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Water loss coaching

CUSTOMER RELATIONS

The risks of reaching a customer satisfaction threshold



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Assessing utility health using performance and vulnerability



FINANCING



Upgrading Jamaica's water and sanitation services with an innovative financing solution

Donors pledge to expand investment in improving watsan services worldwide

Donors at the second UNICEF and World Bank high-level meeting on water and sanitation for all recently announced plans to greatly expand access to improved water and sanitation for millions over the next two years.

Ahead of the World Bank's Spring Meetings in Washington, DC, government ministers from almost 40 developing countries met with UNICEF executive director Anthony Lake, UK International Development secretary of state Andrew Mitchell, chair of the UN Secretary General's Advisory Board on Water and Sanitation HRH the Prince of Orange, and major donors and water and sanitation

sector organisations, to discuss speeding up global access to water and sanitation.

Ministers from developing countries also promised to provide millions that already have access to improved drinking water sources with access to improved sanitation.

The meeting committed to designing innovative new projects, working with the private sector and non-governmental organisations, and extending access to improved drinking water sources and sanitation facilities to millions more ahead of the 2015 Millennium Development Goals (MDGs) deadline.

Dutch minister for European affairs and international cooperation, Ben Knapen,

announced new cooperation between The Netherlands and the UK to bring water and sanitation to an additional 10 million people in nine countries, mainly fragile post-conflict states in west and central Africa.

The initiative will involve match funding for the Netherlands and UK contributions from UNICEF and recipient countries.

At the meeting, USAID administrator Rajiv Shah announced that that organisation will join the Sanitation and Water for All Partnership, and Australia's foreign minister Bob Carr also announced that Australia would also join the partnership. ●

ADB study reveals upsurge in Asia-Pacific PPPs

A new study commissioned by the Asian Development Bank (ADB) has revealed a boom in public private partnerships (PPPs) in the Asia-Pacific region over the past decade, but warns that more effective public sector oversight agencies, and in some instances more political will, are needed to advance the process further.

The 2011 Infrascopes, from the Economist Intelligence Unit, used a benchmark index system to rank the readiness and capacity of a country to carry out sustainable, long-term PPP projects.

Woochong Um, deputy director general of the ADB's Regional and Sustainable Development department, said: 'In order to leverage the \$8 trillion required over the next decade for physical infrastructure in Asia, public financiers like ADB must undergo a complete change of mindset and shift their focus from sovereign projects to PPPs. Studies such as this one will help our developing member countries address the areas of PPPs that need to be strengthened.'

The assessment, of 11 developing economies in the region alongside four benchmark countries and one state, Gujarat in India, shows an increasingly open environment for PPPs, though with individual countries at different stages of readiness.

The Republic of Korea, India and Japan, are the top performing countries in Asia and the Pacific, reflecting their robust institutional and regulatory frameworks. Two benchmark countries, Australia and the UK, were the overall top scorers.

India came in slightly ahead of Japan, reflecting strong political will and rising capacity for PPPs, although problems with implementation remain a challenge, the report notes.

The study also found that China had performed well with a mammoth 614 PPPs reaching financial closure between 2000 and 2009, despite a relatively underdeveloped institutional and regulatory environment. The strong willingness and capacity of provincial governments for

carrying out PPP projects, a friendly investment environment, and the sheer scale of the PRC market for infrastructure drove activity, it added.

Vietnam, Mongolia, and Papua New Guinea were at the lower end of the index, because of a lack of experience with PPPs and underdeveloped institutions and regulatory frameworks. However the study found that they, and other emerging economies such as Pakistan, Bangladesh, Kazakhstan, Thailand, Indonesia and the Philippines, are moving swiftly to put in place the necessary laws and structures to attract more private investment.

At the same time, the study notes that while overall prospects for PPP development remain bright, governments need to continue reforms and address capacity gaps for the design and implementation of effective projects. 'It is the capacity of the public sector to be able to react systematically to the complexities associated with PPP projects that will ensure long-term success,' the study concluded. ●

ADB sells second Water Bond

ADB recently sold its second Water Bond to Japanese investors to help finance its work in the water sector. Denominated in Turkish lira, the bond was issued in February and will provide significant impetus to a wide range of water supply and sanitation, wastewater management, irrigation and drainage, water resources and environmental protection projects, along with technical assistance to improve the governance of the water sector by way of reforms and capacity development.

ADB's total issuance of Water Bonds is \$940.61 million, across five transactions, of

which \$585.8 million (four transactions) is currently outstanding. The funds raised do not go toward specific projects but go into a large pot of money which is used as and when projects require it. But what the bank does assure investors is that it will disburse to water or water-related projects an amount equivalent to the funds raised over the life of the bond.

Maria Lomotan, Principal Treasury Specialist in the ADB's Treasury department, explains: 'ADB's Water Bonds answered an investor desire to be associated with investments that

highlight specific kinds of activities – in this case critical water-related projects – in developing Asia. In this way, the instruments were both an opportunity to invest and an opportunity to be allied with a social need.'

She adds: 'For ADB, Water Bonds were a way to highlight investment into an area of critical need in the Asia-Pacific region where hundreds of millions of people still don't have clean water to drink. Pollution and climate change are also contributing to the growing scarcity of freshwater sources.' ● **LS** See *Analysis*, p7

Stakeholders look for party status as Monterey Peninsula water project goes to public consultation

The Monterey Peninsula Regional Water Authority (MPRWA) has been seeking official party status ahead of the first public consultation session on California American Water's proposed water supply project with the Monterey Peninsula Water Management District and the Monterey Regional Water Pollution Control Agency on 6 June. The proposed supply project aims to provide a replacement water source for local customers ahead of a state-ordered cutback in abstraction from the Carmel river that is due to come into force by the end of 2016.

The proposal is for a three-pronged approach that combines a desalination plant, aquifer storage and recovery and groundwater recharge.

The Monterey Authority argues in its submission that it has a duty 'to protect the social, environmental, and economic interests of its member cities, and to help ensure the transparent development of a reliable water supply for the Monterey Peninsula'.

The public session was due just days after the end of the official comment and response period on 4 June, which California Public Utilities Commission judge Gary Weatherford told local press was due to the 'time sensitive' nature of the proceeding 'against a backdrop of years of failed initiatives'.

The Monterey Peninsula Regional Water Authority (MPRWA) is a so-called Joint Power Authority that consists of six cities: Carmel-by-the-Sea, Del Rey Oaks, Monterey, Pacific Grove, Sand City and Seaside.

A number of other stakeholders were looking for official party status as *WUMI* went to press, including Monterey County, the county Water Resources Agency, the Coalition of Peninsula Businesses, the Marina Coast Water District, and WaterPlus.

California American opposed the granting of this status to the latter two, arguing that Marina Coast was only interested in obstructing the proposal and the original WaterPlus mission of promoting a public purchase of the private firm put it against the proceeding's goals. ●

World Bank energy efficiency assistance programme releases analysis and advice

The Energy Sector Management Assistance Program (ESMAP), which is administered by the World Bank, has released a primer concerned with energy use and efficiency of network-based water supply and wastewater treatment in urban areas.

It focuses on the supply side of the municipal water cycle, including the extraction, treatment, and distribution of water, and collection and treatment of wastewater, and how these activities link to energy efficiency. With electricity costs forming a significant portion of operating costs in many utilities, ESMAP says that improving energy efficiency is key to reducing these costs, allowing for expansion of water services.

Despite challenges such as the condition and age of facilities, technologies used, and energy prices, etc., ESMAP says there is evidence that significant energy savings at utilities in developing countries can be attained cost effectively through adopting efficiency measures described in the primer. ● **LS** See *Analysis*, p8

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MWH awarded Qatar drainage asset management programme

MWH Global has been appointed by Qatar's Public Works Authority as management contractor for the five-year Qatar drainage asset management programme.

In this role the consultancy will support the authority's aim of achieving world-class asset and operational management services, MWH says.

The programme is part of Qatar's National Vision 2030 infrastructure investments, which include highways,

railways, utilities and related services, and is a response to a growing economy and population and the decision to allow the country to host the FIFA 2022 World Cup.

MWH and its subcontractor Scottish Water will begin work immediately within the authority's Asset Affairs Directorate, to create and deploy the drainage asset management programme, which will improve residential and commercial drainage services throughout the country.

MWH Global will manage the operation and maintenance of all drainage assets, including the wastewater treatment and collection systems, treated wastewater effluent systems, stormwater and surface groundwater systems.

MWH was also recently awarded the Qatar Integrated Drainage Master Plan, which involves identifying the country's drainage infrastructure and water resource needs for the next 50 years. ●

World Bank loan to improve public infrastructure in China

The World Bank has approved a loan to China to improve public infrastructure and services for residents and businesses in a number of small towns in Guangdong, Gansu and Hunan provinces.

Small towns play a significant role in China's economic development and urbanisation process, the bank says. As a group, they absorb 40% of the country's rural-urban migrants and employ up to 70% of the labour force.

However, small towns face a number of challenges. For further growth, they need new and better roads, increased water supply and wastewater treatment capaci-

ties, and new marketing infrastructure and support services for small- and medium-sized enterprises.

In the bank's assessment, they need to improve waste management, optimize use of scarce resources and adopt clean and environmentally friendly technologies to reduce greenhouse gas emissions and mitigate climate change impacts.

The integrated economic development of small towns project aims to help the governments of these provinces to adopt and show a comprehensive economic development approach to addressing these challenges.

The project will finance construction or rehabilitation of urban and rural roads, expansion or modernisation of water supply and wastewater treatment facilities, solid waste management system improvements, river embankment rehabilitation, and expansion and modernisation of irrigation infrastructure. The project will be implemented in 28 small towns with a total population of around 1.5 million.

The total project cost is estimated to be about \$300 million, with the World Bank loan financing half the amount and the other half covered by counterpart funds from the provincial governments. ●

New book takes on water sector 'myths'

A new book from Welsh water expert Dr David Lloyd Owen, titled 'The Sound of Thirst', aims to present a moral, economic and sustainable case for financing the many trillions of pounds of work needed worldwide in the coming decades to ensure safe water for all. The Sound of Thirst explores how the human right to water is about empowering people to make reasoned

choices – and how mismanagement and political expediency have contributed to global inequality, says the book's publisher, Parthian.

The book was launched at this year's Hay literary festival in Wales at the beginning of this month, where Dr Owen focused on the UK's water sector in particular, where he said that Britain's failure to update its water

and wastewater infrastructure to reflect its growing population is leading to an increased threat of sewage infiltration into water sources. He also claimed that providing water for free is 'a costly myth' and that the reuse potential of wastewater means that 'if we can get the fear factor out of sewage, it is a fantastic opportunity.' ●

LS See Analysis, p10

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, WUMI 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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Publishing

Veolia Water to optimise New York city's water and wastewater services

Veolia Water has signed a partnership contract with New York city, the US' largest municipal water and wastewater utility, to optimise its public water and wastewater services and make significant annual savings.

In Phase 1 of the OpX programme, which is under way, an evaluation of the performance of the existing water and wastewater systems is being undertaken that will result in recommendations to improve performance and reduce operating costs.

As part of this agreement, a combined team of New York City Department of Environmental Protection and Veolia employees are working with Veolia Water's partners, McKinsey & Company and Arcadis to look for efficiencies and process improvements in operations and maintenance.

A number of areas are being reviewed including operations optimisation; reduction in energy; use of asset management principles and programmes; increased production within process chains; better and more efficient use of chemicals and inventory management and procurement.

Once this phase is completed, improvements that the city chooses will be carried out in Phase 2, which will implement the recommendations.

For the four years of Phase 2 (which is renewable for a further two years if the public authority wants), Veolia Water will optimise the performance of the water and wastewater services, improving their productivity and efficiency levels. The services will continue to be managed directly by New York City using its own personnel.

Veolia said in a statement that the contract will enable the Department of Environmental Protection to achieve savings of between \$100 to \$200 million annually on operation and maintenance costs, representing a budget of \$1.2 billion.

Veolia will be compensated on the basis of savings achieved and documented. Estimated overall revenue could be worth \$36 million, the company said in a statement.

'Our team in New York is supporting a publicly managed and employed model,' said David Alexandre, Veolia Water's programme manager for the DEP project. 'Working closely with McKinsey & Company and Arcadis, we're intent on executing a very deliberate and thoughtful programme to yield as many benefits for New Yorkers as possible.' ●

Metro Manila to improve wastewater collection with World Bank loan

The World Bank has approved a \$275 million loan for a project to improve wastewater collection and treatment in several catchment areas of Metro Manila, and to help improve Manila Bay's water quality.

The Metro Manila wastewater management project (MWMP) will support investments by the two water concessionaires – Manila Water Company and Maynilad Water Services – to increase collection and treatment of wastewater from the metropolis. The city generates around 2M.m³ of wastewater each day, and the water companies have agreed 25-year plans to ensure 100% wastewater collection and treatment.

With a population of almost 12 million people, Metro Manila is in the Laguna lake-Pasig river-Manila Bay corridor. Interconnected by more than 30 tributaries, most of these bodies of water are highly

polluted. In December 2008, the country's Supreme Court passed a key decision mandating the clean up, rehabilitation, and restoration of Manila Bay's water quality to recreational levels.

Manila Water Company will spend \$193.4 million on a wastewater treatment plant and associated network covering north and south Pasig, and Maynilad will spend \$178.3 million on wastewater treatment plants and associated infrastructure in Quezon city, Pasay, Alabang, Muntinlupa, Valenzuela, and a septage treatment plant in the southern part of Metro Manila. Currently, just 17% of the metropolis' wastewater is treated before discharge.

Finance Secretary Cesar Purisima welcomed the approval of the new financing, saying the project will boost the country's efforts to clean up the water

bodies around Metro Manila. He said: 'Water quality improvements in rivers and other water channels in and around the metropolis including Laguna de Bay and Manila Bay will help to improve the environment, and eventually enhance recreational and tourism opportunities.' World Bank country director Motoo Konishi said the project is part of the bank's broader programme of support for Metro Manila urban renewal, which includes work on flood management, disaster risk management and slum upgrading.

He added that that inadequate sanitation imposes severe costs on the economy and the population. Economic losses from inadequate sanitation nationwide, due to health costs and impacts on water quality, tourism and welfare are estimated at around 1.5% of gross domestic product. ●

Beijing set to spend millions on well water quality improvements

Drought-hit Beijing is to spend Y118 million (\$18.7 million) by the end of the year to improve the quality of drinking water from wells in the city. Drinking water quality for around 300,000 people will be improved following modifications to 54 wells, the Beijing Water Authority said. The first tranche of improvements will be made to wells with known safety risks and to those that serve areas that do not have a potable water network.

Bahia seeks funding for potable water projects

Northern Brazil's Bahia state government is asking for federal funding for 26 potable water supply projects including five priority works worth \$180 million. The largest individual asset is the Vitória da Conquista dam, at R130 million (\$63.64 million), with a further R104 million (\$50.9 million) due to be spent on the second phase of a water supply project that will serve 79 towns and villages, the state government said in a statement.

Guyana ministry launches wastewater fund to improve standards

Guyana's Ministry of Housing has launched a Waste Water Revolving Fund as part of a range of moves to align the country with international standards and best practice. The G\$3 million (\$140,000) Global Environment Facility-funded pilot project will improve wastewater management systems around the country. The four-year project will complete in mid-2015.

Organisations pledge to support water and sanitation efforts

Representatives from several international organisations have pledged to promote investments in water and sanitation infrastructure as key steps toward the elimination of cholera from the island of Hispaniola's sovereign states of Haiti and the Dominican Republic. The pledges were made during the launch of a new regional coalition on water and sanitation for the elimination of cholera on Hispaniola.

Agbar's Aqualogy wins Santa Maria master plan work

Agbar's integrated water solutions brand Aqualogy is to undertake the basic sanitation master plan for the municipal council of Santa Maria, in Rio Grande do Sul state, Brazil, which has a population of 260,000. The project will include the water and wastewater networks, stormwater drainage and waste.

Compesa opens to bids for its Recife PPP

Brazil's Pernambuco state water utility Compesa is now accepting bids for its \$2.3 billion public-private partnership (PPP) water and sanitation service improvements contract in Recife, the state capital. The state-PPP partnership is for 30 years, and the investment will take state sanitation coverage from 30% to 90%.

BT pension scheme buys into Thames Water

The BT Pension Scheme has bought a 13% minority stake in Kemble, Thames Water's parent company, from funds managed by Australian bank Macquarie. The UK's largest corporate pension scheme said it was 'seeking to increase its exposure to domestic infrastructure investments that have a natural linkage to UK inflation'.

IADB approves funds for rural Colombia watsan work

IADB has approved a loan for \$60 million for Colombia to help increase rural coverage of efficient and sustainable water supply systems and wastewater management.

Red Cross launches Zimbabwe WASH project

The Zimbabwe Red Cross Society has launched a \$3 million water, sanitation and health project in Chivi Masvingo, Zimbabwe. The four-year project will benefit 100,000 people in 400 communities in the district. Through this project, 50 new boreholes will be drilled, 350 run down boreholes rehabilitated and 3400 latrines will be constructed.

World Bank agrees funds for municipal services improvements

The World Bank has approved an additional financing loan of €37.2 million (\$47.8 million) for the FYR Macedonia municipal services improvement project. The work aims to help the country in responding to the twin challenges of increasing investments in municipal services and infrastructure while tackling shortcomings in municipal performance and capacity.

EBRD supports Romania infrastructure upgrade

The European Bank for Reconstruction and Development (EBRD) is supporting further modernisation of water and wastewater infrastructure in Romania with a R55.5 million (\$16 million) loan to SC APA Canal SA Galati, the water utility for Galati county in the south-east of the country. The project will benefit about 400,000 residents.

The loan will co-fund an EU-approved investment programme of R551.7 million (\$159.2 million) designed to improve the quality of existing water services in the county in line with EU directives.

The EBRD financing will be used to modernise water supply and wastewater infrastructure in five towns – Galati city, Tecuci, Targu Bujor, Pechea and Liesti.

SC APA Canal SA Galati will use the loan to finance investments in water treatment, supply and distribution networks as well as wastewater collection and treatment in the project areas.

The project will also enable the company

to significantly reduce water losses and improve the quality of water and wastewater services provided by the utility.

Jean-Patrick Marquet, EBRD director for municipal and environmental infrastructure, said: 'With this important investment, the EBRD is continuing to play a key role in providing finance for the modernisation of Romania's water sector. This new investment... will help bring the operations of SC APA Canal SA Galati in line with EU environmental standards and ensure quality water supply and sanitation services to its customers.'

An €200 million (\$248.8 million) regional EU Cohesion Fund co-financing framework was launched in 2010 to support important investments in Romania's water and wastewater infrastructure, helping local water utilities to bring their services up to EU environmental standards. To date the framework has mobilised more than €1 billion (\$1.24 billion) of EU funding in Romania's water and wastewater facilities. ●

ICE's call for universal metering sparks debate

The Institution of Civil Engineers (ICE) in the UK has called for 'decisive and prompt' action to tackle the UK's water security, including phased universal metering.

In its annual 'State of the Nation' report, ICE also recommends the development of new water storage facilities across the country, the removal of regulatory barriers that discourage water sharing between neighbouring companies, and 'collaborative' investment in new infrastructure. Universal metering should be accompanied by social tariffs to protect the poorest, ICE suggested.

The report says changing pricing structures to reflect the true value of water and building smaller but more evenly distributed water storage facilities across the UK will be crucial.

Chair of the ICE Water Panel, Michael Norton, noted in a statement that there is no 'silver bullet' solution, adding: 'We are a populous nation facing a growing gap between what we can supply and what our water users need. Sadly it's only when hosepipe bans are inflicted on us that the public has any glimpse of this reality. We have a valuable opportunity while water is in the forefront of the nation's minds to impress on the public the real value of this resource and we mustn't squander it.'

'The changes ICE is recommending will require some upheaval to current regulations as well as firm decisions on how to forecast future demand, but once done we would see the effect relatively quickly.'

The GMB union, which represents water workers, criticised the call for compulsory water metering. The GMB National Secretary for Utilities, Gary Smith, said: 'This ICE call for compulsory water meters is based on the mistaken conclusion that water in the UK is scarce. It is not. Less than 2% of rain that falls in the UK is used in households and industry while the rest runs off eventually to the sea. Blaming citizens rather than water companies for shortages is a cop-out.'

'What needs to be done to avoid running out of water is to store more water from times of plenty to be used at times of scarcity and transfer it from places with surplus water to areas with shortage at times of drought.'

Severn Trent also issued a statement disagreeing with ICE. It said: 'We do not agree with the idea that universal metering will solve drought issues. Whilst metering is a good way for our customers to only pay for the water they use, it's more important for us to help our customers understand why it is important to use water wisely.' ●

World Bank approves financing for Ethiopia's watsan aspirations

The World Bank has approved additional financing of \$150 million to support the Ethiopian government's efforts to provide urban citizens with improved sanitation services and achieve universal water supply coverage by 2015.

The project will increase access to improved sanitation facilities for around 1.5 million mainly low-income, urban residents in Addis Ababa,

Gondar, Hawassa, Jimma, Mekelle and Diredawa, by promoting household latrines, hygiene and sanitation practices and constructing communal sanitation facilities.

As a result of the project, water production will increase from 210,000 to 360,000m³/day in Addis Ababa city and from 23,500 to 50,000m³/day in the five secondary cities.

The water distribution network will

be extended to serve 400,000 more people (40,000 connections) in Addis Ababa and 500,000 more people (50,000 connections) in the five secondary cities.

The project will also instill awareness of water conservation among customers. As well as providing improved water and sanitation services, the project will help to substantially reduce water losses. ●

High-level panel urges action on sewerage in India

An Indian parliamentary panel has asked the country's ministry of housing and urban poverty alleviation to act to complete sewerage and drainage projects under the Jawaharlal Nehru national urban renewal mission.

The panel noted that almost 50% of households in cities like Bangalore and Hyderabad do not have sewerage connections and just 21% of wastewater is treated.

A report from the panel warns that

4861 of 5161 cities in the country do not even have a partial sewerage network, and that sewerage systems in major cities such as Delhi are discharging untreated wastewater directly or indirectly into water bodies. ●

ANALYSIS

Water Bond spurs investment in Asia-Pacific projects

Earlier this year the Asian Development Bank sold its second Water Bond in a move to address the needs of millions in developing Asia that still lack access to water and sanitation services. LIS STEDMAN spoke to AMY LEUNG about ADB's operational plan in the Asia-Pacific region.

The Asian Development Bank (ADB) Water Bond sold to Japanese investors will see the bank provide assistance to an amount 'at least equal' to the net proceeds of the bond for water-related projects in the Asia-Pacific region, said the bank when it announced the February sale. The Turkish L474.5 million (\$260 million) bond, maturing on February 26, 2015, will pay an annual coupon of 6.29%.

Amy Leung, director of ADB's Southeast Asia Department Urban Development and Water Division and Chair of Water Community of Practice, explains that ADB's water supply projects in urban areas normally involve either constructing new systems or rehabilitating and upgrading existing ones. Construction of new systems covers source development – surface or groundwater reservoirs, transmission and distribution networks, and connections to households. Rehabilitation and upgrading of existing networks are intended to improve service to existing customers and connect additional households.

She adds: 'In some cities and urban

centres in the Asia-Pacific region, 24/7 service is not yet a norm, so in addition to financing capital investment, we help with capacity development and institutional reforms to encourage governments to provide more sustainable and reliable services.

'In rural areas, our projects typically include source development, storage tanks and distribution networks, but no household connections, only tap stands placed in strategic locations to serve 15 to 25 households. In some areas, usually more remote locations, the focus is on installing point source hand pumps to draw water from artesian wells,' Ms Leung explains.

'We are also pushing for more investments in sanitation and wastewater management,' she adds. 'Sanitation projects typically involve construction of household, public, and school toilets while wastewater management covers construction of wastewater treatment plants and sewerage networks. Many countries still find it expensive and unaffordable to

invest in wastewater management but countries like China and Indonesia have taken steps to invest.'

Without disposal and treatment of wastewater, pollution of rivers is inevitable, which has a knock-on effect on water resources, and will eventually require more treatment to be usable. This is one key reason why the ADB is pushing for increased attention to sanitation and wastewater management, in parallel with investment in water supply provision. 'They should go together. We have to protect the environment,' she says.

Tackling non-revenue water

Last year the ADB approved its ten-year Water Operational Plan to 2020. 'In the case of urban water supplies, the plan is advocating an aggressive push to reduce non-revenue water (NRW)', Ms Leung explains, particularly where the services are not 24/7.

'The costs of rehabilitating existing networks to prevent commercial and physical losses are much lower than developing new water sources, so this is a much

more cost-efficient investment,' she notes. It is also an urgent issue – in urban areas where between 30% to 70% of the water put into distribution is lost. 'Money has already been spent on treating this water,' she adds. 'The estimated volume is 24 billion cubic metres. Assuming a charge of 30 cents/m³, water utilities are losing almost \$7 billion a year. If we could cut that in half, 124 million people could be supplied with water without the need for developing new sources. It is an area we are really trying to push over the next ten years and it is something doable.'

Ms Leung cites the classic example of Cambodia's capital, Phnom Penh, where general director Ek Sonn Chan of Phnom Penh Water Supply Authority pushed for significant improvements and NRW was reduced from 70% in 1993 to the current 6%. 'Cambodia has demonstrated that it is doable,' she says.

ADB's operational plan also promotes wastewater reuse, as a source of additional water for domestic, agriculture and other uses. 'In the process of treating wastewater you can harvest energy and nutrients,' she explains. Appropriate technologies for differentiated needs are key here. Ms Leung says: 'We are ready to work with countries that are prepared to go into this.' Investments in wastewater should of course go hand in hand with major river clean-up which again is not cheap but delaying it would eventually cost more, she adds.

Supporting sustainable development

In addition, ADB has other projects that

cover water resources management at river basin level, and provides funds for irrigation and drainage and watershed, wetlands and ecosystem protection and preservation.

'We will continue to support water resource management, which is increasingly important – we speak of the water-food-energy nexus, and it is important we see water as a resource that needs to be protected and sustainably managed because of the wider impact on the economy,' she explains.

Most projects come with technical assistance to implement reforms, and capacity development, so that the improvements are sustainable. Among the improvements ADB tries to implement are recovery-based tariffs. 'In developed countries, people are used to paying for water services. In most developing countries, people are used to it being provided free or at a highly subsidised rate. In cases where full cost recovery is not affordable, we promote partial cost recovery, at least to recover the full cost of operation and maintenance, with the government initially subsidising the capital cost and hopefully eventually phasing out subsidies and moving towards full cost recovery,' Ms Leung says.

To achieve this, the regulatory environment also needs to be improved, she notes. 'Utility performance must be monitored, for instance non-revenue water, asset management and services. Governments should have some regulation, first developing it and then enforcing it. Regulation is not just for when the private sector is involved. Public-managed utilities

need as much regulation and should be run along commercial principles and business practices to become self-financing one day. An independent regulatory body is ideal.'

The ADB water bond will help increase ADB's lending in the water sector, she adds. Up to 2020, the bank is hoping to sustain \$2.5 billion in annual lending, of which the water bond funds form a significant element but by no means the whole.

She adds: 'We also want to increase the share of sanitation and wastewater projects. This is currently at 14% and we want to increase it to 25% over the next ten years, and raise the private sector financing target to \$500 million a year to 2020, excluding hydropower.'

'The bank will also, as indicated above, try to ensure that all the water supply projects under the water bond are working towards ensuring that utilities are on their way towards corporate governance. We are also targeting that at least 80% of our water supply projects designed from 2012 onwards include non-revenue water as a major component.'

Ms Leung concludes that ADB is also maintaining close collaboration with development partners, including donors, for additional financial and knowledge resources. It will also continue to enhance partnership with the private sector not only for additional private financing but also for increased access to latest technological advances in water, wastewater and irrigation. ●

Energy efficiency primer highlights importance of utility management

The Energy Sector Management Assistance Program (ESMAP) has published a primer on energy efficiency for municipal water and wastewater utilities that highlights utility governance as a major issue.

LIS STEDMAN spoke to one of the authors, **SEEMA MANGHEE**, about the primer's key findings.

The Energy Sector Management Assistance Program (ESMAP), a global knowledge and technical assistance programme administered by the World Bank, provides analysis and advice to low- and middle-income countries. It aims to increase their know-how and institutional capacity to achieve environmentally sustainable energy solutions, with a view to reducing poverty and generating economic growth.

This primer is part of ESMAP's knowledge clearing house function. It also informs World Bank staff working in urban water supply, wastewater management and energy about the opportunities and good practices for improving energy efficiency (EE) and reducing energy costs in municipal water and wastewater utilities.

The document emphasises that improving energy efficiency is at the core

of measures to reduce operating costs at water and wastewater utilities, since energy often represents their largest controllable operating expense. It concludes that, since many EE measures have a payback period of less than five years, investing in EE supports quicker and greater expansion of clean water access for the poor by making the systems cheaper to operate.

For cash-strapped cities, improving the

energy efficiency of water and wastewater utilities helps alleviate fiscal constraints, while also reducing the upward pressure on water and wastewater tariffs. ESMAP's Energy Efficient Cities Initiative (EECI) was launched in 2008 to support municipal energy efficiency scale-up in World Bank operations and client countries.

Energy efficient supply

The primer, whose authors are Seema Manghee, Feng Liu, Alexander V Danilenko and Alain Ouedraogo, deals with energy efficiency in network-based water supply and wastewater treatment in urban areas. It focuses on the supply side of the municipal water cycle, including the extraction, treatment, and distribution of water, as well as collection and treatment of wastewater – activities that are directly managed by wastewater utilities. On a national or global level, improving energy efficiency of water and wastewater utilities reduces the need to add new power generation capacity and reduces the emissions of local and global pollutants.

Electricity costs are a significant element of water utilities' operating costs. Typically they are between 5 to 30% of operating costs in the developed world but up to 40% or more in some developing countries, the primer notes.

One of the primer's authors, Seema Manghee, explains that 'in fact, the World Bank has been working on energy efficiency in water and wastewater utilities for decades, but not using that exact term. The term 'energy efficiency' started being used a lot more over recent years ago with some successful energy efficiency investments implemented in India, Mexico, Moldova and Ukraine through World Bank-funded projects. Today, everyone is talking about energy efficiency and that is very positive.'

In Ukraine, electricity may account for up to 55% of operating costs, she says. 'The relatively high electricity consumption of Ukraine's water and wastewater utilities must be seen in a historical context. It is hard to imagine today, but in Soviet times, energy was considered so abundant that energy efficiency was not a priority. As a result, Ukraine has one of the world's most energy-inefficient economies. Water supply and wastewater utilities consume 4% of all electricity production and that EE measures can reduce that to about 2.2%.'

Due to the high technical and engineering capacity in Ukraine and not having to pay for energy use during those times, she highlights a legacy of vastly oversized

treatment plants. The systems were oversized so that the wastewater treatment plant for a city of 200,000 might be built to serve two million.

'With electricity prices soaring, this has become a tremendous financial burden today,' she adds.

By the late 1990s there was recognition that municipal utilities could not afford to run such expensive systems, which forced them to think about different types of cost-cutting programmes, she says.

Utility management and efficiency

What Ms Manghee has observed over a decade of working with utilities, irrespective of the size or location of World Bank client countries, is that a large part of a utility management's time is devoted to collecting its own bills and trying to avoid electricity disconnections. 'Part of the move toward energy efficiency is simply due to the need to reduce operating costs. Nevertheless, it is not easy to argue for the need for rehabilitation and retrofitting instead of new construction.' Utility management, local governments and mayors are often under pressure to show highly-visible new infrastructure to their constituents. 'In most cases, the preference is for new construction and large civil works.'

Utilities are also affected by public perceptions, she adds. 'It is politically very difficult to cut off the water supply or raise tariffs. You simply cannot disconnect hospitals, schools, even households. It is a vicious financial circle. It explains how utilities end up with major arrears.'

Training, capacity building and awareness-raising are key to further promoting energy efficiency, she observes. 'It is about making consumers; sector specialists and even young children in school realise how important it is. Knowledge dissemination is a priority too. This is the soft part and perhaps most important aspect of the work.'

In addition to reducing power demand and energy consumption by improving energy efficiency of equipment, processes and overall service delivery, there are

other ways to manage energy. Utilities can manage peak demand and other power system charges by adjusting operation schedules and preventing billing penalties. These activities generate energy cost savings but not energy savings. In addition, utilities can manage energy cost volatility and improve electricity supply reliability by investing in alternative power supplies.

'Leakage is yet another critical problem,' Ms Manghee states. She also recommends that all utilities perform an energy audit, which need not be expensive. 'An expensive analysis may be more thorough, but there are ways and means to do one at low cost as well.'

For local and national governments, it is important to focus on operations and maintenance and not just new infrastructure, she adds. 'New infrastructure can end up magnifying problems. Addressing existing issues is a much higher priority, even if governments do not get credit because of the visibility factor. Reducing water utility electricity costs by 40% may not be something a mayor can point to as a highly visible accomplishment of their three or four years in office. However, this is about long-term planning, even though maximum energy savings sometimes pay back over only 1.5 years.'

There are many options for financing instruments, Ms Manghee adds, such as credit lines, municipal development funds and, where applicable, municipal bonds. 'There is potential to undertake these investments through credit lines, and through development or private banks.'

Governments need to want to address the issue, she notes. Unfortunately, changes in government often bring changes in outlook, and long-term efforts such as this require long-term commitment. 'If you plan to tackle this issue, start by preparing a broad energy efficiency management plan with a dedicated team within a utility, a plan, set targets and monitor them. If done within a broader programme that also addresses infrastructure needs you will have a lot more success on the ground,' she says. ●

Energy savings: examples from Ukraine, Moldova and Russia

Evidence of energy savings in water supply and wastewater systems in the Former Soviet Union are dramatic and plentiful. The replacement of obsolete booster pumps in Lviv, Ukraine saved about 40% of electrical energy used, and the replacement of blowers saved about 24% of electrical energy used.

Similar replacements of single-speed pumps with variable speed pumps, adaptable to variable flows in Balti, Moldova, reduced electricity consumption by an average 63%. The same level of energy savings was produced by replacing obsolete pumps in Gavchina, Russia.

Sorting myth from fact:

a realistic look at the worldwide water sector

A new book, 'The Sound of Thirst', aims to provide an in-depth and easily accessible overview of the wide range of challenges in the water sector. LIS STEDMAN spoke to the book's author, DAVID LLOYD OWEN, about his aim to debunk myths and provide a realistic viewpoint with respect to addressing water needs.

Envisager's founder and managing director Dr David Lloyd Owen's new book, 'The Sound of Thirst', provides an extremely readable argument for why urban water and sanitation for all is essential, achievable and affordable (as the subtitle for the book asserts).

Dr Owen's credentials for writing what is a wide-ranging overview of a multitude of water issues as part of his thesis that this goal is in reach, extends beyond his role with the global water and waste management database developer. In the past he has worked for a range of corporate and institutional investors and is a member of the advisory board of an international fund manager, Pictet Funds, as well as a member of Glas Cymru, the non-profit company set up to manage Dwr Cymru Welsh Water.

He is also a prolific author with five books on the water sector alongside papers, and writes the well-regarded Pinsent Masons Water Yearbook. Having written so many technical documents he notes that 'it is nice to write something with the idea of making it readable'.

In terms of the book's potential audience, he observes that it will be 'anybody who's interested in water. I have listed a lot of sources to back up what I've said so that anyone with a specialist interest can look further. It is for anyone from an industry specialist to someone who doesn't like what they see in the headlines. It is a nudge in the direction of the environment – I am trying to make it as broadly inclusive as possible.'

Dr Owen calls the substantial and comprehensive introduction to the issues 'an accumulation of logic', adding: 'There are an extraordinary amount of myths. Even as we went to press it was extraordinary what was coming out.' He cites the UN statistics on meeting the water Millennium Development Goals as having in the small

print a caveat that 205 million that are officially classed as depending on tap water, in fact depend on bottled water.

He criticises non-governmental organisations trying to persuade the World Bank that it must eliminate private sector involvement, who dubbed the Manila privatisation as the 'world's worst'. He notes: 'They make



no mention of the 1.6 million slum dwellers connected. Water is a proxy for other people's battles, and the ordinary people in the middle don't do very well.'

His is a more pragmatic view: 'As long as you are doing something, as long as you produce outcomes, nothing else matters – who finances it, who runs it.' He has little love for people with other agendas, noting that 'they want it to be developed on their lines only, irrespective of what that means to people. I sometimes feel like asking how many people died as a result of their campaigning.'

However, he admits to 'a degree of perverse optimism' on the grounds that the situation cannot get any worse, therefore it must get better. Of the book's main messages, he says: 'Everyone needs to be honest and realistic about what needs to be done. There is one target, universal urban access to safe water.' Access need not

mean tap, and on the wastewater side flush is not always the right approach, he adds.

'Universal access is a given. Second, water should be valued. We should manage water preservation with the water cycle in mind. Water is not free, people should be able to pay an affordable amount, and there are a plethora of mechanisms to ensure this. Aid should not go to prestige projects in developed countries, but to where it matters,' he says.

In developing countries, development happens when comprehensive water and wastewater systems are in place, he notes. 'Singapore is the classic example.'

He concludes: 'This is not a water-scarce world. The scarcity is in management and political will. We need intelligence on two levels – taking management seriously, and taking politics out of water.' He advises a shift from supply to demand management, noting: 'We have got water, it is about how best to use it.'

In summary, Dr Owen says: 'Utilities have to be fundamentally incentivized to be as efficient and sustainable as possible, rather than meeting random economic targets. Efficiency is the ultimate target, with utilities potentially sharing the costs between customers and themselves.' Above all else, he notes that 'the only thing that matters is water and sanitation for all in an affordable and sensible manner'.

The book was 'unofficially' launched in late May but its official launch was at the prestigious Hay literary festival in Wales earlier this month. Pinsent Masons, he says, kindly offered their London offices for a 'meet and greet' event on 17 July. 'It is an adventure,' he adds. 'The book is being published by a small literary publisher, who said stop writing your novel and write about water.' The result, it has to be said, is both thought-provoking and very much worth reading. ●

Coaching: an emerging need in water loss management

Dealing with water losses requires a holistic approach across all areas of a water utility, with a greater emphasis on the important changes required with regards to capacity building. Business coaching can be a useful tool to achieve this through providing external expertise and a complete overall view of the business in order to help set and work towards goals. **JURICA KOVAC** and **BAMBOS CHARALAMBOUS** outline some of the additional aspects of water loss management with a specific focus on coaching as a discipline in this field, such as what it is, how it works and who can provide it.

Water loss management is defined through setting goals to efficiently, economically and systematically control and reduce water losses in distribution networks. Today it is recognized that this activity is essential, as we are faced with serious changes in our environment (climate change, pollution, rising demand for more potable water) and with a tremendous downturn in the world financial situation (increase in costs, fewer funding opportunities).

It is recognised that water loss management is a multi-disciplinary activity that involves all operational and functional aspects of water. It requires a high level of continuous commitment, capability and active integration / application with appropriate knowledge from water utility management.

We have at our disposal the latest global knowledge on water loss management, such as IWA's methodology, which provides a realistic perception of the issues involved as well as a selection of appropriate methods and practices to control and

reduce water losses, coupled with a variety of technical solutions and technologies. However, this still does not guarantee the successful implementation of a water loss management programme and achievement of goals.

It is important to understand and appreciate that besides technical knowledge regarding water loss management, other aspects or dimensions must also be considered for the successful and sustainable implementation of water loss management activities, through changing existing practices. The concept of three dimensions of change was well described by Rizzo and Vermersch¹ and involves the following: operational dimension, project management dimension and change management dimension.

Coping with the above mentioned changes is a serious and very complex challenge for managers in water utilities. The solutions available are essentially provided by two approaches: implementing changes autonomously, or by outsourcing necessary assistance and guidance.

A key element in providing the right solution is the people within the water utilities, and without proper training, coordination and assistance it is extremely hard to expect positive results. The problem becomes even more complicated with the retirement of dependable and experienced staff. The new generation of employees which will come in to fill the gap will be faced with the challenge of how to duplicate skills and experiences gained over many years by those who leave, and at the same time cope with accumulated water loss issues.

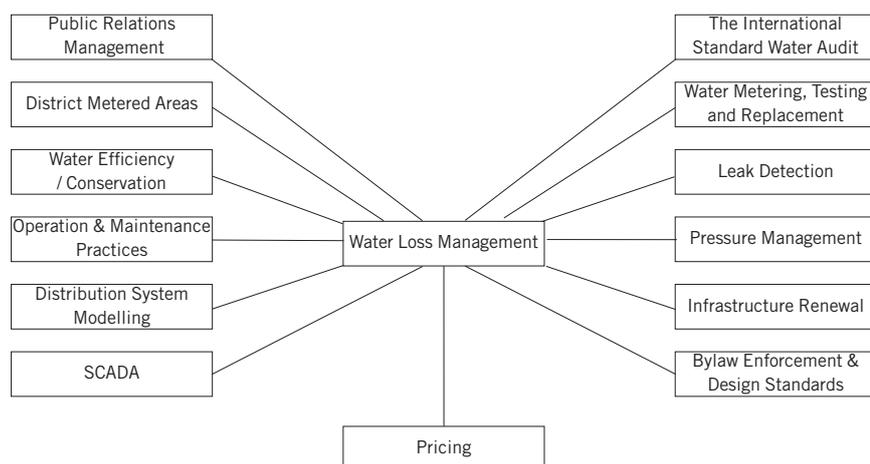
The need for a champion

The management of a water utility is responsible for recognising, understanding, defining and implementing changes. So, it is crucial to identify a change champion² or metaphorically to identify a 'captain' who will steer their ship and crew through stormy waters on a journey from the existing situation into a better one. In order to transform the water utility the captain must have many qualities besides knowledge of water loss management.

Usually, the key manager is often one of the best in the utility with various existing obligations, so taking on new challenges that involve many changes will not, and cannot, assure sustainable results. The issue of adequate capacity and capability of key managers to deal with all problems within an organisation exists in all markets and industries, and in the last few decades an emerging need has been identified for new special kind of outsourced assistance to key managers, called coaching.

It has been realized that change management has become a continuous condition in our world, with accompanying issues such as how to design a required process, the definition of goals and

Figure 1: Multi-disciplinary function of water loss management





External coaching can bring a wealth of experience to a company.

Credit: nokhoog_buchachon / Shutterstock.com

objectives, how to implement it, how to monitor progress and efficiency, and most importantly, how to influence employees (resistance to change, willingness and capacity for new learning, motivation), etc. This has generated market experts with accumulated experiences from different fields of human and business activities.

It is extremely important to have people with a 360 degree vision who are able to comprehend existing challenges and to provide guidance and required assistance as and when necessary. Such people are called 'business coaches' and are able to provide coaching to a business in order to assist them in moving forward and achieving their goals. 'Business coaching' is a collaborative relationship, solution-focused, results-oriented, systematic and enlightening, in which the specific remit of the coach is to work with an employee to achieve improved business results, improved business performance and / or operational effectiveness.

Existing challenges

Water losses can successfully be managed through a series of comprehensive activities covering many issues, such as real and

apparent losses, speed and quality of repairs, asset management, employees' education, use of appropriate technology, etc., with all these associated with the necessary financing capabilities.

This comprehensive approach is challenging for a water utility and successful examples are rare. Perhaps the main reason for this is the difficulties faced by the management team to introduce and lead necessary improvements by relying solely on the utility's own human resources, technical expertise and financial capabilities.

Currently, many utilities around the world are being faced with numerous problems, some of which are set out below under the three broad headings of 'employees and management', 'infrastructure' and 'investments'.

Employees and management

- Reduction in number of employees due to the financial downturn
- Aging workforce (with problems in transfer of skills to new younger employees)
- Unbalanced competence and responsibilities
- Low motivation
- Bad habits

- Insufficient education and training in new technologies and methodologies
- Insufficient organization or control
- Management influenced by politics and lobbying

Infrastructure

- Expanding but without proper follow up in maintenance and secondary development (monitoring, control, etc.)
- Aging networks
- Increased complexity of the urban environment (roads, other installations, activities, ...)
- Lack of new technology and innovation
- Poor security of supplies

Investments

- Insufficient
- Limited implementation
- Without continuity
- Partial in solutions and quality
- Influenced by lobbying and politics

The majority of successful examples show the importance of outsourced assistance in successfully dealing with the above problems. Outsourced assistance is appropriate in most cases, including dedicated projects, specified consultancy services, and performance-based projects. There

are many advantages of current practices in these areas but there are also some disadvantages which can be resolved through coaching. As an example the following problems may arise:

Dedicated projects and specified consultancy services

- Selection of wrong priorities or solutions
- Predefined with limited capabilities for adaptation
- Limited in implementation scope and solution
- Limited duration
- Limited knowledge transfer
- Quality often below standard
- Influenced by lobbying
- High costs with problematic financing
- Tendering and contracting procedures

Performance-based projects

- Legal issues (applicability and limitations)
- Long tendering and contracting procedures
- Political sensitivity
- Share of responsibilities

In addition to all the above challenges the problem of insufficient education and training programmes for water utility employees must be emphasized. It is also important to highlight the fact that water utilities are generally reluctant to adopt new strategies and technologies, with staff not responding to new challenges due to the public nature of the organizations. Without continuous, specific and dedicated education it only becomes more difficult for water utilities to tackle increasing number of problems in a constantly changing environment.

Is coaching a solution?

Evidently available knowledge regarding water loss management is not sufficient to secure improvements in water utilities. Outsourcing could help but is not always easily accessible and affordable. It is therefore crucial for the successful planning of activities and their subsequent implementation to improve the ability / capacity of people working in water utilities. This would involve acquiring knowledge and experience in many different fields of expertise, such as project management, time management, document management, and human and technical resources management³. Sometimes, even with all this, it is not enough to leverage change and additional tools such as thinking

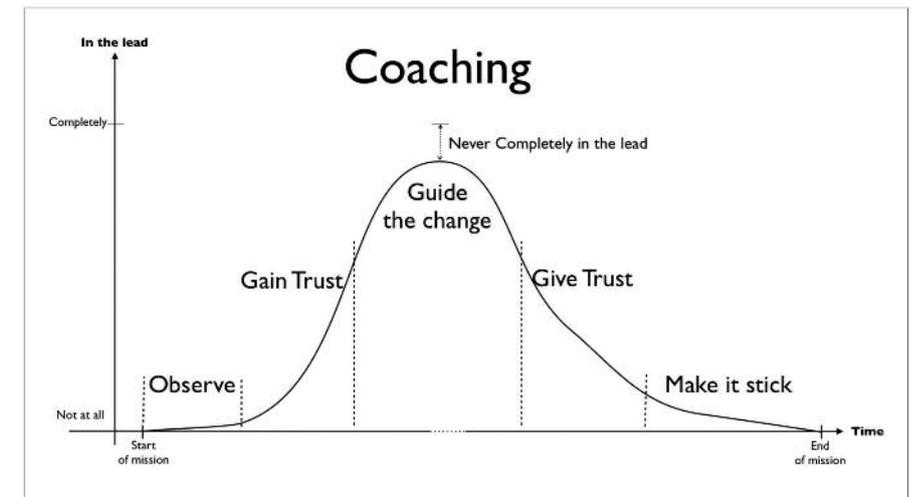


Figure 2: The steps of the coaching approach

skills, learning skills, capabilities for improvisations, etc. must be sought. Beyond these knowledge layers there is the even greater challenge of how to use these tools and skills in a proper manner.

Management and operations in water utilities, and in particular those activities relating to water leakage, is a daily task. Water loss management integrates all kinds of management activities at the same time (reactive, proactive, preventive, risk) and if the right solution or balanced advice is needed it must be provided on daily basis, and coaches are the kind of experts who are able to provide it. The more qualities a coach has, the better and more efficient their relationship with a water utility will be. Water utilities need someone who has been successful in facing their particular challenges and changes before – someone who has been on this voyage before and who can bridge over huge gap that exists between existing knowledge and experiences and desired goals for effective and efficient water loss management.

How coaching works

Transfer of knowledge alone is not enough and will not guarantee that a person who acquired this knowledge will know how to use it. There is usually a lack of practical guidance and application. The aim of practical guidance through a dedicated programme of activities and a close relationship between someone like a coach and employees is to transfer virtues and knowledge from the former to the latter.

Learning could be presented in a simplified form as follows⁴:

- Talk to me... I forget (typical example – conferences and seminars).
- Present me... I remember (typical example – practical presentations).

- Let me do it... I understand (coaching).

The term 'coach' is well known from the world of sports. They are someone undertaking training, teaching, encouraging, monitoring, etc., either with individual athletes, members of a team or a team as a whole. The basic tasks which a coach performs are the following:

- Defining objectives and goals
- Supporting and encouraging
- Presenting the success of a team
- Evaluating the positive and negative aspects of each team member
- Motivating team members
- Creating a favourable environment for success
- Communicating with each team member

The most important aspect of coaching is capacity building – applying a specific way of teaching, which is presented in a simplified form as follows:

- I am doing it. I am explaining it. This first step serves in presenting a new issue.
- You are doing it. I am explaining it. This second step is transitional with new knowledge.
- You are doing it. You are explaining it. Final step with transferred knowledge.

The approach in coaching varies, but in general could be presented with the following steps⁵: observe; gain trust; guide the change; give trust; make it stick (see Figure 2).

Specifics of coaching in water loss management

A coach can be a valuable assistant to the key manager (captain or change champion), or in some circumstances a temporary replacement. Guidance

provided by a coach can help in all aspects of water loss management. They can fill in existing knowledge gaps and skills with the aim of assisting utilities in building their own capacities and independence over time.

A coach can provide specific assistance in the following areas:

- Becoming a key manager's 'right hand' with the aim of identifying areas of weakness and improving them, identifying strong points and emphasizing them, and building new skills and virtues
- Defining and monitoring water loss control programmes
- Wide-ranging experience helps in the selection of appropriate solutions
- Clear and realistic definition of goals and expectations
- Education and training in various topics, including water loss methodology, but also managements skills and other skills (for example the mind mapping technique for taking notes, analysing problems, brainstorming, learning)
- Evaluating, managing and assisting employees (teacher, trainer, leader, role model)
- Forming a communication bridge between management and technical staff
- Providing fast and reliable advice regarding technical solutions and technology
- Providing advice on organizational change
- Understanding and evaluating change (more objective point of view)

Compared to other available alternatives a coaching person has the following advantages:

- Large knowledge potential, capabilities and readiness to assist
- Experience gained from many years of work on a large number of projects
- Affordable prices (compared to standard projects)
- Simpler contracting procedure (often without tendering)
- Open and flexible cooperation adjusted to the needs of the water utility
- Proximity / availability (personal, online, phone, email)
- Simplicity (in cases of shared language)
- Secured continuity and confidentiality
- Transfer of knowledge adjusted to the needs of the organisation and without limitations
- Constant development and upgrade with latest knowledge and examples

Who can be a coach?

Evidently from the description above, finding a coach is not an easy task. All those with excellent knowledge of water loss management are potential coaches, but additional knowledge and skills are needed to be able to provide appropriate coaching service. As it has been here, the sole application or transfer of knowledge related to water loss management is not enough; a coach must combine the following basic qualities / expertise:

- Water loss management
- Change management
- General management skills (project, time human resources, document, risk)
- Human behaviour, psychology and pedagogy
- Communication skills and motivation

It is realistic to assume that in the future water loss experts will turn their attention towards business coaching, with the aim of learning and becoming experienced in other fields of business, thus becoming suitable for potential clients with higher expectations and a desire to accomplish and sustain organizational change in water loss management.

Examples and experiences in coaching

Examples of full-scale coaching in the water industry are still rare. Many independent consultants or consulting companies are already in the market with services very similar to coaching, and with additional fine tuning of their capabilities we soon will be witnessing a rising number of coaching examples in water utilities. Until reliable data from the water industry is available, the following available general research findings will have to be used.

The UK's Chartered Institute of Personnel Management reports⁶ that 51% of companies (from a sample of 500) 'consider coaching as a key part of learning development' and 'crucial to their strategy', with 90% reporting that they 'use coaching'. More recent research in 2011 by Qa Research, an independent marketing research agency in the UK, found that 80% of organizations surveyed had used or are now using coaching, but also found that while 90% of organizations with over 2000 employees had used coaching in the past five years, only 68% of companies with 230-500 employees had done the same⁷.

As a final remark regarding existing examples it is worth noting that in the last couple of months of this concept

becoming better known to water utility managers, there is an extremely positive response and in the future it will be possible to report on experiences gained from a number of coaching case studies in water loss management.

The way forward

The knowledge gap between those who know and those who need help is huge and cooperation is necessary if fast changes in the field of water loss management are to be witnessed. Alternatively, a slow process of change with many mistakes may take place with perhaps a steadily declining potential for improvement, which could adversely affect organizational viability.

Coaching as a discipline presents an opportunity for water utilities to improve performance as well as to build the necessary skills, capacities and efficiency among water utility managers and technicians to assist them in dealing with the multi-disciplinary field of water loss management. ●

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Risk management for customer relations: the unusual situation of reaching a customer satisfaction threshold

A major aspect of utility management is addressing customer satisfaction through communication and information campaigns and stakeholder involvement, however, what happens when a customer satisfaction threshold regarding the quality of services is reached and consumers will not pay higher rates? **VICTOR-LUCIAN CROITORU** discusses the case of Romanian utility SOMES Water which is experiencing a clash between the EU's demands for greater investment and its customers' lack of willingness to pay.

One could believe that effective communication, public awareness and involving all stakeholders in the performance of a public service is a relatively good recipe – a sound way for decision making aimed at achieving the elusive satisfaction of customers. One could also normally never believe that reaching or exceeding customer satisfaction – if possible in the first place – would require risk management-based decision making regarding the continuation or abandonment of critical infrastructure investments aimed toward better service coverage, and improved water quality, public health and environment. But still...

SOMES Water is one of the first, and among the largest, of Romania's Regional Operating Companies (ROCs), established around 2006 following the reform of the water sector in Romania. It is one of many water and sewage utilities in Central and Eastern Europe facing the same dire need for investment in infrastructure modernization in order to

reach compliance with pre- or post-EU accession conditions in terms of water and environment quality. Accordingly, after 1997 SOMES Water started implementing several major EU co-funded investment programmes for water and sewage network modernization and rehabilitation. The four programmes implemented so far have an overall value in excess of €330 million (\$409 million), of which about 75% was EU grants. Each of these consecutive, overlapping investment programmes was preceded by either an affordability study or a full blown professional survey among the various categories of customers and end users. Public opinion was tested on several key themes such as satisfaction with water quality, services, customer relations, affordability and – since each of these programmes had a loan component of around 25% to be supported through the water bill by customers – the willingness to pay more for improved services.

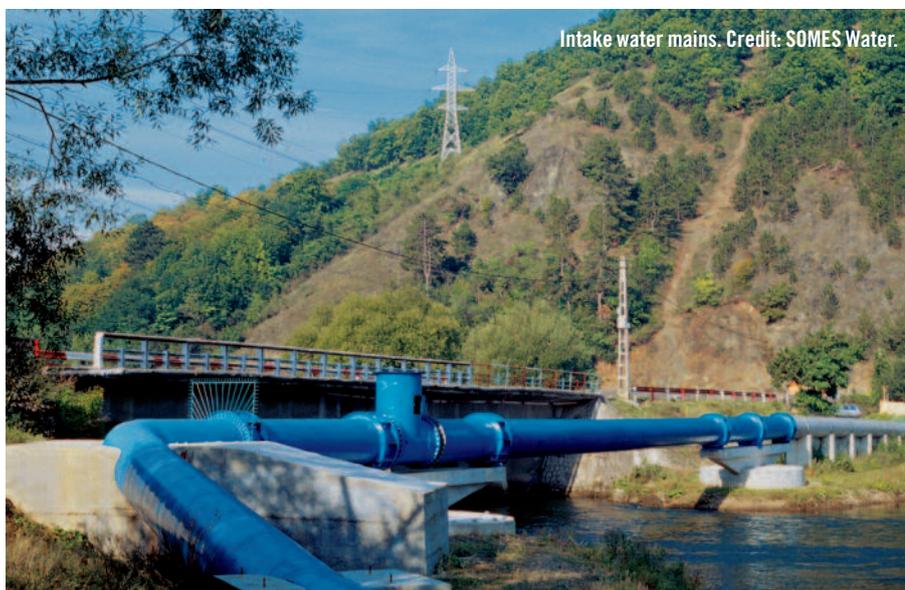
It is no wonder that the affordability study undertaken in 1996 before implementing the first investment programme (Municipal Utility Development

Program stage II – MUDP II) revealed a very high degree (91.8%) of willingness to pay more for improved services despite an acceptable 76% satisfaction level regarding water quality and a rewarding 95.5% satisfaction with water supply (continuity, maintenance, etc.). Tariffs up to the mid-1990s were kept artificially low, and there had been no investment in the water and sewerage infrastructure since the 1970s, so the population believed that paying more for investment would yield a high return. In fact, 58% of customers were willing to pay two to three times the tariffs then in effect, 54% were willing to pay at least 50% more, and 20% were willing to pay an increase of more than 50% – a reassuring level of support for decision making when contemplating long-term investment, since even the 25% to be reimbursed through increased water bills would amount to a significant increase in cost and in this particular case more so as the customers interviewed for this study were told that MUDP II would implement a tariff increase plan with three annual stages of an increase of 29% in each (between 1997–1999)!

Risk management would normally tell us that as long as these programmes are aimed toward improving the quality of services and that people are aware of this, decision making regarding the implementation of further investments would only be jeopardized by a significant alteration of the circumstances surrounding customers' ability to pay.

Reaching the customer satisfaction threshold

This did not happen, with circumstances improving over time, and the specific water consumption decreased steadily between 1996 and 2010 from a average monthly level of 6.3m³/pers. to 3m³/pers. in 2010. Although the water bill (according to specific consumption / household)



Intake water mains. Credit: SOMES Water.

Background of SOMES Water

SOMES Water was established in 1892 in Cluj-Napoca – the informal capital of north-western Romanian region Transilvania – and underwent several transformations and restructuring over the years. After 1989 it was restructured to become Cluj County's Water Sewage Independent Administration, and in 2006 was reorganized into the first Regional Operating Company (ROC) in Romania, and also the first utility in Romania to cross the administrative borders of its own county to take over services in neighbouring Salaj County. On the occasion of the centennial anniversary in 1992, SOMES Water established a Water Museum, one of the few of its kind in Europe, which today has a major role as the headquarters of the company's educational programme for children and young people.

Today, SOMES Water is one of the largest water and sewage utilities in Romania, servicing in excess of three quarter of a million people living in eight municipalities and 133 rural localities in an area of some 10,000 square kilometres in the counties of Cluj and Salaj. It is a shareholder-owned commercial company, the shareholders being the local governments – the two County Councils and all the Local Councils in the cities and communes located in the serviced area. It operates an infrastructure of more than 1850km of water network, 790km of sewerage network, 15 water sources and purification plants and 15 wastewater treatments plants.

In order to improve service quality – water and sewerage – as well as to comply with the relevant EU Directives, SOMES Water has implemented since 1997 four major EU co-funded overlapping investment programmes for infrastructure expansion, modernization and rehabilitation with an overall value in excess of €334 million (\$409 million). The company's Master Plan, set up in 2006 and updated in 2012, determined the need for further €400 million (\$495.2 million) worth of investments in order to reach (by 2020) full compliance with EU Directives for water and environment quality in the entire serviced area.



Cluj WWTP. Credit: SOMES Water.

A short history of the water sector in Romania

Before 1989, each of the 42 counties in Romania were serviced by one centralized multi-utility conglomerate responsible for water, sanitation, heating, public transport, and housing. Massive expansion of the urban areas in the 1970s and the use of poor quality domestic materials, equipment and technologies in the building of water and sewage networks led to huge energy consumption and losses in the networks, poor or no asset management and maintenance, and a complete lack of concern for environment issues, which culminated in a huge need for investment in the water sector after 1988.

Institutional de-structuring of the sector after 1990 led to an opposite situation: the number of utilities increased ten-fold, with each city, town and even commune establishing its own utility with no regard to the economic sustainability or financial viability. Moreover, small utilities had no access to infrastructure modernization funds as public authorities had no funds for such purposes, and all EU investment programmes after 1990 were targeted solely toward large urban areas.

In 2005 there began a progressive re-centralization of the water sector by the establishment of the Regional Operating Companies (ROCs), designed to regroup the smaller utilities and to perform services according to the newly established national strategy, based on the concept of integrated management of water resources belonging to the same catchment area. The establishment of ROCs was also a condition for securing EU grants much needed for infrastructure modernization. This first step of regionalization was planned to be completed by 2010 by returning to no more than 42 operators countrywide. Currently there are some 50 ROCs in Romania of various sizes ranging from those servicing tens of thousands to those few servicing up to 2.5 million people. The national strategy established a plan of further decreasing the number of utilities beyond 2015, aimed toward some ten large river basin-based operators.

increased over the same period, the monthly household average income (MHAI) in the company's service area also increased, and more importantly the weight of the water bill in the MHAI, after a initial steep increase due to the three price hikes of 29%, started to drop significantly after 2000.

During all these years, customer satisfaction regarding water quality and services remained high or increased, being around 91.7% and 89.5% respectively, despite the fact that customers' and end users' awareness of awareness campaigns preceding and accompanying the investment programmes was extremely low.

Now, this could be interpreted as being due to a poor communication strategy, which is a perfectly reasonable explanation, but is also nevertheless one more argument that people had no valid grounds to lose all willingness to pay more for improved services: no awareness means no base for opinion either way.

And that is exactly what happened. According to four market research studies carried out within this period, customers' willingness to pay dropped, apparently for no reason, from the above-mentioned 91.8% in 1996 to a worrying 22.03% in 2010. This was particularly significant as the environment chapter of Romania's accession treaty to the EU states several compulsory objectives to be reached in upcoming years in terms of network coverage, water quality, and wastewater treatment facilities, etc. Attaining these parameters requires further significant amounts for infrastructure investments until at least 2020, and decision making seems to be extremely difficult. Do you take heed of public opinion and stop further investments since they are both satisfied with the current level of services and are not willing to support other improvements, or continue to aim for goals taken on as a nation in front of a community of nations, despite what your regional community said?

Role of communication

The obvious answer is that the ROCs must deploy a more effective and better targeted campaign, strongly supported by the local governments, to convince people to change their mind. This would normally be correct if we were sure that the issue is of 'communicational' nature. However, based on the interpretation of the surveys as a whole as well as other inputs such as customer complaints processing in past years, it appears that the



The Water Museum. Credit: SOMES Water.

Expanding Jamaica's water services with a flexible financing solution

Significant investment is required for Jamaica's National Water Commission to rehabilitate and extend its water and wastewater systems that serve the majority of the island's population. **LIS STEDMAN** looks at how this is being financed through a mix of additional charges to customers and public-private partnerships.

decrease in a lack of willingness to pay more for improved services arose not as a result of affordability or communication shortcomings (even taking into consideration psychological issues generated by the world economic crisis), but through a reaching of an upper satisfaction 'threshold' in terms of service quality (however unusual this may seem), beyond which no further investment is justified (from the customers' standpoint).

It seems that whatever arguments one could use at this point to reinforce the communication with such an audience – the need for social solidarity with those not yet benefiting from best service standards or those not having such services at all, establishing a legacy for future generations and the environment – is doomed to failure: to be satisfied means to be selfish.

In an article about communication tools and strategies in the March issue of *Water Utility Management International* Sanford Berg wrote: 'The lessons are intended to remind decision makers that technical skills are necessary but not sufficient for high performance. Organizations must be able to communicate to various constituencies if their activities are to be understood and appreciated.' But what if a seemingly well appreciated activity leads to a point where communication has no more persuasion and where technical decision making must be given preference over opinion of constituencies? ●

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Jamaica's National Water Commission (NWC) is undertaking an ambitious programme of works that will extensively rehabilitate the island's water and wastewater treatment systems, and in the process rethinking its approach to funding.

NWC, which was established in 1980 by amalgamating the Kingston and St Andrew Water Commission and the rurally-focused National Water Authority, is the major provider of water and sewerage services for Jamaica. It is a statutory organisation, supplying water to over 75% of the population and sewer-

age services to 25% – the remaining service providers are either parish councils or private water companies. In percentage terms, it produces over 90% of Jamaica's total potable water supply. Some 30% of the population still get their water from standpipes, water trucks, wayside tanks, community catchment tanks or directly from rivers and streams.

System challenges

In all, NWC operates over 1000 water supply facilities from treatment plants to wells and booster stations, and 100 wastewater facilities, including treatment



Mona Dam, Jamaica



plants and lift stations. It also takes care of over 4000km of water pipelines, in a wide range of materials including galvanized and cast iron, asbestos cement, ductile iron and steel, as well as 500km of sewer mains.

Vernon Barrett, who is programme manager for the K-Factor wastewater development projects and public-private partnership (PPP) (see box), explains: 'Despite the extensive water supply coverage, the level of service varies widely. Some areas are adequately supplied each day; others are only supplied during specific periods of the day, while others are supplied during specific periods on a particular day or days during the week. The annual average uptimes of a large number of water supply facilities are below 70%.'

The water supply operations face a number of challenges, including unacceptably-high levels of non-revenue water, which now average over 65% of production, the poor state of water supply infrastructure and high electricity costs. A number of the wastewater treatment plants are under-performing, producing discharges that do not comply with regulatory standards, he adds.

NWC also has targets, Mr Barrett explains – after extensive work in consultation with the World Bank, the government of Jamaica approved a water sector policy in 2002 that stipulated all Jamaicans should have access to potable water by 2010 – a date later revised to 2015.

Planning and financing the upgrade

To achieve this ambitious goal, NWC has prepared draft water supply parish plans (WSPPs) that aim to rehabilitate the water supply infrastructure to maximise harnessing of water, reduce the water losses, and generally improve operational efficiencies and service reliability. The plans also aim to increase supply coverage to at least

85% of the population, he notes.

Draft sewerage service plans (SSPs) have also been prepared, with the aim of rehabilitating wastewater treatment plants to at least operate at their design levels, and where possible to incorporate smaller sewer collection systems into large, central systems to allow minor treatment plants to be retired. This programme will also establish central sewerage for the island's major towns.

The cost of implementing these plans is considerable – on the water side, they are estimated at J\$100 billion (\$1.2 billion) and on the sewerage side J\$750 billion (\$800 million). The water plans are being implemented in two phases, with half of the funds being allocated over the next five years, and the remaining half over the next six to eight years. The sewerage plans are similarly divided, with half of the money being spent over the next five years and the other half over the next eight to ten years.

Mr Barrett explains: 'The plans for each parish were prepared by a small team of people who have experience and knowledge of the water supply and sewerage situation in that particular parish. Though working independently on the plans for their respective parishes, the parish teams collaborated on a number of issues during the preparation of their plans. They used technologies such as GIS and hydraulic modeling applications, and were supported by a technical planning team from the corporate office.'

For the WSPPs, the specific issues in regions of each parish were assessed and deficiencies identified – for instance, high NRW, inadequate pipeline capacities and inadequate production capacities, he adds. Measures to address the deficiencies were developed and cost estimates prepared and analysed. The draft plans were then shared with key operatives in each parish, who were able to make suggestions for improvements.

A similar approach was made in preparing the SSPs and a draft 14-year implementation schedule was prepared. 'The focus over the next five years will be on addressing the poor performance of existing wastewater treatment plans through actions such as plant replacements, diversion of sewage flows to better-performing treatment plants, or rehabilitation of existing treatment plants,' Mr Barrett says.

The intention of the WSPPs is to

efficiently provide a reliable water supply service to at least 85% of the population by 2018, and the SSPs aim to ensure wastewater discharges comply with standards set by the environmental regulator, the National Environment and Planning Agency (NEP), as well as to extend central sewerage services to the island's major towns by 2025. NWC also plans to intensify its use of GIS and SCADA, he adds.

Other agencies will be responsible for developing appropriate plans for the areas that NWC does not provide services for. Mr Barrett adds: 'Where it is deemed appropriate, public-private partnership arrangements will be forged to finance and implement some of these projects. This approach will be aggressively pursued in establishing central sewerage in major towns.' ●

The K-Factor and project funding

Funding for major projects is always challenging, and NWC has taken a flexible approach that recognizes there is no 'silver bullet' for project financing and development. The K-Factor programme was established in 2008 as a way to enable selected, specific capital works to be undertaken, and represents a percentage that is calculated on each customer's bill from 2008 to 2021. The main objective is for NWC to use this revenue as a guarantee or collateral to secure loan financing for these works.

The NWC is also making use of PPPs – it has a 20-year BOOT (build, own, operate and transfer) arrangement that is being used to develop and construct the 18MGD (68.4MLD) Soapberry wastewater treatment plant in Kingston, the island's largest wastewater treatment facility, and the commission has also used commercial loans where appropriate.

Vernon Barrett



How healthy is your utility?

Consolidating performance and vulnerability to assess utility maturity

It can be difficult to determine how successful a utility is due to the conflicting demands and range of external factors that can influence operation and financial stability. In an effort to address this, **NIKOLAOS ZIROGIANNIS, L JOE MOFFITT, ALEXANDER DANILENKO, ROSEMARY ROP** and **LILIAN OTIEGO** discuss the use of a performance score and a risk vulnerability score to understand utilities' current health, as well as health in the future.

The definition of a successful water supply and sanitation provider varies due to the nature of services ranging from a human right and natural monopoly to a successful business that serves public welfare. Water utilities are constantly caught in a difficult decision process. By being subject to regulation, as a natural monopoly, the utility has to control the price of the services for the final consumer, while controlling quality and maintain financial incentives for successful operation.

It is commonly accepted that by regulation of the cost structure and revenue rate the municipality or regulator protects social interests from the opportunistic behaviour of the monopolist. The regulator expects three guarantees from the water utility:

- Sustainable supply of water services of a defined quality at least cost
- Access to water services for all customers independent of income
- Water / energy conservation and environmentally friendly operation by the water utility

These three principles are difficult to implement simultaneously. Demand for least cost may result in deterioration of quality. Access to water for all may be costly and require tariff increases or additional funding from the municipality. Economic and administrative tools for water conservation and environmentally friendly operations can be expensive and unpopular (at least in the short-run).

The financial performance of a utility is also hard to estimate using a single indicator as it is affected by several factors, which are usually beyond a utility's reach. These are: affordability (reflected in collection rate and accounts

receivable); exposure to external cost factors (e.g. electricity and chemicals, which usually depend on international prices while all revenue of utilities is in local currency); proper tariff setting principles and timely tariff corrections; municipal development objectives that drive water utility development; and cross-subsidies among different categories of users and social programmes (free or discounted water for the poor without proper compensation to the provider).

It is also important to remember that water services cannot be interrupted. Even if a utility is performing badly in each of its parameters, it cannot be stopped or replaced for obvious reasons. The government or water authority may replace the management, bail-out the company or even declare it bankrupt. Nevertheless, water services will continue to be provided (van den Berg and Danilenko, 2011).

In order to address this, a single index has been developed that allows for the evaluation of the status of a utility based on the combining of a few performance indicators into one consolidated measure. Work has also been undertaken to determine the thresholds of efficient operation on the basis of this consolidated index, and the establishment of a rating system based on these thresholds that can be used to determine the probability of a utility slipping into lower performance categories, as well as establishing the lowest level of performance at which municipal intervention is imminent due to poor overall performance.

The APGAR score

The WSP International Benchmarking Network of Water and Sanitation Utilities (IBNET, 2011) database has been used as a source of performance information on water utilities. As of today, the data from

3100 water companies from more than 110 countries are presented in this database, with about 80 percent of the time series covering four or more years.

The following key performance indicators were combined into a single integrated score named APGAR: coverage (water and wastewater); unaccounted losses; accounts receivable; affordability (determined as a total payment for water and sanitation services as a percentage of gross national income); and operating cost coverage. The term comes from the original APGAR score that was developed to quickly and succinctly assess the health of newborn children immediately after childbirth. Newborn baby health is evaluated based on five simple criteria on a scale from zero to two, then summing up the five values thus obtained (Apgar, 1953; Finster and Wood, 2005).

The IBNET APGAR score works similarly, and assesses the health of a utility on the basis of five indicators (six if a utility also provides sewerage services), while providing insight into its operational and financial performance. Each indicator value is rated on a scale from zero to two, and then a total score is calculated. For those utilities that provide both water and sewerage services, the score is then normalized (as such utilities could have a total of 12 instead of ten). Table 1 provides an analysis of how the components of the APGAR score are calculated as well as the percentage of observations from the database in each category of APGAR value for every indicator.

The analysis of the overall APGAR score of utilities represented in the database allowed us to determine that about 90 percent of utilities that reached the APGAR score of 3.6 went through either a transformation (were bankrupted and subsequently renamed), or obtained a

Table 1 : APGAR score value and percentage of each category of indicators in the database.

IBNET Indicator	APGAR score value	% of observations
Water coverage (%)	0 if < 75%	34%
	1 if >= 75% and <90%	18%
	2 if >= 90%	48%
Sewerage coverage (%)	0 if < 50%	36%
	1 if >= 50% and <80%	27%
	2 if >= 80%	36%
Non-revenue water (m ³ /km/day)	0 if >= 100	8%
	1 if >= 40 and <100	23%
	2 if < 40	69%
Collection period (days)	0 if >= 180	10%
	1 if >= 90 and <180	39%
	2 if < 90	51%
Affordability, W&WW bill as a % of the GNI per capita	0 if >= 2.5%	31%
	1 if >= 1.0% and <2.5%	26%
	2 if < 1%	42%
Operating cost coverage ratio	0 if < 1.0	37%
	1 if >= 1.0 and <1.40	40%
	2 if >= 1.40	24%
Overall APGAR Score	Critically low <3.6	20%
	Low 3.6-5	29%
	Fair 5-7	31%
	Normal >7	20%

significant boost by compensating for accounts receivable, uncollected revenue and delayed investments. An APGAR score of 5 pertains to utilities that barely cover operation and maintenance costs and are struggling with increased urbanization. Utilities with the score above APGAR 7 can be considered as normal.

Water Utilities Vulnerability Index

The Water Utilities Vulnerability Index (WUVI) is a dynamic version of the IBNET APGAR. First, WUVI is conceived as the estimated probability that a water utility will experience a performance problem as measured by a critically low future APGAR score. Three different thresholds of APGAR scores are considered, below which a utility is considered to be in a vulnerable position – an APGAR score of 3.6, a score of 5 and finally a score of 7. Hence, WUVI depicts risk and the higher the threshold that is considered, the more ‘strict’ the index becomes in the sense that the utility has to have a high APGAR score in order to move out of the vulnerability zone. Second, WUVI is an early warning device rather than an ‘actionable’ index. By this, we mean that a high value of WUVI is a symptom of a possible future problem, but does not indicate the specifics of the future problem. Hence, it can be envisioned that managers and policy makers would treat a high WUVI value as an indication that further diagnostics are desirable to determine the issues faced by a particular utility and to formulate potential remedies. From this perspective,

the estimated WUVI is similar in character to many indicators already in use in other fields, most notably the life sciences (Cabalu, 2010; Cutter et al., 2010; Gnansounou, 2008; Liang and Park, 2010). For example, body temperature removed from the norm in humans and animals is not ‘actionable’ in itself, but is rather an indication that some further testing and evaluation are needed to identify the source of the abnormality and undertake appropriate action.

Third, and in a similar vein, the determination of WUVI is relational rather than causal. An association between current values of indicators and future water utility performance has been determined in order to best foreshadow the likelihood of future performance in the critical range. Of course, this does not mean that the most associated indicator can be taken as somehow the cause of a future problem. Such a determination would require diagnostic analysis focused on the underlying characteristics of the individual utility. These methods detect statistical relationships that have, in the past, foreshadowed future water utility vulnerability regardless of whether or not the underlying complexity can be subjected to a detailed logical analysis. Such detection of associations for forecasting purposes is evident in many fields, ranging from security analysis to meteorology.

Following Estrella and Mishkin (1998), the statistical technique probit analysis was used with model selection to develop the WUVI. From a set of possible indicators, the weights and indicators that have

been historically the most accurate in foreshadowing a critically low future APGAR score were identified. Again, following Estrella and Mishkin (1998), a 0–1 indicator of a critically low APGAR score is used as a dependent variable in the model because it is the risk of an APGAR score in a critically low range that is being sought for in WUVI (rather than a point estimate of a specific utility’s actual APGAR score). Moffitt et al. (2012) present a detailed analysis of the estimation methodology used to calculate WUVI.

Application to case studies

To put this into practice, WUVI and APGAR scores were determined for various utilities around the world. In each case the standard WUVI is illustrated (i.e. the value of the index based on an APGAR threshold of 3.6) and importance of the index for each utility is discussed.

Moldova: reforms and external factors of water sector development

The water sector in Moldova has been through decentralization, painful tariff reforms and demand management. Sector reforms resulted in significant reduction of the WUVI. This can be verified from the downward slope of the index on Figure 1. The WUVI starts at a value of 74% in 1996 for utilities in Chisinau and Balti. This suggests that there is a

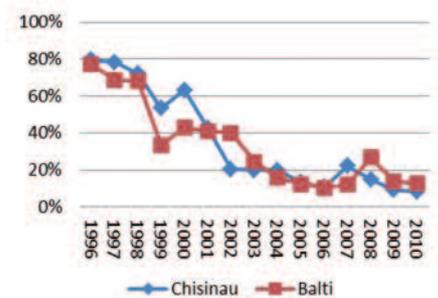


Figure 1: WUVI standard of the two largest utilities in Moldova

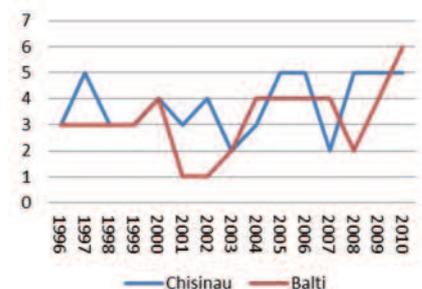


Figure 2: APGAR score of the two largest utilities in Moldova

probability of 74% that in two years' time (i.e. 1998) these utilities will have an APGAR score lower than 3.6. In other words, they are likely to be faced with major operational challenges and experience increased vulnerability. From 1996 onwards, the value of the WUVI decreases, suggesting that the status of the utilities is improving. Figure 2 shows the corresponding APGAR values. We can observe that the APGAR score is stable and increasing during the last few years. A factor that increased the vulnerability of those two utilities was the economic crisis of 2000 and 2008. The WUVI increases for both utilities during those two years, while the APGAR score demonstrates a sharp decline.

The main difference between the WUVI and the APGAR score is that the former provides information regarding the status of the utility two years into the future. The APGAR score on the other hand gives insight pertaining to performance in the present, based on the six indicators of Table 1.

Western Africa: cost recovery vs. vulnerability

Since the 1990s western African national utilities have been pursuing the goal of higher cost-recovery of water and sanitation operations. The task was achieved by most of the utilities, however, it sometimes produced mixed results. In Gabon, despite a significant tariff increase, water consumption was maintained at the same level due to overall country development, thus keeping affordability relatively high. Figure 3 shows the value of the WUVI for Gabon, starting in 2001. That year the utility had a WUVI of 54%, suggesting that in two years' time there was a 54% chance of experiencing significant challenges. The value of the WUVI decreases consistently throughout 2009. This suggests continuous improvement of the utility's operations.

In Benin the focus on improved cost recovery resulted in a reduction in consumption. Reduced consumption resulted in inefficient plant operations, increased losses and costs of operations, and in some cases led to the inability to cope with ongoing urbanization. Benin's poor performance is reflected in the trend of the WUVI in Figure 3. A value of the WUVI of 80% in 2009, suggests an increased vulnerability threat.

In Togo, neglect of cost recovery (as illustrated by the downward trend of that indicator in Figure 4) increased vulnerability significantly. Niger is

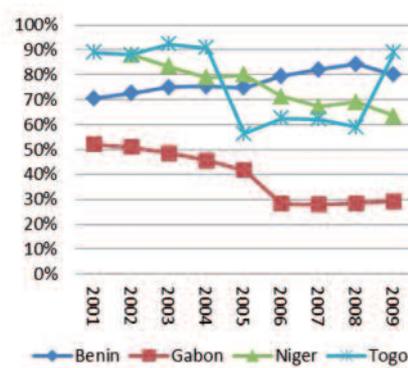
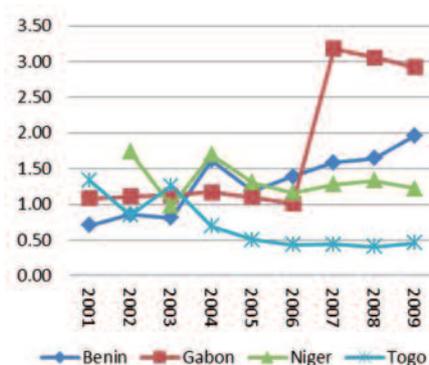


Figure 3: WUVI standard in Western Africa

Figure 4: Cost recovery rate in African utilities



hardly balancing its operations, with vulnerability above 60% throughout the nine year period depicted in Figure 3.

Czech Republic: privatization did not affect WUVI

No difference in WUVI values were recorded between private and public utilities in the Czech Republic, showing that all utilities are performing similarly.

Conclusions

APGAR can be thought of as a coincidence indicator. That is, it correctly determines the current 'health' of the water utilities on the basis of IBNET performance indicators. However, it is not able to provide any prediction regarding future performance. The latter is exactly what WUVI accomplishes. It is constructed to be a leading indicator, in the sense that it has the ability to forecast susceptibility to future stresses. It can thus be used as an early warning mechanism by utility managers. The combined information provided by the two indices can be used for regulation and rating of the water utilities. Considering the complexity of the sector and the competing demands of its authorities and the different customers, APGAR and WUVI can be extremely valuable tools that can greatly assist utility managers. ●

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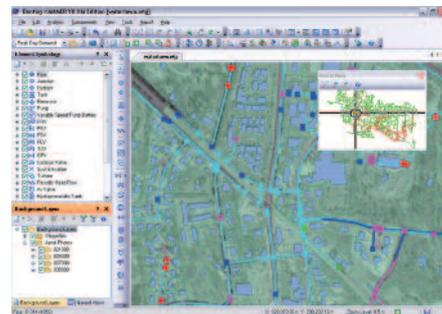
Tianjin Waterworks Group chooses Bentley software to improve efficiency and reduce water loss

Software company Bentley Systems, Incorporated, has announced that Tianjin Waterworks Group Co. Ltd., one of the largest waterworks companies in China, has chosen Bentley's WaterGEMS and HAMMER software to improve its water supply service, decrease operational costs, and extend the life of its water infrastructure. WaterGEMS enhances water distribution and modelling capabilities and HAMMER provides transient analysis to limit water loss, says the company. Together, they will provide Tianjin Waterworks Group with reliable data for the management of its water network and pump scheduling optimization to help reduce water loss and save energy.

With its more than 6200 kilometres of

pipeline, Tianjin Waterworks Group serves approximately 5.2 million people living in and around Tianjin, one of the four direct-controlled municipalities in China. Switching from manual methods to the use of hydraulic analysis software will enable the company to calculate energy consumption, detect water leakage, and provide workflows to improve efficiency. Using Bentley software for transient analysis will enable the company to establish a set of new work processes to save time and cost and increase the reliability of Tianjin's water supply, says Bentley.

Christopher Liew, Bentley vice president, Greater China, said: 'We are extremely pleased that Tianjin Waterworks Group has joined the growing number of water utilities around the globe that are using Bentley's water



solution, including our WaterGEMS and HAMMER products, to reduce both water loss and energy costs, thus preserving local water resources. We look forward to further serving the company's water and information modelling needs through our comprehensive portfolio of robust software as we continue our mission of supporting the economic development of China while sustaining the environment.' ●

www.Bentley.com/water

Schlumberger Water Services launches Visual MODFLOW Flex

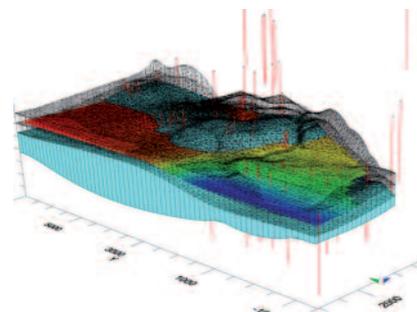
Schlumberger Water Services (SWS) has announced the release of Visual MODFLOW Flex (VMod Flex), what it says is the next generation of groundwater flow, heat and contaminant transport modelling software for groundwater professionals. Visual MODFLOW Flex improves modelling efficiency by integrating 3D hydrogeologic conceptual modelling and industry standard numeric engines in a single, easy-to-use software environment, says SWS.

Ole Christian Meldahl, software business manager at SWS, says: 'With its unique integration of conceptual and numerical modelling, groundwater

modellers are now able to build larger and more complex models more efficiently than before. In addition, the ability to easily generate multiple numerical models from a single grid-independent conceptual model gives modelers the freedom to evaluate alternative scenarios, leading to more accurate models and a better understanding of the groundwater system.'

With VMod Flex, SWS says groundwater professionals are now able to:

- Conceptualize the groundwater system, prior to the simulation
- Build the model with minimal data pre-processing
- Simulate regional and local-scaled models



- Build and run larger, more complex models
- Manage multiple models more efficiently
- Compare and evaluate multiple grid types. ●

www.swstechnology.com

UK utilities invest in Eptica to meet customer service targets

Eptica, a customer interaction management company, has announced that Bristol Wessex Billing Services Limited (BWBSL), the joint venture that handles billing customer service for UK utilities Bristol Water and Wessex Water, will implement its software to manage customer services and meet economic regulator Ofwat Service Incentive Mechanism (SIM) regulatory targets across the companies.

BWBSL will use Eptica's software to create a centralised source of customer service information that covers both Bristol Water and Wessex Water customers. This will initially be used within BWBSL's billing contact centre to handle telephone customer service enquiries for each company, increasing First Contact Resolution (FCR) and reducing Average Handle Times (AHT) for calls. Future plans include extending Eptica's knowledge management software

across other service channels and into other business areas within BWBSL, Wessex Water and Bristol Water.

BWBSL will implement Eptica through a staged roll out. 130 contact centre agents will be part of the first phase, scheduled to go live in July 2012 with up to an additional 150 users added by the end of 2012. Other departments can then be included on the system in 2013. ●

www.eptica.com

El Paso Water Utilities anticipates significant savings from Derceto Aquadapt energy management software

In a move to achieve significant energy savings, along with increased efficiency of water network operations, El Paso Water Utilities (EPWU) – responsible for water supply to El Paso City in Texas, US, and parts of the surrounding county including the large Fort Bliss military base – has begun implementing Derceto’s Aquadapt energy management software.

EPWU’s Vice President of Operations and Technical Services, John Balliew, says the Derceto Aquadapt project is a strategic investment as EPWU works to achieve the optimum balance between water cost, quality, security of supply and long-term environmental sustainability.

‘We’ve selected Derceto’s Aquadapt EMS software based on a pilot study which indicated significant reductions

in our annual energy bill are achievable. Depending on drought conditions and other water supply issues beyond our control, we anticipate a rapid payback on our investment and multi-million dollar savings over a ten-year period,’ Balliew says.

‘We have a complex water distribution network. Aquadapt will give our water network operators a powerful new tool to help them make the best minute-by-minute operational decisions on where, when and how to pump water around our network.’

Supplying more than 800,000 users in the desert climate of El Paso requires balancing groundwater from 150 wells with seasonal surface water supply from the nearby Rio Grande. Water flows through four water treatment plants, three wastewater treatment plants and



one water reclamation plant.

Derceto’s CEO Wayne Spittal says Aquadapt EMS is a good fit with EPWU’s innovative water management and supply strategy that promotes best O&M practices and efficient use of energy. ‘El Paso is leading the industry in its use of technology to maximize both efficiency and sustainability of water consumption and distribution – in the most challenging desert climate,’ he says. ●

www.derceto.com

Welsh Water makes substantial investment in customer service software

UK water company Welsh Water, which serves 1.2 million households and 100,000 businesses, has announced that it has recently invested £250 million (\$387.5 million) to improve customer service and deliver cost savings.

Tim Hughes, Head of Performance and Customer Service at Welsh Water, says that the company was looking for a ‘service incentive mechanism made up of processes that actively encourage ownership and accountability’. ‘Our contact centre has to handle a huge volume of calls and give our customers confidence that we’re dealing with their inquiry as quickly and efficiently as possible,’ he adds.

To avoid the pre-existing reporting and support issues, Welsh Water identified a fully integrated system as a key selection criterion. The company chose Genesys customer service software with an Alcatel-Lucent OmniPCX Enterprise telephony system, and the NICE call and screen recording solution and analytics platform. NextiraOne, a Genesys business partner, was selected to manage the implementation, and to ensure full integration with Welsh Water’s existing standard assessment procedure system and potential future developments.

As Hughes explains: ‘Together with NextiraOne, Genesys and Alcatel-Lucent provided a fully integrated solution with a single point of contact. We chose this solution because of the maturity of the Genesys and Alcatel-Lucent products, and because we could see a clear roadmap of future developments delivered by adopting it as our core technology.’

The new solution utilizes two data centres with a resilient network serving a single platform. The primary data centre runs the live Genesys solution and is mirrored by the secondary, which can take over should a failure of the primary system occur.

The core of the system is the Genesys Customer Interaction Management (CIM) Platform, which has been implemented across the customer service organization. This platform manages customer calls intelligently so that they are immediately routed to the right resource, says the company. The solution manages all inbound voice calls and also provisions the outbound, enabling bulk campaigns such as debt collection to be automated.

Reporting is now handled using Genesys Info Mart, together with Genesys Interactive Insights and

Genesys Workforce Management (WFM). All agents navigate the system using the Genesys Agent Desktop. These reporting tools help managers to review information across the whole system, and an easy to use common user interface makes training and support simple, says the company.

Future plans for the system include:

- Evolving multiple communications channels such as email and web chat while maintaining communications with traditional mail. It is critical to incorporate this into the customer service process and provide the same level of service across all channels, particularly in light of the reliance on written letter communication
- Supporting more proactive customer contact: actively reaching out to customers to setup appointments for engineers, send reminders of appointments or payment dates, make customers aware of new services or breaks in service, or make ‘call-backs’ to customers unable to wait on hold
- Informing customers of outages / incidents via the IVR platform, freeing up agent capacity to deal with more time-critical activities ●

www.genesyslab.com

Advanced Sewer System Designs and Technologies: A Review of the Worldwide Literature

WERF Report INFR4SG09d

Authors: Sybil Sharvelle, Larry Roesner

This document seeks to collect into one place current and new technologies about, or related to, sewerage system design so that wastewater professionals can easily access the most up to date information. The document organizes the information found in the 266 documents that were reviewed for this study into six subject areas: advanced on-site technologies; alternative wastewater collection system designs and technologies; gravity sewer system design and technology; infiltration detection and control technologies; sewer construction / rehabilitation technologies; and pipe materials and joints.

Each of the six subject areas is further subdivided into three technology levels: established technologies; proven technologies; and experimental and foreign technologies. The results are summarized in tabular form for easy review and comparison, followed by informative descriptions of each of the listed technologies. The descriptive section contains information on how the various designs and technologies work, their cost and performance, advantages and disadvantages, locations where the design or technology is in use, and identification of the manufacturer of certain described technologies.

IWA Publishing, July 2012

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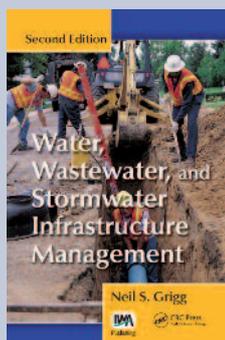
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Author: Neil S Grigg

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IWA Publishing and CRC Press, July 2012

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Stormwater Non-Potable Beneficial Uses and Effects on Urban Infrastructure

WERF Report INFR3SG09

Author: Robert Pitt

This project shows that lessons learned and successes from a wide variety of international stormwater beneficial use projects cover a range of conditions that may be found in the US. Examined are case studies from developing countries in both arid and wet climates, case studies from developed countries in areas where future water conservation is necessary to support continued growth, and from developed countries where sustainable use of natural resources is of high priority. Also examined are typical water quality conditions from different stormwater sources in urban areas and desirable (or regulated) water quality requirements for the use of this water for different applications. Water quality degradation associated with different storage options is also reviewed along with different water treatment options to meet the needed 'finished' water quality before use. Guidance is provided on how to determine the amount of supplemental landscape irrigation needed from stored stormwater, and how to calculate needed tankage volumes for many locations in the US. The report calculates the beneficial use opportunities of stormwater, especially landscaping irrigation, in different areas of the country, along with continuous modelling results for the development of production functions for tankage volume alternatives.

IWA Publishing, September 2012

220pp. eBook only.

ISBN: 9781780400365

To order, visit: www.iwapublishing.com

IWA World Water Congress & Exhibition

16-21 September 2012, Busan, Korea

Email: 2012busan@iwahq.org

Web: www.iwa2012busan.org

This year's IWA World Water Congress & Exhibition will take place in the coastal city of Busan, and will include an extensive range of workshops and events, covering utility finance and revenue challenges, managing water quality in distribution systems, systems modelling, asset management, online monitoring, decentralised systems, and much more. A preliminary programme is now available online.

5th Water Loss Reduction Conference

19-20 November 2012,

Sofia, Bulgaria

Web: www.bwa-bg.com

Water Contamination Emergencies: managing the threats

19-21 November 2012,

Muelheim an der Ruhr, Germany

Web: www.WCEC5.eu

9th International Symposium on Water Supply Technology 2012

20-22 November 2012,

Yokohama, Japan

Web: http://www.jwrc-net.or.jp/aswin/en/symposium_archive/index.html

8th China International Exhibition on Water Treatment Chemicals, Technologies and Applications

7-9 November 2012,

Shanghai, China

Web: www.waterchem.com.cn/en/

5th IWA International Conference on Benchmarking and Performance Assessment (Pi2013)

9-12 April 2013,

Medellin, Colombia

Web: www.iwabenchmarking.com/pi2013

Asset Management for Enhancing Energy Efficiency in Water and Wastewater Systems

24-26 April 2013, Marbella, Spain

Web: <http://iceam2013.es>

Denotes an event organised or supported by the International Water Association