

SOLUTIONS No 2

TUESDAY • 10 July 2018



LIVE @ WCS

Sri Lanka's Path to a Sustainable City

Sri Lanka Prime Minister HE Ranil Wickremesinghe discusses some of the opportunities and challenges of rapid urbanisation



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FEATURE

Women Making Waves in Water

Introducing prolific women who have - and continue to - impact the world of water



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Opinion With Dr Marcus Gover

Dr Marcus Gover, CEO of the UK's WRAP, talks about redefining the 3Rs and moving towards a more circular economy



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The Big Interview: Dr Tri Rismaharini

Surabaya's first directly elected mayor speaks about some initiatives that aim to improve the liveability of her city



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LIVE COVERAGE @ Sands Expo & Convention Centre, Marina Bay Sands, Singapore

LEE KUAN YEW PRIZES

SEOUL AND PROFESSOR RITA COLWELL HONOURED WITH LEE KUAN YEW PRIZE AWARDS

The Lee Kuan Yew World City Prize 2018 and the Lee Kuan Yew Water Prize 2018 were presented to the visionary South Korean city and the American microbiologist Professor Rita Colwell last night

By Sabina-Leah Fernandez



From left to right: Mr Loh Chin Hua, Chief Executive Officer and Executive Director of Keppel Corporation; Dr Lee Boon Yang, Chairman of Keppel Corporation; Mr Park Won-soon, Mayor of Seoul, South Korea (Seoul is the Lee Kuan Yew World City Prize 2018 Laureate); Mdm Halimah Yacob, President of the Republic of Singapore; Professor Rita R Colwell, Lee Kuan Yew Water Prize 2018 Laureate; Professor Leo Tan, Chairman, Temasek Foundation Innovates; Ms Koh Lin-Net, Chief Executive Officer, Temasek Foundation Innovates

The city of Seoul and top American microbiologist Professor Rita R Colwell were presented with their awards for the Lee Kuan Yew World City Prize 2018 and the Lee Kuan Yew Water Prize 2018 respectively by President of Singapore, Madam

Halimah Yacob, at the Lee Kuan Yew Prize Award Ceremony and Banquet held at The Ritz-Carlton, Millenia Singapore last night.

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LIVE @ WCS/SIWW/CESS

6 REASONS TO BE OPTIMISTIC ABOUT CITIES, WATER AND THE ENVIRONMENT

Many minds are seeking solutions to urban issues, and the situation may not be as dire as we think

By Howard James



Dr Chan Heng Chee, Ambassador-at-Large at the Ministry of Foreign Affairs, Singapore, was the moderator for the combined Opening Plenary of this year's edition of World Cities Summit, Singapore International Water Week and CleanEnviro Summit Singapore

A panel of international repute, featuring high-level speakers from government, international organisations and industry, shared their insights on cross-disciplinary policies, management strategies and solutions during this year's Opening Plenary, moderated by

► Continued on P2

DAILY HIGHLIGHTS

<p>Level 5, Level 1, Basement 2</p> <p>INDUSTRY NIGHT @ CITY SOLUTIONS SINGAPORE</p> <p>18.00-20.00</p>	<p>Peony 4403-4406 and 4502-4506, Level 4</p> <p>SPECIAL ASEAN MINISTERIAL MEETING ON CLIMATE CHANGE</p> <p>11.45-17.45</p>	<p>Ballroom B-G, Level 5</p> <p>SIWW WATER DIALOGUE</p> <p>09.00-09.45</p>	<p>Sands A Room A 5001-5103, Level 5</p> <p>CLEAN ENVIRONMENT LEADERS SUMMIT</p> <p>08.30-13.00</p> <p>LEADERS-EXPERTS FORUM</p> <p>15.30-17.30</p>	<p>Ballroom B-G, Level 5</p> <p>WORLD CITIES SUMMIT PLENARY</p> <p>13.45-15.00</p>
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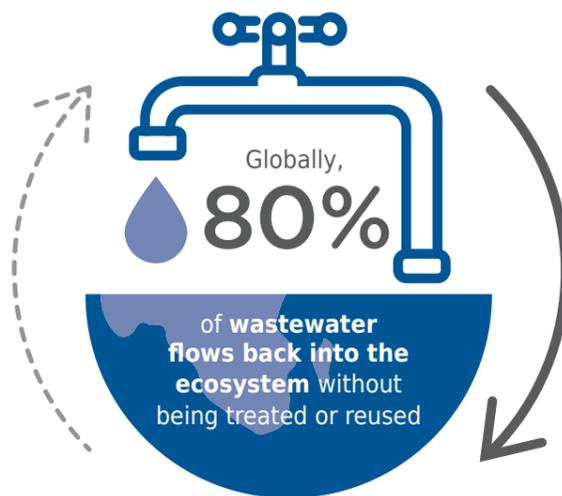
By 2045, the number of people living in cities will increase by **1.5 times** to

6 billion



Source: World Bank

SIWW



Source: UNESCO

CESS

On average,

26 million people

are displaced by extreme weather events – the effects of climate change – every year



Source: UNEP

SEOUL AND PROFESSOR RITA COLWELL HONoured WITH LEE KUAN YEW PRIZE AWARDS

► Continued from P1

Acknowledged as a role model for megacities that have a will to change, current and former leaders of Seoul devised innovative solutions in order to turn Seoul from a bureaucratic city with tension between the government and its people, into a dynamic, inclusive and socially stable city. Furthermore Seoul has proven itself as an example of how a decisive data-driven approach, a commitment to engaging with citizenry and visionary leadership can transform the environment, improve a city's quality of life and boost its vibrancy. The Prize was accepted by Mayor of Seoul, Mr Park Won-soon.

World-renowned scientist, Professor Rita R Colwell, the Lee Kuan Yew Water

Prize 2018 Laureate, was recognised for her pivotal contributions to improving management of waterborne diseases and public health, thanks to her pioneering insights on microbial water quality surveillance. Professor Colwell's seminal research, and its application to cholera, in particular, has saved the lives of millions of people worldwide.

"What motivates me to do research in waterborne diseases is the opportunity to actually travel and to see people who really did not have access to safe water and suffered a variety of infectious diseases... To provide them with safe water is one of the most wonderful satisfactions that anyone could have. It's a great honour to receive



Mapo Culture Depot in Seoul converted disused oil tanks into a cultural venue

this award and be acknowledged. I thank you all for this honour and for your generosity," Professor Colwell said.

"Innovation is difficult process; nevertheless it brings about real change in the lives of citizens. We have grown to become the proud winner of the Lee Kuan Yew World City Prize and I promise that Seoul will share the

processes of innovation with fellow cities of the world and fulfil our responsibility as a global leading city," said Mr Park.

In his speech, Mr Park thanked President Halimah Yacob for Singapore's hospitality and committed efforts in hosting the Trump-Kim summit last month, calling Singapore a "city of peace".

6 REASONS TO BE OPTIMISTIC ABOUT CITIES, WATER AND THE ENVIRONMENT

► Continued from P1

Dr Chan Heng Chee, Ambassador-at-Large at Singapore's Ministry of Foreign Affairs.

With interests across cities, water and the environment, each leader was asked to share a trend or development they were most optimistic about. In no order of priority, these included:

A Bottom-Up Approach to Building City Resilience is Highly Effective

Dr Kristalina Georgieva, CEO of the World Bank, emphasised the importance of buy-in from communities and society at large in building city resilience. She observed that the widespread introduction of policies, coupled with extensive outreach exercises with all stakeholders – including grassroots organisations – is proving successful in



From right to left: Mr Zhuang Guotai, Vice-Minister, Ministry of Ecology and Environment, People's Republic of China; Dr Chan Heng Chee, Ambassador-at-Large, Ministry of Foreign Affairs, Singapore; Mr Steve Demetriou, Chairman, CEO and President, Jacobs; HE Sri N Chandrababu Naidu, Chief Minister, Andhra Pradesh, India; Dr Kristalina Georgieva, CEO, World Bank; Dr Bernard Charles, Vice-Chairman and CEO, Dassault Systèmes; and HE Dr Thani Bin Ahmed Al Zeyoudi Minister, Ministry of Climate Change and Environment, United Arab Emirates

helping cities counter natural disasters and other threats.

Anti-Pollution Measures are Having Much Impact

Mr Zhuang Guotai, Vice-Minister, Ministry of Ecology and Environment, People's Republic of China, shared how Beijing's anti-pollution measures are leading to a dramatic decrease in environmental challenges. By switching from coal to natural gas in the production of electricity, and limiting the number of new cars on the road, among many other initiatives, the levels of pollutants observed in the atmosphere are gradually abating.

Technology is Enabling Better Monitoring and Decision-making

HE Sri N Chandrababu Naidu, Chief Minister, Andhra Pradesh, highlighted how his state is leveraging all forms of technology, ranging from smart networks, to artificial intelligence, big data, virtual reality and much more, to gain better real-time insights, as well as unprecedented access to potential outcomes. These can be leveraged to guide strategy and policy.

Industry Talent is Growing and Increasing its Capabilities

A key differentiation between the urban development, water and environmental industries of today and tomorrow is the availability of talent. While there remains a shortfall, this is significantly less than a decade ago, noted Mr Steve Demetriou, Chairman, CEO and President of Jacobs.

Increased Transparency is Raising Standards Across the Board

Rising stakeholder expectations are leading governments and the private sector to be more open about how they operate, said Dr Bernard Charles, Vice-Chairman and CEO, Dassault Systèmes. This is not only leading to greater buy-in from communities and employees, it is spurring increased corporate value and respect by all.

Mindsets are Changing for the Better

HE Dr Thani Bin Ahmed Al Zeyoudi, Minister at the Ministry of Climate Change and Environment, UAE, observed that perceptions about the environment are changing for the better, and people are taking positive action. "No one is waiting. Everyone is moving."

LIVE @ WCS - SIWW - CESS

BUILDING SUSTAINABLE CITIES IN THE DEVELOPING WORLD

What is it going to take to push the development of more eco-oriented cities in the region?

By **Shanti Anne Morais**



In his keynote address at this year's joint opening of World Cities Summit, Singapore International Water Week and CleanEnviro Summit Singapore, the Prime Minister of Sri Lanka HE Ranil Wickremesinghe discussed the rapid urban expansion of cities today and what it means for developing countries.

Embracing Transformation and Change

Reminiscing on the first photos and newsreels he saw of Singapore back in 1965 while still a student, Mr Wickremesinghe recalled impressive colonial buildings surrounded by slum-like quarters. About 50 years on, the island nation's transformation into a smart, liveable and secure city has been consistently reinforced, with a recent example being the Mercer 2018 Quality of Life survey – Singapore holds 25th place in the list, the highest-ranking Asia-Pacific country.

Bearing in mind Singapore's rapid transformation, it is very apt, he said, that the focus of this year's joint events is on innovation and collaboration – especially since Asia is currently home to about 54% of the world's urban population. By 2050, about 2.5 billion more people will be living in urban areas, with some 90% of this increase taking place in Asia and Africa.

Rapid Urbanisation Means Opportunities

Embracing change is crucial, emphasised Mr Wickremesinghe, as globally, urbanisation is propelling economic growth. By bringing people together, large cities have become centres of modernisation, reaping the benefits of economic success, improving productivity and creating jobs.

Megacities are going a step further, connecting people and businesses to global

markets. At the same time, these cities are giving rise to great opportunities that are normally unavailable in rural villages, attracting waves of people.

More Needs to be Done

However, while there are great opportunities, Mr Wickremesinghe pointed out that urbanisation also has its fair share of obstacles to overcome that seem to be magnified in Asia. The expansion of cities in South Asia and the rest of Asia is impacting infrastructure as well as human development. Revisiting the Mercer 2018 Quality of Life survey, Mr Wickremesinghe observed that at least 50 developing Asian cities rank low in the listing.

It is estimated that approximately 40% of the world's urban expansion may be in slums, exacerbating economic disparities and giving rise to unsanitary living conditions. In addition, rapid urbanisation is linked to environmental concerns such as pollution. Cities located in coastal areas or along river banks may be vulnerable to natural disasters such as floods, landslides, storms and cyclones. Furthermore, poor urban infrastructure such as the lack of affordable housing, road congestion, unreliable power supply and an inadequate number of schools reduce a city's economic prospects, and in turn, its competitiveness.

The challenges are manifold, and Mr Wickremesinghe asserted that urban centres have to take the lead here, with mega infrastructure being the key to enabling economic integration.

Sri Lanka's Three-pronged Approach to a Sustainable City

Urbanised megacities are categorised by wealth creation. Bearing this in mind, Sri Lanka's strategy to urbanise is: redevelop, relocate and consolidate.

The country's western province forms the business, financial and political core and supports a population of nine million. The Western Megapolis project, announced in 2016, seeks to transform the country's urban landscape, attracting much-needed investment into infrastructure, transport networks and high-value-added enterprises. A major aim of the initiative is to turn the capital, Colombo, into a leading sustainable city in South Asia in the long term.

"Good planning for urban development means creating a sustainable city that is environmentally friendly and consumes fewer resources," stressed Mr Wickremesinghe. He noted that the planned Megapolis will consist of a network of urban areas and will include the development of ports in the South such as the Colombo port, infrastructure for industries, a transport hub, sewerage and waste development, and green spaces.

The project will not neglect marginalised groups such as women, children, youth, the disabled, the elderly and the poor. The government plans to focus on housing policies in particular, including better housing, land development and relocating communities who currently live on hazard-prone land.

Acknowledging that water is one of Sri Lanka's crucial issues, Mr Wickremesinghe said that Singapore is a good example to follow due to its leadership in water management. While the two countries share different objectives in this regard, as well as completely different environments, Sri Lanka can learn a lot about building a sustainable water ecosystem from Singapore.

However, in order to succeed, the country needs to first regroup financially, politically and economically, he said. Success will rely on collaboration between various government agencies and the private sector, as well as new laws that will streamline the whole process.

VIEW FROM THE FLOOR

THIS "MECHANICAL STOMACH" CONVERTS FOOD WASTE INTO CLEAN FUEL

Chew on this: a co-digestion facility in western Singapore turns food waste and used water sludge into clean energy

By **Rachael Goh**

Sitting squarely in the Ulu Pandan Water Reclamation Plant is a co-digestion facility that could offer a solution to Singapore's mounting food waste problem. Completed by renewable energy company Anaergia in 2016, the pilot project combines advanced solid waste processing and waste water treatment equipment, through two technologies known as Biorex and Omnivore, to convert food waste and used water sludge into biogas.

Currently, the facility can treat up to 40 tonnes of food waste and used water sludge.

"You can combine food waste and sludge to produce energy with our technology, which we think will be a model for the whole of Asia-Pacific," said Mr Kunal Shah, Vice President of Global Market Development and Strategy at Anaergia.

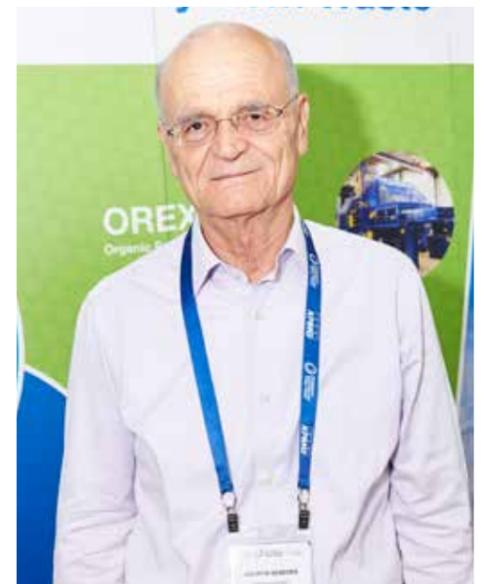
In the year 2017, Singapore disposed of 676,800 tonnes of food waste – equal to the weight of more than 3,900 Circle Line trains. The country also generates 3,000 buses' worth of sludge every year. Confronted with mountains of waste, this novel facility may offer a way for Singapore to cut down on

waste and for its water reclamation plants to eventually achieve energy self-sufficiency.

"We are hoping to create a circular economy, where waste no longer becomes a waste," says Anaergia Chairman and Chief Executive Dr Andrew Benedek, who was the inaugural laureate of the Lee Kuan Yew Water Prize for his groundbreaking work in water treatment membrane technology in 2008.

Since 2017, Anaergia's co-digestion plant has been processing food waste from nine locations in Singapore. These include schools, army camps and a food court. If successful, the plant could be utilised at the Tuas Water Reclamation Plant and Integrated Waste Management Facility when these are ready in 2025.

Anaergia is exhibiting its waste water treatment technologies at City Solutions Singapore 2018, which is being staged from 9 July 2018 to 11 July 2018 at Level 2 of the Sands Expo and Convention Centre.



Dr Andrew Benedek, Chairman and CEO of Anaergia, has received multiple prestigious awards for his work in the water industry, including the Lee Kuan Yew Water Prize in 2008



FEATURE

OVER S\$5 BILLION IN TENDERS TO BE CALLED FOR TUAS NEXUS

World's first facility designed to integrate used water and solid waste treatment, the energy self-sufficient Tuas Nexus will export excess electricity to the grid that can power up to 300,000 homes

By **Nawwar Syahirah**

PUB, Singapore's National Water Agency, and the National Environment Agency (NEA) will be calling for tenders with a total estimated value of more than S\$5 billion over the next five years for civil, mechanical and electrical engineering works for the Tuas Nexus.

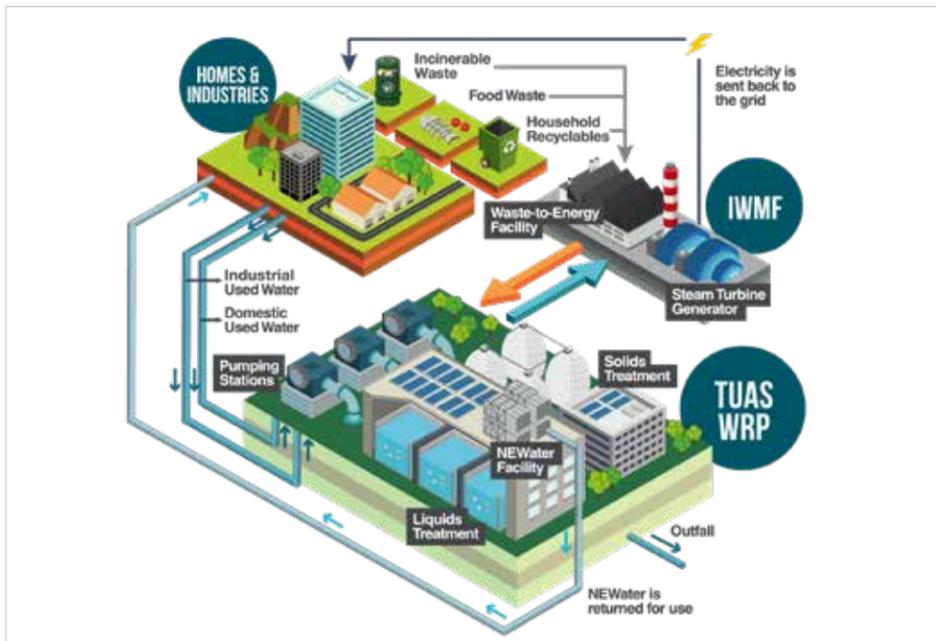
Tuas Nexus – the integration of PUB's Tuas Water Reclamation Plant (Tuas WRP) with NEA's Integrated Waste Management Facility (IWMF) – is the first of its kind in the world planned from the ground up. It marks Singapore's first initiative to harness potential synergies of the water-energy-waste nexus by integrating used water and solid waste treatment processes. Construction of the two facilities is expected to commence in 2019 and will be completed in phases from 2023 onwards.

Tuas WRP is a key component of Singapore's Deep Tunnel Sewerage System (DTSS) Phase 2 and is expected to be ready by 2025. At an initial treatment capacity of 800,000 cubic metres per day (m³/day), it will be the largest membrane bioreactor (MBR) facility in the world, with an overall 30% more compact

footprint compared to conventional plants. The DTSS is the backbone of Singapore's used water management system and also ensures long-term water sustainability by contributing to the goal of increasing NEWater supply from 40% to up to 55% of total water demand in the long term.

Unlike conventional WRPs, the Tuas WRP will receive domestic and high-strength industrial used water flows from two separate deep tunnels. It will also feature a unique combination of advanced physical, biological and chemical treatment processes. This includes space-efficient lamella primary sedimentation tanks, two energy-efficient MBR systems to treat the two used water streams separately to higher quality standards for NEWater and industrial water production, and a thermal hydrolysis process to increase biogas production and energy recovery, as well as reduce sludge for disposal.

In another first, PUB will also reclaim high-strength industrial used water to produce industrial water at Tuas WRP for reuse by industries mainly in Jurong Island and Tuas.



Tuas Nexus will integrate PUB's Tuas Water Reclamation Plant and the National Environment Agency's Integrated Waste Management Facility

REVIEW

EMPOWERING TOMORROW'S WATER TALENT

The Singapore Water Management Series by the Singapore Water Academy delivers high-quality management training for international water professionals

By **Will Chin**

For five days in early July 2018, attendees of the Singapore Management Series (SgWM) on Water Reuse by the Singapore Water Academy convened to pursue studies aimed at increasing their knowledge of water reuse and the management capabilities needed to excel in this area. Presenting practitioner-based technical solutions in urban water sustainability, prominent names in the industry such as Dr Gary Amy and Dr Glen Daigger shared best practices across this discipline.

For more information on the Singapore Water Management Series or other programmes on offer at the Singapore Water Academy, visit pub.sg/sgwa/programmes.

A total of about 11 construction tender packages is expected to be called over the next five years for Tuas WRP, estimated to be valued at over S\$2 billion. The first tender was called in May 2018 for development works at the Tuas WRP site such as support infrastructure, utilities and a near-shore outfall for discharge of excess treated used water into the sea.

IWMF

The IWMF is an integral part of NEA's long-term plan to meet Singapore's solid waste management needs. Unlike a typical waste-to-energy plant which treats only incinerable waste, the IWMF will be built with treatment processes for multiple waste streams namely incinerable waste, household recyclables, source-segregated food waste and dewatered sludge from PUB's Tuas WRP. Integrating these processes in one facility will better enable the IWMF to maximise both resource and energy recovery from waste while minimising its environmental footprint.

A total of three Engineering, Procurement and Construction (EPC) tender packages and one build tender, estimated to be valued at over S\$3 billion will be called over the next five years. The pre-qualification of EPC tenderers will be called in July 2018 to shortlist potential EPC tenderers for the development of key facilities within IWMF Phase 1. The second stage tender for EPC tenders will be called by January 2019.

Harnessing Synergies in Tuas Nexus

A highlight of Tuas Nexus is its ability to achieve full energy self-sufficiency. The co-digestion of sludge and food waste, and the thermal hydrolysis pre-treatment (THP) process at Tuas WRP using steam from IWMF, will enable Tuas WRP to improve the yield of biogas. The biogas will be utilised at IWMF to increase IWMF's overall plant efficiency and boost electricity production.

"The Tuas Nexus is a bold innovation in the action for climate change and sustainability. This pioneering facility was designed to maximise the full potential of the integration of Tuas WRP and IWMF, and marks a new way in which used water and solid waste will be treated in Singapore. We look forward to working with industry partners and technology providers to build Tuas WRP, which aims to be the most energy-efficient MBR plant in the world and the cornerstone of Singapore's used water management strategy," said Mr Yong Wei Hin, Director, DTSS Phase 2, PUB.

The Tuas Nexus showcase at Water Expo is located at Basement 2, Sands Expo and Convention Centre.

The Tuas Nexus Business Forum will take place on Wednesday, 11 July 2018, 10.30–13.00, at Level 4, Sands Expo and Convention Centre.



Participants of the Singapore Water Management Series who attended the Water Reuse segment take in the sights while cruising the Singapore River

PREVIEW



CLIMATE RESILIENCE VIA DESALINATION AND WATER REUSE

Water reuse and desalination are starring in the fight against climate change. Gain insights on key market developments at the Desalination and Water Reuse Forum

By **Rachael Goh**

To better cope with water scarcity, the world is increasingly looking towards desalination and water reuse as two sustainable solutions that can strengthen water security.

These are weather-resilient sources of water that are not subjected to the vagaries of weather, and can help the world better cope with the threat of climate change.

As a small island nation, Singapore is especially vulnerable with climate change hitting us on two extreme ends of the spectrum. More intense and frequent rainfall causes flash floods, while prolonged droughts threaten water security. For Singapore where water is an existential issue, climate change will only exacerbate our challenges.

There is a silver lining though. Surrounded by the sea, Singapore has been tapping this resource to turn seawater into drinking water. It recently marked a major milestone in its desalination journey with the opening of its latest and third desalination plant, Tuas Desalination Plant (TDP).

Not only is TDP the first desalination plant in Singapore to adopt a robust pre-treatment process that combines dissolved air floatation and ultrafiltration to reduce membrane fouling and enhance operational efficiency, energy will be provided by a solar photovoltaic system installed on its roof surface. The system will generate about 1.4 million kilowatt-hours of clean energy a year, equivalent to powering the energy needs of more than 300 four-room flats a year.

With another two desalination plants to be built in Marina East and Jurong Island by 2020, Singapore's plan is to gradually increase its desalination and NEWater capacity to meet up to 85% of its future water demand by 2060.

Indeed, globally, both the desalination and water reuse markets are expected to undergo robust growth over the next decade.

The Desalination and Water Reuse Business Forum will be held on Tuesday, 10 July 2018, 14.00–17.00, at Level 3, Heliconia 3404–3406. Titled "Enhancing Climate Resilience for Cities", the Forum will examine the latest market developments in the water in these sectors.



FEATURE

TOP WOMEN IN WATER

Movers and shakers of the global water industry

By **Howard James**

Much has been written of late about the need for more gender-diverse workforces, with some industries further advanced than others.

Fortunately, the water industry harbours an array of female talent, many of whom head market-leading organisations. In no order of preference, below are some of the women making waves in the water industry today:

Dr Joan Rose, Homer Nowlin Endowed Chair in Water Research, Michigan State University



An expert in water microbiology, water quality and public health safety, Dr Rose is the recipient of the 2016 Stockholm Water Prize. Among many achievements, she developed new molecular tools for surveying and mapping water pollution for recreational and drinking water, irrigation water, coastal and ballast waters. Dr Rose also contributed significantly to the development of Singapore's NEWater.

Cecilia Chow, Co-founder and Deputy CEO, Zweec Analytics



Zweec Analytics is a Singapore-based video and data analytics firm that monitors and analyses water quality. Ms Chow is a key member of the team that developed AquaTEC™, a smart early-warning solution that detects contaminants in water by using technology to observe and analyse fish group behaviours.

Cindy Wallis-Lage, President, Water Business, Black & Veatch



Ms Wallis-Lage heads Black & Veatch's global water business, leading the company's efforts to address billions of dollars in water infrastructure needs around the world. She is acclaimed for her expertise in water reuse, wastewater treatment and biosolids management, and has provided project and leadership expertise to over 100 municipal and industrial facilities globally.

Sue Murphy, CEO, Water Corporation, Western Australia



Ranked eighth in *Water and Wastewater International's* Top-25 Water Leaders, Ms Murphy has played a key role in shaping water and wastewater systems in Perth. Under her leadership, the corporation introduced several innovative programmes state-wide, and headed the development of Perth's second major

seawater desalination plant, which set a new world benchmark for energy efficiency.

Diane D'Arras, President, International Water Association



With a career in water that spans four decades, Ms D'Arras became the first female President of the International Water Association in 2016, and was recently re-elected

for a second term. A fervent proponent of communities and cities building resilience to climate change and water scarcity, she is also a strong advocate for women in water.

Dr Cecilia Tortajada, Senior Research Fellow, Institute of Water Policy, Lee Kuan Yew School of Public Policy



An advisor to major international institutions, Dr Tortajada focuses on water, food, energy and environmental securities through

coordinated policies. She has more than 20 years of experience in water, environment and natural resources management, agricultural development and capacity building. Dr Tortajada is the Senior Research Fellow at the Institute of Water Policy at the Lee Kuan Yew School of Public Policy in Singapore and Editor-in-Chief of the *International Journal of Water Resources Development*.

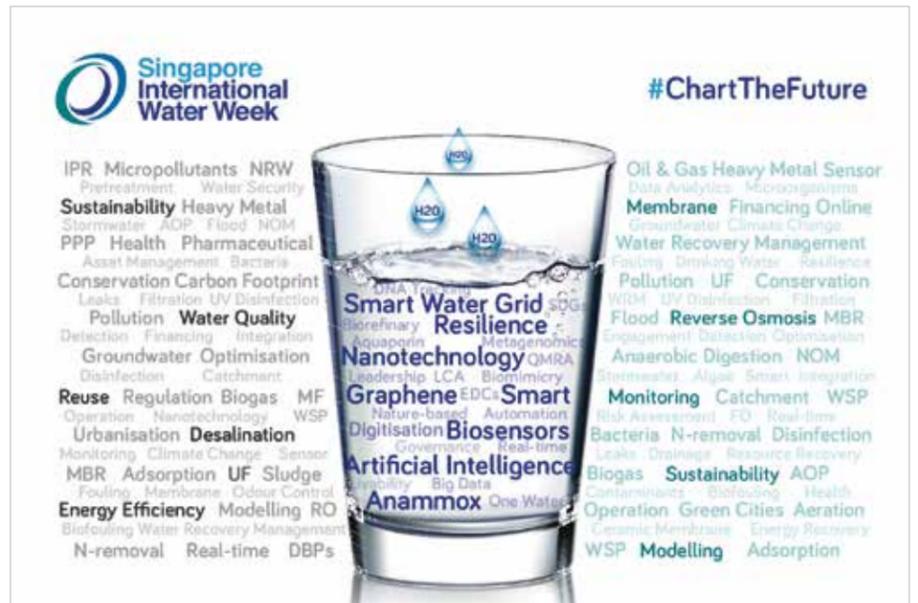
Dr Rita Colwell, Distinguished University Professor, University of Maryland at College Park; Distinguished University Professor, Johns Hopkins University Bloomberg School of Public Health; Senior Advisor and Chairman Emeritus, Canon US Life Sciences; President and CEO, CosmosID



Dr Colwell has dedicated her career to developing innovations that have fundamentally changed the way the world thinks about water microbiology. Among many achievements, her breakthrough discovery of the "viable but non-culturable" (VBNC) phenomenon showed that bacteria can exist in a state in which they are alive and can cause harm even though they cannot be cultured. Dr Colwell also unearthed the critical link between the environment and cholera, leading to her subsequent application of satellite imagery and modelling to predict cholera outbreaks, and the innovative use of affordable sari cloth filters to dramatically reduce drinking water contamination. For her achievements in this field, she was awarded the Lee Kuan Yew Water Prize 2018.

For more views and reviews of industry professionals and projects, visit the Singapore International Water Week Facebook page at <https://www.facebook.com/siww.com.sg/>

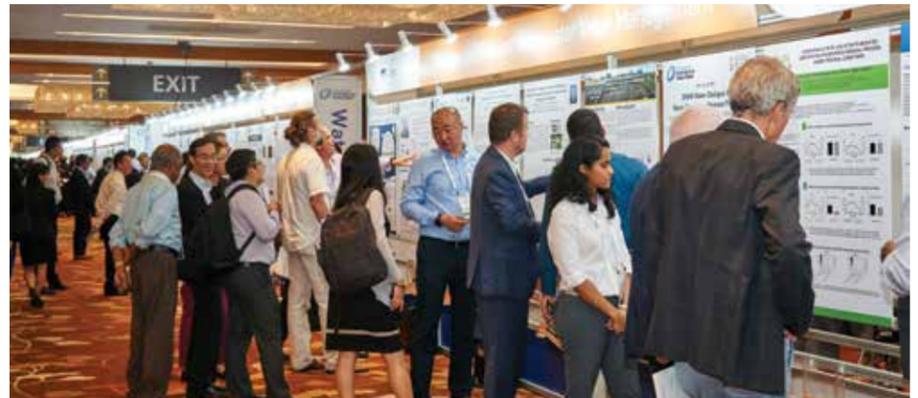
SIWW IN WORDS



Charting the Future of the Water

An interactive word cloud featuring past and imminent water technology trends will be on display at Level 3, Sands Expo and Convention Centre. Co-create by sharing your thoughts on upcoming water trends at siww2018wordcloud.com.

LIVE @ SIWW



WATERING A THIRSTY WORLD: IN PICTURES

The Water Convention Poster Presentation: ideas to tackle water challenges

By **Rachael Goh**

A diverse group of presenters, ranging from university students to policy advisors, explained the concepts underlying over 200 papers on applied water technologies, strategies and solutions at the Water Convention Poster Presentation on Monday, 9 July.

Each paper was evaluated and judged by members of the International Water Association and Singapore's National Water Agency PUB, which will announce eight winners and runner-ups in a closing plenary on 11 July.



Mr Puah Aik Num, Chief Engineer of the Water Supply (Plants) Department at PUB, explains the competition's judging criteria: "The judges are looking for originality and feasibility. We want ideas that can be translated into products that the industry can use."



Doctoral student Ms Samarпита Roy presents her team's analysis of advanced water treatment through phosphorous removal

DAILY HIGHLIGHTS

<p>Ballroom ABGH, Level 5</p> <p>WATER CONVENTION OPENING PLENARY</p> <p>9.50-11.05</p>	<p>Ballroom K, Level 5</p> <p>WATER LEADERS SUMMIT CLOSING</p> <p>11.45-13.00</p>	<p>Heliconia 3404-3406, Level 3</p> <p>DESALINATION AND WATER REUSE BUSINESS FORUM</p> <p>14.00-17.00</p>
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INTERVIEW

OPINION WITH DR MARCUS GOVER, CEO OF WRAP

By **Alison Marshall**



The Waste and Resources Action Programme – or WRAP – calls for a rethink of the 3Rs, from “Reduce, Reuse and Recycle” to “Reinventing, Rethinking and Redefining”. Can you explain the thinking behind this?

The linear approach to using our precious resources is both damaging to our environment and unsustainable.

The traditional 3Rs of reduce, reuse and recycle are now widely understood and in the UK had become ingrained across homes and businesses.

They were a good foundation, but we felt there needed to be a radical step change in performance on reducing the environmental impact of our actions and behaviour.

The 3Rs of the future require us to take a whole-life-cycle approach: *reinventing* at the design stage, *rethinking* a product's use phase and *redefining* its end of life.

This means moving to a more circular economy in which we keep resources in productive use as long as human ingenuity can conceive – extracting the maximum value from products and materials in use and

then recycling them at the end of each service life. This is an economy which minimises the amount of waste and has supply chain resilience as well as shared value hardwired in.

How can authorities achieve greater buy-in among businesses, industry and citizens regarding the idea of “waste as a resource”?

Governments can play an important role in this – but are not the answer alone – through policy changes which encourage and incentivise positive change.

It's also important though to enable and encourage collaboration amongst the various actors who have the ability to bring about lasting change. Only by bringing everyone in the supply chain together can you encourage those actors, who sometimes have very different agendas and pressures, to look together at finding systemic solutions, rather than working in isolation.

Beyond that, governments can also consider the extent to which the fiscal environment can encourage businesses' economic decisions. The fiscal system can influence the choices people make and their behaviour.

What do you view as the most pressing waste management challenges in both the developed world and emerging markets, and how can these be overcome?

We face a number of challenges as the world's population continues to grow, and the planet's resources dwindle. And we need to act now.

At WRAP, through our Resource Revolution plan, we are focused on achieving change in the three areas where collectively we can make the biggest difference and which have the biggest environmental impact: food and drink, clothing and textiles, and electricals and electronics, with resource management underpinning them all.

We face a number of challenges as the world's population continues to grow, and the planet's resources dwindle. And we need to act now



This means focusing on how we can embed the circular economy model as the DNA of the way we do business, which is a challenge. The foundations are there, but they need to be significantly upscaled.

Another challenge – but also an opportunity if we up our game – is how to respond to the import restrictions on recycle adopted by China earlier this year. It has been a wake-up call to the industry and, if we seize the opportunity, could galvanise us into transforming the

recycling sector into a thriving industry which focuses on producing high-quality materials to meet ongoing global needs and demands. But this needs collective action from government and the industry. At WRAP, we have been instrumental in convening discussion to explore solutions.

Are there any cities that stand out to you in terms of implementing a circular economy? What are they currently doing well?

We were impressed with the Mayor of London's ambitious Environment Strategy and the vision to make London the greenest city in the world by 2050. WRAP was involved in the crafting of the strategy and we were especially pleased to see specific references to tackling food waste and driving up recycling rates in the city, along with the commitment to embrace a circular economy approach to waste management.

Together with the London Waste and Recycling Board, we have set up Resource London to respond to this opportunity.



A move to a more circular economy is widely believed to be the way forward, and this might mean a paradigm shift in the way we design, use, produce and recycle plastics

In 2017, **7.7 million** tonnes of solid waste was generated in Singapore, **110,000 tonnes** less than 7.81 million tonnes in 2016



Source: National Environment Agency

In 2017, the amount of waste recycled in Singapore fell by **50,000 tonnes** from 4.77 million tonnes in 2016 to 4.72 million tonnes



Source: National Environment Agency

TODAY'S HIGHLIGHTS

Sands A Room
5001-5103,
Level 5

CLEAN
ENVIRONMENT
LEADERS SUMMIT

08.30–13.00



Sands A Room
5001-5103,
Level 5

LEADERS-EXPERTS
FORUM

15.30–17.30



Rooms 5001-
5103, Level 5

SPA AWARDS
PRESENTATION
CEREMONY

08.45–09.15





INTERVIEW

VIRTUAL ROUNDTABLE WITH HAJIME OSHITA AND DYLAN TERNTZER

A virtual discussion with the CEO of Japan's JFE Engineering and the Co-founder of Singapore-based SuperSteam

By **Howard James**

What are the pressing challenges facing the environmental sector, and what are some of the solutions that can overcome these?

Hajime Oshita (HO), President and CEO, JFE Engineering: Clean air and water for everyone. These two resources move freely across our planet. Therefore, air and water pollution can impact everyone's lives regardless of political or other man-made boundaries. One of the key solutions is the true involvement of all stakeholders. In order for an environmental protection strategy to work, a mixture of legislation, education and innovation must be in place to encourage an active participation from government, industries and communities, and even cross-country cooperation.

Dylan Terntzer (DT), CEO and Co-founder, SuperSteam: The environmental sector is a people business. The problems revolve around people – how they interact with the environment (and pollute it) and how they keep it clean (and the global lack of people to do so). Solutions will likely involve public education; mechanisation, such as the use of time-saving cleaning machines; less indiscriminate use of cleaning chemicals, and the application of robotics and the Internet of Things (IoT), i.e. new technology that can help greatly improve our cleaning effectiveness while using less manpower or making limited manpower more efficient.

Which technologies are important to the day-to-day of running your business, and



From left, Mr Hajime Oshita, President and Chief Executive Officer of JFE Engineering, and Mr Dylan Terntzer, Chief Executive Officer and Co-founder of SuperSteam

what future innovation might disrupt the environmental industry in the near future?

HO: JFE Engineering is a key player in the development of environmental solutions. All our technologies are aimed at bringing a positive disruption in the current environmental management paradigms of countries worldwide. We are constantly developing new initiatives.

DT: For us, enterprise resource planning systems paired with a cloud-based paperless solutions will make the most impact. This will give us access to real-time data and the ability to analyse big data. It is difficult to pinpoint a particular technology that will cause the biggest disruption but my vote goes



to robotics, as this physically helps in the cleaning of spaces.

What role does automation have in your business? How about in a decade's time?

HO: JFE Engineering is a firm believer in the use of technology to improve efficiency across all areas of our business. From communication technologies to facilitate interaction amongst global offices, to computer-aided design and modelling to help engineers on site, to the use of the internet to provide remote operation assistance to our clients in Japan and overseas. Automation is becoming increasingly important and will gain more prominence as technologies, such as artificial intelligence, become more advanced.

DT: We are currently working to automate our back-end paperwork processing. Soon, we will automate many other manual processes. In two years we will see mass automation come online in SuperSteam and the industry. Within a decade, I foresee human cleaners working alongside cleaning robots and IoT-connected devices, allowing for real-time monitoring and big data analysis.

How challenging can it be to attract the right workforce? What steps have you taken to secure the right team?

HO: We believe in the constant training of our teams and encouraging them to innovate. We constantly challenge our teams to break new frontiers with the motivation that we are contributing to the improvement of our planet and the lives of future generations.

DT: Attracting the right people is challenging, and it is important to keep investing in helping them grow and evolve to keep pace with the company. Furthermore, we constantly refine our strategy and look to the future with a five-year planning horizon; we consider what skill sets we will require and where to find them (internal development or recruitment).

How do you see the global environmental sector evolving, and which markets do you think hold high potential?

HO: With rapid population growth worldwide, resources will become unavoidably scarce. Therefore, there is an increasing need to improve the way we manage our resources' life cycle. JFE Engineering believes the Southeast Asian market continues to present strong growth potential for the introduction and adoption of advanced environmental management systems.

DT: The biggest potential markets lie in rapidly developing countries with large population bases – China, India and Indonesia immediately come to mind. Robotics, IoT and software automation will also be in great demand in industrialised nations.

LIVE @ CESS

LIVE @ EXPO

A quick overview of some exhibitors at this year's CESS

By **Will Chin**



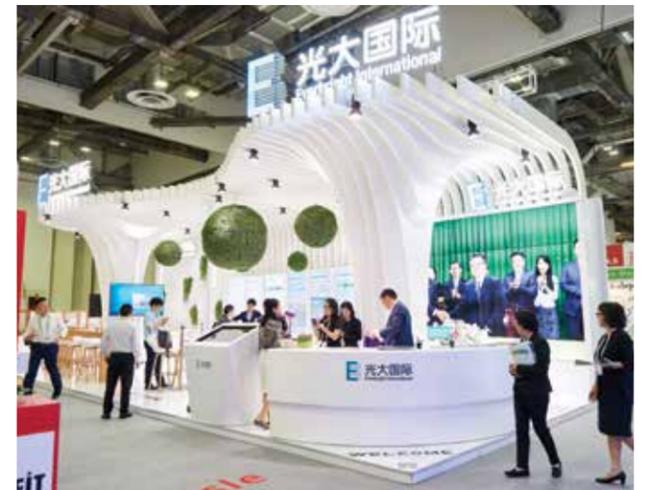
1. KÄRCHER

Kärcher Group presented Isal 6000 – a powerful, all-in-one sweeper that is ideal for urban and suburban environments. Isal 6000 can sweep up road debris and industrial dust without causing secondary pollution to the environment. Speed is not compromised either, with the new model being able to perform heavy-duty cleaning at up to 42 kilometres per hour.



2. CLEAN SOLUTIONS

Clean Solutions is a Singapore-based brand that specialises in integrated environmental solutions, from retail establishments to healthcare facilities. For CESS 2018, the company dished out something wholly different: Alex, a robot that can be customised to provide many services, from wireless payments to providing mall directories. He also dances on command.



3. EVERBRIGHT INTERNATIONAL

Chinese companies have a huge presence on the show floor, and few can match the scale of Everbright International's booth. Representatives of the group were on hand to show off the company's waste-to-energy investments and technologies in 130 locations across 20 provinces and municipalities in China, as well as in Germany, Poland and Vietnam.



PREVIEW

EMBRACING DISRUPTIVE INNOVATION

Public- and private-sector leaders will discuss the role of good governance in preparing cities for disruptive innovations

By **Shanti Anne Morais**

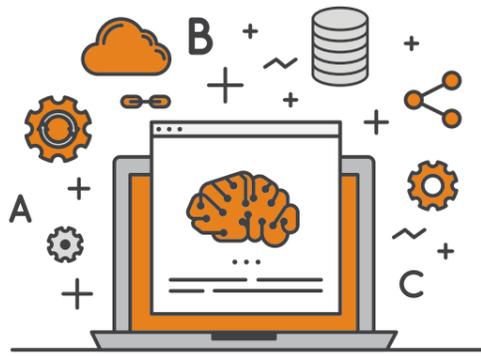
Cities want to embrace disruptive innovation to deliver enhanced services to citizens and businesses, but realising this can be challenging. A key hurdle lies in the nature of disruptive innovation. Difficult to anticipate, city leaders are uncertain of its scope of influence, and others do not know where to begin in managing such disruption. Cities will need to attract buy-in from businesses and citizens as established products and practices get displaced, yet capability and resource gaps, which commonly reside within public-sector bodies, can stall well-intended initiatives.

To address these and unearth the potential of disruptive innovation, cities must exert good governance. But is it enough to enable disruptive innovations to transform cities for the better?

Today's session discusses the latest thinking in this field. Presented by a panel of world-renowned thought-leaders, it will feature cutting-edge ideas and lessons across regions, as well as discuss live projects where disruptive innovation is successfully encouraged and deployed.

Attendees will discover:

- Disruptive innovation in an urban context – the latest trends, challenges and opportunities
- Roadblocks to embracing disruptive innovation and how mayors can achieve buy-in from all stakeholders



Machine learning, deep learning and natural language processing are the three most in-demand skills on Monster.com

Source: Forbes, 2018

- The power of public-private-sector collaboration in realising projects
- Other factors that support the right foundation for disruptive innovations and technologies

The session will feature city leaders from Bilbao and Bristol, as well as executives from McKinsey Global Institute, Fontinalis Partners and ST Engineering.

"Can Good Governance Prepare Cities for Disruptive Innovations?" will take place today, 09.00–10.30, at Ballroom 5201–5301, Level 5.

PREVIEW

THE CASE FOR SOCIAL RESILIENCE

City leaders and experts will deliberate on the importance of social resilience for liveable and sustainable cities

By **Sabina-Leah Fernandez**

There are many threats that can impact cities – natural disasters, terrorism and social challenges such as a rapidly ageing population and increasing inequality. These challenges are interdependent and can impact all aspects of city life.

Building social resilience is critical. Strong communities and networks will provide the necessary support system to citizens during times of crises, but they also strengthen day-to-day interactions. There are many positive examples and best practices from around the world, and cities have much to benefit by learning from one another. By adopting a holistic and integrated approach to empower communities, cities can improve their capacity to adapt, survive and grow in the face of adversity.

The session "Social Resilience – A Critical Component of a Liveable and Sustainable City?",

staged today, will provide answers to several pressing questions:

- How can cities mitigate the social challenges of today?
- How can cities foster an inclusive and cohesive society?
- How can cities empower their communities?
- What are the roles of the people and private sectors?

The forum will feature city leaders from Tirana, New Taipei City, and executives from 100 Resilient Cities, Ibasho and more.

The session "Social Resilience – A Critical Component of a Liveable and Sustainable City?" will be held on Tuesday, 10 July 2018, 11.00–12.30, at Rooms 5302 and 5202, Level 5, Sands Expo and Convention Centre.

PREVIEW



Qianhai New District, located south of Shenzhen and a mere hour's drive from Hong Kong

OPPORTUNITIES IN INDIA AND CHINA ABOUND, ASSERT FORUM SPEAKERS

Speakers at the South Asia and China business forums say both sessions will highlight the enormity of opportunities that both markets exert

By **Howard James**

Two vastly different nations but often clubbed together. India and China, giants of Asia, collectively house 37% of the world's population and account for about 18% of global GDP, according to the World Bank.

While both markets have undergone vast economic growth over the past two decades, they have also faced significant environmental and market entry challenges. These issues, however, are quickly receding. And this no more evident than in the field of urban development.

Dr Sreedhar Cherukuri, Commissioner, Capital Region Development Authority, Government of Andhra Pradesh, India – a speaker at the South Asia Business Forum – described how the Indian Smart Cities Mission is transforming his nation's cities – not just in terms of creating liveable and sustainable cities, but also in terms of presenting openings for foreign companies. "India is open for business," he proclaimed.

The nation's Smart Cities Mission is a savvy initiative. It leverages India's immense technological capabilities, both in terms of technical sophistication and the country's highly skilled IT workforce.

In addition, Dr Cherukuri explained how some of the world's biggest and most successful tech companies either are from or have a significant presence in India; and how the nation is meeting its infrastructure and urban development needs via the use of state-of-the-art digital tools.

Discussing this year's World Cities Summit (WCS), he was particularly upbeat: "WCS gives newly planned cities like Amaravati in Andhra Pradesh the opportunity to share our experiences with peers from around the world. But most importantly, it is



Interested to expand to South Asia? "India is open for business."

also the chance for us to learn from the encounters of others."

Dr Shan Liang, Vice President, Urban Planning and Design Institute of Shenzhen, was equally positive about both WCS and urban projects in China: "The summit strengthens our understanding of how various cities around the world work, and most importantly, it allows leaders and urban planners to come together to share ideas and co-create urban solutions."

Dr Shan was especially happy to discuss the Qianhai New District – a special economic zone located south of Shenzhen and an hour's drive away from Hong Kong. Among many innovative features, he highlighted the district's waterfront corridor, which serves the dual purpose of enabling sustainable water management and creating a more liveable and conducive place to live, work, play and learn.

"The development of such strategic projects across China is realising the nation's ambition of creating highly liveable and sustainable cities for its citizens," Dr Shan added.

The South Asia Business Forum will take place on Tuesday, 10 July 2018, 15.30–18.15, Heliconia 3401AB–3403. The China Innovation Forum will take place on Wednesday, 11 July 2018, 09.00–12.15, Level 5, Ballroom M.



PREVIEW

URBAN GOVERNANCE: SINGAPORE'S PRINCIPLES AND APPROACHES

Making Singapore liveable and sustainable is an ongoing challenge — what are the underlying principles that have guided Singapore's approach to urban governance over the years?

By **Pang Hui Zhen**

There are many elements that make a city liveable and sustainable — a competitive economy, a sustainable environment and a high quality of life. To achieve these outcomes successfully requires a set of principles that guide urban planning and development, contributing to a city's good governance.

Singapore is often cited as the benchmark for urban governance. From the early days when conditions were poor, infrastructure was lacking and the crime rate was high; to the present where the city is safe and its streets are clean, with comprehensive infrastructure and amenities.

What were the principles that guided Singapore's urban planning and development, and contributed to its good

governance? What insights can we glean from Singapore's experience of developing a liveable and sustainable city?

The forum "Urban Governance: Singapore's Principles and Approaches", co-organised with Singapore's Civil Service College, will feature local case studies that illustrate the city-state's approach to urban governance and the principles underlying it, and discuss how the country has managed to create a liveable and sustainable city in which to work, live and play. The panel will touch on a range of examples from the infrastructure, social and economic domains.

"Urban Governance: Singapore's Principles and Approaches" will take place on Tuesday, 10 July 2018, 15.30–17.00, at Sands Grand Ballroom M, Level 5.

PREVIEW



SHAPING CITIES THROUGH INNOVATION AND COLLABORATION IN CULTURE

Explore how cities can leverage culture to enhance the urban environment

By **Chan Jia Yi**

Social fragmentation and technological disruptions are increasingly prevalent challenges faced by cities and their residents. To be liveable and sustainable, cities of the future will require innovative and collaborative urban solutions.

These will likely go beyond existing governance and planning practices employed by authorities, and involve innovative use of culture, in collaboration with key stakeholders.

With this in mind, how can cities meaningfully weave cultural elements into

their urban landscape, and maximise their positive impact for residents?

The forum "Shaping Cities through Innovation and Collaboration in Culture", co-organised by Singapore's Ministry of Culture, Community and Youth, presents ideas that aspire to tackle these issues, and spotlight the value that culture brings to cities of the future and their residents.

"Shaping Cities through Innovation and Collaboration in Culture" will be held on Tuesday, 10 July 2018, 15.30–18.00, at Sands Grand Ballroom N, Level 5.

PREVIEW

BUILDING AND GROWING A THRIVING URBAN FOOD ECO-SYSTEM

Discover the latest innovative advances in the field of food cluster developments and emerging agri-technology

By **Will Chin**

Amid growing pressures on food resources due to population growth, rapid urbanisation and the impacts of climate change, there is growing concern that global supply of food may not keep up with growing demand.

In Singapore for instance, a country of about 730 square kilometres, with a population of more than 5.6 million, the city-state's resources – including land, water and electricity – face many competing uses.

To meet this challenge, innovative developments such as food cluster development and emerging agri-technology have created opportunities for countries like Singapore, making it now possible for farms to harness technologies that enable them to "grow

more with less". But beyond technological innovation, what else does it take to build and grow a thriving food ecosystem in an urban environment? The forum, titled "Building and Growing a Thriving Urban Food Eco-system" and co-organised by Singapore's Agri-Food and Veterinary Authority, will bring together experts in this field to discuss and provide insights on urban food solutions for the future.

"Building and Growing a Thriving Urban Food Eco-system" will be held on Tuesday, 10 July 2018, 15.30–18.00, at Rooms 5201 and 5202, Sands B, Sands Expo and Convention Centre. The event will conclude with the launch of Centre for Liveable Cities' latest publication, Food and the City: Overcoming Challenges for Food Security. All attendees to this forum will receive a complimentary copy of the publication.

SITE VISIT

EXEMPLIFYING INCLUSIVE COMMUNITIES

Tour Kampung Admiralty, which integrates public housing for the elderly with a range of facilities; and Khoo Teck Puat Hospital, a public hospital branded as "garden in a hospital, hospital in a garden"

By **Genevieve Chan**



Photo: Khoo Teck Puat Hospital

A shared trend among cities globally is an increasingly ageing society. According to the United Nations, the number of persons aged 60 or older is expected to rise from 962 million globally in 2017 to 2.1 billion in 2050, and 3.1 billion in 2100. How can cities ensure that they have the necessary infrastructure, housing and healthcare to cater to the needs of the elderly?

Kampung Admiralty is designed for seniors to lead independent, active lifestyles, with public spaces that encourage the elderly to socialise outside their homes. Among other features, it also includes a childcare centre co-located with an Active Ageing Hub to promote inter-generation bonding.

Khoo Teck Puat Hospital incorporates nature into its design to create a tranquil healing environment that promotes patients' rehabilitation. It had been awarded the prestigious Stephen R Kellert Biophilic Design Award.

The site visit will take place on Wednesday, 11 July 2018, at 08.30–13.00.

DAILY HIGHLIGHTS

<p>Sands B 5202, Level 5</p> <p>SOCIAL RESILIENCE - A CRITICAL COMPONENT OF A LIVEABLE AND SUSTAINABLE CITY</p> <p>11.00–12.30</p> 	<p>Ballroom N, Level 5</p> <p>DISRUPTIVE INNOVATIONS - BANE OR BOON FOR CITIES?</p> <p>09.00–10.30</p> 	<p>Sands B 5201, Level 5</p> <p>LET'S TALK ABOUT MONEY - HOW WILL CITIES OF THE FUTURE BE FINANCED?</p> <p>11.00–12.30</p> 
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SPECIAL FEATURE

BUILDING A RESILIENT SINGAPORE PART 2 — COLLABORATION

A cohesive and collaborative community serves as the backbone to resilient cities

By **Genevieve Chan**



This article is the second in a three-part series on Building a Resilient Singapore and explores how Singapore encourages collaboration between citizens to foster social integration and community belonging. Part three will focus on how the island-state has developed climate resilience.

With its diverse and multi-ethnic society, building resilience in Singapore involves more than just adapting to change or managing crises. It is also about building connections and capabilities within communities, to ensure that everyone in society can survive and thrive in the face of challenges.

Public Housing Programme

Public housing in Singapore is more than just providing quality and affordable housing for its residents. It is also a way to unite people from all walks of life, and instil a sense of ownership and belonging through home ownership.

Today, more than 80% of Singapore's population reside in Housing and Development Board (HDB) residential units, with about 90% of residents owning their homes.

Policies in Place

Singapore's good governance and long-term planning have been crucial in providing quality homes and living environment, and building cohesive communities. The Ethnic Integration Policy in particular plays a big role in the country's racial integration and harmony. Implemented in 1989, the policy sets a proportion for a block or a neighbourhood according to Singapore's

ethnic composition, ensuring a variety of ethnicities.

To encourage integration between people of different socio-economic groups, each public housing block also has a mix of different unit types ranging from two-room to five-room flats, while every neighbourhood consists of both public and private residences.

Thoughtful Design

The city-state's high-rise, high-density HDB neighbourhoods are planned and built to encourage the development of neighbourliness and strong social networks by providing shared common spaces. Here, residents of all ages, ethnicities and social classes can interact, live, work and play.

Each public housing town has a centre where larger commercial facilities (such as shopping malls), train stations and bus interchanges are located. This way, each resident can have access to quality public transport and facilities.

HDB blocks have also been designed to allow for more interaction between residents and build community spirit. First introduced in 1970, the void deck is a common feature in many HDB blocks and is usually on the ground floor. This not only provides shelter from the elements but also serves as a communal space for people to meet and socialise.

Another common feature in HDB flats is the shared corridor on every level. Shared by families that live on the same floors, these "courtyards in the sky" provide opportunities for

interaction, which in turn foster a sense of co-ownership and responsibility.

Through its systematic and integrated city planning and thoughtful design, Singapore has developed vibrant towns and cohesive, resilient communities that can serve as the backbone of the nation.

COMMUNITY CARE FOR SENIORS



To ensure that seniors have all the help they need, Singapore introduced the Community Network for Seniors (CNS), a support system with a proactive approach towards community care. The network focuses on active ageing, companionship and care coordination for the elderly. The initiative has engaged 55,000 seniors in the first quarter of 2018 alone.

Besides its own efforts, CNS also brings together various partners such as grassroots organisations, regional health systems and government agencies for maximum impact.

FEATURE



Bussorah Street (pictured), Baghdad Street, Bali Lane and Haji Lane are transformed into car-free zones every Friday, Saturday and Sunday evening – perfect for that weekend catch-up with friends when the weather cooperates

STREETS FOR PEOPLE A CASE STUDY ON RESILIENCE THROUGH COLLABORATION

Going "car-lite" exemplifies how Singapore is building resilience through collaboration

By **Sabina-Leah Fernandez**

Thanks to an initiative by Singapore's national urban planning authority Urban Redevelopment Authority, Singaporeans are taking to the streets – in a positive way. Going car-lite is environmentally friendly, and has the added benefit of giving residents a sense of connection and "ownership" of public spaces. The initiative encompasses three core features:

First, regularly-held car-free zones turn roads into vibrant, pedestrian-only streets. Some well-known car-free zones include Club Street and Ann Siang Hill, which are closed to traffic for outdoor dining on Friday and Saturday nights, and vibrant tourist favourite Little India, where some streets go car-free from 12 noon onwards on Sundays.

Second, Car-Free Sunday closes roads in the central business district and the historic civic district, with a special edition at one of Singapore's innovation districts, one north. Sports, arts and cultural activities organised during Car-Free Sunday encourage the public to walk, jog or cycle, and are also a clever way to lead people to visit nearby sites of interest, parks and museums.

And finally, Streets for People allows similar car-free activities to sprout from the ground up. With demonstrated support from the community, a resident or business operator can apply to close a street temporarily for events such as film screenings, music performances or outdoor fitness classes. Such events bring footfall and vibrancy to the area, turning an ordinary street into a "people-friendly" zone – and helping to foster a sense of community, connection and ownership.



Streets for People allows residents to organise community events such as this yoga session at Lorong Liput, in the Holland Village area

SPECIAL REPORT

THE BIG INTERVIEW

Being the first female mayor in the history of Surabaya, Indonesia, is no small feat. However, for Dr Tri Rismaharini, the election was only the beginning. *Solutions* newspaper speaks to her about the Comprehensive Kampung Improvement Programme, as well as how she has transformed the city into a shining example of sustainability

By **Will Chin**

Could you please share more about the Comprehensive Kampung Improvement Programme (C-KIP)? How have you worked with the community, businesses and non-governmental organisations to improve the overall liveability of the city to date?

About 60% of Surabaya consists of *kampung*, so the government's first priority was to improve the infrastructure, like lighting in *kampung*, overall security in the area, as well as the people's access to the larger economy.

To that end, we invited people to participate in various areas of the community. For example, we cooperated with important figures within the communities, and we even worked with the media to only publish good news about *kampung*. That way, people living there felt more motivated to do good.

We also worked with private sectors and got them involved in the development of the city. In terms of cleanliness, we encouraged people to make the area greener by planting trees and vegetables in front of their homes.

The next thing we did was to improve the local economy. The government provided



The use of ICT in Surabaya actually helps curb and reduce corruption, because we can actually provide more transparent and accountable governance



training, especially for housewives, and we taught them how to make handicrafts, which were in turn sold to the public. Once their business grew sufficiently large, they could recruit their neighbours to join the business.

Furthermore, we constructed libraries and public spaces within *kampung* areas. These are visited by members of the public who want to participate in, say, dancing or other social activities. We also built football fields and playgrounds for children. These initiatives make the *kampung* a healthier place to live, both environmentally and socially.

The application of information and communications technology (ICT) for urban development, especially to address social issues, is rapidly increasing in many cities and countries around the globe. Could you tell us about some initiatives that make use of digital technologies for city management in Surabaya?

The use of ICT in Surabaya actually helps curb and reduce corruption, because we can actually provide more transparent and accountable governance.

Secondly, we have also been able to reduce the operational cost of the city

government. For example, in terms of the expenditure on stationery and paper alone, we used to spend about IDR29 billion (US\$2 million). After the implementation of ICT, this amount decreased to just IDR9 billion (US\$628,831). We have become more cost-effective, which means we can reallocate budget to other more important purposes.

ICT also allows the government to provide services to its people far more quickly, especially in terms of licensing, which helps to attract more investments [into Surabaya]. In fact, even within the government, all management-related efforts are done online as well.

Across the city, the government provides 203 kiosks to allow people to easily access government services. To date, we have rolled-out 1,300 WiFi hotspots at the neighbourhood level, so that citizens can access services much closer to their homes. If they want to apply for birth certificates or marriage certificates, for example, they can easily use the system. There is no longer any need to come to our offices personally.

Lastly, ICT also facilitates communication between parents, children and schools, because it allows the child's activities to be monitored on a daily basis.

Being able to transport people in an efficient and environmentally friendly way is one of the key aspects of the sustainable development of all cities worldwide. What is your mobility vision for Surabaya? Along with providing an efficient transport system for citizens, how are you ensuring environmental sustainability?

Mass transportation is extremely expensive, and most poorer people cannot afford an expensive public transport system, such as an underground metro. Instead, we plan to develop a tram-based system in Surabaya. We are currently still facing problems with railway development, but we will get there.

In the meantime, we have launched a public bus system that allows citizens to pay for fares with plastics. Not only does this mean a cheaper public transport option for everyone, it also helps tremendously in the city's sustainability efforts.



SOLUTIONS

PUBLISHED BY



JOHN BROWN NOVUS

Editor-in-Chief
Howard James

Project Director, Solutions
Ellen Bone

Editorial Director
Alison Marshall

Managing Editor
Sabina-Leah Fernandez

Chief Subeditor
Mary Weaver

Subeditor
Josephine Pang

Writers
Andrea Lee
Chan Jia Yi
Daniel Seifert
Genevieve Chan
Pang Hui Zhen
Rachael Goh
Shanti Anne Morais
Will Chin

Executive Creative Director
Richard MacLean

Creatives
Cherlin Chan
Khairunnisa Anis

Production & Distribution
Kwan Gek Lian
Pearlyn Kwan

Chief Executive Officer
Simon Cholmeley

Chief Operating Officer
Marie Lyte

Address:
Singapore
1 Wallich Street
#20-01 Guoco Tower
Singapore 078881
Tel: +65 6911 7988
Fax: +65 6501 4902

Hong Kong
25th floor, 625 King's
Road, North Point
Hong Kong
Switchboard:
+852 3962 4500
Direct:
+852 3962 4503

Simon.Cholmeley@johnbrownnovus.com

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SEEN@ WCS



One of the biggest takeaways for me is how technology can revolutionise the efficiency of a city's management team. When I return home, I want to speak with my mayor to create pilot projects with heavy use of technology

Hikmat Abdurahmanov
Chairman of Public Council, Tashkent, Uzbekistan

Right: The Hewlett Packard team shows off their autonomous security vehicle, OTSAW O-R3, which is equipped with high-definition cameras and laser scanners to keep premises safe



SEEN@ CESS



I've only just arrived at the convention, but I've been very impressed by the exhibits, particularly how intelligent systems and simulations have been used to properly manage water! I think that is super interesting

Khaing Win Sint
Assistant Electrical Manager (Purchasing Team),
Samsung C&T Corporation

SEEN@ SIWW



SIWW has made its mark by having such an overwhelming overseas presence. You don't have to fly around the world to meet important people. They come here to meet you instead

Shekar Athreya
Process Manager, Black & Veatch



Left: National University of Singapore's NUSoil is a nifty water and nutrient supplement that allows plants to survive even the harshest droughts



Above: IFSC's Scrub 50 can clean 5,000 cubic metres in 130 hours and is completely unfazed by edges and corners

TOMORROW'S HIGHLIGHTS

Peony 4506, Level 4
GREEN JOBS SYMPOSIUM
13.00-14.45

Peony 4502-4504, Level 4
E-WASTE BUSINESS FORUM
14.00-18.00

Ballroom M, Level 5
CHINA INNOVATION FORUM: CHINA IN THE NEW ERA
08.00-12.15

Heliconia 3401A-3403, Level 3
SMART WATER FORUM
09.30-13.00
Begonia 3002, Level 3
WATER CONVENTION CLOSING PLENARY
16.00-17.30

Melati 4002-4104, Level 4
TUAS WATER RECLAMATION PLANT AND INTEGRATED WASTE MANAGEMENT FACILITY FORUM
10.00-13.00