



At the height of the worst drought in generations, Jerson Kelman became head of São Paulo water. He spoke to WaterFront about trying to avert disaster. ► **INTERVIEW: PAGE 8**

Australia's water trading system is still far from perfect – but it is better to be approximately right than comprehensively wrong, writes Mike Young. ► **ANALYSIS: PAGE 10**

Water challenges in South Asian cities are formidable, but not insurmountable. There are ways to reverse the trend, writes Pervaiz Amir. ► **OPINION: PAGE 13**

STOCKHOLM

WATERFRONT

THE FORUM FOR GLOBAL WATER ISSUES | # 1 | MARCH 2015



THE BIG SQUEEZE

Coastal megacities face growing pressure from sea and land

PUBLISHED BY STOCKHOLM INTERNATIONAL WATER INSTITUTE

Photo: Thomas Henriksson



THE FUTURE STARTS NOW

Dear Water Front readers! We have entered a year filled with negotiations and decisions that will shape both policies and practical work for many years to come. As you get this issue in your hand – or on your screen – the Third UN World Conference on Disaster Risk Reduction will be underway in Sendai, Japan. It will be followed by World Water Forum in the Republic of Korea in April and the Conference on Financing for Development in Addis Ababa in July, and starting in September, the UN General Assembly, where a final set of Sustainable Development Goals will be decided. The year will end with the Climate Change Conference in Paris. These are all meetings and processes where we at SIWI invest a lot of time and energy, hoping to inspire decisions for a water wise world.

But, let’s not stop at decisions! All they are is a foundation for our future work. What will really count, what future generations will surely grade us on, is how well we manage to implement these decisions. That’s the real deal. So, please talk to us, work with us, come to Stockholm in August and join us at the 25th World Water

Week to talk about Water for Development. That’s when we kick off our work for the future.

To provide you all with the best possible backdrop for our discussions, we have moved the Week back into central Stockholm where it belongs, close to the city’s water and only a stone’s throw away from City Hall, where the 2015 Stockholm Water Prize Laureate will be celebrated. The name of the laureate will, as always, be revealed on World Water Day. Stay tuned!

In this issue we cover several highly current issues. Josh Weinberg describes how big cities by the coast get squeezed between upstream activities and seas affected by climate change. How will they cope? Find out on page 5. We managed to pin down the new head of São Paulo Water, Jerson Kelman, to ask how one deals with the worst drought in generations. Interview on page 8. And in the Analysis, Mike Young from the University of Adelaide describes how Australia has worked to develop its water trading. Enjoy!

Torgny Holmgren
Executive Director
Stockholm International Water Institute

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PRINTING 13,000 • CIRCULATION 40,000 ISSN 1102 7053

Disclaimer: The opinions expressed within this publication are those of the authors and are not necessarily shared by SIWI or its affiliates.

STOCKHOLM WATERFRONT

Stockholm WaterFront is a quarterly magazine that aims to inform the global water debate and be a source of knowledge and inspiration for professionals worldwide with an interest in water issues. Stockholm Water Front mixes popular science articles with news reporting and carries analyses by some of the world’s most knowledgeable water writers. It is published in print and digitally by Stockholm International Water Institute, and is free of charge.

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Josh Weinberg works in SIWI’s Water-Energy-Food Nexus team and is an expert and coordinator on several of the institute’s programmes in China. He is a former Managing Editor of WaterFront. Josh wrote the cover story about the increasing stress experienced by the world’s coastal cities.

What’s the big lure of big cities by the sea?
Living near the coast is not only nice, it has many features that help economies grow: trade industries, marine resources, tourism can all be found at the coast.

Are coastal megacities waking up to reality?
For major economies on the coast, the risks are too great to ignore completely. Many places are making huge investments to build resilience against flooding and working to reduce pollution. However much more must be done.



Photo: Peter Tvärberg

BRIEFING

WORLD ECONOMIC FORUM: WATER NOW PRESENTS HIGHEST RISK TO WORLD

According to the nearly 900 experts that took part in the World Economic Forum’s Global Risk Perception Survey, a future water crisis would have the most damaging consequences. The respondents also found that a water crisis is closely linked to several other risks; obviously to food, extreme weather events and failure of climate-change adaptation, but also to inter-state conflict, profound social instability and failure of urban planning.



Photo: SXC

“The picture painted by the Global Risk report should be a very sobering one. The water challenges confronting us are indeed tremendous”, said SIWI’s Executive Director Torgny Holmgren. That water is a key concern for future generations is made clear by the fact that among respondents aged below 30, a water crisis is by far the most worrying. Unfortunately, water crisis is among the risks where the least progress has been made over the past ten years. But Torgny Holmgren says that while the survey offers some stark messages, there is a light at the end of the tunnel.

“The world is waking up. We learn every day about new approaches and initiatives that aid the struggle for a world where water is managed wisely and responsibly. I hope that this clarion call is heard across the world, in cabinets, company board rooms and in the negotiations on the Sustainable Development Goals”.

Read more | www.weforum.org

20 CM

Average global sea level rise since 1870. As the climate becomes increasingly warmer, the annual rate of sea-level rise accelerates. Average annual sea-level rise between 1993 and 2010 was almost twice the rate from 1901-2010.

Source: Church, J. A. and N. J. White (2006) and Intergovernmental Panel on Climate Change (IPCC)

THE ROCKEFELLER FOUNDATION LAUNCHES AGRICULTURE NETWORK IN AFRICA

Africa’s finance and agriculture ministers are coming together in the L4AG network, initiated by The Rockefeller Foundation, African Union Commission (AUC) and International Fund for Agricultural Development (IFAD). The exclusive network will provide leadership and strategic thinking to transform and energize Africa’s agricultural sector, to position it as a major contributor to economic growth across the continent.

Read more | www.rockefellerfoundation.org/newsroom

CHARITY AND FASHION RETAILER PARTNER FOR CLEAN WATER

Swedish fashion brand Lindex has partnered with WaterAid to support their work in improving access to safe water, improved hygiene and sanitation in the world’s poorest communities. Lindex will focus on improving the lives of the people living in the communities where the company operates.

Read more | <http://about.lindex.com/en/wateraid>

WASH MEDIA AWARD WINNER CLAIMS PRIZE IN NIGERIA



Photo: Mikael Ullén

Seun Akiyoye, one of the winners in the 2014 WASH Media Awards, celebrated at World Water Week in Stockholm, has gone on to win another prestigious prize in his native Nigeria. Seun was awarded the Development Reporting Prize at the 23rd Diamond Awards for Media Excellence (DAME). Seun Akiyoye is a reporter at Nigeria’s The Nation newspaper.

“Many newspapers do not focus on reporting WASH and development because it doesn’t bring in adverts or any other revenue, in other words it is a thankless job even to the management. But if enough of us can keep at this “thankless job” we may just be able to force policy changes for the benefit of the environment”, Seun Akiyoye told WaterFront.

PRIVATE SECTOR RE-THINKS DEVELOPMENT FINANCE



Photo: iStock images

Ethiopian capital Addis Ababa

THE SUSTAINABLE DEVELOPMENT SOLUTIONS NETWORK (SDSN) ESTIMATES THAT USD 1-3 TRILLION IS NEEDED IN INFRASTRUCTURE INVESTMENTS IN DEVELOPING COUNTRIES IN ORDER TO MEET INTERGENERATIONAL DEVELOPMENT NEEDS.

Three global summits, set to influence development work and policy for many years to come, will take place this year, including Financing for Development in Ethiopia, the UN Summit to Adopt the Post-2015 Development Agenda in New York and the Climate Change Conference (COP21)

in Paris. In order to implement the outcomes of these summits, a new global financing framework is needed – specifically in regards to infrastructure, climate change financing and developing social partnerships.

A recent SDSN forum in London, attended by SIWI alongside a select group of representatives from predominantly private sector organizations and institutions, discussed financing for development.

While it was agreed that there is more capital available than assets and bankable infrastructure projects, a number of concerns were raised by investors. Availability of host government finance and

human resources, political instability in developing countries, institutional capacity for partnerships and project implementation, regulatory standards, and pricing structures and subsidies (e.g. water and fossil fuels) all pose challenges.

The forum was arranged by SDSN, whose Director is Jeffrey Sachs, and Investec Investment Institute within Investec Asset Management.

According to SDSN, the Government of Ethiopia has asked the network to serve as an official advisor to the process leading to the Financing for Development Conference.

Read more | www.unsdsn.org

UN'S JAN ELIASSON PUTS SPOTLIGHT ON WATER DIPLOMACY

Unsustainable water practices combined with a growing world population is expected to put increasing pressure on global freshwater resources in the decades to come. Developing and refining ways of cooperating around our most precious resource is becoming more important. In a recent issue of the scientific journal Nature, UN



Jan Eliasson

deputy secretary-general Jan Eliasson wrote: "...as freshwater shortages become increasingly acute, the threat of violence over water is a real one.

But we must not lose sight of the opportunities that water offers as a source of cooperation." SIWI, having developed

knowledge and offered advice about transboundary water management for many years, in 2014 became host for the International Centre for Water Cooperation (ICWC) under the auspices of UNESCO. The centre aims to deepen the knowledge about transboundary waters and the cooperation opportunities they hold. "Transboundary waters offer unique opportunities for cooperation on several levels. Hydro-diplomacy is an important niche of diplomacy that complements efforts to help build a world where leaders and institutions seek collaboration rather than conflict," says Dr Therese Sjömander-Magnusson, SIWI's director for transboundary waters.

A STANDARD FOR BETTER WATER FINANCING

A water crisis is not a threat in a distant future. It is here, and it needs to met on several fronts. By 2050, more than four billion people will face severe water scarcity if we do not decisively change the way we use water. In an attempt to drive more funding to water projects, the Gold Standard, a certification standard initially developed for carbon offset projects a decade ago, has expanded its model for results-based financing to water.

"Today, we have a financing gap for water projects. The hope is that the Water Benefit Standard will help close this gap", said Anna Forslund, working with climate change issues at SIWI.

To date, two projects have been included in the initiative, a WASH project in Uganda, and an agriculture project in India.

Read more | www.goldstandard.org/water

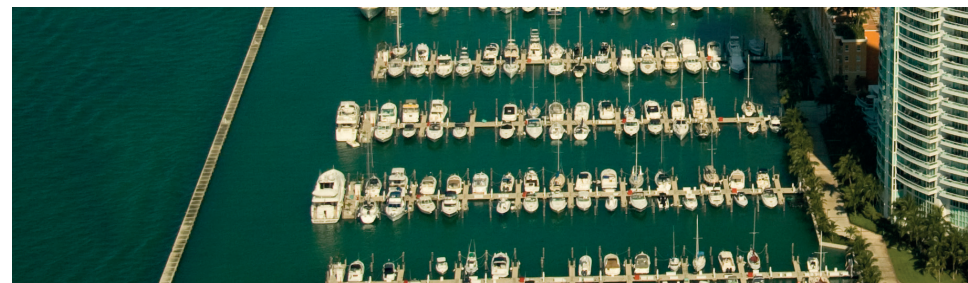
ERRANDUM

In the obituary for John Briscoe, published in WaterFront 4-2014, we wrote that Professor Briscoe, following his reception of Stockholm Water Prize, set up a development fund at his old school in Kimberley, South Africa. That is incorrect. The fund, for the John Briscoe STEM Award, was set up by Prof Briscoe's school colleagues.



THE BIG SQUEEZE

TEXT | JOSH WEINBERG PHOTO | ISTOCK



WITH THE MAJORITY OF HUMANITY SET TO SETTLE BY THE COAST, THERE HAS NEVER BEEN MORE AT STAKE, NOR BETTER REASONS TO ACT.

As the global population grows larger, denser, and more urban, it is also condensing along the coasts. Coastal zones are home to nearly half of the world's people and a majority of the world's largest cities, and will continue to expand rapidly over the next century. From Miami to Mumbai, urban developments in low-lying coastal zones will feel the squeeze as they expand pressure on increasingly scarce freshwater and land resources on one side and face increasing risks from more pollution, rising sea levels and stronger, more frequent storms on the other. Intelligent long-term urban and regional planning, improved coordination between freshwater and coastal management, and increased investment in resilient infrastructure will be needed to ensure coastal developments are sustainable.

While coastal areas include some of the most dynamic, attractive,

vulnerable, and densely populated regions on earth, they are also strongly impacted by activities upstream. As cities expand, agricultural and industrial production also tend to move and grow further up the riverbank. This development often exceeds the reach of city authorities to manage, but can lead to increased competition for resources and more pollution sent downstream. In a recent assessment performed by the Delta Alliance of 14 major delta regions worldwide, nearly all of them faced growing problems with increasing water and soil pollution caused by a combination of urbanization, industrial development and agricultural intensification.

Deteriorating water quality and changes in the sediment loads that accompany this flow can severely alter coastal and marine ecosystem functions and service delivery. Globally, land-based activities cause 80

per cent of nutrient- and chemical-based marine pollution.

Direct environmental degradation leads to coastal erosion, land subsidence and weakened natural infrastructure, all of which increase vulnerability to flooding and extreme weather. Forest clearing and certain farming practices can accelerate soil erosion, increasing the volume of sediment and nutrients flowing through the water that washes up in coastal regions. This can lower the quality of water and at times contribute to algal blooms and eutrophication. Other places face a sediment shortage as the flow of water is held back by dams. Reduced deposits of new sediment can quicken erosion and prevent the natural replenishment of the coasts.

Coastal cities can also be very vulnerable to the impacts of natural hazards. Flood risk will always need to be managed in settlements close to sea level. There are a number of factors that impact the level of risks faced, particularly the density of infrastructure, industries and populations located within flood prone areas, as well as the existing natural, man-made and governance infrastructure of the city (Rockefeller Foundation, 2013).

According to the OECD, the size of the population at risk to natural hazards in the ten largest cities coastal cities will grow to over 80 million people by 2070, four times higher than the number today.

Many cities are sinking faster than the sea is rising. The over-abstraction of groundwater can cause the land to descend with it. Megacities worldwide with known

●●● cases of major land subsidence include Dhaka, Guangzhou, Jakarta, Kolkata, Tokyo, and Shanghai, each of which also faces growing vulnerability to salinization and larger, longer and more frequent flooding incidents (Pelling and Blackburn, 2014). Land subsidence can, in severe cases, also impact road and transportation networks, hydraulic infrastructure and sewage systems. At the same time, urban expansion and the development of the coastal zone in many regions is eroding defense systems against flooding provided by nature. Healthy ecosystems, such as coral and oyster reefs, seagrass, salt marshes and mangroves, provide natural infrastructure to protect against flooding by attenuating waves. In Mumbai, for example, an estimated 40 per cent of its mangrove cover has been lost over the past decade as a result of reclamation for housing, treatment facilities,

IN CHINA ALONE, over 50 million people could be at risk from coastal flooding by the end of the century if greenhouse gas emissions continue to stay high.

Source: www.climatecentral.org

RISKS ARE GROWING on all fronts. One study predicts that annual global flood losses would increase from USD 6 billion in 2005, to 60 billion by mid-century, even if current levels of flood probability were maintained.

Source: Hanson et al, 2011

commercial projects, and the expansion of slums.

Development of coastal regions has destroyed half of the planet's wetlands over the past century. These ecosystems provide numerous additional benefits such as food production, erosion control, carbon sequestration as well as support tourism and recreation but are being depleted faster than they are able to be restored or have their

services replaced by building new infrastructure.

Miami provides a telling example of the high costs of short-term planning for long-term investments. Infrastructure built a few decades ago is already poorly suited for the present. Today, the city is investing heavily in improved water management and climate adaptation to secure its future.

A global ranking (Hanson et al, 2011) assessed that Miami had the greatest level of financial vulnerability to climate change and sea level rise, both today, and for the next half century. The same study predicted that the number of individuals at risk to flooding resulting from sea level rise in Miami could grow from several thousand today, to over four million by 2070.

Recent reporting from the World Resources Institute (2014), discussed how infrastructure planning in the greater Miami region could better account for uncertain conditions that may come over its lifespan. During the 1950-1960's, flood control canals were built only six inches above the sea level at high tide.

Since then, sea levels have already risen 5-8 inches across the region. Now during flood events, gates often cannot be used and the city must pursue new and expensive solutions, such as reverse pumps, which could cost hundreds of millions of dollars to install across the region. Concern continues that plans for building new, improved and expensive treatment plants have not adequately taken protective measures to insulate against increased flood risk resulting from climate change.



MOST THAT CAN LIVE NEAR THE COAST DO – in over half of countries with a coast, four-fifths of the population live within 100 km of sea. The coast provides many opportunities for industry, hold a wealth of natural resources, serves as centers for shipping and trade and are often tourism destinations. Mumbai, India is among the cities most exposed to coastal flooding.

Moderate scenarios for sea level rise could inundate more than two in three of the region's coastal flood and salinity control stations. Additional high-capacity pumping stations will be costly. Moreover, land-use planning makes valuable beaches highly vulnerable to coastal erosion and sea level rise. Most of its domestic sand resources are tapped, while millions of cubic meters more would be needed to restore beach environments under current development scenarios.

The local government is taking a number of actions to protect the oceans from people and to protect people from the oceans. To boost its flood defense, the city is expected to invest USD 300-400 million over the next several years to upgrade infrastructure to ensure better protection against potential sea level rise and larger coastal surges. Through the Miami Ocean Outfall Legislation Program, the Miami-Dade county is also taking action to protect its coastal and marine environments from pollutants upstream. USD 3-5 billion will be invested to reduce nutrient discharges in treated

wastewater, increase reuse of wastewater flows to 60 per cent, and cease disposal into the ocean entirely by 2025.

Coastal developments will continue to be at the centre of the global economy for the next century. There are indications that governments are increasingly interested to support investments to improve their resilience to climate hazards, restore eco-systems and improve the coordination of land-use, freshwater and coastal management. In the United States and the Netherlands, for example,

which are two of the countries with most resources and the highest current level of

TODAY, the global coastal poor population is estimated at 250 million, of which more than half are living in coastal cities.

Source: Rockefeller Foundation

POOR URBAN COASTAL POPULATION may double by 2050; population density in coastal zones is growing twice as fast as non-coastal zones to 2050.

Source: Rockefeller Foundation

assets located in high-risk zones, new multi-billion dollar investments are being made in climate adaptation and environmental protection of marine and coastal environments. Much more investment will be needed in developing areas worldwide. Looking ahead, nine of the ten largest coastal cities that will hold the largest exposed populations and greatest amount of financial assets at risk are located in Asia. As they grow, the costly lessons of past, as seen in Miami, should be avoided.

There is a strong foundation of scientific knowledge on how ecosystems function, and the measures that can be applied to maintain, protect and utilize their services. Communities of practice in the climate adaptation, freshwater, coastal and ecosystem management have developed a wide range of tools, including both natural and green infrastructure solutions and instruments for vulnerability assessment, ecosystem valuation, and trade-off analysis to support sustainable urban development planning. Still, there are many

fronts where our knowledge could be enhanced. Better understanding of how coastal settlement patterns, migration and urbanization and land-use change patterns will impact ecosystems and natural infrastructure is needed, as are mechanisms to improve coordination and implementation of waste, water and land policies.

No universal framework will provide a blueprint for how this can be achieved. Innovative approaches to ecosystem management, inclusive urban planning and sustainable land use policies need to be developed, refined and adapted to specific contexts and account for differences in institutional and physical environments. To support this, SIWI has established a multi-stakeholder initiative "The Action Platform for Source-to-Sea Management" that aims to help fresh-water, coastal and marine experts to connect and engage in collaborative projects, promote best practices, and take collaborative action to improve the management of land, water, coastal and marine linkages. ●

CONNECTING THE DOTS, AND THE EXPERTS

The Action Platform for Source to Sea Management is a multi-stakeholder initiative that enables freshwater, coastal and marine experts to connect and engage in collaborative projects, promote best practices, and take collaborative action to improve the management of land, water, coastal and marine linkages. The platform is open to governments, private sector, scientific community, NGO's and civil society organizations, and is coordinated by a Secretariat hosted at the Stockholm International Water Institute. Several activities will be further developed by the network.

Read more | www.siwi.org/source-to-sea

The case study on Miami draws upon analysis done by Forbes Tompkins, Christina Deconcini, and Rhys Gerholdt of the World Resources Institute, read more at www.wri.org

PREPARING FOR THE WORST

INTERVIEWED BY | VICTORIA ENGSTRAND-NEACSU PHOTO | EDITORA GLOBO S/A & AFP

AT THE HEIGHT OF THE WORST DROUGHT IN GENERATIONS, JERSON KELMAN TOOK OVER AS HEAD OF THE COMPANY SUPPLYING SÃO PAULO WITH WATER. HE SPOKE TO WATERFRONT ABOUT TRYING TO AVERT DISASTER.

A couple of months ago, newspaper reports spoke of “a looming disaster” in São Paulo. How would you say the situation developed?

The four interconnected reservoirs of the Cantareira System have a useful storage of almost one billion cubic meters. Until recently, this seemed to be sufficient to regulate the river flows and supply potable water to roughly 10 million people, which corresponds to half the population living and working in Metropolitan São Paulo. However, the current drought is no doubt an outsider, from a statistical point of view. The inflow volume to the reservoirs in the last months has been roughly 20 per cent of the average. In the worst year of a long historical record (more than 80 years), the inflow in these same months had been more than 50 per cent of the average!

Currently there isn't any drop left in the useful storage. However, there is still some water left below the regular intake. In the middle of February, there was still 76 million cubic meters to be pumped out from the so-called “dead storage” through an emergency installation. There is no concern about the quality of the water as there has been always some flow to downstream from submerged gates.

Obviously, Sabesp (the water company that supplies metropolitan São Paulo) can't allow the reservoirs to go entirely dry, which would lead to an extremely difficult situation in which all would depend only on the inflows. Therefore, we have been decreasing the pressure in the grid. First, this operation was performed only during the night hours, in order to decrease the leakage (some installations are more than 70 years old and physical losses are of the order of 20 per cent). However, as it became more and more necessary to use water parsimoniously, the time intervals of reduced pressure were prolonged and part of the population (less than one per cent) is suffering from insufficient water for long hours and even

days. In general, these families are poor and live in high places, where the water pressure in the pipes is unable to force the water in. Furthermore, they aren't equipped with water tanks. For this reason, we provide free of charge water tanks for low-income families.

Unfortunately it can get worse if it doesn't rain sufficiently in the right places. Since my first day as president of Sabesp (9 January, 2015), I've been saying that we have to hope for the best and prepare for the worst.

In December, the Cantareira reservoir system was down to 7 per cent of capacity. In late January, it was down to 5.4 per cent. Is it still decreasing?

Given the fact that the rainy season in São Paulo starts in October and ends in April, with peak in January and February, the decline of storage that you describe was indeed alarming. After all this is the time of the year when inflow is always greater than outflow. The current year is an exception. Fortunately, this trend seems to be reversing in the first half of February. By mid-February, the storage had recovered to 7.8 per cent of the useful storage.

There were fears that Cantareira would dry up in July. Is that still a threat? For how long would the other reservoirs be able to serve São Paulo?

The other two important systems – Tiete and Guarapirang – are also stressed because they have been supplying water to part of the consumers originally attended by the Cantareira system. Consequently, there is now little water in storage.

In my third day as president of Sabesp, I spent a few hours flying by helicopter with Sabesp technicians in search of new water sources in the neighbouring river basins. We also looked for ways to bring water from the only remaining reservoir in the metropolitan area (Billings) to the existing water treatment plants.

The good news is that it was possible to find some small rivers with reasonable flow in the upstream reaches, close to the basin divides, blessed by orographic rains. Sabesp will fetch this water through several emergency apparatus, pump it up

the hills and dump down into small creeks at the other side of the crest, that belong to the drainage area of both, Guarapiranga and Tiete reservoirs. As the engineering works will be finished still in 2015, there is no reason for despair, even with very low rainfall.

You introduced fines on higher-than-average consumption in February. When do you hope to see any results?

The results are already showing. Some consumers complain about the increase of their water bills, but most now understand that using more water than necessary not only hurts them economically but also, more importantly, is a selfish behaviour.

Are you still considering a rationing of water?

If we did not have a water crisis, water production in Metropolitan São Paulo would be higher than 70 m³/s. Now it is 50 m³/s. In other words, there is already a reduction in production of 30 per cent. An important part of this saving is water that would be lost as leakage to the ground. However, another part is due to decrease of consumption, either voluntary or involuntary. It is voluntary when the consumer changes his or her habits to save money or because he or she understands how difficult the situation is. It is involuntary when the consumer simply doesn't have enough water, due to a decrease in water pressure. Saving more water would demand an extremely tough rationing process that would impose a sacrifice that is much more difficult and would affect much more people than in the current situation. We should only decide to proceed in this way if there are no other alternatives. Fortunately, the emergency engineering works that I mentioned before may solve the problem.

How can São Paulo work to avoid a situation like this in future?

São Paulo has a well-conceived Master Plan designed to increase the water availability by 25 m³/s in the next years. The Plan counts with water from



JERSON KELMAN took over as head of Sabesp in January, as newspaper reports spoke of a “looming disaster” in São Paulo. Jerson Kelman has been a member of the Scientific Programme Committee (SPC) of World Water Week.

“Unfortunately most of the rain fell downstream from the catchment areas”

SÃO PAULO is the most populous metropolitan area in the southern hemisphere. In February, the biggest reservoir system supplying the city was at a seven per cent capacity.



neighbouring basins and with the re-use of served water. However, this extreme drought took us all by surprise.

To what extent do you believe the water shortage is a result of deforestation?

During the helicopter flight over the upper Tiete river basin, I could observe large areas covered with Eucalyptus. It is well known that forests increase evapotranspiration and, therefore, decrease the amount of water that otherwise would flow to the reservoirs used for water supply. So, one couldn't say that water shortage is a result of deforestation. On the other hand, trees

are important to control erosion and increase infiltration and, therefore, the base flow. In other words, local deforestation, at a scale insufficient to alter the pattern of regional rainfall, tend to increase the mean and the variance of river flows.

To what extent has the recent downpour and resulting flood in São Paulo alleviated the situation?

Unfortunately most of the rain fell in the city, downstream from the catchment areas of the water supply reservoirs. Water storage has increased a bit, but not sufficient to revert the situation. ●

TRICKS OF THE TRADE

LEARNING FROM AUSTRALIA'S WATER REFORM EXPERIENCE

TEXT | PROF MIKE YOUNG PHOTO | ISTOCK

AUSTRALIA HAS BEEN DEVELOPING ITS WATER TRADING SINCE THE 1990S. THE SYSTEM IS STILL FAR FROM PERFECT, BUT IT IS BETTER TO BE APPROXIMATELY RIGHT THAN COMPREHENSIVELY WRONG, WRITES PROFESSOR MIKE YOUNG IN THIS ANALYSIS.



As water scarcity becomes more common, a wide range of people are recommending that water rights, abstraction licences, permits – whatever you call them – should be made tradable.

When water entitlements and allocations are tradeable AND the arrangements used to specify are well designed, trading can bring significant economic, social and environmental benefits not attainable through other means.

Australia, arguably more than any other country, has embraced the idea that water entitlement and allocation arrangements can be improved. Today, virtually all irrigation communities, towns and cities are better off than they would have been if Australia had not committed to water policy reform.

One of the ideas central to the improvement of water policy arrangements in Australia has been a commitment to the development of robust entitlement and allocation regimes. Another has been the notion that it is better to rely on markets rather than ministers to reallocate rights to access to water.

Water, by the way, remains a public good in Australia. All actions are taken in an attempt to deliver the best outcome in a timely manner. There is a role for markets but the water market is not the king. That is, the market is the servant used to deliver desired outcomes in a timely manner. The government remains the master.

Australia was one of the first countries to attempt to embrace water trading on a large scale. The process began in the 1990s. From the outset, it was envisaged that it should be possible to trade water allocations across state borders on a daily basis so that water is always put to its best use and this

use kept within sustainable limits. As the first country to attempt to develop arrangements that allowed trade at this scale, many mistakes were made.

With the benefit of hindsight, it became clear that the nation had not thought enough about the sequence and extent of the reforms needed to prevent water trading from making things worse rather than better.

Playing catch-up, Australia has spent the last decade improving its water entitlement, allocation and use control systems so that water trading helps rather than hinders progress. To the delight of all, the final outcome is one that has generated much more innovation than anyone ever expected and has created much more prosperity than anyone thought possible.

No other nation need make the same mistakes. Among other things, Australia has learned that trading can significantly reduce the adverse impacts of droughts on communities.

In the recent near decade-long Millennium Drought, water allocations traded backwards and forwards across three state borders in the Southern connected River Murray system at lightning speed. Faced with the knowledge that many users would end up with a zero allocation, nearly every water user began to search desperately for ways to save water. All knew that the total amount of water that would be available would be very low. In the end, the total amount available for use was just 30 per cent of the water that was normally allocated to all users!

Free from the impediments to trade that burden water users in most other countries, an efficient solution was found. As a result, the gross value of irrigated agricultural production fell by less than 20 per cent.

As far as I am aware, no other country has got to this level of performance. In Australia, “More crop per drop” has a very real meaning. No water minister could have achieved the same economic or social outcome.

What can other countries learn from this experience?

The first and most important lesson is that every country should start the process of building a water-right system that has hydrological integrity and is designed to allow trading to occur should it become necessary. Those interested in learning about these mistakes may like to read a report that I wrote for the OECD on the lessons learned from the 17 biggest mistakes made. To this day, nearly every other country I am familiar with has still to learn these lessons.

It took Australia two decades to re-design its water right system and develop the governance arrangement necessary to cope with droughts, link urban and rural administrative systems, establish water-right registers that have integrity and find the best way to resolve tensions between those interested in the environment and those interested in productivity. Australia also had to learn how to build robust water accounting systems and to deal with things like connections between surface and groundwater systems.

In retrospect, it can be stated with clarity, that the best way forward is to stop trying to set up water markets and, instead, focus on the nature of a water

shares. No exceptions are made – even if you are a large town or city. This does not mean that you will not have access to the water you need. It just means that you will need to find a way to buy water allocations.



River Murray in southern Australia

rights from someone to whom an allocation has been made. This simple administrative rule has locked in an arrangement that ensures that use is kept within sustainable limits. As towns grow, they are forced to buy water shares from willing sellers.

Behind the scenes, a huge amount of effort went into the development of share registers and getting rid of lots of paper buried in office folders and various poorly maintained filing systems. Today, the only way you can trade a water share is to contract to change the names attached to a share in a central register. No other arrangement is allowed. This simple rule has proved critical in allowing markets to function.

The creation of simple registers that have integrity, among other things, has allowed the banking industry to become involved in the improvement of water use efficiency. Today, it is possible for anyone to mortgage a portfolio of water shares. The process is simple and extremely straight forward – so much so that lawyers rarely get involved. As a result, banks have been very willing to lend money to people wishing to improve water use efficiency. Shares by the way are shares. Australia learned the hard way that no-one can ever be guaranteed a right to water. ●●●

“In Australia, ‘more crop per drop’ has a very real meaning”

right system that allows trading to work. Another is to think carefully about the best way to protect the environment and keep transaction costs low.

One of the first building blocks, now used nationally, is to define each long-term interest as a legal entitlement to a share of any water allocated to a region. The rule is simple. If you don't have a water share, no allocations will be made to you. If you want to receive allocations, you must hold water

••• It is wiser, always, to wait until the water exists and then allocate it. It is the role of users, not government, to manage supply risks. Another important innovation has been the so-called “unbundling” of water rights.

Unbundling involves the splitting of a “right” into its component parts and the development of administrative arrangements that allow each part to be managed separately. Instead of recording all entitlements, conditions, obligations etc. in a single document, Australian irrigators have access to a share register, a water account and a suite of use approvals, works approvals, etc.

Unbundling has made it easy to track water and work out who holds what. Every water user has been given a water account that looks like a bank account. Water, as it becomes available, is credited to an account and, as it is used, debited from that account. By law, every water user must have a water account and all significant forms of water use must be metered. Allocation trades – colloquially called temporary trades – are made by debiting one account and crediting the other.

There’s an old adage that says “if you can’t measure it, you can’t manage it.” Australia has spent a significant amount of time installing meters and building the accounting systems needed to track water use. Metering, however, is not enough.

“If users don’t respect your allocation system, then you have little chance of managing it.” In Australia, every water user understands that if someone wants to take more water someone else

AUD 1 MILLION

The maximum penalty for the unauthorised taking of water in New South Wales

At a totally different scale, Australia has also thought long and hard about the best way to keep politics and lawyers out of the water management process. Among other things, this has resulted in the assignment of water shares to the environment so that this “sector” is treated as an equal player in the allocation process. In most other countries, water legislation aims to put the environment first but in practice often fails to look after it properly. Another innovation has been a commitment to the development of a statutory water allocation plan for each water body and for each of these plans to be approved by parliament. Each plan contains the detail necessary to prevent most water trades ending up in court.

This magazine is not the place to map out all the detail. The main lesson that stands out from Australia’s experience is that every country should check the water entitlement and allocation systems it is using.

With few exceptions, most water entitlement and allocation systems evolved under conditions that no longer exist. If a careful review finds that the water entitlement and allocation system being used is not able to manage the rapid onset of a drought and/or changes in the demand for or supply of water, it might be time to begin improving the way water rights are specified and the allocation of water to users managed.

When I look carefully at the Australian experience, I have come to the conclusion that all water rights should be defined as a share and that all the allocation systems used should have hydrological integrity and be designed to perform well during times of stress.

Today, in most regions, two water markets are alive and well. There is a market for allocations and a market for shares. Proposals to go back to the old system are very rare. Proposals to improve the system still emerge on a regular basis. The system we have is still far from perfect but it’s better to be approximately right than comprehensively wrong. ●

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“Most water entitlement and allocation systems evolved under conditions that no longer exist”

has to take less. Stealing water – taking more than you are entitled to – is stealing from your neighbour!

It took quite a bit of time to shift community attitudes from one which tolerated a degree of stealing to one that was respected. Under the water accounting systems used today, there is some flexibility. Every water user is given time to “make good” by purchasing unused water allocations from someone else. Failure to make good, however, is treated as a serious offence. The penalty for taking water not allocated to you is several times its market value. Non-compliance is rare. In New South Wales, the maximum penalty for the unauthorised taking of water is a AUD 1 million fine and/or seven years jail.

TURNING THE TITANIC

HOW TO MEET THE URBAN WATER CHALLENGES IN SOUTH ASIA

TEXT | DR PERVAIZ AMIR PHOTO | AP

WATER CHALLENGES IN SOUTH ASIAN CITIES ARE FORMIDABLE, BUT THEY ARE NOT INSURMOUNTABLE. FROM MASS AWARENESS CAMPAIGNS TO TECH INVESTMENTS, THERE ARE WAYS TO REVERSE THE TREND, WRITES PERVAIZ AMIR IN THIS OPINION.



Despite high economic growth rates, challenges of poverty, water, and energy are glaring in South Asia. It houses 1.6 billion people, or one fifth of the world’s population. Add another 1.4 billion people in bordering China and you have the largest concentration of humans on earth, all aspiring to a better (often meaning urban) life. With a projected 60 per cent of the population residing in urban centers by 2050, provision of water infrastructure and tapped water are an overwhelming challenge. From Delhi, India the good news is that almost 60 per cent of the population has access to tapped water of variable quality. Still, 30 per cent of the population is devoid of clean and safe drinking water and others, such as those living in squatter settlements, scavenge for water. In Pakistan, Bangladesh, Sri Lanka and Afghanistan the situation is even more precarious due to low historical investments in water infrastructure and services. The majority still suffers from water-borne diseases. While major epidemics are history, the poor are still vulnerable. Incoming climate-hit refugees are putting further pressure on cities.

Urban centres have failed to keep up with needed water-related infrastructure. Some, like Karachi, have supplemented fresh water through underground pumping and river diversions. However, line losses account for 40 per cent of water not getting to consumers. Add another 20 per cent lost to leaking taps at homes and you have a full-blown crisis of delivery efficiency and rising costs. Residents respond by installing dug wells or hand pumps. Water quality of both sources is dubious. Even where scarcity demands, trucking in water is costly. Low income consumers pay almost ten times the price that metered water costs.

Poor governance and outright corruption makes water a lucrative business. Cartels and water mafias have emerged in cities like Karachi in Pakistan.

Their business model recognizes that growing urban populations will ensure a steady supply of customers. The price of fuel is equivalent to a litre of bottled water. Still, people cannot drink oil, no matter how low the price! The mafias enforce their own governance rules and prevail upon the water boards by stealing public water and controlling underground and surface water points through collusion or coercion. The net result is differential pricing of water and little control over its quality. Even bottled water in Karachi fails to meet the minimum WHO standards. As South Asian cities boom, water woes will further aggravate the situation, and pricing in multiple markets will reflect this scarcity. City governments overlook such protests and public outcry. Silent sufferers of water shortages must fend for themselves.

In India, desperate planners asked Delhi residents to start roof-top water harvesting to cope with rising water demand. Even cities with long sea coasts and high economic growth rates fail to invest in expensive desalinization technology to overcome urban water supply problems. Both high upfront investment and poor governance are reasons for such inaction. Nor is waste-water treatment similar to that in Singapore, where 100 per cent of the city’s waste-water is recycled and offered as safe tap water. A lack of cutting-edge science and multi-stakeholder commitments act as hurdles.

Yes, the water challenges in South Asia are formidable, but they are surmountable. Reform should start with mass-awareness campaigns on water-saving at all levels. Build capacity to create a cadre of water managers. Offer loans for quick water fixes in homes and factories. Right pricing and rationing where conditions demand and finally; planned investments in affordable technology. Encouraging peri-urban agriculture with canal flows close to city centres can help recharge depleting groundwater resources with fresh water. ●

Dr Pervaiz Amir is Regional Expert South Asia GWP/ Director Hisaar Water Partnership.

“Women’s representation rose in numbers but their influence remained symbolic”

TEXT | MOA CORTOBIUS PHOTO PETER TVÄRBERG

In late 2014, Sweden’s new foreign minister, Margot Wallström, made history when she declared the commencement of a feminist foreign policy for the country. Even if the level of ambition has few precedents, the application of a gender perspective is not novel. Today, most development actors and larger organizations relate to gender mainstreaming in one way or another, also in the water sector. The link between women’s active engagement and sustainable water management is generally well recognized.

Yet, evaluations tend to show that the operationalization of gender mainstreaming is fraught with difficulties and that progress is often limited. Despite knowledge about the issue, internal and external barriers persist – time and resource constraints, lack of capacity and buy-in are organizational weaknesses commonly highlighted. A less discussed, and more contentious, barrier is the potential far-reaching political effects that a gender perspective can have on the own organization, partners and beneficiaries.

Supporting the knowledge management work of eleven water governance programmes, I came across stories of adversities and mistakes in the implementation of gender strategies. Several programmes struggled with the aforementioned organizational weaknesses, but what worried the staff more was the resulting unpreparedness to prevent and meet the resistance and backlashes at the local level.

When programmes promoted women’s participation in local water user’s committees, women’s representation rose in numbers but their influence on decision-making remained symbolic. From fear of women being misled by foreign ideas and values, men would not allow them to receive information or participate in activities alone. In a few cases women were even met with domestic violence in response to them challenging cultural norms by engaging in programme activities – reactions contrary to those intended.

Since power is relative, dependant on a person’s relations to other people and groups formed by social and cultural norms and distribution of wealth, activities aimed at empowering



women will, if successful, alter the power dynamics in a group of people, society or organization. Lack of understanding of the social processes that are set in motion by gender activities can, like for several of these water governance programmes, generate unexpected reactions and at worst put women and girls, or other marginalized groups, at risk.

With this, I by no means want to advise water projects or investments to shy away from applying gender strategies. On the contrary, the water governance programmes also showed that when the gender strategies were successful they contributed to the services’ sustainability, the communities’ prosperity and increased gender equality. By involving men, especially those in leadership positions; organizing women for collective action and; working consciously with gendered power structures, conflicts could be prevented and mitigated and gender strategies adapted to the local context. Moreover, these experiences hint at another lesson learnt; the unmet need to speak more openly not only about good practices, but also of negative effects and experiences. But, because of the high demands on water projects to quickly show good results in order to gain renewed support from financiers, courage, and potentially financial independence, will be required for open scrutiny of adversities. Yet, striving towards sustainable water management and dignified lives for all, it is crucial that we don’t continue to minimize the conflicts and difficulties that we meet – especially if we want to reach those most in need. ●

Moa Cortobius works in the UNDP Water Governance Facility at SIWI, focusing on gender, inter-cultural and integrity aspects of water governance.

CALENDAR

14-18 MARCH

UN World Conference on Disaster Risk Reduction

The conference will attempt to build the resilience of nations and communities to disasters. This includes a review of the implementation of the Hyogo Framework for Action, and consideration of the experience and recommendations of regional and national strategies/institutions. Effort will also be made to adopt a Post-2015 framework for disaster risk reduction, and identify ways to best cooperate around the implementation of the framework, and periodically review its implementation. The event takes place in Sendai, Japan. www.wcdrr.org



22-27 MARCH

Water Week Latin America 2015

SIWI supports the Water Week Latin America as a Key Collaborating Partner, aiming to strengthen the links between the conference and World Water Week in Stockholm. SIWI will take an active part in the event and present the outcomes from last year’s World Water Week at the Opening Session. Water Week Latin America 2015 focuses on a new way of thinking and positive action towards water-related challenges. The event takes place in Viña del Mar, Chile. <http://waterweekla.com>

20 MARCH

Announcement of Stockholm Water Prize Laureate

On 20 March, SIWI will announce the 2015 Stockholm Water Prize Laureate. This year the prize celebrates 25 years. www.siwi.org/prizes/stockholm-waterprize

22 MARCH

World Water Day

In 1993, the United Nations General Assembly designated 22 March as the first World Water Day. In its 22nd year, the theme for World Water Day is ‘Water and Sustainable Development’. This year, the international community is making critical decisions for future global development. The sustainable management of water is fundamental to our ability to implement these decisions. www.unwater.org/worldwaterday



12-17 APRIL

7th World Water Forum 2015

Every three years, the World Water Forum mobilizes creativity, innovation, and know-how around water. SIWI will co-host a number of events, including in association with the new UNESCO Category II Centre, the International Centre for Water Cooperation (ICWC). The event takes place in Daegu and Gyeongbuk, Republic of Korea. <http://eng.worldwaterforum7.org>

19-21 APRIL

World Economic Forum on East Asia 2015

East Asia continues to be the world’s economically fastest-growing region and its most populous. The region is now preparing for the launch of the ASEAN Economic Community by the end of 2015, heralding a new era in the free movement of people, goods and services across a contiguous economic bloc of ten countries with over 600 million people. The event takes place in Jakarta, Indonesia. www.weforum.org/events/world-economic-forum-east-asia-2015

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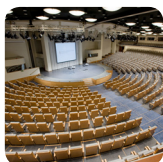
STOCKHOLM **WATERFRONT**

Meet the 2015
Stockholm Water
Prize Laureate!

OUT IN
MAY

2015 WORLD WATER WEEK

Water for Development



NEW VENUE, NEW FORMAT

This jubilee year, both Stockholm Water Prize and World Water Week turn 25. To celebrate, the conference will return to the heart of Stockholm (www.stoccc.se). We have also transformed the conference programme. This year, all events apart from the workshops will run for 90 minutes. There will also be a range of interesting activities linked to the exhibition – which will also be open to the public.

REGISTRATION
OPENS
15 APRIL

PRIZES AND AWARDS



World Water Week features several world-renowned award ceremonies, including the prestigious Stockholm Water Prize Award Ceremony and Royal Banquet.

SEMINARS & WORKSHOPS



In addition to 140 seminars, eight workshops take place during the Week, showcasing thought leadership on content connected to this year's theme: Water for Development.

NETWORK



In 2014, World Water Week had over 3,000 participants and 270 convening organisations from 143 countries.

EXHIBITION



Demonstrate your company's strong commitment to addressing water-related issues. Raise awareness of your work to both the public and participants of the Week.

FIELD VISITS



World Water Week offers field visits as an opportunity to experience practical examples of the science and policies discussed during the conference.

YOUNG PROFESSIONALS



During 2015 World Water Week we will again host a Young Professionals' Day – an entire day of activities specifically for future water and development professionals.

