full cost, a water system cannot be sustainable. However, how can sustainability be achieved without looking at the environmental costs, such as overexploitation of water resources and the degradation of receiving water bodies due to the absence of appropriate treatment of the effluents? And their economic impact on human activities, public health and economic development? Obviously, the full value of water goes much beyond economic aspects.

Water is a free gift from God or Nature. However, the collection, distribution and cleaning of water is not free and must be paid by someone.

The legitimate costs of the development of water infrastructure and of the management of water services must be covered either by users through water charges or by direct government subsidies coming from taxpayers.

The purpose of this paper is to discuss the relation between investment, water pricing, effective services and sustainable development. Huge investments are needed, in both emerging and industrial countries, to meet human and biodiversity needs. Current investments and spending worldwide are much too small to ensure safe access to water for all, appropriate sanitation services, and wastewater treatment before its disposal in the environment. As an example, India is a country where water and sanitation services (urban and rural) are particularly poor. According the to the World Bank, India would have to invest around US$ 50 billion in the next ten years just to meet the Millennium Development Goals for Water and Sanitation[1].

In developing countries today, over one billion people have no access to drinking water and three billion people are not connected to piped water that is distributed in the house or just outside (yard). It is estimated that, by 2050, around 3.5 billion people will live in regions affected by water scarcity. Billions of dollars of investment in infrastructure development will be needed to quench the thirst of these populations. To face these challenges investments in water infrastructure will grow significantly, production costs and operation and maintenance costs will increase as well. This will result in a significant impact on prices. Therefore, like oil, prices for water will increase. In 2007, Global Water Intelligence (GWI), a water market journal, calculated that global water utility tariff rose by 5.9%. The highest percentage rises came from Eastern Europe and Russia: Tbilissi in Georgia: 100% increase, Rostov: 78%, Bucharest: 72%, but also in some developing countries (Calcutta: 67%).

There is a general consensus on the need to invest significantly more money for the development of water resources and infrastructure. There is no such a consensus however on how water access and services should be priced.

Water utilities play a key role in managing investments, maintaining the state of the asset and operating the water and sanitation systems. It is interesting to observe that, according to a World Bank study in 2005 on utilities serving 132 major cities worldwide, only 30% of them recover entirely their cost (operation & maintenance and investments) from the tariff paid by customers, 30% cover only the operation and maintenance costs and 40% do not cover their operation and maintenance costs. In low-income countries, close to nine out of ten utilities are unable to finance their operating costs from the tariff.

We can deduce from these data that either many utilities worldwide receive significant subsidies from the State; or that they are unable to cover their operation and maintenance costs, resulting in a progressive deterioration of the system.

In the first case, a highly subsidized tariff may induce at least two negative aspects: cheap water may result in resource wastage if the economic signal of the price is absent; on the other hand, large subsidies from public budget is a blank cheque to inefficiency: there is no incentive for the utility management to work hard, be more efficient and provide a better service when they cover all their cost even with a mediocre service.

The vicious circle of low tariff leading to the deterioration of infrastructure is well known. This is a very common situation in cities of developing nations: networks that just serve the centre of the city, with intermittent service and high unaccounted for water (UFW) and no resources to finance the expansion of networks required by the

urban growth.

Efficient utilities need effective management autonomy and financial integrity. Given the monopolistic nature of their activities they must be given performance targets and must be accountable for service quality standards. However, water too often is a political issue that is confined to the short term interest of many politicians. Tariff increases are always unpopular. Elected officials often prefer postponing needed tariff adjustment than risking social discontentment.

A sound tariff policy is crucial to ensure the sustainability of water services, to maintain the integrity of the asset and infrastructure, to make the necessary investment to serve the poor and protect the environment. Where water resources are scarce, the water tariff should encourage water conservation and avoid wastage. It should also ensure that every family, including the poorest ones, do not dedicate a too high proportion of their household spending for water. With this purpose in mind, increasing block tariffs have been widely used, with the assumption that small consumers are poor and should pay less and large consumers are rich and can pay more.

Many studies have demonstrated the inefficiency of increasing block tariff as a redistribution mechanism. On the contrary, it often affects more the poor who share connections, for instance. A much better approach is the use of social policies via targeted subsidies and support to household spending (since a poor family has numerous needs, including education, food, water and so on). In developing countries, subsidies should be directed first in financing the cost to access to services (distribution networks in low-income areas and the payment of connection fees).

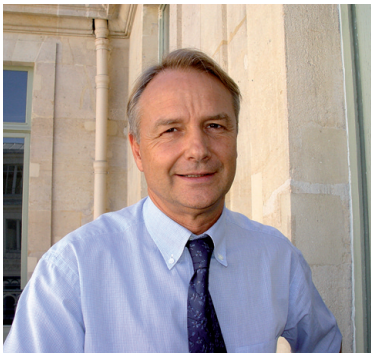
Peak tariffs, summer tariffs or specific surcharges linked to the severity of drought can be used to curb demand, using the principle of demand elasticity to price. Operationally, this implies the reading of meters at short intervals (less than a month), which is rarely the case in many industrialized countries. The use of price increase and elasticity of demand for water to reduce consumption often affects poor households to a greater extent and can produce unpredictable effects in term of revenues for the water utility. Often, good results have been obtained during periods of drought by public campaigns encouraging people to save water and prohibiting certain usages of water (car washing, garden watering etc.)

It may be in the long-term interest of the consumers to pay more for water. When the water tariff is significantly below the actual costs, the utility is unable to properly maintain and renew the investments. The quality of the service will progressively deteriorate, leakage increases and the expansion of infrastructure needed to cope with the urban growth, particularly for poor communities, does not take place. Not being aware of the water value, the lucky customers receiving water at a cheap price have no incentive to make efficient use of this resource. Little resource is available for sewage treatment resulting in degradation of ecosystems and threats to biodiversity.

Better tariffs will give utilities more resources to invest, to deliver higher service quality, to treat wastewater, to protect the environment and to expand networks in underserved low-income areas. Various studies have shown that consumers are willing to pay higher water bills when the service is reliable. Moving towards full cost recovery will allow providers to cover their overall costs and, especially in developing countries, will allow them to serve communities who are not currently connected. Natural resources will be conserved and the biodiversity will be protected.

However, guaranteeing a water company full recovery of its cost should not be a blank cheque to inefficiency. Tariff increases should be tied to performance improvements. Significant efforts need to be dedicated to reducing non-payment and to repairing leaking water pipes. There is also the need to be imaginative in targeting the subsidies to counter the potential negative impacts of higher tariffs on poorer consumers. ●

[1]Millennium Development Goals for Water and Sanitation: target set by the UN in 2000 to half the proportion of people without safe access to water and sanitation by 2015. India is a country where water and sanitation services (urban and rural) are particularly poor.



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Aqua Enviro Technology Transfer: Managing the Catchment - Flows, Loads and Sewers
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Ozwater '09 - Australia's National Water Conference and Exhibition 'From Challenges to Solutions'
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Joint CIWEM/CLG Conference: Water and Planning: Planning Guidance for Water Issues in Sustainable Development
24 March 2009, London, UK
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