



Reaching the goal of sustainable water and sanitation for all in time for the Agenda 2030 deadline is going to take far more money than the world is spending on water today. ► ANALYSIS, PAGE 08



When making decisions about water, do we know the faith of stakeholders at the table? Are faith organizations present? And should we care? ► FOCUS, PAGE 14

STOCKHOLM

WATER FRONT

#1 | APRIL | 2018



**BRUCE RITTMANN AND
MARK VON LOOSDRECHT
PARTNERING WITH
MICROORGANISMS**

CAPE TOWN PLANS BEYOND DAY ZERO

MOVING INTO THE NEW NORMAL

Last summer, WaterFront covered the then-emerging water crisis in Cape Town. Since then, the city has seen Day Zero warnings, international media spotlights, and water rationing. In this issue we revisit the South African metropolis to see how it is coping with the new normal. What are Capetonians doing to deal with water scarcity not only today but in the long run? And has the drought changed citizens' attitudes towards water? Read the Cover Story on page 4.

The 2018 Stockholm Water Prize laureates, Professor Bruce E. Rittmann and Mark van Loosdrecht, show us how we can partner up with microorganisms to take the "waste" out of "wastewater". We asked them about their current work and upcoming inventions. Read their interview on page 10.

Three years into Agenda 2030, it's still not clear how to mobilize sufficient resources to achieve the goal of sustainable water and sanitation for all. On page 8, this issue's Analysis looks at how the private sector can help fill the financing gaps.

Religious beliefs influence many people in their daily decisions around water. Yet, they are rarely at the core of our discussions on water. How come and which role do faith organizations play? Read more on page 13.

In the Last Word, Malin Falkenmark reminds us that water scarcity requires far more attention than it is currently getting. More on page 15.

Enjoy the read!



Torgny Holmgren
Executive Director,
SIWI



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EDITORIAL STAFF

Johannes Ernstberger | Editor
Marianne Engblom | Graphic Designer

Contact: waterfront@siwi.org

2018 EDITORIAL BOARD

Anton Earle
Lotta Samuelsson
David Michel

PHOTOS

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Andreas Karlsson | Cover Photo

STOCKHOLM WATERFRONT

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STOCKHOLM INTERNATIONAL WATER INSTITUTE

Box 101 87
Visiting Address: Linnégatan 87A
SE-100 55, Stockholm, Sweden
Tel: +46 8 121 360 00
Fax: +46 8 121 360 01
www.siw.org

HEADS OF STATE CALL FOR SHIFT IN THE WAY WATER IS VALUED

The High-Level panel on Water, consisting of eleven heads of state and a special advisor, calls for a fundamental shift in the way the world manages and values water. In its report *Making Every Drop Count: An Agenda for Water Action*, the Panel presents several recommendations for changing the way the world understands, values, and manages water.

“With increasing scarcity, we must recognize the many values attached to water, be it economic, social, environmental, cultural or religious”, Torgny Holmgren, Executive Director SIWI, commented.

The report also sets forth a new approach to catalyze change, and build partnerships and cooperation, outlining why an integrated and inclusive approach that draws in sectors like agriculture, and other stakeholders, such as city mayors, is needed.

WORLD WATER DAY CELEBRATIONS AROUND THE WORLD HIGHLIGHT NATURE-BASED SOLUTIONS



The theme of this year’s World Water Day, Nature for Water, put the spotlight on how one can work with nature, instead of against it.

As more than 2 billion people lack access to safe drinking water and more than twice that number lack access to safe sanitation, the international

community is drawing attention to nature-based solutions for the water challenges of the 21st century.

“Water is the essence of life, but we don’t save it enough. It’s time to change mindsets, it’s not about development versus the environment,” said Erik Solheim, head of UN Environment.

The 2018 edition of the UN World Water Development Report, published in the leadup to World Water Day, outlines a range of nature-based solutions for water management, from personal measures that can be applied in the home, to examples of “green” infrastructure that can be applied to rural and urban landscapes – such as planting new forests, restoring wetlands, and constructing green walls and roof gardens.

World Water Day is celebrated every year on March 22. It sets the foundation for the theme of World Water Week, the largest annual water event, in late August.

80%

Globally, 80 percent of wastewater flows back into the ecosystem without being treated or reused, contributing to a situation where around 1.8 billion people use a source of drinking water contaminated with faeces. (Source: UN-Water)

1.8

BILLION PEOPLE

BRUCE RITTMANN AND MARK VAN LOOSDRECHT WIN 2018 STOCKHOLM WATER PRIZE

Professors Bruce Rittmann and Mark van Loosdrecht have been named the 2018 Stockholm Water Prize Laureates for revolutionizing water and wastewater treatment.

Professors Mark van Loosdrecht and Bruce Rittmann are widely recognized as leaders in the field of environmental biotechnology-based processes for water treatment. Their pioneering research and innovations have led to a new generation of energy-efficient water treatment processes that can effectively extract nutrients and other chemicals – both valuable and harmful – from wastewater.

Mark van Loosdrecht is Professor in Environmental Biotechnology at Delft University of Technology, The Netherlands. Bruce Rittmann is Regents’ Professor of Environmental Engineering and Director of the Biodesign Swette Center for Environmental Biotechnology at the Biodesign Institute, Arizona State University, USA.

In its citation, the Stockholm Water Prize Nominating Committee recognizes Professors Rittmann and van Loosdrecht for “pioneering and leading the development of environmental biotechnology-based processes for water and wastewater treatment. They have revolutionized treatment of water for safe drinking, and refined purification of polluted water for release or reuse – all while minimizing the energy footprint”.

The professors’ research has led to new processes for wastewater treatment currently being used around the globe.

“Together, Professors Rittmann and van Loosdrecht are leading, illuminating and demonstrating the path forward in one of the most challenging human enterprises on this planet – that of providing clean and safe water for humans, industry, and ecosystems,” says SIWI’s Executive Director Torgny Holmgren.

Read more in the interview on page 10

THE DAY AFTER DAY ZERO



Text | Görrel Espelund **Photo** | Andreas Karlsson

CAPE TOWN HAS DEFEATED DAY ZERO. FOR NOW. WATER CONSUMPTION IN THE CITY HAS MORE THAN HALVED, BUT THE CHALLENGES OF FINDING LONG-TERM SOLUTIONS REMAIN.

Executive Deputy Mayor Ian Neilson's office is on the sixth floor of Cape Town's Civic Centre. From here, you can see the harbour, South Africa's second largest. In the other direction, the city unfolds into the formal and informal settlements of the Cape Flats. This is one of the areas where Cape Town is drilling for water as part of its water augmentation scheme. The city expects to draw 80 million litres

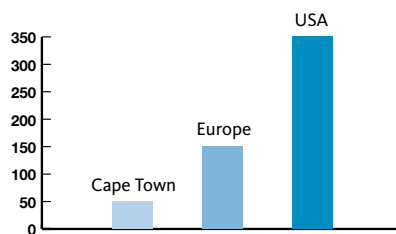


Figure 1 Average water consumption per person per day in Cape Town is 50 litres, in Europe around 150 litres and in the US around 350 litres.

of water per day from the aquifer on the Cape Flats.

"We are also drilling in the surrounding mountains. It's deep drilling, so it's more expensive and slower, but it will produce water," Neilson says. Together with Xanthea Limberg, member of the Mayoral Committee for Informal Settlements, Water and Waste Services, he was delegated to take the political lead for water on 19 January this year.

By that time, speculations were rife as to whether Cape Town would be the world's first metropolis to run out of water.

— FINDING LONG-TERM SOLUTIONS



The so-called Day Zero has been called off for now but Capetonians remain aware of the dire situation and most of them say that their water management have changed permanently. At the few natural springs in the city, such as this one in Newlands, people still gather to collect additional freshwater on a daily basis, something many refer to as "the new normal".

Water restrictions had been in place for more than a year, the drought was the worst in 100 years, dam levels kept dropping, and water consumption didn't go down to the levels required. Day Zero, the day the city was going to turn off the taps, was set for 12 April.

In February, the city normally consumes 1.200 million litres of water per day. This year, new restrictions were put in place, limiting water use to 50 litres of water per person per day (see Figure 1). By March, consumption had come down to around 510 million litres per day. Day Zero was called off. At least for the time being.

No single factor could claim the success. Agricultural irrigation had come to an end, dam levels weren't dropping as fast, the council had made significant increases to water tariffs, and the water pressure in the network had been drastically reduced.

"We've learnt a lot about managing our water network system and what can be achieved by pressure reductions and tariff adjustments. We also took tough action on individual consumers who were using very large amounts of water. Such households were fitted with Water Management Devices," says Neilson.

However, saving water through punitive measures – or as Neilson puts it: "sending economic signals, trying to make citizens understand the real cost of water" – is a short-term solution.

To guarantee sustainable water supply in the future the city must find alternative sources. Cape Town can no longer rely on its winter rains.

"We must reassess our water supply strategy and have a greater diversity of water supply," says Neilson.

Drawing water from the aquifers is one solution. Augment the reuse of water is another. ●●●

●●● “Up to now, we have only reused around seven per cent of our wastewater. It has essentially been for irrigation. We are now working on several water-reuse projects. Some of this water will be treated to potable standard and connected into the system where there are other supplies,” says Neilson.

Cape Town and the province of the Western Cape aren't the only regions in South Africa affected by drought and water scarcity. Neighbouring provinces, the Eastern Cape and Northern Cape, have also been declared national disaster areas.

Ahead of World Water Day, researcher Marius Claassen at the Council for Scientific and Industrial Research (CSIR) pointed out that, countrywide, an average of 37 per cent of water supply is lost before it reaches users due to among others leaks and incorrect metering. In other words, water shortages are not only caused by lower rainfall, but also a failure in infrastructure.

At the Department of Water and Sanitation, Deputy Director-General Trevor Balzer attributes the water crisis to a combination of recurrent droughts driven by climate change, and insufficient water infrastructure maintenance and investment, together with a lack of skilled water engineers.

If the water situation is not managed properly, it will have a negative effect on the country's economic growth, and hundreds of thousands of people risk losing their jobs. In the Western Cape, 600.000 people are employed in two water-intensive sectors: agriculture and tourism. To get through the crisis, the business sector has had to take action.

At the Foreshore, an area reclaimed from the sea, The Westin Cape Town hotel used to pump water out of its basement at a rate of one million litres a day. But not anymore. A desalination plant has been installed and will produce approximately 400.000 litres of potable water per day. At full occupancy, the hotel uses 180.000 litres of water per day.

“The water seeping through is seawater diluted with ground water, so we get more potable water out of it than we would get out of sea water,” says chief engineer Andrew Gartshore. The idea of making use of the water, instead of just pumping it back into the sea, had always been on the table, he says. But, it wasn't until water tariffs went up that the investment made financial sense.

Leon Meyer, General Manager at The Westin Cape Town, explains:

“When the drought became a real issue, we realised that even though we had reduced our water consumption by

“As a community, we have been able to reduce our footprint by halving our consumption of water. It has come at a cost, but it could secure water for future generations.”

25 to 30 per cent, we can't save what we don't have. We needed to find a way to produce water, and the obvious one for us was a desalination plant.”

The investment for the set-up comes to between 350.000 and 400.000 USD. The plant will supply water to three hotels in total, and this means a significant reduction in the use of municipal water. Day Zero or no Day Zero, Meyer can't see that they will go back to old habits in the foreseeable future.

“As South Africans, we've done a lot in a very short time to change our habits. As a community, we have been able to reduce our footprint by halving our consumption of water. It has come at a cost, but it could secure water for future generations.”

Exactly what made consumers reduce their water footprint is not entirely clear. According to Neilson, 50 to 60 million litres per day have been saved thanks to the pressure reduction. But, as for the rest of the savings?

At the Environmental-Economics Policy Research Unit (EPRU), University of Cape Town, a team led by Professor Martine Visser has been analyzing water consumption in the city for almost ten years. From different studies over the years, they have observed that behavioural nudges work very well. Professor Visser and EPRU researcher Johanna Brühl explain:

“Our aim was to encourage people to conserve water. The behavioural nudges we used involved comparing a household's consumption to their average neighbour, making households

“We realised that even though we had reduced our water consumption by 25 to 30 per cent, we can't save what we don't have.”



Chief Engineer Andrew Gartshore (right) at The Westin Cape Town shows the sea water that was previously pumped out of the hotel basement.



Professor Martine Visser (left) and researcher Johanna Brühl (right) at the Environmental-Economics Policy Research Unit at University of Cape Town.

conscious about how much they could save by reducing their consumption and also using social recognition, such as putting people's names on a list on the city's website if they succeeded in reducing their usage to incentivize water conservation."

Then came the drought and a whole battery of interventions from the city.

"We are now trying to untangle what effects the different steps have had. But it's difficult to see which intervention had which effect, because sometimes they were implemented together or just a few weeks apart," says Brühl.

"We can see that when people were no longer allowed to irrigate their gardens with municipal water, consumption went down. Likewise, when people were urged to flush their toilets with shower water."

The research also shows that the citizens of Cape Town have demonstrated a high level of co-operation during the water crisis.

"In January, the messages from the city were framed very negatively while our data showed that a large proportion of residents had reduced their consumption tremendously. So, we wanted to get that message out," says Brühl.

"We feared that if people didn't think others were saving, the incentive for working towards the common good was no longer there. Most people are conditional co-operators. If they see that you are co-operating, they will too. When the city realised that, their message changed," says Visser.

Even if water levels go back to normal, Visser and Brühl don't think consumption will go up to the same level as before the crisis. Studies from other parts of the world also point in that direction, but there are other lessons to be learnt.

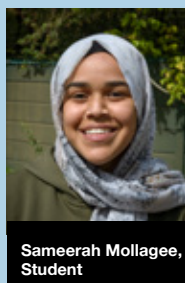
"Our studies show that behavioural nudges are good to use as a complement to awareness campaigns, tariff increases, and restrictions," says Visser.

But, demand-side management is for short and medium-term solutions. In the long-term, municipalities must think more strategically around the bigger infrastructural investments needed.

"Cities must also revise their revenue models, which make them reliant on income from water and electricity. As long as the institutions that are supposed to drive change are loath to get people to conserve too much – because then they won't get the income they need – we will not see real, sustainable change," she says. ●

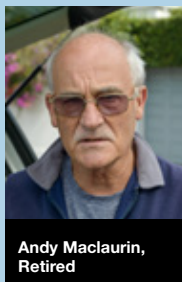
VOICES FROM CAPE TOWN · VOICES FROM CAPE TOWN · VOICES FROM CAPE TOWN

HAS THE WATER CRISIS HAD A LASTING EFFECT ON YOUR RELATIONSHIP WITH WATER?



Sameerah Mollagee, Student

"I used to shower whenever I felt like it, but I don't do that anymore. To save water has become a habit that I think will stay with us. We don't want to end up in this situation again."



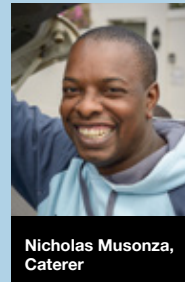
Andy Maclaurin, Retired

"This has been a wake-up call for all of us. I've never thought of water as a scarce resource, but now I do, and will continue doing so. One has become very conscious."



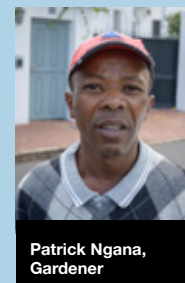
Di McGregor, Financial Manager

"It's actually been easy to change habits. I often fetch water from the fresh water spring – a lot of people do. It has brought us together, and that is a positive thing."



Nicholas Musonza, Caterer

"I have changed my menus and try to make more finger food and wraps, which don't demand plates and cutlery. I hope when the crisis is over we can go back to normal."



Patrick Ngana, Gardener

"The crisis has made me see water as something very precious. I don't water my plants with water from the council anymore, and I think carefully when I do my washing."

FALLING SHORT – NEW FINANCING

Text | Victoria Veres

REACHING THE GOAL OF SUSTAINABLE WATER AND SANITATION FOR ALL IN TIME FOR THE AGENDA 2030 DEADLINE IS GOING TO BE A CHALLENGE. IT WILL TAKE INFRASTRUCTURE, GOVERNANCE, NEW PERSPECTIVES, AND A LOT OF MONEY. FAR MORE OF THE LATTER THAN THE WORLD IS SPENDING ON WATER TODAY.

6 CLEAN WATER AND SANITATION



SDG 6, ensuring water and sanitation for all by 2030, will require huge sums of money invested in the water sector in the coming years; 114 billion USD per year, according to the World Bank, in order to achieve targets 6.1 and 6.2 on water supply, and sanitation and health alone. The Organisation for Economic Cooperation and Development (OECD), claims that the total financial needs for making the world water secure could require additional investments of 500 billion USD annually between 2016 and 2030.

But even when including all financial sources, public and private, the financing gap is huge. And the more time that passes the more difficult it will be to reach the target in time. According to Dr Alex Money, Programme Director at the School of Geography and the Environment at Oxford University, estimations show that only about 20 per cent of the necessary investments are financed today, meaning there is still an 80 per cent gap.

"The short pessimistic answer is that no, it will not be possible to close the financing gap", says Dr Money. He has a background in the private sector and has done extensive research on its role in the water sector.

For a more optimistic view he points out the necessity of re-thinking and stop focusing on this as just a big sum of money. The more approachable way of looking at it is to use the SDG 6 and go through all its different targets from SDG 6.1 onwards on a country basis. Instead of just looking at one big number, this would make it possible to find the biggest gaps on a national basis today compared to the targets and then direct capital to where it can do the most good.

Some optimism is certainly useful to handle the amounts of money necessary but still missing. The

new outcome report from the UN High Level Panel on Water (HLPW), *Making Every Drop Count*, points out that if the world continues on the current path there may be a 40 per cent shortfall in water availability by 2030. The lack of investment in infrastructure is one of the big obstacles and needs to at least double.

The report basically asks for a new financing paradigm. Some of the necessary changes listed are: improving efficiency and governance to increase creditworthiness in the sector; blending in private finance; allocating resources better to get more bang for the buck; improving capital planning in the sector to reduce the cost per unit and making the banking system part of the solution by changing the financing institutions' view on the role of sustainable water management in development.

This demands a big role for the private sector. Dr Money points out that no model will achieve success without the private sector. The OECD Roundtable on Financing Water in September 2017 was also very

clear on this as a means of increasing investments to the extent needed.

Historically however, private sector involvement has been low. It accounts for about 7 per cent of total spending on water supply and sanitation

"The SDGs have changed the picture of risk. Now there is also the risk of missing the SDGs and that makes it possible to attract other types of investors."

in developing countries, and only 0.5 per cent in sub-Saharan Africa. Constraints have been uncertainty in revenue because of political interference, unclear regulations on private sector involvement in water, and also risk-adjusted returns considered being too low, according to the OECD. According to Dr Money another problem has been lack of information exchange between those who want funding, such as small infrastructure actors, and those who want to fund. However, at today's low cost of information, with for example social media, it should be possible to create more transparency so that these barriers can be lowered.

The most popular term in financing discussions right now seems to be blended finance, as recommended by the HLPW, the OECD, researchers and the private sector. OECD defines it as the "strategic use of development finance for the mobilisation of

METHODS NEEDED FOR THE WATER SECTOR



additional commercial finance towards the SDGs in developing countries.” The idea is that development finance will help engage private capital. It cannot completely solve the problem, but fix financing needs in specific projects, and have a catalytic effect by improving transparency, efficiency and governance. The OECD reports that aid commitments to water and sanitation have increased by 5 per cent annually for the last decade. A survey from the organisation also shows that official development finance interventions mobilized an additional 1.5 billion USD from the private sector in 2012–2015, the main instruments being guarantees and loans.

Dr Money sees new possibilities in this kind of financing as well as new actors. Moving from traditional public private partnerships, from development finance institutions and multi-lateral banks to also including actors such as financial institutions and philanthropists. In order to get the very large

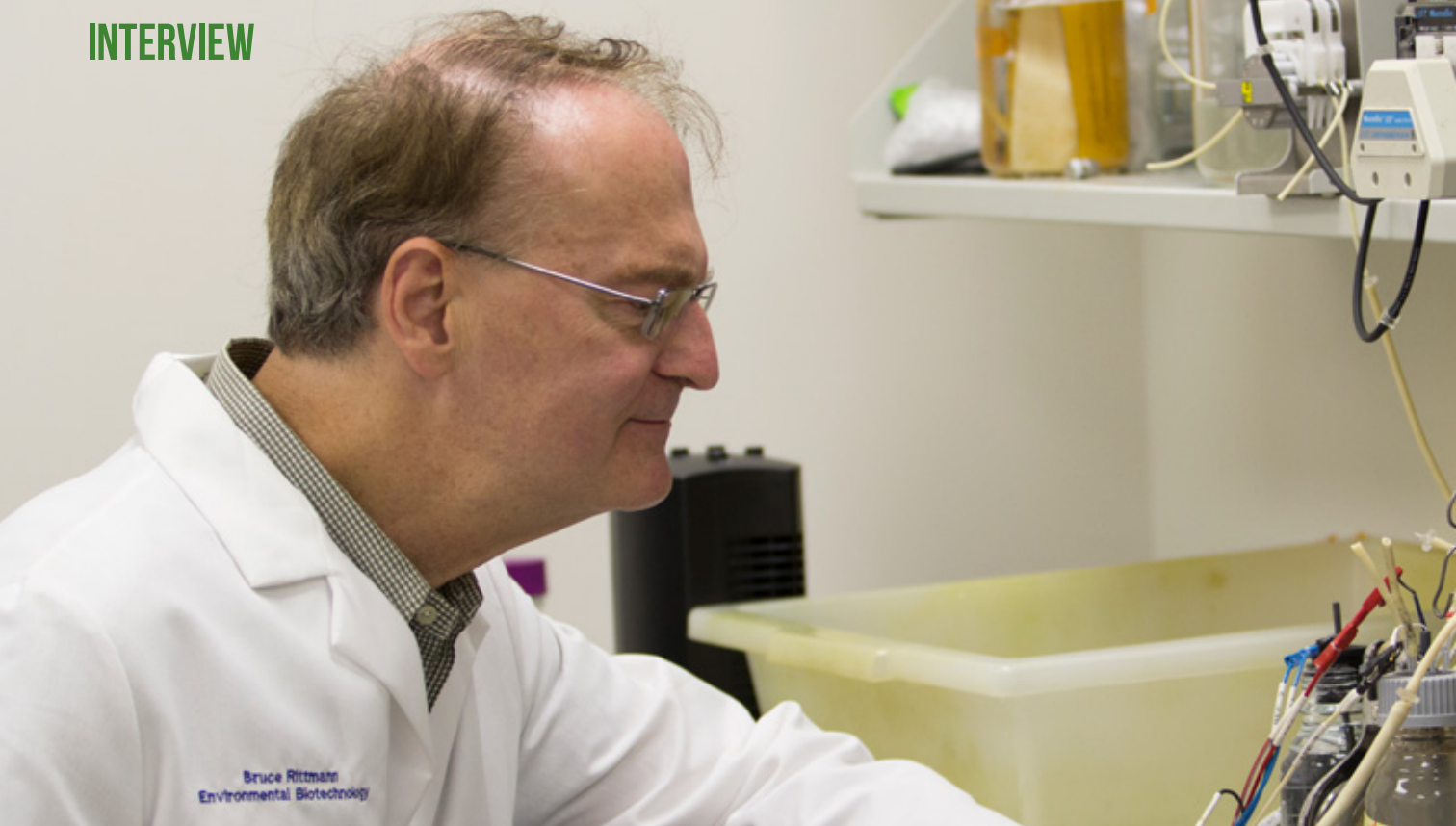
amounts of money needed, our financial models have to be expanded.

He points out that one of the biggest challenges for involving the private sector has been the risk-return ratio of projects. The important thing is to de-risk the projects. That is what public financing has to do, and that is why blending is such a good idea.

With the SDGs there has also come along a new broader way of looking at risk, beyond just economic risk, and that opens new possibilities.

”The SDGs have changed the picture of risk. Now there is also the risk of missing the SDGs and that makes it possible to attract other types of investors”, says Dr Money and brings the example of private sector actors such as philanthropists and millennials and their engagement in these issues.

”This has made us think about other risks than the economic. The SDG is good in that way”. ●



TAKING THE “WASTE” OUT OF “WASTEWATER”

Text | Maria Sköld Photo | Biodesign Institute; Jessica Hochreiter; TU Delft

MAYBE IT IS TIME TO TAKE THE “WASTE” OUT OF “WASTEWATER”? THIS YEAR’S STOCKHOLM WATER PRIZE LAUREATES, PROFESSORS **BRUCE RITTMANN** AND **MARK VAN LOOSDRECHT**, ARE USING MICROBIOLOGY TO CREATE PROCESSES THAT COULD TURN POLLUTANTS INTO VALUABLE RESOURCES.

Professors Rittmann and van Loosdrecht were named the 2018 Stockholm Water Prize Laureates for their pioneering role in the water-related environmental biotechnology revolution currently taking place.

“Today, we are in a revolutionary period which incorporates powerful biological

technologies to accomplish what we could have only wished for in the past,” as the Stockholm Water Prize committee noted in its citation.

Rittmann and van Loosdrecht have both played a leading role by presenting new knowledge around microbiological processes in wastewater, with each

of them writing over 500 articles in peer-reviewed scientific journals.

But their contributions are not only academic. Their research has also led to a new generation of water treatment processes that make it possible to remove harmful contaminants from water, cut wastewater treatment costs, reduce energy consumption, and even recover chemicals and nutrients for recycling.

Bruce Rittmann is Regents’ Professor of Environmental Engineering and director of the Swette Center for Environmental Biotechnology at the Biodesign Institute, Arizona State University in the



USA. He currently holds 16 patents and has helped found two companies to exploit his inventions related to recovering energy and valuable metals from waste streams. Similarly, the Environmental Biotechnology research group around Professor Mark van Loosdrecht at Delft University of Technology in The Netherlands, has contributed a number of patented innovations that have turned wastewater treatment on its head.

WaterFront asked the two laureates to describe both their current work and what they plan for the future.

What can microbiological engineering contribute to wastewater treatment?

Mark van Loosdrecht (MvL): It can help us become more resource-efficient and create a more circular economy. At a time of rapid population growth, this is extremely important.

Bruce Rittmann (BR): Traditionally, we have just thought of pollutants as something to get rid of, but now we're beginning to see them as potential resources that are just in the wrong place. In environmental biotechnology, we form partnerships with microorganisms that help us clean up pollution in contaminated waters and generate new valuable resources.



“Traditionally we have just thought of pollutants as something to get rid of, but now we’re beginning to see them as potential resources that are just in the wrong place.”

Professor Bruce Rittmann



“I wish more people understood the importance of water! The water architecture in our cities is so hidden from view that we just take it for granted.”

Professor Mark van Loosdrecht

●●● **Could you give some examples of how your research is used?**

BR: I have a substantial number of patents and many of them are on a technology called the membrane biofilm reactor (MBfR), which has been commercialized. It uses naturally occurring microorganisms to remove contaminants such as perchlorate and selenate from water.

MvL: At Delft, we have developed quite a few processes, but the two most important ones are the Anammox process and the Nereda process. The Anammox process is used in industries and municipal wastewater treatment to remove nitrogen from wastewater and allows for energy production. The Nereda technology is based on granulation of bacteria, which allows a simpler and cheaper municipal wastewater treatment process. A Nereda plant can be built on a smaller patch of land and uses less energy than conventional methods.

How has the concept of Environmental Biotechnology evolved over time?

BR: The process of creating resources has been with us for a long time. My PhD advisor Perry McCarty, who won the 2007 Stockholm Water Prize, used anaerobic microbiological systems to generate energy out of organic stuff already in the 1960's. What's new is the realization that there is a lot more than just energy out there; we've also got nutrients, metals and other things that could be of real value. So, now we see a new field of options opening up.

MvL: Traditionally, the civil engineering field was mainly about studying hydraulics rather than biology. But there has been a shift in the sanitary sector in the past decades, with more and more people realizing that it is biology that really cleans the wastewater.

In your own research, what do you hope to focus on in the future?

BR: We're in the middle of a paradigm shift, with a new focus on creating environmental, social and economic benefits. I'm focusing more and more on developing valuable resources using our microbial systems. It's becoming increasingly clear how we can improve environmental quality in a way that also brings economic benefits.

MvL: We're looking at how we can convert all the organic chemicals in food waste and wastewater into one or two compounds that can then be used for further material production. One

is a renewable, biodegradable plastic and another is biopolymers with many interesting properties; they could e.g. be used as flame retardants.

You both like to talk about cost efficiency – why is that so important?

BR: For many reasons – in any society, there is a limited amount of resources and many problems that need to be solved. So, people are naturally wary of new technology that requires big investments. But if they are instead offered new solutions that help them save money or make money... then they will, of course, be much more interested.

MvL: In low-income countries it is often difficult to collect taxes and there is a lot of uncertainty. This makes it more difficult to make necessary investments in for example sewage systems. But you won't have to rely as much on governments for the infrastructure if you have a wastewater treatment process that can generate both its own energy and even extra income from chemicals that can be recycled.

What is the one thing, in relation to your work, that you really wish people knew?

MvL: I wish more people understood the importance of water! The water architecture in our cities is so hidden from view that we just take it for granted.

BR: I would like people to understand that microorganisms are our friends and partners! Some people seem to be scared of microorganisms and associate them with diseases and bad news. But that's a misconception. Environmental biotechnology is really all about forming partnerships with microorganisms because then they will provide us with all kinds of wonderful services. If we're smart, we should do much more of that in the future. ●

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HAVING FAITH IN WATER

Text | Johannes Ernstberger Photo | Thomas Henrikson

WHEN MAKING DECISIONS ABOUT WATER, DO WE KNOW THE FAITH OF STAKEHOLDERS AT THE TABLE? AND SHOULD WE CARE?

If you imagine the world population as ten people, eight of them would be religious. This affects the way people interact with and view water.

Water plays an important role in all main religions, be it in water-related rituals such as Wudu, the Islamic washing before prayer, or in the way certain water bodies are considered sacred like the Ganges river in Hinduism.

In many societies, people's relationship to water is formed by spiritual and religious beliefs.

This has recently been confirmed by the Making Every Drop Count-report of the High-Level Panel on Water which, as one of its main outcomes, pointed out that water carries many values – economic, social, environmental, cultural and spiritual.

“To people on the local level in the watersheds, faith is something very important,” points out Prof. Aaron Wolf, who researches water conflict management at Oregon State University.

Still, when we talk about water, we rarely do it on a spiritual level.

One reason is faith organizations. They would be the obvious channel through which one could address religious or spiritual values of water.

But there is a reluctance to include them in decision-making around water. According to Prof. Wolf, there is a sentiment that we should keep religion and state separate; that religion belongs to the private life and not in the public domain.

The reality, however, looks different. In most countries, 79 per cent according to the Pew Research Center, a US-American think tank, the government gives preferential support or favours to some religious groups and clearly discriminates against others.

State and religion are rarely separate.

Religions and faith organizations often abuse this influence. Worldwide, the Pew Research Center accounts that, religious groups in more than 60 countries have tried to prevent other religious groups from operating.

The International Humanist and Ethical Union argues non-religious people in many cases face harder discrimination than religious minorities. In their recent Freedom of Thought-report, they point out that in 2017, “85 countries in total exhibited severe discrimination against non-religious individuals.”

“To people on the local level in the watersheds, faith is something very important.”



During a seminar at World Water Week 2016, religious leaders of different faiths discussed the work they do at local level on water issues.

This track record of human-rights violations fuels the reluctance of inviting faith leaders to make decisions about water.

But again, this ignores parts of the reality.

Faith organizations already play major roles in sustainable development. “Some of the world’s largest relief and development organisations are rooted in religion”, explains Paul S. Rowe, researcher at Trinity Western University, Canada, and

author of Religion and Global Politics, “including World Vision, Caritas, the Aga Khan Foundation and Compassion International.”

“Religious organizations”, he continues “speak deeply to the hearts of people, in a way that facilitates cultural and social change.”

Excluding them from stakeholder meetings risks missing the opportunity to talk to a highly influential localized actor.

Prof. Wolf lifts the Columbia basin on the border between Canada and the US as a positive example. In this case, the Catholic Church advocated for protecting water from an ethical standpoint. As carriers of this message, they proved to be more effective on a community level than e.g. water utilities.

Also, many faith organizations have a long-standing experience of addressing cultural or spiritual values of water. For water professionals, who are used to talking about water in a rational way, faith traditions can offer tools that talk to people on a spiritual and emotional level Aaron Wolf argues, “regardless if you’re a religious person or not.” ●

“Missing the water scarcity elephant in the room”

Text | Malin Falkenmark Photo | Peter Hanneberg

What explains the limited attention paid to tomorrow’s massive water scarcity problem, for which, among others, the World Economic Forum has been warning for years? Already five years ago, 1.2 billion people were living in regions with a combination of severe water stress and chronic water shortage – a zone where water availability will not allow much water beyond what is needed for water supply and secured environmental flow. In water-short regions, food production will have to benefit from heavy rains and flood flows, instead of from conventional irrigation.

For some reason, the particular attention water scarcity, and its links to both food production and societal water supply, received in the late 1980’s and early 90’s through the International Water Resources Association more or less expired in the mid 90’s. As a result, the intended readers of the water scarcity-oriented articles of the time remained limited, and were some 25 years later replaced by their children, now crowding the ResearchGate readership reports!

How can this huge elephant in the room – living under water scarcity – continue to get so little attention? For instance, how will one secure water supply for the 80 megacities that Africa foresees by 2025 – only eight years from now? Can a safe water supply of this size be possible without long-term foresight? Will it be feasible to find the raw water close to dry savanna cities? Or are we heading for another 80 ‘Cape Town’-cases in the 2020’s?

Contributing to the situation seems to be a widespread blindness to population growth. This refers to the continuous addition of new adult population strata, as an unavoidable effect of increasing life spans. In other words, the multidecade-long phenomenon of new annual cohorts of surviving grownups, expecting to live long and healthy lives, enjoying growing socio-economic development. This is an issue the late Professor Hans Rosling has laid large emphasis upon in his highly appreciated lectures to broad public audiences.

To reach the Sustainable Development Goals (SDGs) in only 12 years will require focus not only on water scarcity awareness but also on water-related risk aversion. Today, water-related risks need much more attention, in particular their inter-connections, e.g. between droughts, extreme weather events, water crises, large-scale involuntary migration, crop failures and hunger crises. Obviously, a system’s perspective will be essential.



Since so many of the SDGs are in fact water-coupled, long-term water wisdom will be an essential element and tool for clear-sight approach, risk avoidance, foresight, shift in thinking, and development of modernized water governance.

Stunted sustainability conceptions, and related livelihood resilience risks will demand weight given to a water wisdom with broader focus, and – importantly – conscious time scale awareness. The world’s water-related expertise must be given the chance to address, in time, livelihood issues of enormous relevance also for the next generation. That is, before they happen, not once they already have happened. ●

ABOUT THE AUTHOR

Malin Falkenmark is a globally renowned water expert and serves as Senior Scientific Advisor at SIWI and Professor of applied and international hydrology at Stockholm Resilience Center, Stockholm University.

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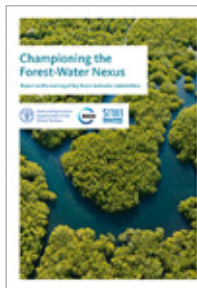
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