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NAVIGATING INNOVATION: EXPLORING THE INTERSECTION OF SMART CITIES AND DIGITAL WATER

Dear Esteemed Readers,

In the ever-evolving tapestry of our world, the synergy between technology and urban water systems takes centre stage in this edition of EverythingAboutWater Magazine. Welcome to the editorial stream that explores the intricate interplay of "Smart Cities and Digital Water," an exploration poised at the nexus of innovation and sustainability.

As the digital era unfolds, our cities are undergoing a profound transformation. From intelligent infrastructure to data-driven resource management, the concept of smart cities is reshaping the landscape of urban living. In this issue, we delve into the dynamic realm where cutting-edge technology meets the essence of water, unravelling how digital solutions are revolutionising water management in our increasingly interconnected urban spaces.

Within these pages, anticipate insights into the latest advancements fueling smart water systems. From sensor networks optimising distribution to data analytics enhancing efficiency, the convergence of digital technology and water management promises not only a more resilient future but also opens avenues for intelligent decision-making. We aim to shed light on the strategies that empower cities to become more water-wise, leveraging technology to address challenges and forge sustainable paths forward.

This edition serves as a compass, guiding leaders, communities, and policymakers towards solutions that marry technological innovation with ecological stewardship. As you navigate through the following pages, envision a future where smart cities seamlessly harmonise with digital water ecosystems.

In conclusion, I extend my gratitude for joining us on this explorative journey. May the insights garnered from "Smart Cities and Digital Water" catalyse transformative actions in your spheres of influence, ensuring a resilient and water-secure future for generations to come.

Thanks & Regards,

Simran Arora

Editorial Incharge

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DROPLETS

CNN's Going Green explores the innovations protecting and purifying water

Water is one of the most precious resources on our planet – we use it to grow food, produce energy, and many products we use rely on it. It is interconnected with everything, and all living things need water to survive. Yet polluted waterways, dwindling access to reserves and declining ocean reefs are putting this vital element in peril. In this episode of Going Green, CNN visits the innovators around the world discovering new ways to protect, preserve and purify the lifeblood of our planet.

First, CNN visits Cape RADD, an organization in South Africa focused on conserving the Great African Sea Forest and the wildlife that live there. Cape RADD is dedicated to marine research that engages both biologists and citizen scientists. South Africa is one of the top global hotspots for sharks, and one project Cape RADD has embarked upon is studying the shy shark species.

CNN then explores a solar-powered desalination solution created by Elemental Water Makers, which aims to provide clean water in areas that are water-scarce or have limited access to electricity. More than 2 billion people globally do not have access to clean drinking water. After seeing one rural community in Madagascar facing this reality, the Dutch company's CEO Sid Vollebregt and co-founder Reinoud Feenstra were determined to find a solution for water scarcity. Their innovation was built around reverse osmosis – a water purification process that removes contaminants by pushing water through a porous membrane.

CNN then travels to the California, US to visit Epic Cleantec, a startup recycling wastewater into reusable non-potable water. The company seeks to make water use more circular by creating water recycling systems built within buildings themselves, thus eliminating the need to discharge wastewater into a sewer and transport it to a remote treatment facility.

Next, CNN visits Glanris, a company converting agricultural waste like rice hulls into a water filtration medium capable of removing contaminants and metals from water, all while sequestering carbon. Glanris was founded in Mississippi, US, right across America's largest rice-producing state, Arkansas, with the mission to take agricultural waste and turn it into biochar. Not only does this conversion process remove carbon dioxide from the normal carbon cycle, biochar can also be used in a variety of products like plastics, water filtration and battery anodes. Biochar's porous nature is also said to improve soil production by increasing water and nutrient retention in the soil.

Finally, CNN meets Bloom, a sustainable materials company that's turning toxic algae waste into plastics used in consumer products. While algae can be beneficial in many ways, pollution can turn algae into harmful blooms which can deplete oxygen levels, release toxins and kill aquatic life.

GMDA to Build 5th Filtration Unit at Water Treatment Plant

Gurugram Metropolitan Development Authority (GMDA) is planning to construct a filtration unit at Chandu Budhera Water Treatment Plant. It will begin the tendering process for the project by the end of this month. This will be the fifth unit and will have a capacity of 100MLD. According to a GMDA official, the upcoming filtration unit will be built at an estimated cost of Rs 64 crore. Work on augmenting the water supply has already started, officials added.

Construction of the fourth unit at Chandu Budhera WTP is underway and is likely to be completed by June next year. After the addition of the fifth unit, its total capacity will be increased to 500MLD by 2025.

The GMDA is expecting to complete the tendering process within the next three months and work on the fifth unit is likely to start by the next financial year, the official added.

“In view of the growing population, especially new development along Dwarka Expressway and Southern Peripheral Road, we are working on strengthening and augmenting the water supply in the city in a phase-wise manner. While the work on the fourth unit is already underway, we have got the necessary approval and will now float the tender for the construction of the fifth unit at Chandu Budhera WTP by the end of this month. Once completed, the filtration unit will increase the treatment capacity to 500MLD from its existing 300MLD by 2025 at Chandu Budhera WTP,” Rajesh Bansal, GMDA's chief engineer of infra-II division, said.

In addition, a detailed project report is being prepared for the construction of a 100MLD unit at Basai WTP. Earlier, the metropolitan authority planned to enhance the capacity of both WTPs by over 50% by 2024. As per the infrastructure development plan prepared by IIT Roorkee, the city's requirement is estimated to touch 1,135MLD by 2031 for a population of 52 lakh and 1,408MLD by 2041 for a population of 66 lakh.

At present, GMDA is supplying 300MLD water from Chandu Budhera and 270MLD water from Basai WTP in the city. The peak demand is 650MLD, resulting in a gap of 80MLD, which is either met through borewells or private tankers.

Chennai city waterways may carry cleaner flow with revamped sewage treatment plants set to produce better-quality reclaimed water

City waterways may carry cleaner flow as Chennai Metrowater is set to complete retrofitting work in existing sewage treatment plants in a few months.

The water agency is refurbishing the existing sewage treatment plants that were added to the network during various years. Officials of the Metrowater said the treatment technology in seven sewage treatment plants across the city was being modified to suit the new quality norms.

ATER NEWS

The oldest one, with a capacity to treat 23 million litres a day of sewage, was built in Nesapakkam in 1974. Spread over 45 acres, the Nesapakkam premises have four plants, including the recently commissioned 50 mld tertiary treatment plant. The plants together treat nearly 94 mld of sewage received from various zones such as Kodambakkam and Valasaravakkam.

Work in five of the seven STPs will be completed by December this year. The project in 110 mld Kodungaiyur plant and 120 mld Koyambedu STP would be finished by March next year.

Work is underway to upgrade the facilities in Kodungaiyur and Koyambedu plants with Moving Bed Biofilm Reactor (MBBR) technology that has effective biological treatment compared to the conventional activated sludge process adopted now in the STPs.

The MBBR technology was adopted in the existing plants as it was found to be best suited to partially dismantle and replace some units with improved technology to comply with quality standards, officials said.

The operation of the plants and the quality of treated wastewater are monitored using the SCADA (Supervisory Control and Data Acquisition) online system by various agencies. The project aims to produce better-quality reclaimed water. The biochemical oxygen and the total suspended solids that determine the quality of treated sewage would be reduced to less than 10 mg a litre and 20 mg a litre, respectively. In Nesapakkam plant, the BOD level has been reduced to less than 7 mg/litre, officials said.

Citing a recent signing of a memorandum of understanding with representatives of the German Water Partnership, officials said the 23-mld plant in Nesapakkam, which has entered its 50th year, would be renovated using German technology. A study on the operation and technology and replicable models with better efficiency will be done in the first phase. The plant's capacity may be enhanced by using reclaimed water.

Work would be taken up in three or four months with the concurrence of the Department of Economic Affairs for funding. Once the project to strengthen the sewerage treatment infrastructure is completed, Metrowater's sewage treatment capacity is expected to increase from the present 745 mld to 1,082 mld, officials said.

VMC Raises Awareness on Drinking Water Management Through 'Water Diwali' Programme

An innovative 'Water Diwali' programme was organised by the engineering department of the Vijayawada Municipal Corporation (VMC) on Wednesday. The event aimed to focus on drinking water management on the occasion of Diwali, symbolising the dispelling of darkness and the illumination of lights.

It was organised under the joint auspices of MEPMA and VMC as per the instructions of the Union Ministry of Urban Development and Housing at KL Rao Head Water Works in

DROPLETS

LANXESS expands its range for PFAS removal from water

With the new macroporous anion exchange resin Lewatit MonoPlus TP 109, the specialty chemicals company LANXESS is expanding its range of selective resins for the efficient removal of contaminants such as per- and polyfluoroalkyl substances (PFAS) from water. The resin will be presented for the first time at the international trade show Aquatech, which will take place in Amsterdam, the Netherlands, from November 6 to 9, 2023. Ion exchange resins have proved themselves over many years and all over the world as a reliable and efficient means of removing contaminants from water. Ion exchange and adsorption processes sometimes even have a cooperative effect," says Dr. Dirk Steinhilber, Technical Marketing Manager in the Liquid Purification Technologies business unit at LANXESS. "Lewatit MonoPlus TP 109 is especially suitable for the purification and remediation of water with PFAS concentrations exceeding 10 ppb. As an integral part of our range of resins, it helps us to develop custom solutions for removing PFAS." In addition to its high selectivity, the macroporous resin exhibits good kinetics and high fouling resistance. Furthermore, the uniform bead size ensures improved hydraulics. It can be efficiently regenerated with tried-and-tested regeneration chemicals such as methanol and sodium chloride. "Especially with higher PFAS concentrations in water, this is a crucial benefit – not least because it allows the resin to be used sustainably," says Steinhilber.

Lewatit MonoPlus TP 109 efficiently binds not only different PFAS but also complex anions such as nitrate, bromate, chlorate and perchlorate so that they can then be reliably removed from water. It can even remove chlorate from concentrated sodium hydroxide. In addition to the newly presented Lewatit MonoPlus TP 109, LANXESS offers a range of other selective resins for removing PFAS and that can also be combined for pre-cleaning and final polishing. The heterodisperse, gel-type, strong base anion exchange resin Lewatit TP 108 DW helps to remove PFAS – especially short-chain members of this substance class – even in concentration ranges of less than 10 ppb and, thanks to its extremely high selectivity, into the ppt range. At a fire service training site in Australia, for example, up to 200 ppb of PFAS were removed from more than 50 million litres of groundwater over the course of many months. Due to the high usable capacity and correspondingly long service lives even in the presence of chlorides and sulfates, regeneration is not recommended for this resin. Lewatit TP 108 DW is certified to Standard 61 of the NSF/ANSI/CAN and so meets US requirements for contact with drinking water – a key quality criterion in many countries.

As a weak base, macroporous anion exchange resin, another selective resin – Lewatit MP 62 WS – offers medium selectivity for PFAS. Thanks to its high total capacity of more than 1.7 eq/L and also its high operating capacity, it is ideal for pre-treating heavily contaminated leachate, such as can be found close to the source of contamination. This resin, too, can be efficiently regenerated, in this case with sodium hydroxide. Finally, Lewatit K 6362 is a strong base anion exchange resin that can be used for final polishing in a two-stage process, with Lewatit MonoPlus TP 109 or Lewatit MP 62 WS being used in the first purification stage. At noon on November 8, 2023, Steinhilber will be taking to the AquaStage at Aquatech to give a presentation entitled "The Use of Selective Lewatit Ion Exchange Resins for the Removal of Emerging Contaminants: PFAS and Beyond", in which he will talk about the characteristics and potential applications of the selective resins from LANXESS for removing contaminants from water.

Bhavanipuram. As many as 50 Amrit Mitras selected from self-help groups were sensitised to the need to conserve drinking water sources. The civic body officials explained the process of water purification to Amrit Mitras who visited the filter bed. Glasses and water bottles were provided to the Development of Women and Children in Rural Areas (DWCRA) group members.

Narayana Murthy, executive engineer of VMC, stated that they are providing drinking water to 14 lakh people in the city. He mentioned that due to various factors like wasteful disposal of water in drainage systems and a lack of recycling, water reserves, and groundwater are depleting, and people are falling ill due to stagnant water. He urged everyone to clean the water reservoirs at least once a week.

Metrowater Clears Encroachments Along Conduit Lines Transporting Water to Chennai's Kilpauk Treatment Plant

The Chennai Metropolitan Water Supply and Sewerage Board or Metrowater has started clearing encroachments on British-era conduit lines, which carry water from the Red Hills reservoir to Kilpauk Water Treatment Plant.

The water agency has identified nearly 1,300 encroachments from Rajamangalam to Kilpauk water works. It carried out an analysis using differential global positioning system (DGPS) and drone survey in the stretch to identify the changes in land use and the extent of encroachments of the boundary.



The three conduit lines, the oldest of which was built with brick masonry in 1914, are under constant threat of encroachments. The third dilapidated line is now being reconstructed. The lines, running for a distance of 10 km-12 km, carry nearly 224 million litres of raw water a day drawn from the Red Hills reservoir.

While these lines run underground, at a depth of around 2 m, the land



they pass through, spread over nearly 165 acres, faces the risk of being encroached upon owing to rapid urbanisation. The conduit lines go through Surapet, Korattur, Villivakkam, New Avadi Road, among others.

Metrowater officials said the land was transferred to the water agency in 1978. The vacant land is essential for the construction of additional conduit lines, considered to be the backbone of the city's water distribution network, to meet growing drinking water demands in the coming years.

To protect the lands, Metrowater has started earmarking boundaries of the three conduits and clearing encroachments in phases. Conduit line-I's alignment has been demarcated for 536 m, after 10 encroachments were removed in Surapet. Demarcation of boundaries of the two other lines in Surapet will also be carried out.

Metrowater is in the process of evicting commercial encroachments along with the Special Tahsildar, Madhavaram taluk, and fencing off the portions of lands retrieved. It had recently cleared 10 encroachments on Water Canal Road in Korattur and in Thanthankuppam. It is also involved in fencing off portions of land and building compound walls in Surapet and Puthagaram.

Notices have been issued to 12 more commercial structures on R.K. Link Road in Thanthankuppam. Officials noted that several residential colonies have developed and unauthorised temporary roads have formed over conduit lands, particularly on Water Canal Road. Besides dumping of debris, the lands are being used for various infrastructure works.

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Bengaluru National Highway To Be Blocked Over Cauvery Water Issue



Bengaluru: Pro-Kannada activist Vatal Nagaraj on Sunday said that the Pro-Kannada organization will block the National Highway near Hoskote toll in Bengaluru over the Cauvery water issue.

According to Vatal Nagaraj, the organization will block the highway on Tuesday (October 10). Earlier, on Thursday, Mandya police detained members of pro-Kannada organizations protesting over the Cauvery Water Issue. The governments of Karnataka and Tamil Nadu have been locked in a protracted tussle over the sharing of Cauvery waters. The river is seen as a major source of sustenance for the people in the two states.

The Cauvery Water Regulation Committee had ordered Karnataka to ensure the release of 3000 cusecs of Cauvery water at Biligundlu starting from September 28 till October 15, 2023.

Karnataka had filed a review petition against the order both in the Supreme Court and in CWMA (Cauvery Water Management Authority).

Karnataka Chief Minister Siddaramaiah had earlier expressed his disappointment on the recommendation of the Cauvery Water Regulation Committee (CWRC) which has directed Karnataka to ensure the release of 3000 cusecs of Cauvery water at Biligundlu starting from September 28 up to October 15, 2023.

"Cauvery Water Regulatory Committee (CWRC) ordered to release of 3,000 cusecs of water, I have already spoken to our advocates. They have suggested us to challenge this order in the Supreme Court. We will challenge it in the Supreme Court. We don't have water to release to Tamil Nadu. We are challenging the orders of the CWRC," Chief

Minister Siddaramaiah had said. Meanwhile, the Cauvery water-sharing issue has led to political turmoil in Karnataka with former Chief Minister Basavaraj Bommai accusing the state government of "lacking" the "will" to protect farmer's interests.

It is worth mentioning that the Karnataka government had cited a severe drought in parts of its state to refuse the supply of water to Tamil Nadu. The Tamil Nadu government has accused its neighbour of lying to the nation about the supply of water.

Karnataka's Bogadi Residents to Have Access to Clean Piped Water

Bogadi residents in west Mysuru will have access to clean piped water soon. Bogadi town panchayat has initiated a demand survey for piped water connections that will supply surface water from Cauvery River round the clock. This initiative is part of the Amrit 2.0 scheme, which aims to provide safe drinking water to all households. The newly formed Bogadi town panchayat includes Beerihundi, Jatti Hundi, MK Halli, Basanahalli and surrounding areas.

One of the challenges faced by the local residents is the issue of hard water, which is expected to be resolved once the town panchayat starts the Cauvery water supply.

According to Basavaraju M, chief officer, Bogadi town panchayat, the Rs 73 crore water supply scheme will be implemented by the Karnataka Urban Water Supply and Drainage Board. "Once completed, the residents of the town panchayat will get Cauvery water round the clock from Hale Unduwadi water project," he said. According to locals, the town panchayat limits are witnessing rapid expansion, including several new government-run hostels for students. "This area which falls under the Mysuru Urban Development Authority (Muda) is witnessing rapid



horizontal expansion with new residential projects being launched by private developers. However, the big challenge is the drinking water crisis. With the Total Dissolved Solids (TDS) level in the range of 1,000ppm to 2,000ppm, all the residents were forced to opt for tank water or use water softeners. We hope this water supply scheme will be completed at the earliest," said Sukanya G Rao, a resident of RR Nagar.

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NATIONAL WATER NEWS

October 2023

Flash Floods In Sikkim After Cloudburst, Parts Of National Highway Washed Away

Connectivity to Sikkim, including capital Gangtok, has been affected on Wednesday after an overflowing Teesta river washed away parts of NH-10 that connects the state to the rest of the country. The river water rose to an alarming level after a cloudburst triggered a flash flood in the northeastern state.

The cloudburst occurred over Lhonak Lake in North Sikkim leading to the flooding of the river which flows through Sikkim and West Bengal. A massive search is on to locate 23 Army personnel, reported missing after the flash floods.

Videos recorded by locals showed a large section of a road washed away by the raging river waters. As per the Central Water Commission, Teesta was flowing below warning level at 6am on Wednesday and expected to cross its warning level within six hours.

"The flash flood made its way through River Teesta sweeping Indreni Bridge in Singtam town, some 30 kilometres from Gangtok. A connecting bridge of the Balutar hamlet was also swept away around 4 am," the Gangtok District Administration told news agency ANI. Many homes near the river basin in Singtam have been evacuated to temporary relief camps in the town.



Residents from the Chungthang town, some 90 kilometres north of Gangtok, near the Teesta Dam have also been rescued. As per the defence ministry, two bridges were also damaged in Dikchu and Toong towns connecting Singtam to Chungthang in North Sikkim. The Border Road Organisation (BRO) is rescuing locals in the areas.

Earlier, a flash flood alert was issued in the north and east districts of Sikkim. Parts of Sikkim have witnessed heavy rain since last night. "Low lying areas such as Gazoldoba, Domohani, Mekhaliganj and Ghish may be affected. Please be alert," it said.

"Nobody has been injured but there has been significant damage to public property. Some people have also been reported missing. Relief operations are going on," said Chief Minister Prem Singh Tamang said while on a visit to Singtam.

Those living on the banks of the Teesta river have also been advised to evacuate their homes to ensure their safety. All are advised to stay alert and avoid travel along the Teesta river basin, an alert message by Sikkim State Disaster Management Authority read.

"Light to moderate rainfall is expected during the next 3-4 days over Sikkim," the weather office said in a tweet.

Sikkim: 14 dead, 120 missing, bridges, dams, roads washed away in flash flood



At least 14 persons were killed and another 120 people, including 23 army personnel, went missing after a flash flood triggered by a glacial lake outburst following heavy rains in north Sikkim in the early hours of Wednesday.

The toll is expected to rise sharply with officials saying that at least 40 bodies have been recovered by different agencies after the disaster struck.

"The Glacial Lake Outburst Flood (GLOF) in portions of Lhonak lake in Mangan district, which caused the rise of water levels with very high velocities downstream along the Teesta River Basin in the early hours of October 4, 2023, has caused severe damage in Mangan, Gangtok, Pakyong, and Namchi Districts," said a statement issued by the Sikkim government.

The flash flood also washed away the Teesta – III dam at Chunthang.



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At least six bridges were washed away and the National Highway 10 (NH10) was damaged in multiple areas. "North Sikkim has been totally cut off from the rest of the state while Sikkim has been cut off from the rest of India as the flood had badly hit Nh10," said Prabhakar Rai, director of Sikkim's disaster management department, said.

North Sikkim received around 39 mm rain between Tuesday morning and Wednesday morning.

"The rains had probably triggered an avalanche which led to a GLOF. As huge volumes of water and debris comprising boulders came gushing down they hit the hydro dam in Chunthang. The dam was washed away and the entire load gushing down with tremendous force," said Ashim Sattar, a scientist with IISc Bengaluru, who had studied the lake and the glacier extensively.

Scientists said that over the years the Lhonak glacier retreated and the lake has grown in size making it vulnerable to GLOF.

"We are all aware of the recent natural calamity that has struck our state. Emergency services have been mobilised to the affected areas, and I personally visited Singtam to assess the damages and engage with the local community," Prem Singh Tamang (Golay) chief minister of Sikkim wrote on his X handle.

According to the Central Water Commission (CWC), the flood took place around midnight. Officials said that the water level started rising very fast, at nearly 15 metre per second. At around 6 am the water level in the Teesta river near Melli was flowing 3 metre above the danger level.

"The flood water reached Chungthang around 1 am and triggered heavy damage in the Teesta-III hydro dam. By around 2:30 pm the low-lying areas in the districts downstream were flooded," said an official.

Until Wednesday evening, the different agencies had rescued at least 600 people mostly those who lived on the highway near the river.

"Four major bridges, a GREF (General Reserve Engineering Force) crusher plant and hundreds of other houses have been damaged. NH-10 is blocked at multiple places. Some labourers at the GREF plant are also missing," the official added.

Meanwhile, four National Disaster Reserve Force (NDRF) teams are working in Sikkim and the other bordering areas near Sikkim-West Bengal border along the banks of the Teesta river.

With Teesta river flowing through four districts of West Bengal before entering Bangladesh, a flood alert was also sounded in the districts of north Bengal and neighbouring Bangladesh.

"Release of huge volumes of water triggered a flood-like situation in the north Bengal districts. On the instructions of chief minister Mamata Banerjee, a team comprising state ministers and bureaucrats rushed to north Bengal to oversee rescue operations," said a West Bengal government official.

Around 5800 people have been rescued from the four districts of north Bengal and shifted to safer places. One column of the army was requisitioned to rescue a family stranded in Rangpo area.

Meanwhile, a low pressure over Jharkhand and an associated cyclonic circulation triggered heavy rain in West Bengal. The India Meteorological Department has forecasted enhanced rainfall activity in the eastern state till Thursday.

"Heavy rains couple with discharge of water from DVC barrages have resulted in flood-like situation on Bankura, Howrah, Hooghly, West Midnapore, and South 24 Parganas. The state government has set up 190 shelter camps and evacuated more than 500 people," said an official.

Uttarakhand tunnel collapse: Rescuers race to save 40 workers trapped in India tunnel

Rescuers are racing to save 40 workers trapped inside a collapsed tunnel in the northern Indian state of Uttarakhand since Sunday morning. The workers, who were building the tunnel, were trapped when part of it caved in due to a landslide.

Officials have been able to establish contact with the men and have been providing them with food, water and oxygen while they try to get them out. They say they expect to rescue the workers by Tuesday night or Wednesday. On Tuesday morning, the state government said rescue teams were "preparing to drill and insert a metal pipe of 900mm diameter in the part of the tunnel blocked by debris" to reach the workers.

Officials hope the men will be able to squeeze through the narrow pipe to safety. The tunnel in Uttarkashi district is part of the federal government's ambitious highway project to improve connectivity to famous pilgrimage sites in Uttarakhand. The mountainous state, where several Himalayan peaks and glaciers are located, is home to some of the holiest sites for Hindus.



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The accident occurred at 05:00 local time (23:30 GMT) on Sunday when a portion of the Silkyara tunnel, around 200m away from its opening, collapsed while the workers were inside, senior police official Arpan Yaduvanshi told BBC Hindi. A landslide nearby caused heavy debris to fall on the tunnel, leading to its collapse. The mounds of debris cut off oxygen supply to the workers. Authorities said they established contact with the trapped men on Sunday night using walkie-talkies.

A pipeline, which was laid for supplying water to the tunnel for construction work, is now being used to supply the trapped men with oxygen, food and water, they added. Rescuers will have to dig through several metres of debris before they can start the evacuations. Excavators and other heavy machines are being used to dig through the debris. State Chief Minister Pushkar Singh Dhami said national and state disaster relief teams were working together on rescue efforts. "All the workers trapped inside the tunnel are safe and every effort is being made to get them out soon," a statement from his office said.

Farmers running out of water in Punjab, India



Water is crucial to rice farmers and when it is lacking, they tend to rely on groundwater. Globally, water taken from underground reservoirs supports 40 per cent of agriculture, but if groundwater levels fall, it becomes harder to reach over time.

In Punjab known by some as India's breadbasket, groundwater is being depleted faster than it is being replenished. Three farmers from Punjab explain how they experience water scarcity and how they deal with it.

'Not just a problem for future generations'

Amandeep Singh: Ten years ago, the groundwater here was between nine and 12 metres deep, while today it is found between 18 and 21 metres. We very much rely on groundwater, as we only have access to canal water once a week, which is not sufficient for us.

Every year, we have to dig deeper to reach the groundwater. This is not just a problem for future generations, but something we experience today already. Reaching the groundwater is very expensive, but we landowners have no choice.

Because of the reduced groundwater level, not only landowners, but everyone will face losses. We will no longer have water for farming or drinking. Without it, there will be no farming, and therefore no future for landowners.

Harjeet Singh: The groundwater we use for our paddy fields is not being recharged from above. However, without rains, we have to use groundwater, as canal water is not available here.

Seven to eight years ago, we could reach groundwater at 4.5 metres deep, while now it is only reachable at 21 metres. The declining water level affects my income, and I cannot afford to install a borewell. It would be devastating if the groundwater disappears, and it is important that the world understands our issue, as only then something can happen. One person alone cannot do anything. Only when we come together and make a collective effort something can change.

Before the groundwater becomes unreachable or runs out completely, we will have to save rainwater in lower places. For now, there is no other solution.

Combining tradition with technology

Vishvajeet Singh Jyani: Over the years, we have noticed that the rainfall and weather patterns have been quite erratic. The canal water and groundwater we depend upon has also become unreliable.

At our family farm, the main motto is, "traditional wisdom with modern technology". My father was also a farmer and used many traditional techniques. I completed an education in computer studies, and together we have combined our core strengths by integrating traditional techniques with modern research and technologies to implement good management of natural resources.

The main water source we are provided with is canal water that comes from the Harike wetlands and the Satluj River. We store that water by

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using our water management system, or we put it in the field. Sometimes, we have to supplement it with groundwater. The integrated water management system is very important to us because it helps us to save water when it is not required in the field. It functions as a back-up system which supplements our canal water and groundwater.

If there is excess rainfall in the field, we store that as well. Whenever we experience drought-like conditions we can use it to water our land. We have done much to help the groundwater recharge and are currently very happy that we can reach it between three and six metres.

When groundwater becomes scarce and reaching it goes beyond the possibilities local farmers have, the state and central government will step in. They have already developed plans and have, in some states, even implemented those. Farmers are being incentivized to plant crops other than rice and equally water-guzzling crops.

If you want farmers to save groundwater, simply telling them to preserve it does not work. If they get incentives to plant other crops, farmers will need no convincing. As farmers are the backbone of the country, if they follow suit, society will follow.

Kerala rain: Schools, colleges shut in Thiruvananthapuram as water enters houses

Heavy rain since Saturday night lashed Thiruvananthapuram district leading to waterlogging and flooding of streets, roads and low-lying areas. In the wake of heavy rainfall lashing parts of Kerala, all the educational institutes will remain closed on Monday in Thiruvananthapuram. The incessant downpour has triggered flood-like situations and landslides in various areas across the capital city.



Visuals shared by the local news channels showed that the heavy showers since Saturday night have lashed Thiruvananthapuram district leading to waterlogging and flooding of streets, roads and low-lying areas.

Water entered hundreds of homes in the district and in some areas there were also incidents of landslides, according to the visuals. Visuals also showed cars almost submerged while rescuers evacuated people from homes in inflatable boats to camps in some parts of Thiruvananthapuram. Meanwhile, the Central Water Commission also issued a flood warning for three rivers in Thiruvananthapuram district. It has been issued for the Karamana, Neyyar, and Vamanapuram rivers in the district.

State general education minister V Sivankutty, who visited the flooded areas, said in a Facebook post that the rain since the previous night has created an unusual situation in Thiruvananthapuram city. There has been water logging in many places and a situation has been created where the rising seawater does not recede. Necessary government offices have been instructed to remain open, added Sivankutty.

The India Meteorological Department (IMD) on Sunday issued an orange alert for four districts-- Thiruvananthapuram, Kollam, Pathanamthitta and Alappuzha, while a yellow alert has been issued for eight districts of the state for the day. The IMD also predicted isolated heavy rainfall in many places in the state in the coming days.

Glacial lake bursts in India leaving 100 missing and 19 dead

CNN — More than 100 people are missing in India's northeast after heavy rain caused a glacial lake to burst, leading to flash floods which ripped through the Himalayan state of Sikkim Wednesday, killing at least 19 and washing away roads and bridges, according to the state government.

A "sudden cloudburst" over Lhonak Lake, in the northern part of the state, sent fast-moving torrents of water surging down the Teesta River in Sikkim's Lachen valley, raising water levels 15-20 feet higher than normal, the Indian Army said in a statement. A cloudburst is a very sudden and destructive rainstorm.

Chungthang Dam, also known as the Teesta 3 dam and part of a major hydropower project in the state, was "washed away," according to a statement issued by the National Disaster Management Authority on Wednesday night. Drinking water supplies and sewage treatment plants have been "totally damaged" across affected districts, according to the state government.



Video from the north of the state shows a muddy deluge rapidly overflowing the river, and flooded houses caked in dirt and debris, while images show search teams using excavators to uncover army vehicles buried deep in the mud. Rescue and restorations operations are underway with both state and national disaster personnel involved, the government said.

Known as the rooftop of the world, the ecologically-sensitive Himalayan region is prone to flash floods and landslides, and flooding is not unusual in Sikkim. But scientists are clear that extreme weather is becoming more frequent and more intense as the human-caused climate crisis accelerates.

As search efforts continued Wednesday, the Indian Space Research Organization (ISRO) released dramatic images showing the volume of water which had been released from Lhonak Lake following the cloudburst. Lhonak Lake is a large glacial bullet-shaped water body that sits at the foot of a melting glacier.

An analysis of the images shows more than 60% of the water held in the lake drained out after the extreme rainstorm triggered a glacial lake outburst. This phenomenon happens when a glacial lake rises too high or the surrounding land or ice gives way and the lake bursts, sending water and debris rushing down mountains.

One satellite image shows the lake holding about 167.4 hectares of water on September 28, while another dated October 4 shows the lake reduced by more than half – holding approximately 60.3 hectares of water in it. “It is observed that lake is burst and about 105 hectares area has been drained out ... which might have created a flash flood downstream (in the Teesta River),”

ISRO said in text accompanying the images. Scientists have long studied Lhonak Lake, identifying it as one of the fastest swelling glacial lakes in the region with a high risk for a potential glacial outburst, according to multiple studies.

In recent years, the state’s Disaster Management Authority led several expeditions to the site, concluding that a glacial lake outburst would “cause huge devastation downstream” and that “loss of life and property” were likely. Pipelines were installed at the lake to siphon off the water as a short-term solution. And last May, the state government held a consultation workshop on such a risk, with the director of Sikkim’s Department of Science and Technology highlighting the “urgent need for an early warning system for these glacial lakes in Sikkim.”

Search efforts hampered by heavy rain

The Sikkim city of Pakyong was the worst affected with seven people killed in the floods and 59 people missing, the Sikkim government said.

Among those unaccounted for are dozens of members of the Indian Army. A “massive” search and rescue operation to find the missing soldiers has been launched but efforts were hampered by “incessant rains” and flooding that had cut off roads and washed-out bridges, the army said.

On Wednesday evening, one soldier was rescued and is in a stable condition but 22 others remain missing, according to the army. In an update Friday, the army said that “certain military equipment including firearms and explosives were carried away by the Teesta River” and urged the public to be vigilant and “report any unfamiliar objects, crates, packages, firearms, or any suspicious items.” The missing military equipment could “pose a potential risk of a dangerous explosion,” it said.

At least 11 bridges collapsed in the flooding, impeding rescue efforts and cutting off remote areas, the government said.

In the state capital and largest city Gangtok, three deaths were reported and 22 people missing, it added. More than 2,000 people have been evacuated and relief camps have been set up across the state to help more than 22,000 people affected by the flash floods.

On Thursday, the state government said at least 3,000 tourists remain stranded in Sikkim’s Lachung and Lachen and that helicopters are being deployed to help evacuate them. The Teesta-V Hydropower Station was reported to be “under shutdown presently and not

generating electricity,” the All India Radio (AIR) News reported, citing the country’s Power Ministry. “All the bridges downstream to Teesta-V Hydropower Station up to Tarkhola and Pamphok have been submerged which has severely affected commutation and communication in these areas,” it said.

A “detailed assessment” of damage to the hydropower projects would be made by the central government once the flood water recedes, AIR News reported. The India Meteorological Department has forecast heavy rainfall to continue across the country’s east and northeast, including Sikkim, for the next two days.

Sikkim’s chief minister Prem Singh Tamang said in a post on X, formerly Twitter, that emergency services have been mobilized to the affected areas, and he has “visited Singtam to assess the damages and engage with the local community.” Singtam is a town affected by the flooding about 30 kilometers (18 miles) from Gangtok.

Indian Prime Minister Narendra Modi called the situation an “unfortunate natural calamity” and offered “all possible support in addressing the challenge.”

“I pray for the safety and well-being of all those affected,” he wrote on X.

Glacial outbursts will affect millions

The Himalayan region is highly vulnerable to the climate crisis. Himalayan glaciers feed into rivers that provide freshwater to two billion people and many communities depend on the glacial waters to irrigate their crops.

But a recent report warned the glaciers could lose up to 80% of their ice by 2100 as temperatures rise, heightening the likelihood of floods, landslides, avalanches and also drought. As glaciers around the world melt at an alarming rate, about 15 million people who live near glacial lakes are at risk from catastrophic glacial lake outbursts, with more than half concentrated in just four countries – India, Pakistan, Peru and China – according to a study earlier this year.

These lake bursts have been compared to an “inland tsunami” and their impact akin to a sudden dam collapse, experts previously told CNN. The ensuing floods happen with little to no warning and previous glacial lake outbursts have killed thousands of people and destroyed property and critical infrastructure. A 2020 study of the Teesta River basin by scientists from the Indian Institute of Technology Guwahati, found an increase in rainfall and temperatures this century and that Sikkim’s many glacial lakes are expanding due to glacier and snow melt as temperatures rise.

The researchers warned that heavy rainfall events can cause the sudden expansion of lakes, risking glacial outburst floods, and it was “critical” that state disaster management departments are properly equipped to respond to such disasters and that policy makers implement climate change adaptation strategies. In 2021, a Himalayan glacier collapsed in Uttarakhand, sending an avalanche of water, dust and rocks down a mountain gorge, and crashing through two hydroelectric projects, killing at least 38 people.

In India’s north, communities have warned for decades about unregulated commercial development, deforestation and back-to-back dam building in the fragile region, increasing the risk of disasters, flooding and landslides.

Andhra Pradesh to Release Water Once a Week for Standing Crops in Krishna Delta

Anticipating average rainfall, the state government kickstarted kharif season by releasing water from Prakasam barrage in the very first week of June. Paddy planting has been completed in about 10 lakh acres by July. “Sufficient water has been supplied to Ayakattu from Prakasam barrage. Water is being taken from the Pattiseema lifting scheme and Pulichintala project due to the lack of flow in the Krishna river,” said a senior irrigation official.

According to officials, about 35.93 tmc ft water from the Pulichintala project was released to meet Krishna delta needs while another 29.88 tmc ft of water was drawn from the Pattiseema scheme. About 20 tmc ft water was supplied from inflows to Krishna river utilising the flood flows from Munneru, Paleru and Keesara.

The chief minister has reviewed the situation with the officials of the water resources and agriculture departments from time to time and prepared a contingency plan, the irrigation minister added. He explained that the government has made a necessary plan to protect the crops planted by the farmers and accordingly the water in the Pulichintala project and the water from Pattiseema has been used very carefully in a balanced manner.

The Pulichintala project actually has almost its full capacity of water at the beginning of the season. In the initial phase, about 18 tmc of water was released for the crops of Krishna delta in order to utilise Godavari water for its own delta needs. Subsequently, Godavari water was drawn through Pattiseema scheme and saved remaining 20 tmc ft water in Pulichintala project. Water from Pattiseema was utilised till the end of July thanks to the sufficient inflows to Godavari.

GLOBAL W

DROPLETS

Blue City and Nijhuis Saur Industries join ties to open the first innovative circular water solution

Blue City Circular Water is the first ever innovative water solution in the city of Rotterdam maximizing the reuse of (waste)water in residential and commercial buildings and recovering green fertilizers and reducing freshwater consumption. The revolutionary installation, called Blue City Circular Water, turns rainwater from the rooftop and grey water into water to flush toilets and simultaneously treats the wastewater of the building, recovering its nutrients. In this partnership, Nijhuis Saur Industries together with Semilla Sanitation, Blue City, Hoogheemraad Schieland & Krimpenerwaard and Waterschap Hollandse Delta, water is treated in a smarter and more sustainable way building resilience against water scarcity.

Managing water scarcity and drinking water availability. On average, a Dutch household uses approximately 129 liters of drinking water per person per day. This high-quality water is often used for laundry and to flush toilets. Society must find better and smarter ways to protect the precious drinking water needed for human consumption. It is inevitable that - with climate change, increased pollution of natural water resources, and a growing population - access to fresh drink water is already becoming a serious challenge. Without immediate action, a serious water shortage is a very real threat for a country like the Netherlands in the years to come.

In the basement of Blue City, a circular model is created. Toilets, unisex urinals, and showers have been installed to collect the various sanitary water flows separately. With the launch of this installation, a fully integrated and safe water treatment concept for the entire building is created, efficiently reusing water and extracting valuable nutrients such as compost and fertilizers.

This project is not only piloting the technical feasibility but also the economic feasibility at full scale. The sanitary system, based on space technology, uses water collected from rainwater and from the sinks and showers (grey water), urine from the urinals (yellow water) and water from the flushed toilets (black water). The wastewater is purified to be reused as irrigation water to grow plants in and outside the building. This creates a circular water stream without any waste. Green fertilizers are extracted from the yellow water, and compost and fertilizer from the black water. This installation delivers a decentralized circular solution and closes the wastewater and food loop, delivering three of the necessities for life: sustainable water, food, and safe sanitation.

Later, her Majesty Queen Maxima visited Blue City to meet the circular entrepreneurs and discuss the possibilities of scaling up circular initiatives. During the tour around Blue City Circular Water, the participants highlighted the importance of cooperation and innovation and the positive ecological impact of the closed-loop concept to give water the value it deserves and contribute to a more sustainable and resilient future.

Wastewater in France to be Monitored for Covid and Other Viruses

France has launched a system to begin monitoring wastewater for Covid 19 and for other viruses.

The objective is to better assess the burden of winter viruses on public health and the healthcare system, Caroline Semaille, the Director General of France's official public health body Santé Publique, announced at a press conference.

Each week a sample will be taken from 12 wastewater treatment plants; one in each region of the country excepting Corsica. The data recorded will then be included in the government's weekly bulletin on acute respiratory infections from October 11.

French researchers have been pioneering efforts to explore the possibility of tracking the circulation of Covid based on the presence of the virus in human faeces and therefore waste water. These have been tested since the beginning of the pandemic and now the launch of a new monitoring system, SUM'Eau. It will run alongside older systems and is viewed as a useful step towards monitoring and thus controlling the virus.

A benefit of wastewater testing is that it can alert positive cases earlier than other methods. It is also independent of other screening practices, which is believed to be beneficial in recording cases of Covid where those infected have little or no symptoms. Last winter was marked a so-called "triple epidemic" of Covid, influenza (flu) and bronchiolitis, three acute respiratory infections.

The circulation of all three illnesses at the same time put significant pressure on the healthcare system as each affects a slightly different population meaning multiple demographics were left needing help at once. It is for this reason that while surveillance using SUM'Eau will initially be focused on Covid, it is hoped to be used for other viruses in the future – in particular influenza and bronchiolitis.

Using integrated surveillance and gathering multiple data on these viruses will make it possible to have a "global vision and help in the decision for the provision of care," added Ms Semaille. France started a new Covid booster campaign on October 2, as cases of the virus continue to rise. The campaign, mainly targeting vulnerable people, had been due to start on October 17 but was brought forward on advice from France's health risk committee.



ATER NEWS

Global water cycle 'spinning out of balance': UN meteorological agency

The World Meteorological Organization said on Thursday that the hydrological cycle was increasingly out of balance due to climate change and made a call for a fundamental policy shift towards better monitoring.

"We are seeing much heavier precipitation episodes and flooding. And at the opposite extreme, more evaporation, dry soils and more intense droughts," said WMO Secretary-General Petteri Taalas in a statement as the U.N. agency released its State of Global Water Resources report for 2022.

It showed that over 50% of global catchment areas experienced deviations from normal river discharge conditions, with most of them drier than normal, citing China's Yangtze River as an example.

On the other extreme, it cited floods in Pakistan that killed more than 1,700 people last year. "...Far too little is known about the true state of the world's freshwater resources. We cannot manage what we do not measure," the WMO said in a statement.

The water report is only the second such analysis done by the WMO and includes data from large river basins, including river discharge, groundwater, evaporation, soil moisture and reservoir inflow.

Dams in the Seomjin River basin, Korea, run smarter with AI

In August 2020, following a period of prolonged drought and intense rainfall, a dam situated near the Seomjin River in Korea experienced overflow during a water release, resulting in damages exceeding 100 billion won (USD 76 million). The flooding was attributed to maintaining the dam's water level 6 meters higher than the norm. Could this incident have been averted through predictive dam management?

A research team led by Professor Jonghun Kam and Eunmi Lee, a PhD candidate, from the Division of Environmental Science & Engineering at Pohang University of Science and Technology (POSTECH), recently employed deep learning techniques to scrutinize dam operation patterns and assess their effectiveness. Their findings were published in the Journal of Hydrology.

Korea faces a precipitation peak during the summer, relying on dams and associated infrastructure for water management. However, the escalating global climate crisis has led to the emergence of unforeseen typhoons and droughts, complicating dam operations. In response, a new study has emerged, aiming to surpass conventional physical models by harnessing the potential of an artificial intelligence (AI) model trained on extensive big data.

The team focused on crafting an AI model aimed at not only predicting the operational patterns of dams within the Seomjin River basin, specifically focusing on the Seomjin River

DROPLETS

TreeToTextile wins international award for innovative fiber technology in the textile industry

Swedish company TreeToTextile has been named one of the winners of the prestigious ITMF Start-up Awards 2023 for their innovative work in creating a low-impact, biobased textile fiber. The award was presented during the annual conference of the global industry organization ITMF in Kegiao, China on November 6th.

The International Textile Manufacturers Federation (ITMF) presents this award for the second consecutive year to companies with innovative ideas. The criteria also encompass aspects related to business models, sustainability, recyclability, digitization, and qualitative efficiency. The winners are selected by an international jury of experts.

"It was truly inspiring to participate in the conference in China and to receive this in front of fellow representatives from the industry across the world," said Andreas Nilsson, Head of Commercial at TreeToTextile.

The aim of the ITMF Start-up Awards is to connect start-up companies with innovative products or services to established companies within the textile value chain. TreeToTextile received the award for their work in creating a biobased textile fiber through an innovative chemical process that refines cellulose from wood and other cellulosic sources into textile fiber. The technology is more energy-efficient and uses fewer and safer chemicals compared to conventional fiber production.

"We are proud that our development of a new low-impact, biobased fiber is receiving this industry recognition. It's a testament that we are on the right path towards our vision – Better fibers for all," said Dr. Roxana Barbieru, CEO of TreeToTextile.



Their objective was to formulate a scenario outlining the methodology for forecasting dam water levels. Employing the Gated Recurrent Unit (GRU) model, a deep learning algorithm, the team trained it using data spanning from 2002 to 2021 from dams along the Seomjin River. Precipitation, inflow, and outflow data served as inputs while hourly dam levels served as outputs. The analysis demonstrated remarkable accuracy, boasting an efficiency index exceeding 0.9.

Subsequently, the team devised explainable scenarios, manipulating inputs by -40%, -20%, +20%, and 40%, of each input variable to examine how the trained GRU model responded to these alterations in inputs. While changes in precipitation had a negligible impact on dam water levels, variations in inflow significantly influenced the dam's water level. Notably, the identical change in outflow yielded different water levels at distinct dams, affirming that the GRU model had effectively learned the unique operational nuances of each dam.

Professor Jonghun Kam remarked "Our examination delved beyond predicting the patterns of dam operations securitize their effectiveness using AI models. We introduced a methodology aimed at indirectly understanding the decision-making process of AI-based black box model determining dam water levels." He further stated, "Our aspiration is that this insight will contribute to a deeper understanding of dam operations and enhance their efficiency in the future."

The research was sponsored by the Mid-career Researcher Program of the National Research Foundation of Korea.



UN shelters across Gaza run out of water as Israel cuts essential supplies

As Israel has cut off the flow of food, medicine, water and electricity to Gaza, UN shelters across the territory have run out of water.

According to a report by AP citing Juliette Tuma, a spokesperson for the UN's Palestinian refugee agency UNRWA, about half a million Gaza residents have taken refuge in UN shelters across the territory and are running out of water.



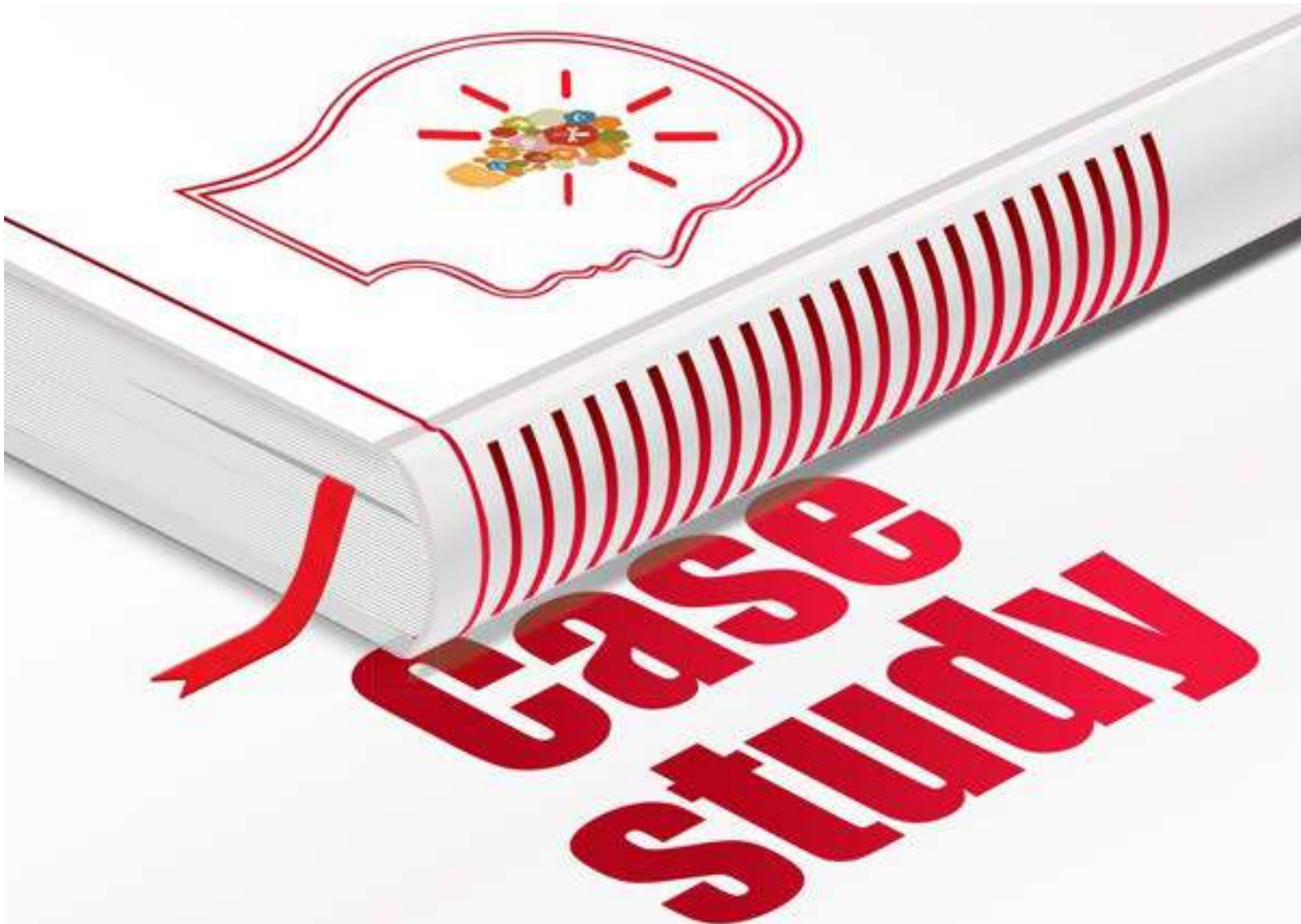
"Gaza is running dry," she said, adding that UN teams have also begun to ration water. A quarter of a million people in Gaza moved to shelters over the past 24 hours, the majority of which are UN schools where "clean water has actually run out", Inas Hamdan, another UNRWA spokeswoman was cited in the AP report.

Israel has pounded Gaza with airstrikes and told the estimated 1 million residents of the north to flee south ahead of its planned attack. More than 2,300 Palestinians have been killed since the fighting erupted last weekend, said the Gaza health ministry.

Relief groups have called for the protection of over 2 million civilians in Gaza and urged for an emergency corridor to be established for the transfer of humanitarian aid.

"The difference with this escalation is we don't have medical aid coming in from outside, the border is closed, electricity is off and this constitutes a high danger for our patients," Dr Mohammed Qandeel of Nasser Hospital in the southern Khan Younis area was quoted as saying in an AP report.

According to the report, doctors are worried for the lives of patients dependent on ventilators and those suffering from complex blast wounds needing around-the-clock care. Medical officials at Gaza City's Shifa Hospital estimated at least 35,000 men, women and children crammed into the large open grounds, in the lobby and in the hallways, hoping the location would give them protection from the fighting.



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In Brazil's Amazon, rivers fall to record low levels during drought

The Negro River, the Amazon's second largest tributary, on Monday reached its lowest level since official measurements began near Manaus 121 years ago. The record confirms that this part of the world's largest rainforest is suffering its worst drought, just a little over two years after its most significant flooding.

In the morning, the water level in the city's port went as low as 13.5 metres (44.3 feet), down from 30.02 metres (98.5 feet) registered in June 2021 — its highest level on record. The Negro River drains about 10% of the Amazon basin and is the world's sixth largest by water volume.



Madeira River, another main tributary of the Amazon, has also recorded historically low levels, causing the halt of the Santo Antonio hydroelectric dam, Brazil's fourth largest.

Throughout Brazil's Amazon, low river levels have left hundreds of riverine communities isolated and struggling to get access to drinkable water. The drought also has disrupted commercial navigation that supplies Manaus, a city of 2 million with a large industrial park.

Manaus is the largest city and capital of Amazonas, the state hit hardest by the drought. In late September, 55 of 62 municipalities there entered states of emergency due to the severe drought. "There is no more water to go through. Navigation is over," boatman Cledson Lopes Brasil told The Associated Press.

Brasil operates in Marina do Davi port, a getaway to dozens of riverine communities, some of them with sandy beaches that attract tourists. The once bustling area is now surrounded by parched soil, with many boathouses high and dry.

For one month now, Brazil has switched to a lower-powered boat, better suited for shallow waters. Still, he can't reach most communities along Taruma-Açu, a tributary of the Negro River. Some riverine dwellers must walk up to three hours to reach their houses — and tourism has stopped altogether.

Manaus and other nearby cities are also suffering from high temperatures and heavy smoke from nearby man-caused fires for deforestation and pasture clearance. The drought is also the likely cause of dozens of river dolphin deaths in Tefe Lake, near the Amazon River.

This is a startling contrast to July 2021, when Negro River waters took over part of the Manaus downtown area. The historic flood, which also ruined crops of hundreds of riverine communities, lasted for about three months. Philip Fearnside, an American researcher at the Brazilian National Institute of Amazonian Research, a public agency, expects the situation to deteriorate, both during the ongoing event and in the future with increasing frequency and severity of similar events with climate change.

He said surface water in the eastern equatorial Pacific Ocean is now warmer than during the "Godzilla" El Niño of 2015-2016 and is expanding. In the Amazon, these Pacific warmings primarily lead to droughts in the northern part of the region.

Moreover, a warm water patch in the tropical North Atlantic Ocean is causing drought in the southern part of the Amazon, similar to what happened in 2005 and 2010, according to researchers.

"The forecast is for the start of the rains to be delayed compared to normal, and for a drier-than-normal rainy season," Mr. Fearnside said. "This could result not only in extreme low water this year, but also low levels in 2024. Until the rainy season begins in the basin, the situation that is already underway should worsen."

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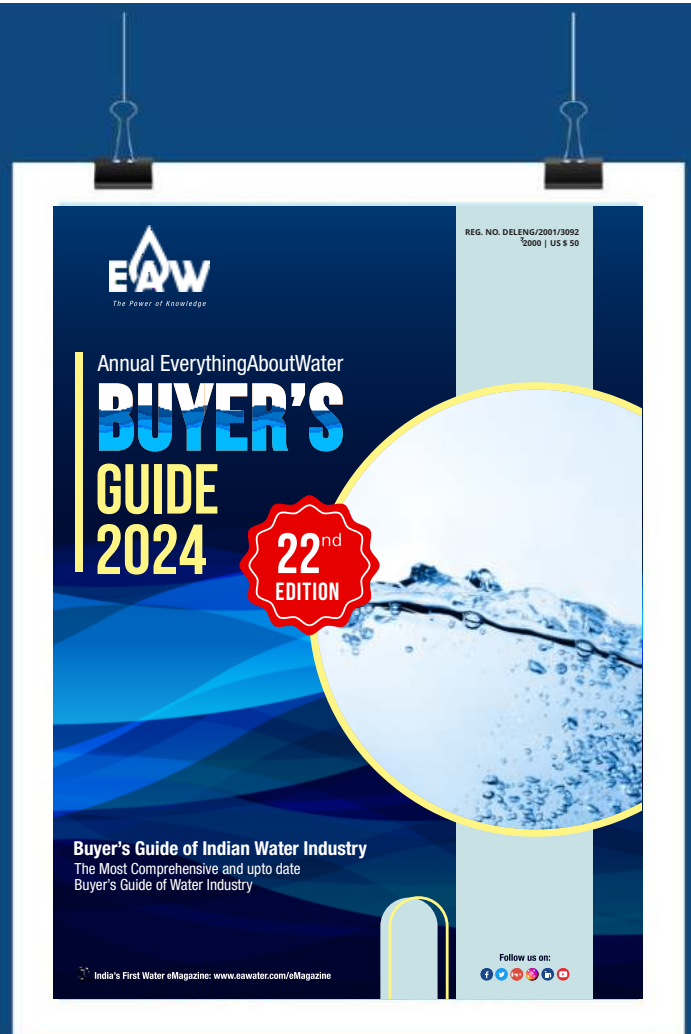
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Aalto University Develops Digital Twin To Optimize Carbon Balance In Wastewater Treatment

Energy consumption reduction and greenhouse gas emissions mitigation are among the top priorities at many wastewater treatment plants regarding upcoming tightening changes in legislation. Some water pollutants removal, especially nitrogen, requires energy-intensive aeration and a comprehensive operation to minimize the formation of highly intensive greenhouse gas (GHG) – nitrous oxide emitted by the biological nitrogen removal process. While wastewater treatment operation performed by water utility already meets current requirements established by the EU Commission, new techniques and approaches to implementation are required to mitigate energy consumption and greenhouse gas emissions.

Studies on GHG emissions hotspots and process control have been performed within the collaboration of Aalto University Water and Environmental Engineering researchers and Helsinki Region Environmental Services Authority HSY. Based on this collaboration, a new project, DIGICARBA, was started in 2023 to create a digital treatment plant tool to help wastewater treatment operators in process control and optimization.



The proposed digital tool will have a wastewater treatment process model connected to continuous data transmission from the Helsinki wastewater treatment plant to produce predictive simulations. In this case, operators will be able to see the impact of different treatment process changes and decide on the most suitable one with the lowest carbon footprint, energy consumption, and best effluent quality. Also, the developed tool can be used for new operators' training', says Ksenija Golovko, a doctoral researcher who works with the project.

The potential digital tool could be used globally as many treatment plants will require carbon balance optimizations in the near future.

Therefore, a market potential study will also be introduced to develop the technology further.

Business Finland ("Decarbonized Cities" program) is funding the DIGICARBA project until the end of 2025. The project will be supported by collaboration with Helsinki Region Environmental Services Authority HSY, FCG Finnish Consulting Group Oy, Valmet Oyj, Brighthouse Intelligence Oy, and Mittausguru Oy. The Water and Environmental Engineering Research group will be involved from the Aalto University side, offering Master's students an opportunity to participate in the project for the thesis work and helping to promote wastewater treatment plants' path to carbon neutrality. The calls for Master's thesis positions will be announced later on the Aalto University website and DIGICARBA LinkedIn page.

Egypt's Irrigation Minister Stresses on Ensuring Access to Clean Water and Sanitation for All



Egypt's Minister of Water Resources and Irrigation, Hani Sweilam, said that climate change is a major challenge for the water sector, as it causes more floods and droughts around the world. Sweilam was speaking at the Partnership Development for Climate Adaptation in Arab States (PDCA) conference and explained how climate change affects water resources. He said that higher temperatures increase water consumption and change rainfall patterns while rising sea levels lead to saltwater intrusion in groundwater in coastal areas. The minister stressed the importance of mitigating the impacts of climate change and ensuring access to clean water and sanitation for people, especially in the Middle East and North Africa region, which is one of the most water-scarce regions in the world. Sweilam also mentioned the efforts made by Egypt to cope with water issues, such as reusing 21 billion cubic meters of water annually to cover part of the gap between supply and demand and importing food products worth about \$15 billion annually.

The minister also reviewed the ministry's efforts to protect the northern coasts from climate change and to support African countries in providing clean drinking water to their citizens.



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"The country has been subjected to extreme weather phenomena, and the Cutzamala System is no exception," said the water commission's head, Germán Arturo Martínez Santoyo.

Mexico as a whole had 25% less rainfall than expected this year, compared to averages from the past three decades. More than three-quarters of the country is experiencing drought, the commission reported, while 93% of the Valley of Mexico itself is in drought, the country's chief meteorological expert said.

Officials announced three new water wells and improvements to 58 existing wells, despite experts warning that the city's groundwater is already severely depleted. The commission also said it would continue work on a new water treatment plant at the Madin reservoir, just northwest of Mexico City.

Rafael Carmona Paredes, the capital's chief water official, urged people "to adopt new habits" to ensure the city does not run out of water. "The problem we face requires that, as citizens, we take responsibility," Paredes said.

Kurita to participate in private lunar exploration program that aims to search for water resources

Kurita Water Industries Ltd. (Head Office: Nakano-ku, Tokyo; President: Hirohiko Ejiri; hereinafter "Kurita") is pleased to announce that we participate as a supporting company in HAKUTO-R, a private lunar exploration program by ispace Co., Ltd. (Head Office: Chuo-ku, Tokyo; Representative Director, Founder & CEO: Takeshi Hakamada; hereinafter "ispace").



HAKUTO-R is a program overseen by ispace that integrates two lunar exploration missions planned to execute by 2024. Under this program, ispace has already developed its own lander and lunar rover, launched a lunar landing mission in December 2022, and attempted another lunar landing in April 2023. Furthermore, ispace has a plan to launch a lunar exploration mission in 2024.

Mexico City imposes severe, monthlong water restrictions as drought dries up reservoirs

MEXICO CITY -- Mexican officials imposed severe, monthlong cuts to Mexico City's water supply at midnight Friday, acting just a month after initial restrictions were ordered as drought dries the capital's reservoirs.

The Mexican National Water Commission and mayor announced the moves at a news conference, but officials did not report the cuts on social media until just four hours before they took effect.



Abnormally low rain has dropped the Cutzamala system — a network of three reservoirs serving over 20 million residents in the Valley of Mexico — to historic seasonal lows. The system is 44% lower than it should be at this time of the year.

Officials began restricting water from Cutzamala by roughly 8% on Oct. 17. Friday's cuts are much more drastic, representing a further 25% of the system's total flow. Twelve boroughs, mostly in the west of the city, can expect lower water pressure until the restrictions lift, officials said.

Officials did not specify when that would be, saying only that restrictions would stand for "the next few months." They noted the rainy season — which at normal levels of precipitation would replenish the city's water — won't start until around May.

Mexico has never before announced such stringent or long-running restrictions to the city's water because of drought. The city's residents have suffered worse cuts in the past, but only because of strikes or repairs, all of which ended within days. Officials said El Niño and heat waves caused the recent falloff in rain, but added that drought conditions have been intensifying the past four years and gradually lowering reservoir levels. Studies have shown climate change creates stronger El Niño patterns that bring periods of decreased rain.

October 2023

GLOBAL WATER NEWS

In order to realize their "Moon Valley 2040" concept², ispace aims to search for water resources on the lunar surface and build space infrastructure utilizing its resources in the future. Kurita agrees with this concept and has signed an agreement with ispace to be a supporting company for HAKUTO-R, as the initial stage to realize the program.

For more than 70 years since its founding in 1949, the Kurita Group has consistently developed businesses relating to water and engaged in efforts to achieve the realization of its corporate philosophy "Study the properties of water, master them, and we will create an environment in which nature and humanity are in harmony." By applying advanced technologies in the water treatment field building by our accumulation of know-how and insights into the space exploration field, Kurita aims to develop the technologies, including energy production (hydrogen generation) on the lunar surface utilizing water resources implicated possibility that may exist on the moon, for generation and recovery of water that can contribute to the sustainable construction of space infrastructure. Then, by utilizing expertise acquired in the space field, we will create and provide solutions that can contribute to solving social and industrial issues on Earth, aiming to contribute for the realization of a sustainable society.

Hiroyuki Suzuki, Executive General Manager of Innovation Division at Kurita said the following: "Water is essential not only for human life but also for industrial infrastructure. For the space industry under harsh conditions not existing on Earth to accelerate from now on, Kurita will develop innovative technologies for the infrastructure of the space industry based on our accumulated knowledge of water and make practical use of them to realize a sustainable society."

Takeshi Hakamada, Representative Director, Founder & CEO of ispace, commented: "We are delighted to welcome Kurita's joining in HAKUTO-R. Kurita's excellent water treatment facilities, which already have actual experiences used for the space industry, would be crucial technologies for using water resources on the moon in the future. We hope that Kurita's participation in HAKUTO-R will act as a catalyst for taking a new step toward the development of technologies and businesses for use in space and on the moon, and the experiences and technologies accumulated by the project will lead to successful results for giving back on earth."

BingX Charity Responds to Hurricane Otis in Mexico

Hurricane Otis became the strongest storm in recorded history to strike the Pacific coast of Mexico.

This Category 5 hurricane made landfall near Acapulco, where its heavy rain and strong winds unleashed massive landslides and knocked out power lines. Otis, which has left a trail of destruction on its path, has resulted in urgent food, water, and shelter needs for thousands of Acapulco residents affected by this catastrophe. BingX has taken the initiative to contribute to the recovery of local communities.

In the wake of this natural hazard, BingX has taken a hands-on approach by actively engaging in the procurement, organization, and delivery of crucial relief materials. BingX's aid package encompasses vital supplies, such as clean drinking water, non-perishable food items, personal hygiene essentials, and various other indispensable resources. A dedicated team oversaw the acquisition and transportation of these goods, ensuring their swift and efficient distribution to the most affected areas and communities where they are urgently needed.



"BingX wishes to express its solidarity with residents of Acapulco and reaffirms its commitment to support the community as much as possible during this difficult situation," said Megan Nyvold, Head of Branding at BingX. "At BingX, we believe that blockchain technology and crypto can do good for global communities. In times of crisis like this, it is essential to come together as one and provide support. Our donation is a small step toward the recovery of Acapulco, and we are committed to continuing to provide assistance to the best of our capabilities."

In line with its ethos of giving back, BingX Charity has actively engaged in philanthropic endeavors since 2019. In early October, it successfully completed the "Bright Horizons for Children" project in Vietnam, raising fund and collaborating with local partners and blockchain communities. This collective effort culminated in the establishment of a new school for children in Dien Bien province, featuring three spacious classrooms and modern restroom facilities, complemented by a safe and vibrant anti-slip playground. BingX remains steadfast in its commitment to creating positive impacts and working tirelessly for the betterment of global communities in need.

USA's Westmoreland, Allegheny County Residents Advised to Begin Water Conservation



Thousands of water customers in Westmoreland and Allegheny counties are being asked to begin conserving water as one reservoir is reaching low levels. According to the Municipal Authority of Westmoreland County, the Beaver Run Reservoir sits at 1,034 feet of elevation above sea level and the historical average elevation at this time of year is 1,041.1

Now that the reservoir has dipped to 1,034, the authority along with state regulators, will seek voluntary conservation measures from the customers in the area that get water from the reservoir. Along with the more than 50,000 MAWC customers, those of the Monroeville Municipal Authority, Plum Borough Municipal Authority, Parks Township Municipal Authority, and the Gilpin Township Municipal Water Authority will also be asked to partake in conservation measures.

"It's smart to cut back a little now, and that will hopefully decrease the length and severity of any necessary conservation measures," said Board Chairman Randy Roadman. Suggestions to conserve water include not hosing off surfaces, watering lawns or washing cars, turning off the faucet when brushing your teeth, shorter showers, and filling the sink to wash or rinse dishes rather than running the water.

Should the water level drop another 12.1 inches, the water conservation plan could move from voluntary to mandatory.

California's Turlock and Ceres Residents Get Treated River Water After 30 Years



Turlock and Ceres residents are finally drinking treated water from the Tuolumne River. Officials gathered at the plant, which reduces the cities' reliance on wells. Hefty rate increases starting in 2018 are covering most of the \$220 million cost. The ribbon-cutting came after 30-plus years of off-and-on discussion about the project.

"High-quality drinking water is now flowing to our communities that are so much in need of a long-term solution to the declining groundwater levels and increasingly stringent water-quality regulations," Ceres Mayor Javier Lopez said. The Turlock Irrigation District is selling part of its river supply to the plant, just east of the Geer Road Bridge. According to advocates, less pumping by the cities will mean a more abundant aquifer for farm and urban users alike.

To start, Ceres expects to meet about a third of its demand from the plant. Its first water ran through a pipeline along Hatch Road. Turlock plans to get about half of its water from the Tuolumne at first. Deliveries began this afternoon through a pipeline mostly along Berkeley Avenue.

Plant General Manager Christopher Fisher said customers should expect a somewhat "softer" taste as the river and well sources are blended. That refers to trace minerals in the water. The plant can produce 15 million gallons of water daily. Future funding could bring the capacity to 45 million. Nearby cities could get their own shares of the water if they pay some of the cost.

Beyond 2020' Initiative Provides Clean Water to 10,000 People in Malaysia's Villages

Water filters have been installed in 25 communities in the Sabah and Sarawak regions of Malaysia, providing clean drinking water to 10,000 people, as part of 'Beyond2020', the UAE-driven humanitarian initiative.

Beyond2020 was launched by the Zayed Sustainability Prize in 2019 in partnership with several leading organisations with the aim of furthering the humanitarian legacy of the UAE's Founding Father, Sheikh Zayed bin Sultan Al Nahyan,

by providing sustainable technologies and solutions to vulnerable communities around the world. Malaysia marks the 17th deployment of the initiative, which will continue to offer life-transforming interventions to a broader number of beneficiaries worldwide, providing tech for good and fostering development that is inclusive and sustainable.

Commenting on the installation in Malaysia, Dr Sultan Ahmed Al Jaber, UAE Minister of Industry and Advanced Technology, Director General of the Zayed Sustainability Prize, and COP28 President-Designate, said, “This project highlights the critical link between water and climate change and emphasises the potential for water innovations to uplift communities, and promote economic prosperity.”

Nik Nazmi Nik Ahmad, Minister of Natural Resources, Environment and Climate Change, said, “We recognise the importance of extending these benefits to all segments of society, empowering every individual to lead healthier, more productive lives.”

The communities impacted by the recently deployed environmentally friendly water filters are located in the Sabah and Sarawak regions of Malaysia, along the Rajang River. The people there have traditionally relied on surface water from the river for drinking and subsistence. Without the proper technology and systems to treat the water, however, villagers often experienced health issues. Children regularly suffered from diarrhea and dysentery, indicating the likelihood of waterborne parasites in the drinking water.

Water interventions are necessary to ensure that vulnerable populations, particularly children, women and the elderly, have access to clean drinking water. Mansoor Mohamed Al Hamed, Chief Executive Officer, Mubadala Energy, said, “This achievement fulfills the critical imperative to provide clean water to those in need through our community investment projects.”

In partnership with Watroam – a social enterprise that specialises in designing simple, portable, durable, and affordable water filtration systems catered specifically for disaster relief and rural development, and the 2022 Zayed Sustainability Prize winner in the Water category – Beyond2020 deployed water filtration solutions, providing the communities with access to clean and safe drinking water.

As the sizes of communities differ between varying regions along the river, Watroam provided two different water filters, catering to the specific needs of each group – the CommfilterTM Plus and ROAMfilterTM Ultra.

Both filters can remove over 99% of bacteria and viruses, but the CommfilterTM Plus provides safe drinking water for households and communities, while the ROAMfilterTM Ultra is designed to serve larger communities with its high flow rate. The filters utilise natural gravity flows or low wattage pumps, requiring little to no electricity to operate. They are easy to set-up and maintain, making it sustainable for locals to manage and use in the long-term.

Malaysia is rich in water resources, but in recent years, water supplies have been under pressure due to a combination of population growth, urbanisation, industrialisation and the expansion of irrigated agriculture. The deployment of environmentally friendly filters that enable communities to meet their water needs sustainably supports the realisation of Malaysia's national water vision.

Beyond2020 brings together a leading number of partners which include Abu Dhabi Fund for Development, BNP Paribas, Mubadala Energy and Masdar.

As part of the initiative's impact to-date, a total of 17 deployments have been rolled out, including energy, health, water and food-related solutions, transforming the lives of over 221,800 people in the following countries: Nepal, Tanzania, Uganda, Jordan, Egypt, Cambodia, Madagascar, Indonesia, Bangladesh, The Philippines, Rwanda, Peru, Lebanon, Sudan, Ethiopia, and Vietnam. In addition to Malaysia, another 3 countries have been identified as deployment grounds going forward.

LANXESS: New distribution partner for Lewatit ion exchange resins in France

Specialty chemicals company LANXESS will be selling its Lewatit ion exchange resins and Bayoxide iron oxide adsorbents in France through distribution solutions provider Caldic with immediate effect. With this step, the company aims to standardize its distribution structure in Western Europe. In the Benelux countries, LANXESS has been working with Caldic for many years.



“We are very pleased to have gained Caldic as an experienced sales, marketing and distribution solutions partner for France, with in-depth knowledge of the market and applications for our products,” says Simon Libert, Sales Manager France at LANXESS’ Liquid Purification Technologies business unit (LPT). “This will strengthen our position in the French market, especially in combination with the existing structure in Belgium. Our customers in both regions can expect a further improvement in service quality.”

Caldic is a global company that has been active in the food, personal care, pharmaceutical and industrial formulations sectors for more than 50 years, providing customized solutions for industry, particularly in the water and environment markets.

Commenting on the collaboration with LANXESS, Maxime Toth, Managing Director at Caldic France, says: “The LANXESS product range perfectly complements our water treatment and environmental solution portfolio in France. It makes us a one-stop-shop solution provider for our customers. In the current context of increasingly stringent environmental standards and limited water availability, having efficient water treatment is becoming a national imperative for France. The partnership between LANXESS and Caldic is an important step to effectively address requirements today and in the future.”

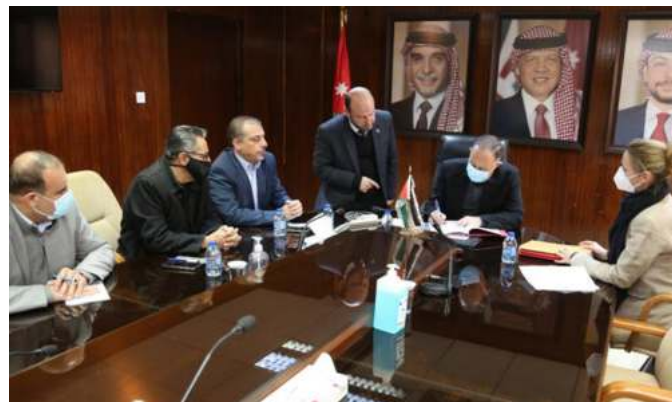
LANXESS is a leading specialty chemicals company with sales of EUR 8.1 billion in 2022. The company currently has about 13,100 employees in 32 countries. The core business of LANXESS is the development, manufacturing and marketing of chemical intermediates, additives and consumer protection products. LANXESS is listed in the leading sustainability index Dow Jones Sustainability Index (DJSI World and Europe).

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Jordan Signs Loan Deals With Germany to Support Water Sector



Jordan signed financing agreements worth 125 million Euros (about US\$134 million) with the German Development Bank (KfW) to fund two water projects in the country.

The projects aim to achieve optimal use of water resources in Jordan to ensure the sustainable availability of water supplies, Jordan's Ministry of Planning and International Cooperation said in a statement on Tuesday.

The agreements were signed following a meeting in Amman between Jordan's Minister of Planning and International Cooperation Zeina Toukan and German Federal Minister for Economic Cooperation and Development Svenja Schulze.

During the meeting, Toukan praised the strategic partnership that unites the two countries and the importance of the continued support that Germany provides in various development areas, most notably the water and sanitation, education, and vocational training sectors.

The German minister lauded the strategic partnership between Jordan and Germany, expressing the German government's appreciation for all the efforts Jordan made in hosting refugees.



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ADVENT OF SMART CITIES THROUGH DIGITAL WATER

By S. Prasanna, Murugappa water technology & Solutions

It's high time we start recognizing each and everyone's responsibility to save water. Nature has given us abundantly and is still ready to give if we human beings allow. People drain out water resources and are now trying to recycle water using artificial chemical processes, again damaging nature. Efficient water management of the urban water cycle is one of the current concerns with the increase of urban areas due to the population growth, economic development, and possibility of water scarcity due to climate change. To face the increase of the water demand it is imperative, the creation of digital water solutions provide a real-time monitoring, decision support system, to manage the water supply network efficiently and optimize the water-energy nexus.

WHAT IS SMART WATER?

One of the six elements that make up a smart city is "smart water." The other five are mobility, energy, public services, buildings, and integration. According to Water World, these activities aim to enhance the quality of life by making the city more efficient and sustainable. The term "smart water" refers to a holistic management strategy for this irreplaceable resource and the infrastructure that supports its procurement, purification, and distribution. When it comes to planning for these difficulties, every city is distinct. Still, some strategies are broadly applicable in that they can be combined into a design for the smart water cities of the future.

Water stress is one of the major concerns worldwide, due to the high population density in cities, expanding urbanization, economic development and other factors, urban water supply is particularly vulnerable. UN estimated that by 2050, a decline in urban water availability in of at least 10%, due to climate change. Climate change challenges conventional water infrastructure solutions and is therefore critical to sustainable development that needs adaptation and mitigation through efficient water management.

In this context, it is possible to face some challenges in urban and peri-urban water supply firstly, changing water consumption patterns secondly, establishing local predictions for changes in weather patterns thirdly, Setting and enabling service and acceptance levels fourthly, developing emergency plans for extreme events and finally optimizing the system for water demand. There is a call for action to implement new strategies and technologies, creating future scenarios for the increase of water demand and water stress, which means, the emergency of ready-to-market digital water solutions. In Europe, the future-proof European model for a water-smart society entails a paradigm shift in the way our future society will be organized and managed regarding water. A digital water solution can provide a water solution for sustainable and climate-resilient development.

THE FUNCTION OF SUSTAINABLE WATER MANAGEMENT IN SMART CITIES

According to a recent UN report on drought, changing weather patterns are causing droughts to occur more frequently, more severely, and for longer periods, intensifying food insecurity and poverty. As they expand, cities will see increased smart water demand from various sectors, including residential, ecological, and industrial. Hence, smart city planners must prepare for the next five to ten years and potentially even the next century.

Gaps in India's current water and wastewater infrastructure can be successfully filled with technologies like Artificial Intelligence (AI), Big Data, and the Internet of Things (IoT). Given that the majority of nations have water stress, smart cities must make sure that the populace has access to enough water. Several proactive methods can improve the existing water situation, including recycling, actions to upgrade the distribution network, wastewater treatment facilities, desalination, and smart water metering.

SMART WATER RECYCLING

As smart water cities are based on the concept of sustainability, they must efficiently utilize their resources by eliminating wastage. Smart water recycling is essential in smart cities. Why not recycle water the same way we do plastics and metals? A multi-use strategy is feasible because some activities, such as restrooms and landscaping, do not necessitate drinking-quality water. Greywater, or recycled water devoid of waste, can fulfill many of these requirements. Reusing up to 75% of residential smart water as greywater is possible. Smart water is primarily used for bathing, cooking and drinking. After treatment, it is provided for general cleaning, washing dishes, clothes, and flushing. This water is once again treated before being used for farming and gardening. Recycling occurs on a societal level, where RWAs care for treatment facilities.

WASTEWATER TREATMENT IN SMART CITIES

Over the past few years, the groundwater table has quickly declined, particularly due to improperly controlled extraction and excessive use. As a result, the necessity of efficient wastewater treatment in smart cities across the nation has gained momentum. India can treat about 37% of the entire amount of wastewater produced in the nation daily. Smart water cities can establish wastewater treatment facilities equipped with the necessary technology to handle municipal garbage efficiently. Based on their different quantities, individuals and organizations can also set up wastewater operations at various scales inside their structures. An excellent example of smart water management in Singapore. The country meets 40% of its water demand through smart water management strategies.

WATER METERING AND GOVERNANCE

People typically underestimate how much smart water they use each day. The transition to smart meters from conventional ones will enable real-time measurement and an understanding of the water use patterns in smart cities. This will enhance the effects of budget allocation, management, and water governance. To efficiently handle water distribution, cities like Chandigarh and Pune have shifted to a smart meter-based system. Over the past three years, the Pune Municipal Corporation has been installing 275,000 smart water meters.

Additionally, these meters will enable individuals to use water properly. Depending on the type of consumption, they may be rewarded or penalized. Smart water meter data can be used to regulate water use for other activities like car washing and gardening and limit water consumption to essentials during droughts and other extreme weather conditions.

an integrated approach to sustainable water and wastewater treatment. It encourages better management of water resources for a variety of uses. Additionally, it establishes a strong ecosystem that fosters stakeholder involvement and promotes public-private partnerships for water infrastructure initiatives in smart cities.

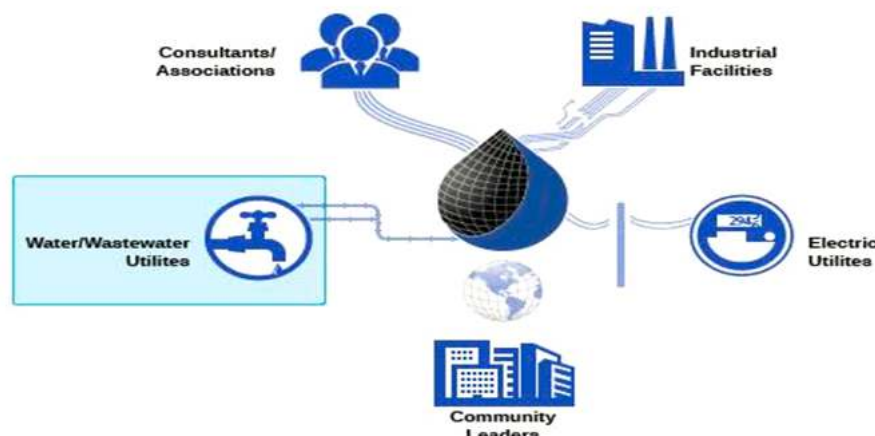
WATER DISTRIBUTION SYSTEM

The urban water cycle integrates the engineer infrastructures to provide potable water to the consumers, as well as water collection, water treatment and discharge residual water into the environment after use. A water supply system (WSS) integrates a section of the urban water cycle, it delivers water from sources to customers, involving various steps, namely water collection, water treatment, storage and distribution of water between water storage and water consumers (domestic, commercial and industry consumers).

management entities, requiring time for extensive analysis of the vast amount of information (Big Data) existing in the water system. More recently, two systems emerged and were accepted by companies Automatic Meter Reading (AMR) and Advanced Metering Infrastructure (AMI), widening the base concept for big client's telemetry and extending it to all end clients. A relevant detail that is transversal to all the artificial intelligence mechanisms described is the Internet of Things (IoT). It allows through sensors scattered throughout the water system to capture huge amounts of data that will be taken into account by the algorithms. Through the IoT paradigm, numerous data are collected throughout the WDS and then sent on a regular time basis (structured in a format called Time Series, to a central system that can be used for insights regarding the network, eventual problems and its management, turning it into a very useful approach to the water management entity. This large amount of data can be used to power an artificial intelligence-based support system and transform it into a digital water system. A ML model, Support Vector Machines (SVM), is also applied for problems in an urban context being used in water supply, energy and health, approach to water, Artificial Intelligence, Machine Learning and Deep Learning used in smart cities with machine learning techniques. Deep Learning differs from other artificial intelligence mechanisms because it is capable of learning alone about data characteristics and classifying them, consequently enriching decision making. It is precisely with this purpose that it is intended to verify the usefulness of DL in the water sector, creating the digital solution Water Wise System, that can be applied to a city under the paradigm of Smart Cities, explained further.

For a DL algorithm to work effectively, a large volume of data requires has to be used and placed through a data modeling process to be categorized and capable of making decisions further by automatically interacting with the equipment on the WDS and ultimately, optimizing decision making DL can contribute positively to hydraulic modelling simulations that consists in a computer mathematical model and logic-based representations of real WDS and it can be used with simulation programs, such as EPANET.

Nowadays, hydraulic modelling can be extremely helpful to make decisions and evaluate the condition of the water systems, for the present and the future scenarios of the water system. At this point, it's possible to understand the concept of Digital Water linked to the Water Wise System and as a relevant theme of Artificial Intelligence, applied to the universe of urban management and, consequently, to the paradigm of Smart Cities.



DISTRICT COOLING FOR SMART CITIES

This has become a viable alternative technique for effectively and sustainably cooling huge spaces. HVAC applications in smart cities can be simplified by using smart water solutions like intelligent pumps with variable frequencies that can adjust to the liquid's changing speed, flow, and temperatures.

The GIFT city center in Rajkot was the first smart city in India to employ district cooling. They have significantly saved water and energy thanks to this. Several other cities, like Thane and Amaravati, are attempting to install district cooling.

INTEGRATED APPROACH TO WATER SUSTAINABILITY

A framework for smart cities can be developed using

WDS is composed of several elements, such as pipes, pumps, valves, reservoirs, storage tanks and various types of sensors like the flow meter or pressure meter. The operation of bringing water to consumers is complex, therefore, is necessary to consider parameters like water pressure, flow and water quality.

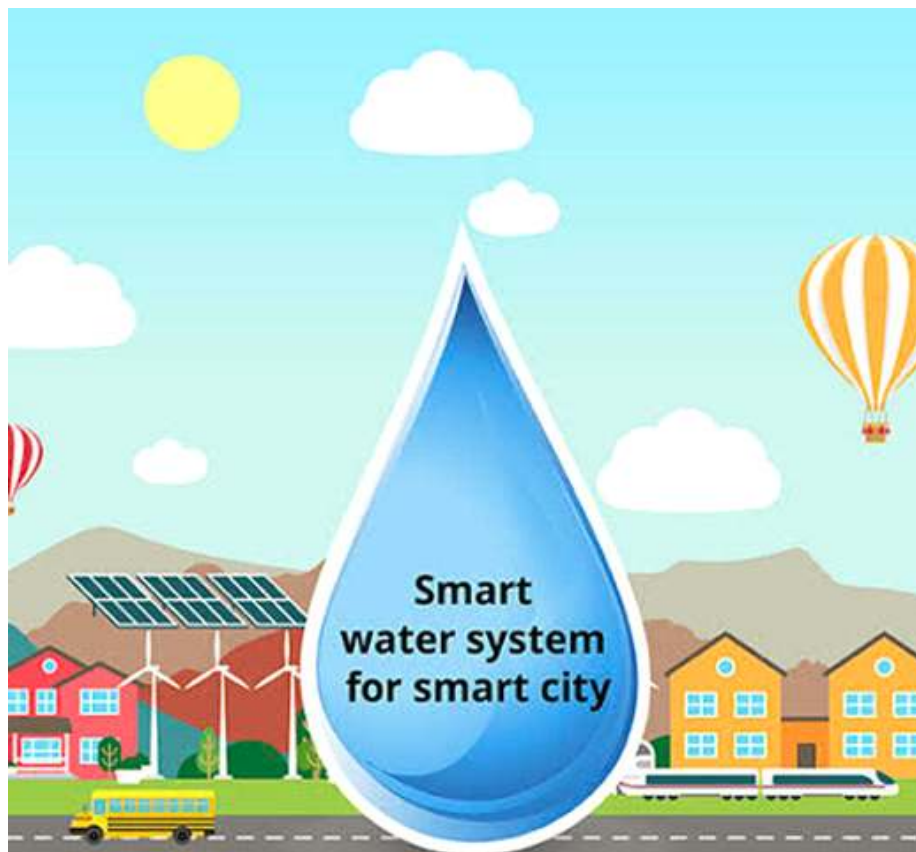
DIGITAL WATER

Digital Water, Smart Water, Internet of Water or Water 4.0, there are countless terms being used to define the exciting transformation taking place in the water sector at the present time. Water supply systems in Portugal are often equipped with some technological intelligence, such as the SCADA (Supervisory Control and Data Acquisition), some control stations and GIS systems. Although, efficient management does not correspond to the resources available in most

The term Smart City has been increasingly used and to better understand this concept, is essential to understand the origin through two major factors: urbanization and the digital revolution, i.e., technological evolution. Water Wise System, a digital water solution for control and monitoring in real time water distribution systems. Consequently, an architecture of the solution was represented as a preliminary study result. Further studies are essential and planned, to develop and validate the architecture presented, for Machine Learning optimization methods and evaluation procedures. Thereby, Water Wise System requires a water management entity to acquire a pilot project and test the solution in situ. Presently, Wakaru Consulting has a demo of the Water Wise System running in a cloud system using simulated water data. Water Wise System is capable to integrate the universe of a Smart City, however, it has been verified in scientific community and throughout this paper, the water systems currently require more research and smart technological equipment to become more efficient. Additionally, some dogmas will have to be overcome in water management entities, because of the static management through decades. Therefore, believing in digital revolution it is crucial to continue looking forward, analyzing the W2S solution to adapt the concept and the architecture developed for the present issues and the future problems to contribute for digitization of the water sector.

FINAL WORDS ON SMART WATER FOR SMART CITIES

Sustainable water and wastewater management depends on residents' and stakeholders' attitudes in smart cities. For improved water resources management, smart cities also need investments in water conservation infrastructure. To guarantee that existing water resources are used wisely, it is crucial to raise the appropriate level of awareness and sensitization as cities adopt sustainability and new technology. To be precise, smart work is more appreciable than hard work thus, cut copy paste makes many works simpler and brings out worthy results same way copying from nature will fetch fruitful result a well as benefit mankind for generations.



ABOUT THE AUTHOR



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Result driven Environmental Engineering professional with a decade plus years of experience in Water and Wastewater technologies focusing on design & execution of treatment systems. Skilled researcher with extensive knowledge about contaminant removal technologies. Expert level skills in incorporating industrial wastewater treatment solutions.



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TRANSFORMING URBAN LANDSCAPES WITH DIGITAL WATER SOLUTIONS AND REVOLUTIONIZING SMART CITIES

By Mandar Vaijanapurkar, Head of Drives Sales, Marketing & Services at Danfoss India Region

The concept of smart cities is rapidly gaining momentum as urbanization continues to increase and water demand rises. The integration of digital technologies and innovative strategies has become imperative in efficiently managing water resources in urban environments. The amalgamation of cutting-edge technologies, innovative strategies, and the concept of Smart Cities is revolutionizing the way water within these densely populated environments is perceived, managed, and utilized. As cities continue to evolve, the integration of advanced technologies and data-driven strategies becomes pivotal in safeguarding the future of urban water resources. Embracing these innovations not only addresses immediate water challenges but also fosters a paradigm shift towards a more sustainable and water-resilient future for urban landscapes worldwide.

THE EMERGENCE OF SMART CITIES AND DIGITAL WATER

Smart Cities represent the epitome of urban evolution, envisioning interconnected and intelligent systems that optimize resources, enhance efficiency, and elevate the quality of life for residents. Central to this vision is the concept of Digital Water—a paradigm shift in water management that leverages data,



advanced analytics, and intelligent infrastructure to optimize the utilization and conservation of this precious resource. The increasing global urbanization and the consequent surge in water demand have elevated the significance of efficient water resource management. Smart cities, leveraging cutting-edge digital technologies and innovative strategies, present a compelling solution to address the complex challenges associated with urban water management.

Digital water involves real-time data collection, predictive analytics, and digital monitoring systems. These elements combine to transform conventional water networks into intelligent, agile systems that can adapt and respond swiftly to changes in demand, water quality, and infrastructure performance. With the increasing importance of sustainable water management in an increasingly water-pressured world, digital water represents a vital cog in the smart city machinery.

Transformative Integration of Technology Digital Water represents the convergence of advanced digital technologies with traditional water management practices. This revolutionary approach involves the utilization of real-time data, predictive analytics, and digital monitoring systems to enhance the efficiency, reliability, and overall sustainability of urban water networks. By harnessing the power of digitalization, cities can gain unparalleled insights into water usage patterns, quality monitoring, and infrastructure performance, thereby enabling proactive and informed decision-making.

ARTIFICIAL INTELLIGENCE (AI) AND MACHINE LEARNING

The advent of AI and machine learning has empowered cities to unravel the complexities of urban water management. Through advanced algorithms, AI can sift through vast volumes of data to discern patterns, forecast demand, and identify anomalies. Machine learning algorithms can detect irregularities in water quality, anticipate maintenance requirements, and optimize distribution networks, thereby contributing to sustainable and resilient water management practices. AI technology can drive the development of intelligent energy management systems. These systems can analyze patterns in energy usage and adjust the distribution of energy accordingly, thus promoting energy conservation. They can forecast water demand based on factors such as weather, population growth, and consumption patterns. This helps in better management and distribution of water resources.



INTERNET OF THINGS (IOT) INTEGRATION

The proliferation of IoT technologies has redefined the landscape of urban water management. IoT-enabled sensors and devices facilitate comprehensive monitoring of water infrastructure, paving the way for precise data collection, real-time analysis, and actionable insights. This interconnected ecosystem allows for the seamless integration of various components in the water supply chain, enhancing operational efficiency and resource optimization. Regarding digital water systems, IoT integration can bring about significant improvements in water management and conservation. IoT sensors and devices can be deployed to monitor water quality, detect leaks, and manage water distribution networks effectively. This can lead to more efficient water supply and management, contributing to sustainable urban development in India.

Additionally, leveraging IoT in smart cities and digital water systems can enable the collection of vast amounts of data. This data can be analyzed using Artificial Intelligence (AI) algorithms to derive valuable insights for informed decision-making and efficient resource allocation.

Danfoss, a global leader in energy-efficient solutions, has been at the forefront of driving innovations in urban water management. Their range of cutting-edge technologies, such as AC drives and variable frequency drives, has revolutionized the energy efficiency and operational precision of water infrastructure systems. These solutions, tailored for water and wastewater applications, optimize pump and motor operations, thereby delivering substantial energy savings while ensuring reliable and efficient water management. Danfoss India has deployed variable frequency drives that offer energy-efficient solutions for a varied range of applications in water infrastructure. These include water supply, wastewater treatment, and irrigation systems. Leveraging these drives leads to significant energy and cost savings, making them integral components in India's smart city infrastructure.

Danfoss establishment of the Common Data Platform facilitates real-time monitoring

electricity, heat, and water consumption, optimizing maintenance actions and operations for utilities. Additionally, it enables improvements in customer awareness about consumption patterns, promoting efficiency-focused behaviors.

The journey towards sustainable and resilient urban water management necessitates an unwavering focus on innovation, technological integration, and strategic partnerships. Through the comprehensive adoption of digital water initiatives in the context of smart cities, urban areas can pave the way for efficient, proactive, and sustainable water management practices. With massive amounts of data and automation, cities can improve overall service delivery, respond quickly to changes, and make informed decisions for the future. Urban areas around the world are gradually awakening to the powerful potential that digital water holds. By adopting a strategic approach that welcomes innovative technologies, our country can be well on its way to smart cities where water management is efficient, sustainable, and savvy.



ABOUT THE AUTHOR



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& Services at Danfoss India Region

Mr. Mandar Vaijanapurkar is an experienced business manager in the mechanical and industrial engineering industry. With a strong background in product management, business strategy, key account management, and business development, he has proven himself as a skilled sales professional.

Mr. Mandar has been an integral part of Danfoss India close to two decades, specializing in the sales and marketing division for Danfoss Drives. With his expertise and dedication, he has played a crucial role in driving the success of the company in the India region.

SMART INSTRUMENTATION ADDRESSING THE SI-LOS OF VAST INSTALLED BASES TO FUTURE PROOF THE WATER INDUSTRY

By Sabyasachi Bhattacharyya, Global Product Line Manager, Digital & Service, Instrumentation BL, Measurement and Analytics Division, ABB



Managing field devices and instrumentation in water utilities poses significant challenges for operators. The complex nature of water systems, combined with the multitude of devices and instruments involved, requires meticulous attention to detail and a

comprehensive understanding of the equipment's functionality.

Operators must be adept at monitoring a multiplicity of sensors, meters and valves spread across a vast

cat's cradle of pipelines to ensure accurate measurements and efficient operation. Additionally, dealing with ageing infrastructure presents obstacles such as outdated technology and limited connectivity options.

Meanwhile, cybersecurity risks loom ever larger due to the interconnectivity of modern systems, making it imperative that operators keep up-to-date with latest security protocols while remaining eternally vigilant to potential threats. As technology advances rapidly in the water utilities sector, operators must embrace automation tools and data analysis techniques in order to enhance their decision-making capabilities while managing field devices and ensuring safe water delivery to consumers.

ACCURACY AND COMPLIANCE ARE CRUCIAL FOR FIELD DEVICES IN WATER UTILITIES

Given the sheer scale of water utilities' infrastructure, reservoirs, treatment plants, pipeline networks and so on, any inaccuracies in measuring parameters such as flow rates, pressure levels and quality thresholds

can adversely affect the overall performance and efficiency of the entire water treatment facility. Furthermore, strict regulations govern the monitoring and management of water resources to ensure public health and safety.

Therefore, it is imperative that field devices adhere to regulatory guidelines and maintain absolute precision in measurement. Inaccurate readings can lead to inefficient resource allocation, misinterpretation of data, increased costs and even compromised public health. Moreover, non-compliance with regulatory standards may result in severe penalties or legal consequences. Therefore, ensuring accurate measurements and strict adherence to regulatory compliance is pivotal for maintaining effective operations within water utilities.



THE IMPACT OF NEW OPERATING STANDARDS AND REGULATIONS

In an age of intense scrutiny of water utilities' operations, the introduction of new operating standards and regulations has a profound impact on the economics of water utilities. These standards, often promulgated in response to a combination of media outcry and market demand and implemented in order to ensure public health and environmental sustainability, require considerable investment in infrastructure, technology and personnel training.

Compliance with such regulations may necessitate expensive upgrades to treatment facilities, distribution networks and storage systems. Additional funds may be required for regular monitoring and testing of water quality parameters. These costs translate into higher operational expenses. To compensate for these increased expenditures, utilities may need to raise water rates or seek additional funding through government grants or loans.

These funding demands can burden consumers with higher water bills while acting as an impediment to economic growth by diverting resources from other sectors.

However, it is important to recognise that these regulatory measures ultimately safeguard the long-term availability of clean and safe drinking water for communities while preserving precious natural resources.

SUSTAINABILITY THROUGH TECHNOLOGY

The onus is therefore on operators to maximise efficiency in all areas. They must embrace sustainable practices by incorporating advanced technological and digital solutions. For example, smart meters enable real-time monitoring of water usage and help identify leaks and other abnormalities. A data-driven approach not only cuts waste but also saves significant operating costs.

Additionally, state-of-the-art filtration systems and treatment plants equipped with automation technology ensure consistent water quality while reducing energy consumption. Adopting digital platforms for customer engagement enables better communication regarding conservation efforts while educating consumers and the public about water-saving habits. Embracing technology is a crucial step for water utility operators to achieve long-term sustainability while meeting growing demand.

AN ASSET PERFORMANCE MANAGEMENT PROGRAM IS VITAL

With a plethora of instruments and field devices that are deployed in the water utility sector all throwing off data of various kinds, the implementation of an asset management program becomes imperative. Flow meters, pressure sensors, level gauges and control valves play a fundamental role in monitoring and regulating water networks.

A comprehensive asset management program enables organisations to track and maintain these devices by adopting proactive maintenance strategies, making regular calibration checks and commissioning timely repairs. Moreover, it enables improved decision-making through accurate asset information and reliable performance data. By investing in such programs, water utilities can not only extend the lifespan of their assets but also optimise operations, reduce downtime, improve customer satisfaction levels and ultimately achieve better long-term financial outcomes.

Connecting physical (OT) and digital (IT) worlds has become paramount in ensuring the efficient management and utilisation of resources throughout the process industry sector. Water utilities, recognising the potential that analysis of data can unlock, are gradually transforming traditional systems into smart networks that leverage technological

advancements to improve efficiency, sustainability and customer satisfaction.

By integrating sensors, meters and various IoT devices with robust software analytics, water utilities can collect real-time data on usage patterns, leakages, infrastructure conditions and even climate predictions. This invaluable information enables informed decision-making about demand forecasting, infrastructure optimisation, proactive maintenance measures and resource allocation.

Furthermore, leveraging this interconnected network allows water authorities to monitor network performance remotely while promptly identifying potential issues before they escalate. Ultimately, embracing the integration of physical and digital realms within water utilities represents a promising future for improving resource management capabilities while ensuring an uninterrupted supply of high-quality water to customers efficiently.

ISOLATED APPLICATIONS AND SILOED DATA TEND TO LIMIT OPERATIONAL INSIGHTS

One challenge that vast installed instrumentation bases present is their legacy infrastructure which may contain devices and instruments of differing vintages in which isolated applications and siloed data sets can act as hindrances to realising comprehensive operational insights and to IT/OT convergence generally. This fragmented approach restricts the ability holistically to analyse and optimise aspects of utility operations.

The lack of integration between different software solutions leads to minimal cooperation and collaboration among departments, resulting in disjointed workflows and duplicated efforts. Furthermore, when important data is dispersed across multiple platforms or stored in separate repositories, it becomes arduous to gain a consolidated understanding of operational performance. These information silos prevent utilities from harnessing their true potential.

To address these challenges, there is an increasing need for centralised systems that can provide seamless data integration across multiple applications. By breaking down these barriers and fostering cross-functional visibility, utilities will be better equipped to make informed decisions and drive efficiencies throughout their operations.

ASSET MANAGEMENT PROGRAMS IN WATER UTILITIES ENABLE ON-PREMISE, IN-CLOUD AND REMOTE ACCESS

Asset management programs in water utilities enable

the seamless integration of on-premise, in-cloud, and remote access capabilities, providing a comprehensive view of asset information and facilitating efficient decision-making.

On-premise access ensures real-time monitoring and control of critical assets within the utility's premises, allowing for immediate response to any anomaly or failure. In-cloud accessibility provides a centralised platform for storing and analysing vast amounts of data related to asset performance, maintenance history and regulatory compliance.

Furthermore, remote-access capability enables authorised personnel to retrieve information from off-site locations, enhancing collaboration and enabling timely decision-making even when not physically present at the utility's facility. Overall, by utilising these versatile asset management programs, water utilities can improve operational efficiency, optimise resource allocation, mitigate risks, extend asset lifespan and enhance customer satisfaction through continuous delivery of high-quality water services.

SUPPORTING PREDICTIVE MAINTENANCE STRATEGIES

Asset performance management (APM) programs in water utilities play a critical role in optimising operations and ensuring the efficient functioning of infrastructure. Through robust data analytics combined with artificial intelligence, these programs can empower predictive maintenance strategies, which are instrumental in preventing breakdowns and minimising downtime. By capturing real-time data from sensors installed across the assets, APM systems can monitor their condition and identify potential issues before they escalate into or unscheduled downtime or costly failures. This proactive approach not only helps reduce maintenance costs but also enhances asset reliability

and extends an asset's lifespan. Moreover, by leveraging machine learning algorithms, APM programs can continually analyse historical data alongside real-time inputs to develop accurate models for predicting future asset behaviour and performance.

This empowers utilities to adopt proactive maintenance strategies that address problems before they impact service delivery. The comprehensive insights provided by APM solutions facilitate informed decision-making for resource allocation, prioritisation of repairs, and strategic planning for infrastructure upgrades or replacements — ultimately enabling water utilities to deliver reliable services while maximising operational efficiency.

FUTURE-PROOFING THE WATER SECTOR

By integrating advanced technologies such as Internet of Things (IoT) sensors, data analytics, and cloud computing into traditional physical infrastructure, water utility companies can effectively monitor and manage their assets in real-time. This connection allows for proactive maintenance, timely repairs and cost-effective resource allocation. By leveraging the power of digital technologies to collect data from physical assets like pumps, pipes and treatment plants, water utilities can gain valuable insights into their performance and condition. This enables predictive maintenance practices that prevent unexpected breakdowns and reduce downtime. Moreover, the integration of digital tools facilitates the optimisation of resource usage by identifying areas of inefficiency or excessive consumption. Ultimately, by connecting physical and digital worlds in asset management programs, water utilities can ensure reliable service delivery while maximising operational efficiency in an increasingly complex and politically sensitive environment.



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Sabyasachi Bhattacharyya, ABB Measurement and Analytics, looks at the challenges facing water utilities and how physical and digital convergence is solving the dilemmas of vast installed bases



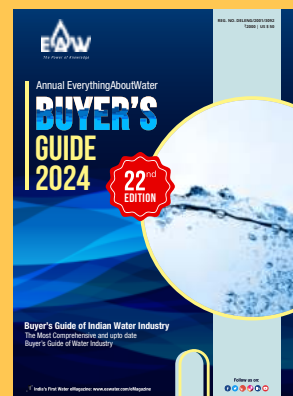
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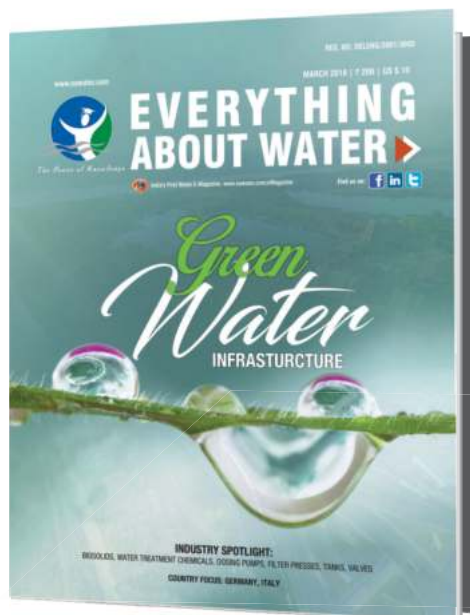


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REVOLUTIONIZING URBAN LIVING: SMART CITIES AND DIGITAL WATER MANAGEMENT

By Rajul Parikh, Co-Founder of ALFAA UV



In a rapidly urbanizing world, the concept of "Smart Cities" has taken center stage. These innovative urban centers employ state-of-the-art technology not only to enhance the quality of life for their residents but also to ensure the efficient and sustainable management of vital resources. Among the many aspects of this smart transformation, water management stands out as a critical domain.

URBANIZATION ON THE FAST TRACK

Urbanization is a global phenomenon, with more

people moving to cities than ever before. This transition poses both opportunities and challenges. On one hand, cities are hubs of innovation, economic growth, and cultural exchange. On the other, they exert immense pressure on resources, most notably water.

As urban populations swell, the demand for freshwater skyrockets. Access to clean and reliable water becomes a pressing concern. Here's where the concept of Smart Cities steps in. Smart Cities employ advanced technology and data-driven strategies to

create sustainable and efficient urban environments. Key to this mission is optimizing water management through digital systems.

DIGITAL WATER SOLUTIONS IN URBAN ENVIRONMENTS

In today's digital age, data is the new currency, and it's no different in urban water management. Smart Cities are increasingly turning to digital technologies, IoT (Internet of Things), and data-driven solutions to revolutionize how they handle water resources. These digital water solutions enable city planners to make informed, proactive decisions that conserve resources and enhance service quality.



1. IoT and Real-Time Data:

The foundation of digital water solutions is real-time data. IoT sensors are strategically placed throughout the city's water infrastructure, continuously collecting information on factors like water pressure, flow rates, water quality and even the condition of pipelines. This data is transmitted to a central platform where it's

analyzed, providing a comprehensive picture of the water system's health.

2. Predictive Maintenance:

With the insights gleaned from real-time data, cities can implement predictive maintenance programs. By detecting anomalies and predicting potential issues like leaks or equipment failures, maintenance teams can respond proactively, saving time and reducing water losses.

3. Demand Forecasting:

These technologies allow for precise demand forecasting. By understanding when and where water is needed the most, cities can allocate resources efficiently, ensuring that every drop counts.

SMART WATER INFRASTRUCTURE

Smart water infrastructure is another pillar of digital water management in Smart Cities. It involves the integration of sensors, real-time monitoring, and automation into urban water supply systems, enhancing their efficiency and resilience.

1. Sensor Integration:

Advanced sensors are placed at key points within the water distribution system. These sensors detect water quality, pressure, and flow rates. They're often connected to actuators that allow for real-time adjustments, ensuring consistent water quality and pressure.

2. Real-Time Monitoring:

The real power of smart water infrastructure lies in real-time monitoring. When a sensor detects an issue, the system can automatically adjust operations. For example, if a sudden drop in pressure is detected, the system can redirect water flow to ensure that residents still receive adequate pressure.

WATER QUALITY MONITORING IN SMART CITIES



Maintaining water quality is a top priority for any city. Smart Cities employ advanced techniques and sensors to monitor and ensure clean, safe water for their residents.

1. Online Water Quality Monitoring:

Sensors continuously monitor key water quality parameters, including pH, chlorine levels, and the presence of contaminants. They can trigger immediate alerts if an issue is detected, allowing rapid response.

2. Continuous Surveillance:

Rather than relying on periodic manual sampling, online sensors provide continuous surveillance. This ensures that water quality issues are detected as soon as they arise, reducing the risk of contamination and illnesses.

CHALLENGES AND FUTURE TRENDS

While the digital transformation of urban water management offers immense benefits, it's not without challenges.

1. Data Security:

Managing vast amounts of sensitive data requires robust cybersecurity measures. Ensuring the integrity of the data and protecting it from cyber threats is a critical challenge.

2. Infrastructure Investment:

The implementation of digital water solutions demands significant initial investment in sensors, software, and training. Cities must balance these costs with the long-term benefits.

3. Integration:

Integrating various digital systems and ensuring they work seamlessly can be complex. Overcoming this challenge is essential for maximizing the efficiency of digital water management.

In terms of future trends, we can anticipate the following:

- **Artificial Intelligence:** AI will play an increasingly significant role in processing and analyzing the massive amounts of data generated. It can provide predictive insights, optimize water distribution, and even automate decision-making processes.
- **Greater Sustainability:** Smart Cities will continue to focus on sustainability. Rainwater harvesting, wastewater recycling, and more eco-friendly treatment methods will gain prominence.

- **Community Engagement:** Cities will strive to involve residents, corporates in water conservation efforts through apps and platforms that encourage responsible water usage.

WATER PURIFICATION IN THE DIGITAL AGE

In today's era of rapid urbanization, the way we manage, distribute, and purify water is evolving dramatically. As our cities grow and water resources become more strained, the need for innovative, efficient, and sustainable water purification systems is more pressing than ever. This transition into the digital age has given rise to the concept of "Smart Cities," where cutting-edge technology is harnessed to improve the quality of life for urban residents and ensure the responsible use of resources. At the heart of this transformation lies the revolutionary concept of "Digital Water".

Digital Water solutions leverage the power of technology, IoT (Internet of Things), and data-driven approaches to redefine how we handle water. The vast Indian commercial water purification industry, teeming with over 2500 participants, has traditionally been driven by price considerations in a largely unregulated environment. However, the status quo is on the cusp of a significant transformation, thanks to the advent of Artificial Intelligence (AI) and the limitless possibilities offered by the Internet. We've already witnessed the far-reaching impact of the Internet of Things (IoT) in our daily lives. It has revolutionized home automation, fitness tracking, and even transportation through platforms like Uber. But the pressing question remains: Can we leverage the power of AI to usher in an era of intelligent water management?

AI: A GAME-CHANGER IN THE FUTURE OF WATER PURIFICATION

In the bustling commercial water purification industry of India, marked by over 2000 players, the primary focus has been on price rather than system performance and water quality. This has resulted in a market filled with intense competition, often lacking in quality and workmanship. Breakdowns, frequent repairs, and maintenance issues have been commonplace. More critically, users couldn't reliably determine if the water from these systems was truly pure, putting their health at risk. Hidden damage to crucial system parts further compounded these problems. The question arises: Can the use of IoT and AI address these challenges and make water purification more reliable and efficient?

By integrating IoT and AI into water purification, it's possible to monitor systems in real time, predict maintenance needs, and guarantee water quality. These technologies offer unprecedented insights into the purification process, ensuring that the essential goal of pure and safe water is consistently met. While there are challenges to overcome, IoT and AI hold the promise of a future where water purity is no longer uncertain, but a surety, transforming a chaotic and competitive industry into a reliable and quality-driven sector.

Cloudtap's Role in Smart Water Management:



Cloudtap, a frontrunner in the realm of water purification and management, has been at the forefront of this digital transformation. Our mission is to provide state-of-the-art solutions that revolutionize how we perceive and manage water. With over two decades of experience, we have embraced digitalization as an opportunity to enhance water quality, conserve resources, and contribute to the creation of cleaner, more sustainable cities.

The Cloudtap purification plant with sensors continuously monitors vital water quality parameters and plant performance 24x7 and sends this data to the internet-based Cloudtap engine. The engine further sends this data to an AI system that receives this data and analyses it, using deep learning proprietary algorithms to ensure that the water is absolutely pure. The Cloudtap AI system even detects minor abnormalities which signify potential problems in the making. Performance alerts detected by the AI system are automatically routed to the nearest field support engineering team based on the GPS location via the Cloudtap engine. Faults or even potential faults are resolved before they lead to a breakdown in the system. To ensure complete transparency, customers have 24x7 access to Cloudtap's online dashboard where they can check water purity and plant performance of all their Cloudtap installations, whether UV powered, or having both RO+UV in their purification process.

Our cloud-connected water purification systems have been instrumental in improving water quality while reducing waste.

These systems are designed to integrate seamlessly into the urban landscape, ensuring that every drop of water is put to good use. Whether it's at the point of consumption in homes, offices, or even industrial facilities, our innovative approach emphasizes quality, efficiency, and conservation.

I believe that digital water solutions offer not just an opportunity but a responsibility to pave the way for a sustainable and water-secure future. The smart city of tomorrow needs to function as an integrated ecosystem where water is treasured as a precious resource.

We're committed to continuing our relentless pursuit of excellence in the domain of digital water management. In close collaboration with Smart Cities, we aim to lead the way toward a future where cities are not just smart but also sustainable, resilient, and profoundly in harmony with their water resources.

The fusion of technology and water in the modern urban environment is an endeavor that will test our collective resolve and innovation. However, in rising to this challenge, we have an opportunity to shape cities that are not just advanced but also more livable, sustainable, and water-conscious. As we navigate this digital transformation, our journey is one that holds the promise of a cleaner, safer, and more prosperous future for all. Together, we embark on this exciting path towards a brighter, water-secure tomorrow.

IN CLOSING

The rise of Smart Cities brings promise to the urban future. By embracing digital water management, these cities are not only ensuring that their residents and corporates have access to a clean and reliable water supply but are also spearheading a revolution in sustainable resource management. The impact is not just local but resonates globally, emphasizing the urgency of adopting similar strategies to meet the water challenges of our increasingly urbanized world.



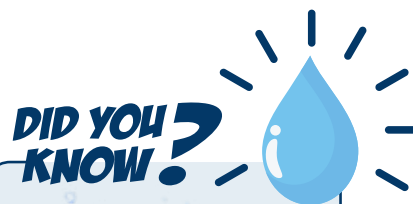
ABOUT THE AUTHOR



Rajul Parikh
Co-Founder of ALFAA UV

Rajul Parikh is a co-founder of ALFAA UV, India's leading manufacturer & exporter of UV water, air & surface disinfection systems and is passionate about people, and the environment.

As a co-founder, has contributed towards making Alfaa a market leader in UV technology and India's first ISO 9001 certified water purification company. Has played a key role in the development and implementation of marketing strategy, HR strategy and brand communication at Alfaa UV.



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SMART CITIES AND DIGITAL WATER MANAGEMENT SOLUTIONS

By Bibhu Prasad, Senior Consultant, Avalon Consulting, and Shreyus Gopalakrishnan, Consultant, Avalon Consulting



SMART CITIES AND DIGITAL WATER MANAGEMENT SOLUTIONS

There is an opportunity to use smart metering and supporting digital water management solutions to

- Optimise the usage of scarce urban water resources by minimising leakage
- Minimise Non-revenue water for the government
- Optimise taxes for the consumers of water (beneficiaries)

There are challenges in building the infrastructure, maintaining the infrastructure, and helping the various stakeholders navigate the new digital ecosystem.

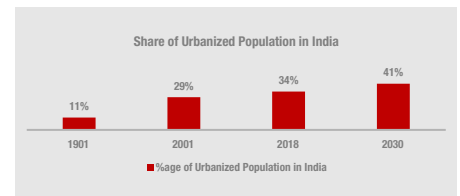
We have proposed a holistic set of solutions involving public-private partnerships in building and maintaining the infrastructure, mass communication to build consumer awareness and training/mentoring for key stakeholders.

OPPORTUNITIES IN THE DIGITAL WATER SPACE

An exploding urban population scenario, inefficient water management with the traditional systems, the smart cities mission and technological developments such as IoT and SCADA are some of the key factors that will drive growth and opportunities in the digital water sector.

Exploding urban population: Our cities with a

burgeoning population depend heavily on the local water supply. There is immense demand and stress on the local water supply as the needs are ever-increasing for urban dwellers. Increasing apartment complexes, industrial layouts, and commercial spaces in all major cities of India have accelerated groundwater depletion and degradation of freshwater supply.



*Source: Census, WHO Report

By the year 2030, at least twenty-one Indian cities will face acute shortages of water and may be marred by extreme climatic conditions and poor water management systems, according to a World Bank report.

Traditional water systems: From the perspective of urban local bodies or the water authorities in the cities, it is essential to ensure a safe drinking water supply to the cities 24/7. However, the public water utilities are riddled with inefficiencies such as lack of operational visibility, poor leakage and pressure management, inefficient energy utilisation and inaccurate demand and supply planning, because of archaic systems and processes present on the ground. The Central Water Commission report states that 40% of the water gets wasted due to leakages

and thefts before it reaches the final intended consumer. With such a high rate of urbanization, these leaks and wastages lead to an increased cost of supply.

With the traditional systems on the ground, it is an ever-increasing herculean task for the ULBs to reduce water leakages and thefts and supply to every household while also maintaining the quality of the water supply. It becomes essential to reduce non-revenue water (unbilled water) to reduce the financial burden on ULBs for water supply and ensure the financial sustainability of the water utilities.

Smart Cities Mission: To combat various inefficiencies in public management systems the Government of India has launched the “Smart City Mission” and with it a plethora of “smart” opportunities have been introduced. The mission focuses on urban development and retrofitting or upgradation of urban facilities, thereby giving a decent quality of life to urban dwellers. Never was such a large-scale dedicated project launched by any government to build smart cities. A total of Rs 1,70,983 Crores has been invested to build 100 smart cities across the country. Amongst the many core infrastructure elements that are associated with Smart city projects, water management systems form a crucial part.

Water management objectives: The smart cities mission has laid out a strategy to ensure smart water supply to urban users, thereby paving a roadmap for city management and technology suppliers in the digital water space. The mission includes and proposes efficient water management system solutions such as “Smart meters and management”, “Leakage identification”, “Preventive maintenance”, “Water quality monitoring”, and “Water recycling”. The mission also strives to keep the solutions measurable through a few key performance indicators.

A crucial KPI is the **% of non-revenue water in the system**. Non-revenue water (NRW) can occur through real losses such as leaks in pipelines or through apparent losses such as metering inaccuracies. High levels of NRW indicate severe detrimental impacts on the financial viability of water utilities. Apart from several environmental benefits such as reduced energy consumption and efficient resource management, an effective NRW is attractive for smart city management and water utility suppliers as it improves the bottom line through efficient management of operations and maintenance.

Another key performance indicator is the **% of the establishment and maintenance cost of water supply**. An optimal management of establishment

and maintenance costs is necessary as there are always trade-offs between the two. A low establishment cost may lead to a high operations cost and vice versa. Inefficient management of water utility systems also leads to high maintenance costs leading to inefficient resource utilisation and unnecessary spending of budget on MRO activities.

A third important KPI is the **% of O&M cost covered by urban users through taxes**. Covering the increase in water management costs through frequent tax rate hikes may cause civil dissatisfaction. This practice is also not sustainable for the future of a city. The only alternative method is to reduce the operation costs through efficient systems management, thereby increasing the percentage of cost covered through user taxes.

The three KPIs coupled together provide an excellent opportunity for various stakeholders to take part in digital water solutions to combat various inefficiencies in the utility system.

IoT and SCADA: To meet the challenges of utilising a scarce resource efficiently and effectively measuring and billing the water supplied, advanced digital technologies are required. Smart water management uses a combination of hardware, software, and analytics for the efficient distribution of water in a city.

With the advancement of emerging technologies by various private organisations, Smart water solutions can be implemented using remote actuators, sensors, pressure valves and SCADA (Supervisory Control and Data Acquisition) systems.

The SCADA system enables remote 24x7 monitoring of the entire water supply distribution network including various parameters on a real-time basis such as:

- Quality of water (pH, chlorine, turbidity, dissolved oxygen level, chemical oxygen demand etc.)
- Water pressure.
- Flow level.
- Performance of Control elements (e.g. – valves, actuators)

Data regarding all these parameters are collected through various sensors placed within the network. The data from all sensors get assimilated at the central control station for analysis. The real-time data analysis identifies inefficiencies, anomalies, and leakages in the network. The analysis highlights the red flags for the authorities to take necessary actions, thus reducing response time while enhancing the reliability of the system. Issues of inequitable or inadequate water supply to parts of the network,

complaints from citizens, loss of revenue due to unbilled water etc. automatically get taken care of through the SCADA-based smart water management system. This leads to cost savings through an overall improvement in energy efficiency within the network. Not to mention, there are even savings through reduction in operational costs.

With the advent of 5G and better computing power, the whole digital water value chain be realised with real-time data transfer and computing power

CHALLENGES IN IMPLEMENTING DIGITAL WATER

However, despite the issues faced by our cities around water supply and the numerous advantages of using SCADA and IoT-based smart water systems, very few cities in India have implemented smart water management systems. Delhi, Ahmedabad, Bengaluru, Pimpri-Chinchwad, and Naya Raipur are some of the cities that have implemented the system. Nashik, Koppal, and Okhla are some of the places which have plans to implement the system shortly.

Main challenges in the adoption and implementation of IoT and SCADA systems for water management:

- MRO and compatibility:** IoT and SCADA use a wide range of hardware and software which very often might be sourced from different vendors. To ensure that all the hardware and software are maintained and work seamlessly with each other might be a challenging task. If there are legacy systems in place, then it can be even more difficult, as the legacy systems might not be working well with most modern-day equipment or software used in SCADA systems. There also must be a large-scale exercise in maintenance, repair and overhaul of the new IoT and SCADA system with the existing ERP and MIS systems, ensuring harmonization of the data formats, data exchange protocols, security mechanisms etc. To avoid issues of compatibility arising midway during the MRO process, the implementing authority must collaborate closely with vendors and the system integration partners to identify compatibility issues at an early stage and address them at the earliest.
- Scalability:** IoT and SCADA-based digital water systems require several hardware such as sensors and actuators etc. To reach a wider area, the count of hardware components also increases proportionally. With the increase in the number of hardware components implemented, the cost of data collection increases. The lack of economies of scale in the system defeats the entire purpose of

making cost-efficient SCADA-based water systems to identify inefficiencies in the system for which actions need to be taken. As these systems grow with more hardware components, the overall system becomes more complex and increases the risk of failure. Thus, reliability becomes an area of concern.

However, this can be managed if the implementation is done with a robust scalable system architecture in place from the beginning. The planning must be done with the possibility of adding more hardware components and processing more data without any compromise on the reliability of the system.

- **Training** – SCADA-based smart water systems are quite complex and require specialized knowledge. It is critical to devise tailor-made training programmes for people with a variety of skill levels and experience. Apart from the training, it can also be a huge change management exercise to drive government officials of water supply entities in this major shift in the method of working. The training should not just focus on features and functionalities but also on the procedures and protocols to be followed for effective maintenance and operations.
- **Cost** – Modern-day IoT and SCADA systems are complex systems with multiple specialized components and advanced software making them quite expensive to not just procure and implement but also to maintain. Ongoing support from the implementation partner for the deployment of specialized manpower, hardware maintenance and replacement, and software updates, is also a significant part of the cost. Therefore, in a large-scale project implementation of this nature, it is essential to prepare a financial model assuming costs of all nature and expected revenues to gauge the financial viability and the working capital requirement.

PROPOSED SOLUTIONS TO OVERCOME VARIOUS CHALLENGES IN IMPLEMENTING DIGITAL WATER

Stakeholders need to look at the problems and solutions therefore from a three-pronged approach. The first level is the set of public system stakeholders, the next are the project contractors, startups and private organisations who design, develop, operate, and transfer the systems and the last level is the end users or beneficiaries of the digital water systems.

- **Public-private partnership** is a powerful method to ensure innovation stays in public management systems. Water utility authorities can float tenders to attract leading startups

and organisations to build, operate and transfer smart water systems. PPP in smart water management not only offers business opportunities for various private sector organisations but also ensures continuous innovation from the public authorities' standpoint.

- **Workshop with public authorities:** Public advocacy organisations, consulting firms and technology innovators need to hold workshops with public bodies to keep them abreast of the latest technological developments and the various benefits that can be realised in public management systems.
- **Engagement with beneficiaries:** The water supply authorities or the Urban Local Bodies themselves need to engage with beneficiaries on a continuous basis to discuss the problems being faced and build consensus on possible solutions that can help them.
- **Mentorship from benchmark cities:** Urban development authorities can reach out to smart cities that have already implemented smart water solutions and request guidance from the respective leadership stakeholders on the implementation plans and roadmaps.
- **Innovative financing methods:** Project financing is a major obstacle as implementing IoT and SCADA-based hardware requires a significant amount of money. Since the public systems depend on financing the systems through taxpayers' money, innovative financing options can be looked at. For example, through public-private partnerships, capital funds can be utilised to implement the systems. Performance or KPI-based financing can also be explored to bridge the gap in financing needs. Innovative financing can be a breakthrough in implementing smart water management systems.

SUMMARY AND CONCLUSION

In conclusion, there are good arguments in favour of smart metering and digital water management solutions. They have the potential to optimise water resource usage, minimize non-revenue water, and enhance tax efficiency with benefits for all stakeholders. The challenges of infrastructure development and maintenance, as well as navigating the digital ecosystem can be addressed by public-private partnerships, mass awareness building, and stakeholder training.



ABOUT THE AUTHOR



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Bibhu Prasad is a senior consultant with specific interest in urban development. He has also worked with few state governments and the central government for implementation of urban development projects. He has worked with clients on performance improvement, cost optimization, new market entry strategy projects. Other than consulting, Bibhu has worked with companies in the mining, banking, and logistics sectors.



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Shreyus Gopalakrishnan is a consultant with 4+ years of experience in Business plan formulation, Go to Market strategy, Market entry and Digital Transformation across sectors such as Agribusiness, Manufacturing and IT. His experience prior to Avalon includes working with the strategy department of an Agribusiness startup on areas such as carbon credits and market place platforms for farmers. Personally, he loves travelling to new geographies and exploring new cultures.



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BUILDING SUSTAINABLE WATER SUPPLY WITH SMART METERING

By Kriti S. Golwalla, Marketing Manager for APAC and Middle East region at Kamstrup



Shirpur Warwade is the first town in India to implement smart water meters and automatic meter reading system for 100% connections. Today, with the data received from 13500 smart meters installed, the daily water supply has reduced by 33% and time spent on the entire billing process has become one-third than earlier. Finally, the citizens of Shirpur have a new appreciation of the water they are consuming.

Despite its only 80,000 inhabitants, Shirpur Warwade in the Dhule district in the north of Maharashtra is a progressive town well-known within the areas of education and innovation. In 2013, Shirpur-Warwade Municipal Council (SWMC), the public utility managing the water supply in the draught-prone city, launched a milestone project of establishing 24x7 water supply throughout.

Until then, Shirpur citizens had intermittent water supply, which led to improper water usage by most consumers. During supply hours, they would fill up buckets and tanks and use water carelessly. Moreover, the council had no proper tracking

mechanism of water supplied and consumed. Instead, consumers were billed at a flat rate on a yearly basis. The lack of accountability also meant a high number of unauthorised connections resulting in theft of water.

In addition, the process of manual meter reading, billing and revenue collection was extremely time-consuming and resource intensive. Moreover, the intermittent supply made the pipeline network vulnerable to bursts and leakages and little attention was paid towards repairs, as timely information was not available.

In its endeavor to ensure each household clean water 24x7, SWMC was looking for a smart water metering solution that would allow them to efficiently measure and manage consumption as well as introduce fair billing for its customers.

CHOOSING THE RIGHT SOLUTION

The council's primary focus was finding reliable

quality meters and a dependable Automatic Meter Reading (AMR) solution with long-term operations and maintenance. Kamstrup checked all the boxes and in 2014, SWMC chose them as the city's smart metering solution provider.

Kamstrup smart meters overcome the shortcomings of traditional meters like air measurement, low flow challenges and recalibration and repair every few years. In addition to their life-long pinpoint accuracy, they include smart alarms that detect incidents like leak, burst and tamper. And their robust AMR solution drastically reduces manual efforts and risks of human error.

A CHALLENGING STARTING POINT

Since the beginning of meter installation in 2014, Kamstrup has been actively involved with SWMC as a change management partner. As the citizens of Shirpur were initially resistant to the new metering policy, this included conducting training sessions and

reading trials for council employees to empower them with grievance handling and preparing consumer demos to ensure transparency and trust between the council and its customers.

The actual installation was not trouble-free either. As an example, narrow lanes and dense housing infrastructure made it impossible to install the meters in the traditional horizontal position. However, thanks to the ultrasonic technology, Kamstrup meters work equally well in any direction and could therefore be installed in the vertical position.



DAILY WATER SUPPLY REDUCED BY 33%

Shirpur began the official cycle for water bills in April 2018 and has already seen great results in terms of both water and time saved. With the Kamstrup metering solution, they are now recording monthly readings and issuing quarterly bills based on volume consumption, which has benefitted both SWMC and Shirpur citizens. “Today, it is much easier to track consumption and customer complaints have reduced a lot”, says Shri Ulhas Agarwal, then HOD – Water Supply, SWMC. In addition, improved ease of operation in day-to-day tasks and supply process efficiency translates into an increased level of service from the field service department and boost employee performance and morale.

COMMITMENT TO WATER PRESERVATION

The efforts SWMC put into generating awareness about water conservation and consumption-based billing has paid off. In the last 2 years, the number of high-volume consumers show a sharp decline and the otherwise low consumption consumers are now seen on the map due to the transparent and automatic meter reading mechanism.

The council has also realised and converted many unauthorised connections, thereby adding accountability at each step. Previously, most Shirpur citizens worried that their water bill would increase once the meters were installed but after seeing their

exact consumption readings and being billed accordingly, they are now committed to conserving water.

“We now know how much water we are consuming on a daily basis and we are using it carefully. Even with the scarcity of water and depleting rainfall, we are assured that we will have an equitable water supply since we are paying as per consumption. This meter is very useful for that” says, Harish Mahajan, citizen of Shirpur.

The effect of increased awareness is very noticeable and promising for the future, says Shri Amol Bagul, CO, SWMC: “We usually see a huge spike in water consumption in May compared to April due to the summer season, but this time, thanks to customer awareness and meter installation, we have actually been able to save 15 million litres of water in May, 2018.” Furthermore, he boasts about the 100% revenue collection the council experiences since smart metering solution came into operation.



	Pre meter installation	Post meter installation
Water consumption	No estimate of water consumption per capita	Exact data on water consumption per capita
Water usage	No control on water consumption, excess water usage	Citizens have become conscious about their consumption and it has drastically gone down
Daily water supply	120 million liters	80 million liters
Billing structure	Flat rate billing	Consumption-based billing
Bill generation	Annually	Quarterly
NRW information	No data available	Detects leak, burst, and dry with the smart alarms of the meter
Meter reading	No accountability for water	Automatic Meter Reading
Meter reading and billing	50 – 60 days	Within 5 days
Connection holders	A high number of unauthorized connections resulted in the theft of water	A high number of authorized connection holders eliminating any theft
Customer service	Disconnect between the council and consumers as no data was available for meter reading	Trust and transparency between the council and consumer due to accurate meter reading

About the project

No. of smart meters installed
13,500

Add-Ons
10 years of Operations & Maintenance with extended warranty

Contractor
Padmavati Constructions

O & M Contractor
Balraj Tech. Solutions

Kamstrup Solution
FlowIQ® 2101 ultrasonic smart water meter, automatic meter reading solution with USB meter reader and software.



ABOUT THE AUTHOR



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Marketing Manager for APAC and Middle East region at Kamstrup

Kriti S. Golwalla is a passionate marketer who enjoys working closely with customers. It is intriguing for her to create impact through consumer insights, especially in this challenging market of energy and water consumption and drive business benefits. As Marketing Manager for APAC and Middle East region at Kamstrup, her focus is on developing new markets and customer segments and identify innovative ways to interact and engage with them.

INTEGRATION OF URBAN FLOOD MANAGEMENT WITH SMART CITY MISSION

By S.K. Mazumder, Retd. Professor of Civil Engineering, Delhi Technology University (DCE), Former AICTE Emeritus Fellow and Dean of Technology, Delhi University

INTRODUCTION:

India is a signatory to the 2030 agenda for sustainable development and has committed to achieving inclusive, safe, resilient, and sustainable communities and settlements. India's urbanisation story is one that is unprecedented with 483 million (34.9 per cent) people living in cities in 2020, and the share is expected to rise to 43 per cent in 2035. The country's flagship urban missions—housing for all, clean india mission, smart cities mission (SCM), Atal mission for rejuvenation and urban transformation (AMRUT), national mission for sustainable habitat, national urban livelihoods mission—have transformed over 4,800 cities and towns. (SCM, 2015)

ABOUT SMART CITY MISSION

SCM offers a unique scale for sustainable development goals (SDG) localization. The SCM mission has undertaken over 7,800 projects across 100 cities since its inception in 2015 and directed an investment of over USD 22 billion. These projects fall under the ambit of area-based developments (60 per cent of total projects) and pan-city smart solutions (40 per cent), which focus on the entire city. So no space is left behind and all communities benefit from the mission's investments. The largest share of projects and investments are directed towards basic infrastructure and services which seek to improve the liveability outcomes in the emerging urban areas. The three pillars of the mission are liveability, economic ability, and sustainability.

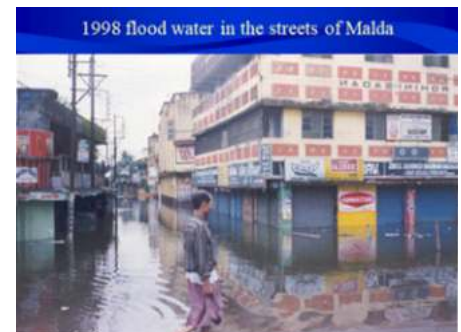
DIFFERENT OBJECTIVES OF SCM

Nearly 44 per cent of the total SCM projects contribute to clean water; sanitation has the second largest share of projects at 13.3 per cent followed by affordable clean energy at 8.6 per cent and decent work and economic growth at 6.4 per cent. The three pillars of SCM are liveability, economic ability, and sustainability. These are further subdivided into 21 distinct sub-sectors e.g. education, health, housing and slum up gradation, water supply, sewerage, roads, solid waste management, public transport, energy, recreation, Green environment etc. (SCM, 2015).

URBAN FLOODING AND ITS IMPACT ON SCM

Unfortunately, urban flooding and flood management is not included in the agenda for SCM. Most of the civilizations in the world have come up by the side of rivers. Rivers are not only source of water for municipal and industrial consumptions, they also act as drainage channel for disposal of storm run-off and waste water water transport, recreation etc. For example, megacities like Delhi is on the bank of river Yamuna; Kanpur, Patna. Allahabad (Prayagraj) lie on the bank of river Ganga; Kolkata is located on the bank of river Hooghly—a branch of Ganga. Floods in these rivers severely affect the housing, transportation and other infrastructures of the cities making life miserable. Similar flood damages are reported in the cities of Surat, Patna, Mumbai, Guwahati located on the side of rivers Tapi, Ganga, Mithi and Brahmaputra respectively. Destruction in Kedarnath town by GOLF in river Alkananda and that in Malda on Ganga river banks are shown in photographs-1 and 2 respectively. It is of utmost importance, therefore, that urban flood management should be integrated with SCM to avoid

loss of infrastructures built with huge investments under SCM.



Flood damage in Malda town



Devastation of Kedarnath town by GOLF in river Alkananda in 2013

URBAN FLOOD AND FLOOD MANAGEMENT

Different causes of urban floods

People curse God when floods damage localities in the pre-development stage. Same people ask for compensation from project authorities when flood damage occurs in post-development period. Principal causes of urban flooding are

- Excessive rainfall in a short period
- High run-off as most of the open spaces are covered
- Existing water bodies are filled in to meet the increasing need for human habitations, roads, industries etc.
- Poor and outdated design of storm drainage sewers/drains and lack of proper maintenance of the drains reducing their carrying capacity
- Submergence of drain at outlets due to rise in HFL in the river and lack pumping
- Poor people encroaching on flood plains due to lack of proper flood plain zoning, regulations and administration.

Urban flood control/management

Before adopting any flood control management measure in urban areas, it is extremely important to diagnose the exact cause of flood. Broadly, the measures may be grouped in to two categories, namely, structural and non-structural measures, as briefly discussed in the following paragraphs.

STRUCTURAL MEASURES

Those engineering measures which aim at reducing flood peaks by storage of water in the catchment areas, improving carrying capacity of channel for a given peak, reducing run-off from the catchment.

Storage of run-off

Flood peaks can be substantially reduced by storage of water in the catchment called flood routing as illustrated in Fig. 1. Tehri reservoir u/s of Tehri dam has considerably reduced flooding in Uttarakhand and UP. Similar storages in Bhakra dam and Maithon dam have reduced flood peaks and damages in the states of Punjab and West Bengal respectively. These are large storage reservoirs which can be built in hilly and mountainous areas only since cultural values of the submerged land is very little.

In plain areas, however, people will not allow construction of high dams and overhead storage reservoirs since the lands are very costly and losses may be more than benefits. In such situations, use of retention/detention tanks are very useful in substantially reducing floods as illustrated in Fig. 2. It may be seen that storage in such tanks (shaded area) aims at reducing the flood peak arising due to urban

development. It is brought to pre-development flood peak by temporarily storing run-off in the tanks. They are also beneficial for domestic uses, desilting of flood water, recharge of ground water, fish culture, recreation etc. Suitable pumping system has to be installed to evacuate water from these tanks so that they may rout subsequent floods as per rainfall frequency. A typical detention basin is shown in Fig. 3 Further details about the design and operation of these tanks are available elsewhere (Mays, 1999)

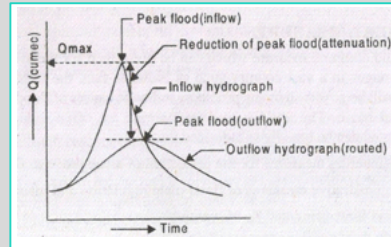


Fig.1 Illustrating routing peak inflow flood outflow peak by storing run-off (Note: area between inflow and outflow hydro graph is the required volume of storage)

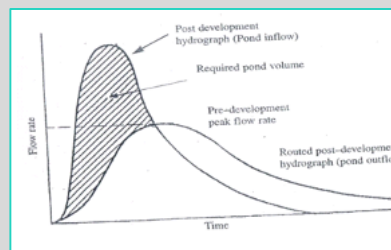


Fig. 2 Storage in detention/retention tank (shaded area) help to rout post development peak to pre development peak

Improving drainage system

One of principal causes of urban flooding is poor and unscientific drainage system. They must be designed scientifically as per time of concentration, design magnitude, intensity and frequency of rainfall. IRC:Sp:42 (2014) gives the details of computing run-off and sizes of conduits. Different causes of urban flooding and remedial measures are discussed.

River training/improvement/flood embankments

There are several reasons which causes rise in high flood level (HFL) in a river and consequent reduction of carrying capacity of drains due to submergence at their outfalls (Mazumder, 1966). Desilting/dredging help in reduction of HFL and free drainage of sewer water. Flood embankments are preventive measure from flooding/protecting urban areas. However, such embankments unless maintained properly cause breaching and sudden flooding.

Proper sluices/pumping facilities must be provided to evacuate flood water to avoid water logging.

Rainwater harvesting

Run-off is rainfall excess which is governed by losses due to infiltration/interception/evaporation. The losses due to infiltration etc. are reduced considerably in post development period since most of the open spaces are covered, trees removed and water bodies filled in to meet the increasing need for human habitations, roads, industries etc. As shown in Fig. 2, post development flood peak is always higher than pre-development peak in city areas. Rainwater harvesting-natural or artificial- is extremely useful to increase losses due to infiltration and reduce run-off and flood peak. It also helps to increase ground water storage and ground water table. More details are available in the book 'ground water hydrology' by Todd (1980).

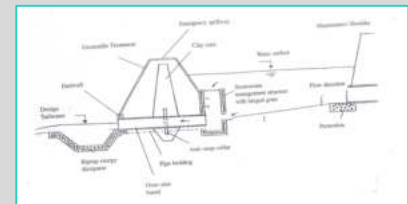


Fig.3 Sectional View of Detention Basin (Source:Hydraulic Structures-Design and Construction Hand book-By Mays, Mc.Graw Hill,1999)

NON-STRUCTURAL MEASURES

They comprise of flood forecasting, soil conservation, flood fighting etc. details of which are available in a book by the author (Mazumder, 1970).

SUMMARY AND CONCLUSION

Govt. of India has an ambitious plan of improving life quality by implementing smart city mission (SCM) through development of infrastructures. However, no mention is made about urban flooding and flood management in the proposed SCM. The present paper is intended to fill in the gap. Different causes of urban flooding have been analysed and flood management principles and practices are outlined.

REFERENCES

1. IRC:SP-42 (2018) "Guidelines for design of highway drainage" pub by Indian Roads Congress, Kamakothi Marg, R.K.Puram, New Delhi
2. Mays, Lary W.(1999) "Hydraulic Structures Design and Construction Hand Book", Chapter-14, 'Hydraulic Design of Urban Drainage Systems' by Ben Chie Yen & A.Osman Khan, pub.McGraw Hil
3. Mazumder (1966) "Limit of submergence in a critical flowmeter", J. of Institution of Engineers, India ,Vol. IXV No. 7 pt. CI March , 66
4. Mazumder, S.K.(1970) "Irrigation engineering"pub. Galgotia publications,Ansari road , New Delhi.
5. SCM (2015) "Smart cities mission-Publication by the Min. of housing, Govt. of India
6. Todd,Victor Keith (1980). "Ground water hydrology" pub. John Willey & sons, Inc. New York,Toronto, Singapore



ABOUT THE AUTHOR



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Born in 1938, Prof. S.K. Mazumder graduated in Civil Engineering from B.E. College, Shibpur (now IEST, Shibpur, Howrah, West Bengal). He took his M.Tech. and Ph.D. degrees in Civil Engineering (Water Resources) from IIT, Kharagpur. He is Fellows of CBIP, IAHR, IEI, ISH, & IWRS and members of CDC, CEAI, ECI, IDC, IPHE, IRC & ISCA. Prof. Mazumder has 62 years of teaching, research, design & consultancy experience in hydraulics & water resources engineering.

Prof. Mazumder guided 30 thesis at M.E. and Ph.D. levels and 10 projects at B.E. Level, authored 2 books, edited 1 book and contributed chapters 3 books. He carried out several research projects sponsored by Govt. & private bodies. He has published 216 technical papers in reputed National / International journals and Conferences in India and abroad. He delivered several key-note /lectures and chaired many sessions on Hydraulics &Water Resources.

He was an Assistant Engineer in Irrigation & Waterways Directorate, Govt. of West Bengal, during 1959-62. Lecturer at IIT (Kharagpur) during 1962-67, Assistant Professor at R.E. College (now NIT), Durgapur, during 1967-75 and Professor of Civil Engineering (Hydraulics &Flood Control) at DCE (now DTU) during 1975-98. He was AICTE Emeritus Fellow during 1998-2000. During Feb.-Nov.,1991 he was a visiting professor at Swiss Federal Institute of Technology, EPFL, Switzerland. He was Head of Civil Engg. & Dean, Faculty of Technology, University of Delhi. During 1973-1975, he was Hon. Secretary of The Institution of Engineers, India at Durgapur center and Hon. in -charge of evening coaching classes for students from Durgapur -Asansol industrial belt.

He was a member of Expert Assessment Committee (EAC) in Irrigation & Flood Control group, Min. of Environment and Forest, Govt. of India. He was a member of Governing Body of National Institute of Hydrology (NIH), society ass minister's nominee. Currently, he is one of the faculty members of Indian Academy of Highway Engineers (IAHE).

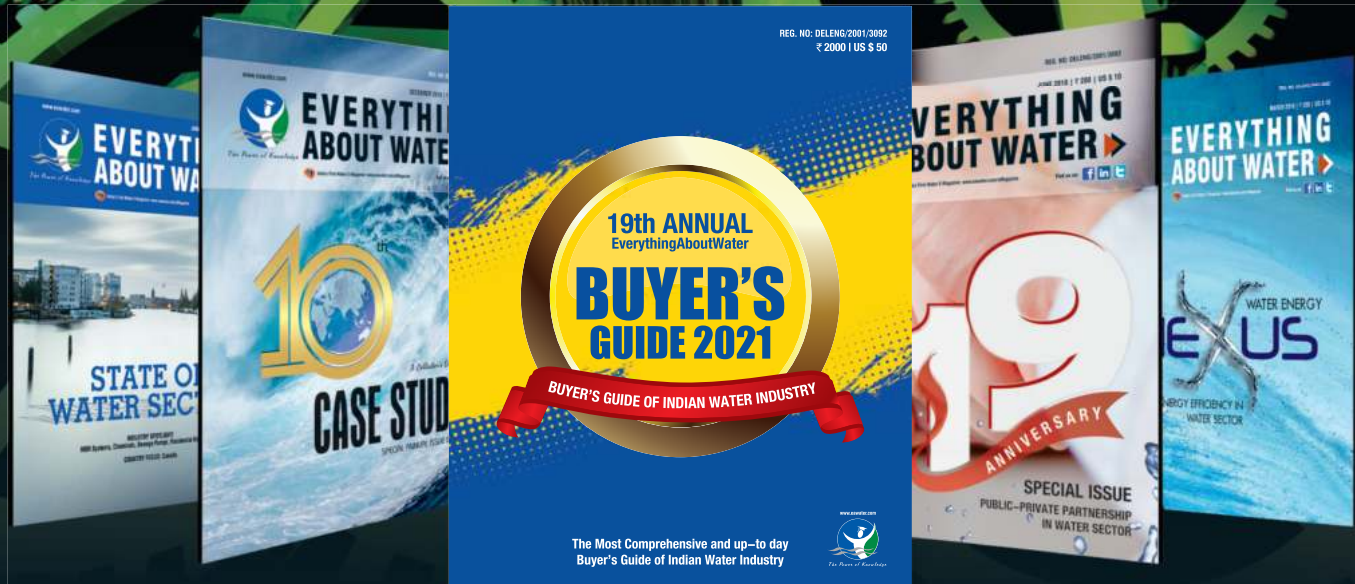
After retirement, Prof. Mazumder served a no of consultancy organizations e.g. ICT Pvt. Ltd, Scott Wilson India Pvt. Ltd., Aqua Green Engg. Pvt. Ltd., Rambol (india) Pvt. Ltd. He is retained by M/s Maccaferri (India) Pvt.Ltd.

He got several awards from the Institution of Engineers (India), Indian Roads Congress (IRC), Distinguished Leadership Award from ABI (USA), Distinguished Professor award from DCE . in 2009, he received 'Life Time Achievement Award' from Indian Society for Hydraulics (ISH) at CWPRS, Pune, for his immense contribution in Hydraulics and Water Resources Engineering. He received best reviewer awards from ISH for the years 2019-20 and 2020-21 . He was the guest editor for the Journal vol. 51, no. 1, March 21, on the topic 'Scour and Scour Protection for Bridges' published by The Indian National Group of the International Association for Bridge and Structural Engineers.

He is actively associated with formulation of Indian codes e.g. Bureau of Indian Standards (BIS) and Indian Roads Congress (IRC) for formulation of codes /guidelines. He received a letter of appreciation from Bureau of Indian Standard, Govt. of India, for his contribution in the areas of Flood Management, Erosion Management and Diversion Works sectional committee (WRD 22) and Canals and Cross Drainage Works sectional committee (WRD 13) . Further details are available in his **website: www.profskmazumder.com**



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HOW PREDICTIVE MAINTENANCE IS HELPING IN THE FIGHT AGAINST WATER SCARCITY

By Krishna H. Prashanth, Global Product Line Manager- Measurement and Analytics, ABB

Despite 70 percent of the Earth's surface being covered in essential, life-sustaining water, only three percent of it is fresh and accessible for human and animal consumption, or for growing crops. The remaining 97 percent of fresh water is trapped in polar ice caps and glaciers.

Currently, approximately four billion people — almost two-thirds of the world's 7.7 billion population — experience severe water scarcity for at least one month every year, while more than two billion people live in countries with a permanently inadequate water supply.

And that's a major issue. With the world population projected to grow by an additional two billion by 2050 and the global water shortages that are already commonplace in several regions, industries and municipalities worldwide are urgently seeking solutions that will avoid a full-scale water supply crisis.

Clean water scarcity can be caused by many things, including diminishing physical resources triggered by climate change; but can be equally caused by inefficient distribution or waste management infrastructures, or the failure of regulatory bodies to protect and conserve existing sources of supply. This highlights the urgency of putting measure in place,

but it also highlights the need for it to be done quickly, with a coordinated approach.

Fortunately, new instrumentation and analytical measurement tools that take advantage of state-of-the-art digital technologies are now available that can help to address these challenges and transform the way that water is treated and managed.

NEW TECHNOLOGIES, NEW POSSIBILITIES

As in any process, improvement in the way that water is managed starts with measurement. Whether it's measuring dissolved oxygen levels in aeration to optimize energy consumption or using flow and pressure measurement to pinpoint leaks in distribution networks, instruments and analyzers provide the vital frontline in fine-tuning the performance of water treatment and distribution processes.



The latest generation of digital measurement instruments and analyzers not only provide high quality water assessment throughout potable and wastewater treatment processes, but also measure the efficiency of the water treatment plant itself.

Through the enhanced insights delivered by these technologies, operators can make informed decisions based on data that reflects real-world, near real-time operating conditions.



THE POWER OF PREDICTION

To understand the benefits of predictive maintenance, it is important to distinguish between it and other types of maintenance regimes, specifically “run-to-fail”, and preventive maintenance approaches.

As its name suggests, run to fail involves simply running the instrument until a failure occurs and then fixing it. This can pose particular risks where a device is used as part of a critical function such as fluoride or chlorine dosing, which could have a direct impact on both water quality and human health. Even if safety is not directly involved, the instruments may be critical for other reasons, such as measuring effluent flows or residual turbidity and total suspended solids levels to ensure compliance with environmental regulations.

By contrast, preventive maintenance seeks to structure a programme of intervention to ensure an instrument does not get into such a condition that failure is likely. This is an effective method but can be costly for all but the most critical instruments. – It can also lead to instruments being unavailable for a time.

Predictive maintenance evaluates the condition of an instrument via periodic or continuous condition monitoring, using this data to determine when to perform maintenance, as opposed to relying on a maintenance schedule based on historical information. These maintenance activities are performed during normal operations to minimize disruption.

The move to digital instruments has made this easier. These instruments produce a wealth of information,

not only about the parameters they are designed to measure, but also about their own performance and how they are maintaining their designed accuracy. Many devices can conduct checks on their own circuitry, aid calibration and evaluate their own performance. The result is lower maintenance costs, a longer equipment life and reduced downtime. Predictive maintenance also improves production quality by addressing problems before they can lead to equipment failures.

The concept of the Internet of Things (IoT) is also influencing how predictive maintenance is achieved. Connected instruments that can send their data to a remote server, either hosted on the user's premises or by the instrument vendor, are essentially part of the IoT world.

Today's sensors are increasingly using AI and Machine Learning to rapidly understand, learn from, and predict performance to help identify where and when problems are either occurring or are likely to occur.

Using data obtained and analysed by AI-based

and how certain types of maintenance are required so human resources can be more efficiently scheduled and distributed.

A machine-learning model can reliably pinpoint issues with virtually any system component and provide a highly informed prediction of time to failure (TTF). By predicting TTF, the sensor enables manufacturers to intercede more effectively and schedule repair tasks when they are needed, ensuring that uptime is kept to a maximum.

There have been attempts to introduce predictive maintenance in the past, but those models typically relied on human expertise to interpret increasingly vast volumes of data, which is beyond the capacity of smaller teams of engineers. A highly trained algorithm, that readily absorbs and quickly learns from data over time, can make swift and accurate predictions that can then be turned into action.

That's not to say that predictive maintenance should replace preventive maintenance.

There is a place for both, but if deployed in parallel,



sensors to predict the need for maintenance largely negates the necessity of paying multiple visits to check equipment or systems that may or may not require a service.

The ever-increasing availability of cloud computing and the power it delivers to machine learning and artificial intelligence algorithms, devices and applications mean that predictive maintenance devices are only going to become increasingly sensitive and much more intelligent because they will have access to vast volumes of data that they can readily understand and interpret for operational maintenance personnel, therefore making increasingly accurate predictions as to when, where

they should work together to ensure the best possible outcome for their respective aims.

Sensors that enable predictive maintenance are by themselves designed to be exceptionally low maintenance. In fact, some are 100 percent maintenance-free. That makes them even more attractive for deployment both locally and in remote areas to keep a much closer eye on any discrepancies to water quality, treatment, or volume.

KEEP IT SIMPLE

Simplicity is another very important factor in ensuring that devices can be deployed quickly, easily and to the

best effect. The aim is to maximize the utilization of maintenance engineers by enabling them to do more, more easily and more quickly. By limiting complexity without decreasing performance, digital measurement sensors and transmitters enable a much broader range of water and waste management procedures to be handled either fully remotely, or with a much-reduced staff, without compromising quality, safety or production.

Furthermore, because these transmitters use ABB's common operating interface, operators trained on one device can apply the same knowledge to program and operate any other instrument or analyser with a minimum need for further training.

IMPROVEMENT STARTS WITH DIGITAL MEASUREMENT

The inherent benefits of digital water quality and operational treatment sensors mean they are well-placed to help organisations to meet the goals of tackling water scarcity, meeting increasingly stringent environmental protection legislation, and maintaining and profitability through reduced operating costs.

Digital data, combined with online analytics, machine learning, and help from virtual assistants, are making predictive maintenance more mainstream and accessible. As ever more sensors swap from analog and become part of the digital world, users will be able to gain a far better understanding of their real maintenance needs, cutting costs and keeping water treatment plants and distribution networks running smoothly while ensuring critical operations are monitored constantly.

For more information, visit: abb.com/measurement.



ABOUT THE AUTHOR



Krishna H. Prashanth
Global Product Line Manager-
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Many regions of the world are experiencing growing water scarcity as supplies are stretched to meet a growing range of demands. Krishna H. Prashanth, Global Product Line Manager-Measurement and Analytics ABB, explains how the latest digital measurement technologies are helping to maximize the operational efficiency of water treatment plants by helping to predict when problems are likely to happen so that timely action can be taken to avoid them.



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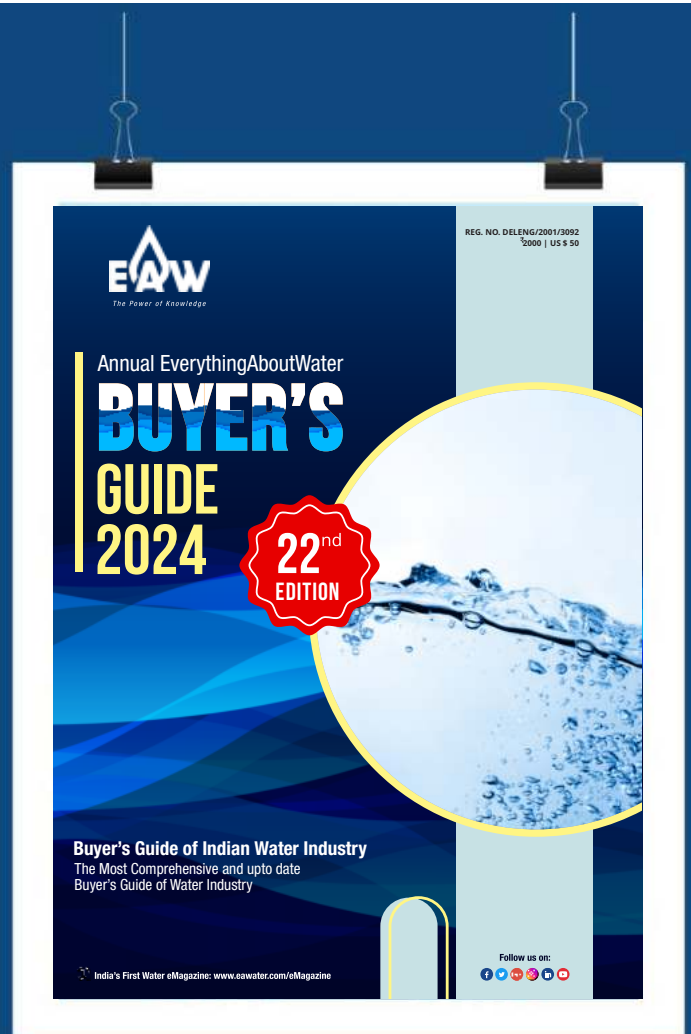
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iPUMPNET: SMART TECHNOLOGY FOR EFFICIENT PUMPING

Anil Sethi, Chairman, Pump Academy Private Limited

Water is a unique resource, having paramount importance for both human and economic development, as well as for sustaining livelihoods. But it is unevenly distributed globally, and in India which is having almost 18% of global population, only 2.5% of fresh water resources are available. Even the limited quantity is declining due to unsustainable consumption and resource management.

Access to safe drinking water was declared as a human right by the United Nations in 2010, but this remains a challenge for India. Depleting ground water, lack of storage facilities, inadequate rainwater

harvesting mechanism and increasing water pollution in the ground water and water bodies like ponds, lakes, rivers due to sewage and industrial effluent discharge, and agriculture runoff are posing extreme challenge for water utilities.

The international standard recommends classifying nations with per capita water availability below 1,700 m³ per year as water-stressed. Considering this criteria, India is projected to experience a reduction in per capita water availability to 1,401 m³ by 2025, decreasing further to 1,191 m³ by 2050, intensifying the water stress. Given India's development path,

encompassing population growth, economic activities, production demands, rapid urbanization, shifts in food consumption, changing lifestyle, and water use practices, more significant water challenges may need to be addressed in coming years.

WATER PUMPING STATION

Water and energy are vital resources, and their effective management can provide significant economic and environmental benefits. From historical era to modern times, several measures, including



economic and political factors have been considered to control energy consumption. Over the past few decades, water utilities have been challenged by new stringent regulatory requirements, increased costs and energy demand, and reduced availability of quality water sources. The water supply and water availability will fully depends on energy consumption. This means optimizing the pumping station and distribution system of water for sustainability.

Water pumping station, an essential infrastructure of water distribution system helps transporting water from one location to another. Operating a pumping station incurs substantial capital costs, and the pumps demand a significant amount of electricity to operate. Pumping systems are responsible for a significant portion of the total electrical energy use. Considering the increase in energy prices in water distribution systems, the issue of optimal operation of pumping station is very crucial.

According to MDPI reports, the electrical energy utilized in water pumping constitutes a substantial portion of the overall operational expenses, accounting for approximately 20% of the world's total energy consumption in pumping systems. This presents a significant energy challenge and imposes a considerable financial strain on water utilities and industries. Reports show that the electrical energy used to pump water, comprises a high portion of the total operational costs of the water supply system.

Enhancing energy efficiency of water-pumping station is very important for minimizing the electricity consumption and reducing power bills. A viable approach to achieve this objective involves incorporating iPUMPNET to optimize the operations of pumps, thereby offering substantial benefits.



Pumping stations constitute a substantial investment and the costs associated with their replacement can be considerable. These stations are integral components of water and wastewater infrastructure, designed to facilitate the efficient movement of fluids within the system. Given their critical role, any malfunction or failure not only disrupts service but also poses financial implications for the utility.

The expenses related to replacing pumping stations involve not only the procurement of new equipment but also the costs associated with installation, commissioning, and potential modifications to the existing infrastructure. Moreover, the process of replacing machineries stations often requires careful planning and may result in downtime, further aggravating the impact on services and potentially leading to additional costs associated with emergency response measures.

In light of the significant financial outlay involved, the importance of proper operational management, routine maintenance, and proactive issue resolution becomes even more pronounced. By safeguarding the longevity and efficiency of pumping stations, utilities can mitigate the need for premature replacements, optimizing the return on investment and ensuring the continuous and reliable function of water and wastewater systems they support.

iPUMPNET: THE GAME CHANGER

Maintaining the water and wastewater systems depends heavily on the dependability of pumping stations. A single system failure or breakdown in the system can lead to substantial disruptions in water and wastewater services, posing risks to public health, causing property damage, and resulting in revenue losses. Effective operational management plays a crucial role in enhancing system reliability by identifying and resolving issues before they escalate into equipment failures. IIoT (Industrial Internet of Things) based system can further enhance the effectiveness of operation and maintenance by leveraging real-time data from connected devices and sensors



The potential energy savings from implementing iPUMPNET across all water pumping stations in India are estimated to be nearly 5 gigawatts (GW).

Recognizing the necessity for a transformative approach to the operation and management of pumping stations, Pump Academy Private Limited identified shortcomings in traditional methods, which often led to inefficiencies, elevated maintenance costs, and restricted control over pump performance. With a combined experience of establishing over 500 medium and large pumping stations in India, and steadfast commitment to altering this landscape, it embarked on a mission to transform the industry.

It introduced a groundbreaking solution called iPUMPNET, a patented IIoT-enabled system designed to optimize the management of pumping stations. Harnessing the power of digital technologies, iPUMPNET enables intelligent pump monitoring, remote control, and real-time data analysis. The advanced system offers invaluable insights into pump performance, facilitating proactive maintenance, energy optimization, and minimizing downtime.

iPUMPNET aims to improve the operations of pumping stations while enhancing energy efficiency thus making the pumps smart and responsive. It is a secure and centralized platform that monitors pumping station operations in real-time through an intuitive dashboard interface accessible via internet and mobile applications.



The implementation of iPUMPNET across all water pumping stations in India is anticipated to result in a substantial decrease of about 3.06 million tonnes in carbon emissions. This accomplishment would represent a significant stride realizing the ambitious objective of achieving Net-Zero Emissions in India by 2070, as envisioned by the Honourable Prime Minister of India.

iPUMPNET can improve:

- Pumping stations operational efficiency upto 35%,
- Reduce energy cost by 25%,
- Extend the life of pumping systems by 50%,
- Reduce the life cycle cost (LCC) of pumping stations by 40%,
- Practically eliminates unscheduled breakdowns and maintenance requirements

It streamlines workflows and improves overall efficiency of pumping stations; provide access to legacy data, helps in functional reporting while providing control through centralized monitoring system thus helping authorities with deep insights and remote evaluation. It converts the dynamic performance of machines into running parameters by linking electrical, mechanical, and hydraulic factors. It also gathers real-time pump health data and issue alerts to predict and detect potential risks and pump failure.

The implementation of iPUMPNET across all water pumping stations in India is projected to result in potential energy savings of approximately 5 gigawatts (GW). Based on the current cost of energy generation, this could lead to revenue savings in the range of Rs. 250 billion.

COURSE OF ACTION

Pumping stations constitute a substantial investment, and the associated costs for their replacement can be notably high. The financial implications of replacing pumping stations underscore the importance of preventive maintenance and proactive management to extend the operational lifespan of these facilities.

The idea behind the development of iPUMPNET was to transform existing pumping stations into more efficient infrastructure that could be used in various sectors such as water supply, wastewater treatment, power generation, irrigation, oil and gas, paper and pulp and several other industries. Such technological interventions empower water utilities and industries with valuable insights, enabling them to make informed decisions and address water challenges more effectively, ultimately leading to a resilient and sustainable water management.

By implementing strategies to identify and address potential issues early on, water utilities can mitigate the need for costly replacements, thus maximizing the return on investment in pumping station infrastructure. The deployment of iPUMPNET not only provides protection against abrupt failures but also enhances long-term cost-effectiveness and contributes to the overall sustainability of water and wastewater systems.



ABOUT THE AUTHOR



Anil Sethi
Chairman, Pump Academy Private Limited

Anil Sethi is the Chairman of Pump Academy Private Limited. He has over five decades of expertise in the water sector with numerous commissioned projects. He established the company with the vision of offering innovative solutions to water utilities, aiming to transform pumping stations into technologically advanced, automated, and responsive entities with robust processes. His remarkable contributions to nation building initiatives have earned him widespread recognition, with numerous awards honouring his achievements.



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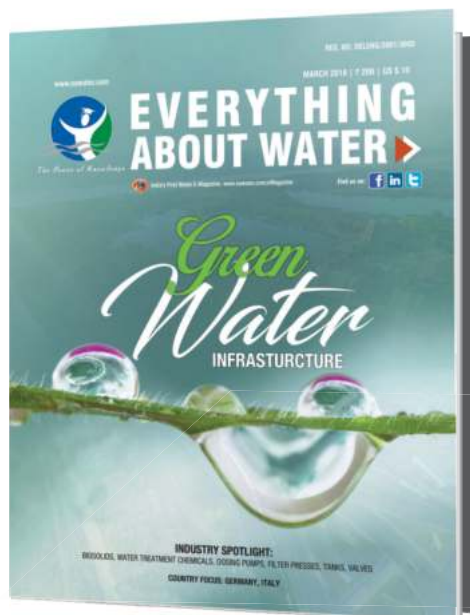
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SRWM (SMART REJECT WATER MANAGEMENT) IN DOMESTIC RO PURIFIER

By KD Sameer, EnviroChem Services (OPC) Pvt. Ltd.

INTRODUCTION:

Water is indispensable for life. Therefore, the quality of usable water should be conserved. Due to pollution, waste disposal, and increasing development, the quality of usable water is decreasing. Hence, there is an urgent need to address this problem at all possible levels to ensure the availability of safe drinking water. Currently, there are many processes available to remediate contaminated water. One of the best treatment methods for eliminating water contaminants is Reverse Osmosis (RO), which removes harmful impurities by membrane separation. In the RO, water gets filtered through semi-permeable membranes, which have a membrane pore size of 0.0001 microns, about 1/100 the diameter of a strand of human hair, allowing only water molecules to pass through and retain all the dissolved chemical contaminants. However, RO technology is not compatible with all types of water. The Water Quality Association India (WQAI) states that RO cannot be universally applicable for all water types due to its technology limitation of membrane filtration, which is the characterization of the ions, metals, or other particles to pass or retain apart from size. As membrane filtration works on very tiny pore-sized membranes molecularly separating dissolved chemical contaminants, these RO membrane pores cannot, by design, discriminate between so-called healthy or unhealthy chemicals.

The World Health Organization (WHO) defines Total Dissolved Solids (TDS) as inorganic salts and small amounts of organic matter present in a solution in water. Further, the WHO describes that dissolved solids present in water may affect its taste. Yes, taste and palatability, not purity.

In the report prepared by WHO in 2003, as reference material to set new water guidelines, water with TDS less than 300 mg/liter was deemed excellent, water with TDS between 300 and 600 mg/liter was good;

water with TDS between 600 and 900 mg/liter was fair; water with TDS between 900 and 1200 mg/liter was poor, and water with TDS over 1200 mg/liter was unacceptable.

From India's perspective, the Bureau of Indian Standards (BIS) prescribes a TDS value of 500 mg/liter as acceptable for drinking water. The said TDS value of 500 mg/liter is widely accepted as a benchmark for water quality and taste. Further, BIS specifies that, in the absence of alternative sources of water, the TDS up to 2000 mg/liter is the permissible limit. However, water with low concentrations of TDS may also be unacceptable because of its insipid taste.

RO water is suitable for high TDS areas, coastal areas of India like Gujarat, where there has been pesticide use like Punjab, or places where alternative sources of water are unavailable because RO is an effective solution for long-term uses. However, when RO purifiers are recommended as a household solution for the area having optimal TDS, the problem starts.

PROBLEM:

The RO process only eliminates chemical contaminants in the water, giving a free pass to all biological contaminants like bacteria and viruses. Currently, various technologies like ultraviolet (UV), Ozonation, Biocidal resins, and allied materials are readily available in the market for the treatment of said pass-through biological contaminants. Some available RO water purifiers combine RO with UV to immobilize biological contaminants. However, there is much evidence that this UV immobilization does not work, or at least in some cases unable to eliminate viruses like Hepatitis E. Further, one of the widely known problems that occur from consuming RO water is acute magnesium and possibly calcium deficiency leads to complaints of cardiovascular disorders, tiredness, weakness, or muscular cramps.

As stated, RO water doesn't contain enough minerals, when consumed, it leaches minerals from the human body. This means that the minerals consumed from food and vitamins are unavailable to the human body. The fewer minerals consumed with more minerals excreted from the human body causes various side effects and chronic health problems. Further, various scientific studies concluded that low-mineral water was responsible for an increased elimination of minerals from the body.

The stated characteristics of RO water, which doesn't contain enough minerals, on consumption also leads to dissolved electrolyte dilution in the human body. This inadequate dissolved electrolyte redistribution may compromise the function of vital organs. Conditions like tiredness, weakness, and headache are early signs with more severe symptoms like muscle cramps and impaired heart rate. Further, various scientific studies suggested that RO water may be a risk factor for hypertension and coronary heart disease, gastric and duodenal ulcers, chronic gastritis, goiter, pregnancy complications, and several complications in newborns and infants, including jaundice, anemia, fractures, and growth disorders.

The problem continues when used for cooking vegetables, meat, cereals, etc. The RO water causes substantial losses of all essential elements from the food. When quantified and compared with the mineralized water, these losses reach up to 60% for magnesium and calcium or even more for other micro-elements like copper 66%, manganese 70%, and cobalt 86%.

To overcome the said mineral deficiency in the RO water, according to the WHO, the practice of adding minerals back into the RO water could not be considered optimum, as the water does not contain all its beneficial components.

In the case of borderline deficiency of any given element, even the relatively low intake of the deficient element with drinking water may play a relevant protective role. It is practically not feasible to recreate natural water with all its minerals and trace elements in Domestic RO water.

THE SOLUTION:

To develop a Smart technology that preserves the characteristics of natural water and immobilizes biological contamination with utmost efficiency. The developed SRWM (Smart Reject Water Management) is a small attachment to the existing RO purifier, providing maximum recovery with optimum mineral preservation in the attached RO purifier.

The following are the results of the conducted studies.

Particular	Quantity	TDS, mg/l
Seawater	24	38000
Surface Water	96	280
Feed Water	120	7824

Table 1: Feed Water

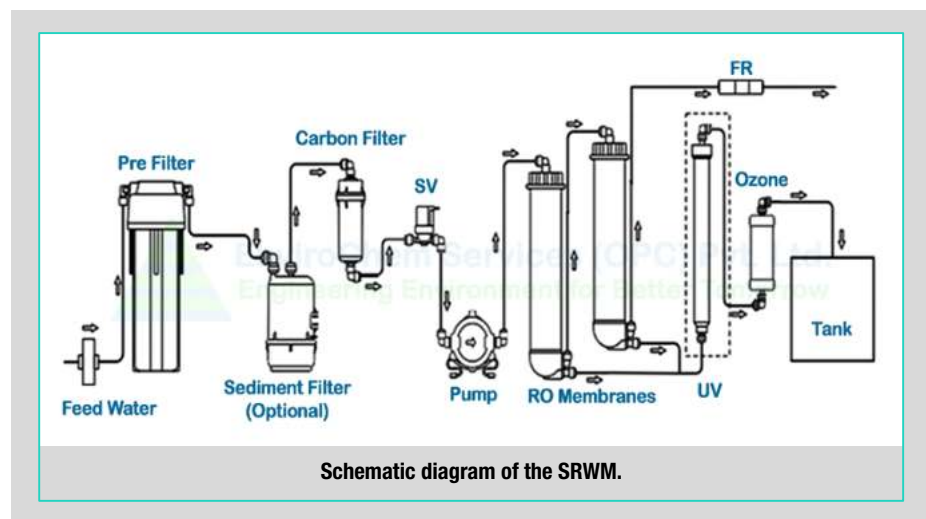
The unit SRWM in the Domestic RO Purifier tested for a couple of months on the mixture of 20% seawater (TDS of ~ 38,000 mg/liter) and 80% surface water (TDS of ~ 280 mg/liter). During start-up, the RO Purifier is fed by surface water only. After stabilization i.e. about 1 hr, the RO purifier is fed with seawater, gradually increasing and decreasing the seawater and

surface water flow, respectively, in the step of 120 liter/hr.

The optimum TDS and maximum TDS of 262 mg/liter and 304 mg/liter, respectively, were observed. The reduced reject water flow of 18% is observed in the SRWM when compared with the uninstalled RO purifier. Using such technologies in the RO purifier enables access to safe potable water in the household with minimum environmental impact.



Beneath the Earth's surface, there are massive underground oceans locked in the Earth's mantle. Scientists estimate that these hidden reservoirs of water may contain three times more water than all the surface oceans combined.



The SRWM measures the TDS at multiple locations and ensures that the TDS of RO water is between 100 mg/liter and 120 mg/liter.

Further, according to the WQIA, RO achieves about 20-30% purified water, draining about 70-80% of feed water. This drained water, also known as reject water, is saline as it has a higher concentration of chemical contaminants. The SRWM saves about 20-30% of reject water, further increasing the efficiency of the RO purifier to about 50-60%.

THE RESULTS:

The conducted studies show that recovery of domestic RO water system is directly proportional to water conservation and inversely proportional to the energy consumption per unit of treated water.

Particular Time, Min	Feed Water		Product Water		Reject Water	
	Flow, L/Hr	TDS, mg/l	Flow, L/Hr	TDS, mg/l	Flow, L/Hr	TDS, mg/l
0	120	280	97	42	23	1295
6	138	1483	110	113	28	6962
12	164	2754	128	162	36	11942
18	178	3284	141	225	37	14793
24	202	4023	156	301	46	16483
30	216	4378	162	303	54	16604
36	222	4516	175	301	47	20374
42	228	4647	182	302	46	22029
48	232	4731	183	303	49	21390
54	236	4812	191	303	45	24033
60	240	4890	192	304	48	23235

Note: Time starts after the stabilization of the Domestic RO Unit with Surface water

Table 2: RO Unit Test Results

CONCLUSION

As per The Energy and Resources Institute (TERI), direct drinking water consumption in India is limited to about 2-4 Liters/Capita.Day. Hence, we can save direct water of about 0.76-1.52 Liter/Capita.Day. Consequently, using such measures will provide every 3rd person with free RO water.

The benefits of SRWM in a Domestic RO Purifier are not limited to simultaneous TDS optimization. It also allows the designer to consider the lower reject water concentration and flow. Consequently, increasing the life of kitchenware and pipelines in buildings, commercial kitchens, and many more, with marginal commercial inputs on the system. Moreover, we are grateful to the Government of India, Vendors, Friends, and Family for their support in the Engineering Environment for Better Tomorrow.



ABOUT THE AUTHOR



KD Sameer
Envirochem Services (OPC) Pvt. Ltd.

KD Sameer is the Director of EnviroChem Services (OPC) Pvt. Ltd., the environmental and process consultancy, engineering environment for better tomorrow. Before this assignment, he held leadership positions in several leading water infrastructure companies. He is a chemical engineer and has done a postgraduate degree in chemical engineering. He has more than 9 years of experience of which over 7 years is at the EnviroChem Services as a R&D, Design, Engineering, Environmental, and Process Consultant.

EnviroChem Services (OPC) Pvt. Ltd. is established in the year 2016 with a vision of "Engineering Environment for Better Tomorrow." ESPL is solely working towards Air, Water, Soil, and Noise Pollution Abatement. EnviroChem Services takes up Wastewater Treatment Projects (ETP, CETP, WWTP, STP, ZLD, etc.), Water Treatment Projects (RO, DM, PSF, ACF, Advanced Membrane Filtration for Silica, Metal, etc. Removal, etc.), Water Conservation Projects (Rainwater Harvesting, Water Leakage Detection & Repairing, etc.), Air Pollution Control Systems (Cyclone Separator, Bag Filter, Volatile Organic Filters, Odor Control Systems, Air Purifiers, etc.), Municipal Solid Waste Management, Biogas Plant, Solar Power Projects, Waste-to-Energy, Soil Remediation, & Noise Reduction Measures.

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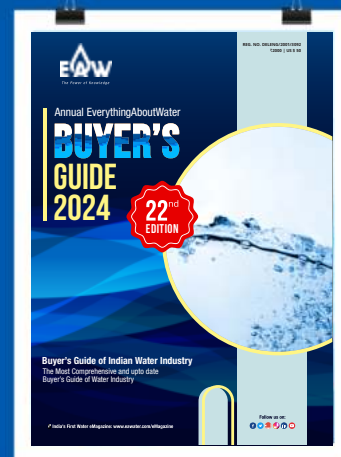
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THE FILTRATION THEORY: MEDIA TO MEMBRANE

By Dilip Yewalekar, Senior Vice President, Jain Irrigation and Manisha Kinge (M.Tech-Agri Engg), Jain Irrigation

Every day we sip - Filtered Tea/Coffee! It is also one kind of screen filter available in the market and we normally use it to separate solid tea/coffee particles and make the tea/coffee drinkable.



People are more vigilant and cautious about health related to water quality at home, in the office, in the hotel, and in travel. Although Municipal Corporations/Water Supply Agencies are adopting various steps to purify water and attempting to deliver water at the gate of the community in potable form, it cannot be guaranteed, because during the transit contamination of water could take place. That's why water purification, RO & and desalination units are in more demand in the world and are procured by an individual to have safe potable water for drinking and to avoid the risk of the spread of waterborne disease. Awareness & and marketing campaigns of water purifiers & and RO units in Television, Newspapers, magazines, and media are in full swing.

Water filtration is a process used to remove impurities

and contaminants from raw water, making it safe for consumption by humans. There are various filtration methods, ranging from coarse filtration to membrane filtration each with its principles and applications. The theory is based on the physical and chemical properties of water, as well as the size composition, and charge of the particles or substances to be removed. Here's an overview of filtration theory from coarse to membrane filtration systems.

WHY FILTRATION SYSTEM IS IMPORTANT IN THE WATER SUPPLY SYSTEM.

The raw water is contaminated by physical, chemical, and biological, pathogens, micro-organization, and solids. It is not safe to drink raw water as it is as it causes complex diseases in humans. Filtration is one of the stages in drinking water purification. It is necessary to filter the raw water and make it safe for drinking. Various kind of contaminants present in the water is displayed in Table 1.

Table 1. Impurities in raw water

Physical impurities	Silt, Clay, Sand, Stones, Suspended particles. Solids, Inorganic matter
Chemical impurities	TDS, Silicates, Chlorides, Calcium, Fluorides, Magnesium, Phosphates, Bicarbonate, Sulfates, Nitrates, and Ferrous compounds
Biological impurities	Pathogens, Bacteria, Protozoa, Viruses, and parasites, Organic matter, Algae, Threaded particles.
Gas	Oxygen, Nitrogen, Carbon-dioxide, Hydrogen-sulfide etc.
Toxic	Arsenic, Cyanides.
Radioactive	Radiation from radioactive elements, mining areas, nuclear reactors.
Other	PH, EC, Foul Smell, Bad Taste, Color- Turbid Appearance,

Types of Filtration Systems

The filtration system is one of the stages used in water purification plants for drinking purposes.

It is classified under four categories (**Figure 1**).

1. Sand Separator
2. Sand filtration
3. Screen filter
4. Porous filter



Figure 1 Various filtration system

1. Sand Separator

- Coarse filtration is the initial step in water treatment and typically involves the removal of larger particles and debris.
- The primary goal is to protect downstream filtration systems and equipment from damage or clogging.
- In a Sand Separator, water flows in a vortex, and heavier particles get settled in the collection chamber.

2. Sand filtration

- In a rapid Sand filtration system, water is passed through a layer of fine sand media to remove the suspended particles including micro-organisms and colloidal matter.
- It is suitable where the water contains algae, clay, silt, micro-organisms, and suspended particles.
- Filtration level is in the range of 100-300 microns.

3. Screen/mesh filter

- This filter is followed by a sand filter and used to filter the raw water to a fine level.
- Stainless steel screen mesh is used to filter the water.
- Filtration level is in the range of 100-200 microns depending on the magnitude of physical impurities.

4. Membrane (Ultra/Nano) filtrations.

- It effectively removes divalent ions such as calcium and magnesium as well as organic matter, and pathogens.
- It can remove even smaller particles, including most viruses and macromolecules.
- It is often used for water softening and desalination processes.
- Filtration range of 10 to 50 microns.

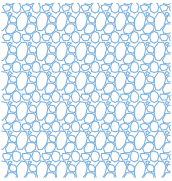
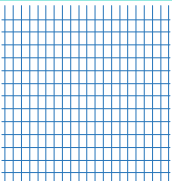
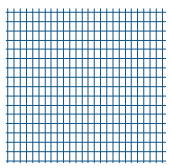
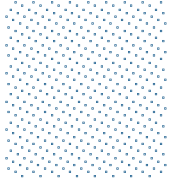
5. Porous filter (Reverse Osmosis)

Reverse osmosis is the most advanced and fine filtration process, using a semipermeable membrane with very small pores of less than 10 microns. It removes almost all solutes including salts, minerals, and most organic compounds. It is commonly used for desalination of seawater, producing high-purity water for various applications.

DESIGN CRITERIA FOR FILTRATION SYSTEM

Designing an effective water filtration system requires careful consideration of various criteria to ensure the removal of specific contaminants and delivery of safe, clean water. Each filtration system is designed for various kinds of flow, filtration range, and purpose shown in Table 2. However, the following criteria shall be accounted for during the design of the filtration system.

- **Water Source:** Types of water source, Year availability of assured water.
- **Climatic data:** Prevailing climatic data, Temperature, Relative Humidity, Rainfall, Solar Radiation, Evaporation, and allied conditions.
- **Water Test Report:** Physical, Chemical, and Biological parameters are present in the raw water.
- **Water demand:** Total water demand per day basis.
- **Power source:** Power source available, Govt electrical power, Diesel Generator set, Solar-Hybrid power.
- **Topography:** Ground elevation/contours, soil strata, and localized conditions.
- **Pressure and flow:** The theory of water filtration includes the pressure and flow rates. Applying pressure to water can enhance filtration by forcing water through the filter medium more efficiently.
- **Chemical adsorption:** In addition to size exclusion, some filtration process involves chemical adsorption. This occurs when contaminants are attracted to the surface of the filtration medium due to chemical interactions, such as electrostatic forces. Activated carbon is a common filtration medium that relies on adsorption to remove organic compounds and certain chemicals from water.
- **Selective filtration:** The selectivity of a filtration process is determined by the properties of the filter medium and its ability to interact with particular contaminants.
- **Safety Measures:** Prioritize safety features for operators and maintenance personnel. Ensure that safety protocols are in place, and provide training for system operation and maintenance.

Filter media	Image	Type of flow	Range	Purpose
Coarse / Sand		Three/Multi dimensional	100-300 micron	To separate algae / suspended particles, Silt, clay
Screen		Two dimensional	100-200 micron	Fine particles
Membrane		Two dimensional	50-100 micron	Suspended, fine particles
Porous		Three / Multi dimensional	10-50 micron	Fine suspended particles, Pathogens, minerals

- **Contaminants removal efficiency:** Identify the target contaminants and specify the required removal efficiency for each. Different filtration methods and technologies have varying capabilities for removing specific contaminants.
- **Pre-treatment and post-treatment:** Consider the need for pre-filtration and post-filtration treatment to optimize the performance of the filtration system and maintain water quality downstream.
- **Operating and Maintenance Cost:** Evaluate the operational and maintenance costs associated with the chosen filtration technology.

This includes consumables, energy requirements, and routing maintenance tasks.

- **System Reliability and Redundancy:** Incorporate redundancy and reliability features to ensure continuous operations. Backup filtration units and monitoring systems can minimize downtime and maintain water quality during maintenance or unexpected system failures.
- **Space and Footprint:** Consider the available space for the filtration system and select equipment and configurations that fit within the available footprint. Vertical or Horizontal configurations may be options.
- **Regulatory Compliance:** Ensure that the filtration system complies with local, state, and federal regulations and standards governing water quality and treatment. Compliance with guidelines such as the Safe Drinking Water act-SDWA is essential
- **Monitoring and Control Systems:** Implement monitoring and control systems to continuously assess water quality, flow rates, and system performance. Automated controls can optimize filter backwashing and maintenance schedules.
- **Lifecycle cost and longevity:** Consider the lifecycle costs of the filtration system, including initial costs, ongoing operational expenses, and the expected lifespan of equipment and filter media.
- **Local Conditions and climate:** Account for local environmental conditions and climate which can affect the performance of filtration systems. Extreme temperature, humidity, and weather conditions should be considered.
- **Aesthetics and Integrations:** In cases where the filtration system is visible to the public or integrated into urban settings, consider aesthetic design elements to ensure that it blends with its surroundings.

CONCLUSION

In summary, the water filtration theory is a combination of physics, chemistry, biology and allied engineering aspects. And based on a combination of physical and chemical principles that determine how various contaminants are removed from water. By understanding the properties of both water and filter medium, engineers and scientists can design effective filtration systems to ensure the availability of clean and safe water for a wide range of purposes.



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OZONE - UV COMBINATION IN SWIMMING POOLS – A REALITY

Advanced Oxidation Process, more commonly called AOP is a process that combines the strengths of ozone and UV technology. By using this combination, we get results that are not achieved when each of them are used individually.

AOP techniques can be used effectively for swimming pools water treatment. This involves the use of ozone, ultra violet rays & residual chlorine together to ensure that the properties of all the three are combined judiciously to ensure that their advantages are maximized.

AOP systems are in particular very safe for their young swimmers who are very susceptible to infections contacted through pool water. With AOP the quality of swimming pool water will surpass any international standards and for regular swimmers is a boon. However since we are combining two or more technologies the CAPEX is increased, For those clients who consider health above anything else AOP in swimming pool is the best treatment they can adopt for their pools.

The ozone that is produced at 8% concentration (minimum concentration required for AOP) is intelligently & partially converted into ozone & OH radical combination to maximize disinfectant and oxidation properties. This partial conversion takes place in a specially designed AOP reaction chamber. Within this AOP chamber the required OH radicals are produced and the pool water will be charged with high amounts of Ozone and OH free radical. While ozone acts as a disinfectant, the OH radicals act as an oxidizing agent removing micro pollutants, TOC, THM precursors, Chloramines and urine components from the swimming pool water. The small amounts of chlorine that is added after the reaction chamber will have the desired disinfectant level in the pool. (OH radicals are far superior oxidizing agents than Ozone & hence combined with ozone will have better results than using ozone alone). OH radicals can only be produced using ozone or hydrogen peroxide.

Why is the combination of ozone and OH radical so effective?

If you understand the effectiveness of both ozone and the Free OH radicals, you will readily agree that using the combination judiciously will produce excellent results. The effectiveness of OH radicals and ozone is indicated by what we call as Oxidation reduction potential. Each oxidising agents are rated according to their Electro Oxidation Potential. (EOP).

The EOP of chlorine is the lowest (1.36). That of OH radical is the highest (next to Fluorine at 3.06) and that of ozone is 2.08. That is why combining both will produce such excellent results.

Advantages AOP systems (not all parameters are specified for pool disinfection)

Pool Health Parameters	Chlorine Only	Ozone & Chlorine	Indizone AOP System
Bactericidal Effects	GOOD	VERY GOOD	EXCELLENT
Removal Colour, Odour, Taste	VERY GOOD	VERY GOOD	EXCELLENT
Turbidity Improvement	GOOD	VERY GOOD	EXCELLENT
COD Reduction	GOOD	VERY GOOD	EXCELLENT
Top Removal	NOT PROVEN	NOT PROVEN	POSSIBILITY
Virus Inactivation (Rota Virus, Polio1)	SATISFACTORY	GOOD	EXCELLENT
Coliform Reduction	GOOD	2 LOG REDUCTION	3 LOG REDUCTION
Destruction of Crypto & Giardia	NO EFFECTS	GOOD	EXCELLENT
Destruction of Legionella	NO EFFECTS	GOOD	EXCELLENT
Chloramine Removal	NO EFFECTS	VERY GOOD	EXCELLENT
THM Precursors Removal	NO EFFECTS	VERY GOOD	EXCELLENT
Removal OD Urine Components	NO EFFECTS	VERY GOOD	EXCELLENT
Removal Of Iron, Manganese	NO EFFECTS	EXCELLENT	EXCELLENT

With this technology you will ensure that all times, the pool water is clean and healthy and is very safe for the swimmers your clients to get a fool proof disinfectant system. Expensive because you need to have additional equipments and control systems, but for those who view health as prime most importance AOP systems can provide better quality and a safer water to the client.

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THE ENIGMATIC CHARM OF THE DEAD SEA



Nestled between Israel and Jordan lies a natural wonder shrouded in mystique – the Dead Sea. This captivating body of water isn't just a salty sensation; it's a playground for the curious and a haven for those seeking an otherworldly aquatic adventure.

Saltier Than a Snack Attack: The Dead Sea isn't your average swim spot – it's a salt-lover's paradise. With a salinity of around 30%, compared to the ocean's 3%, you'll find yourself effortlessly floating on the surface like a buoyant ballerina. Dive in, and you'll experience the buoyancy of a thousand beach balls, making every splash a surreal, gravity-defying dance.

Mud Madness: For the beauty enthusiasts, the Dead Sea offers more than just a swim. Its mineral-rich mud, famed for its therapeutic properties, beckons visitors to indulge in a spa-like experience. Slather on the silky mud, let it dry under the warm Middle Eastern sun, and emerge feeling rejuvenated – it's the Dead Sea's own version of a natural beauty treatment.

Sink or Float: The mystery doesn't end with buoyancy. The Dead Sea has a curious habit of gobbling up objects, turning them into salty relics. Drop a rock into the sea, and watch it transform into a crystallised masterpiece. The sea has been known to petrify anything it touches, leaving behind eerily beautiful salt sculptures.

Healing Waters: Beyond the fun and games, the Dead Sea has long been celebrated for its therapeutic qualities. Rich in minerals like magnesium, calcium, and potassium, the water is believed to have healing properties for various skin conditions and joint ailments. Visitors flock to its shores not just for a dip but for a rejuvenating soak in nature's own remedy.

Historical Echoes: The Dead Sea isn't just a geological marvel; it's a living testament to history. Surrounding its shores are ancient sites like Masada, an iconic fortress, and the mystical city of Qumran, where the Dead Sea Scrolls were discovered.

Every ripple in its waters seems to whisper tales of civilizations long past, adding a layer of intrigue to its already enchanting allure.

Sunset Serenity: As the sun dips below the horizon, the Dead Sea transforms into a canvas of warm hues, casting a spellbinding glow across its surface. Sunset at the Dead Sea is a spectacle of nature, a serene moment where time seems to stand still, allowing visitors to bask in the ethereal beauty that makes this saltwater oasis truly magical.

In a nutshell, the Dead Sea is not just a destination; it's an experience that transcends the ordinary, inviting all who venture to its shores to become part of the extraordinary tale of the Dead Sea.



T E N D E R

Operation And Maintenance Of 2.25 Mld Water Treatment Plant And Distribution System At Csez, Kakkanad			
Authority	Municipal Corporation		
Location	Kerala, Ernakulam		
Bid Open Date	24 Nov 2023	Tender Value	10.87 Lac
Doc Collection Date	23 Nov 2023	FTID	2311184456090
Special Repair And Addn/Alteration To Sewage Treatment Plant/Drain Pipe Of Transit Camp And Provn Of Door (Pvc) For Newly Constructed Bathroom Near Transit Shed Of Mc/Mf Det Under Ge Guwahati			
Authority	Zilla Parishad		
Location	Assam, Guwahati		
Bid Open Date	7 Dec 2023	Tender Value	2.23 Lac
Doc Collection Date	5 Dec 2023	FTID	2311184404930
Spl Repair To Sewage Pipe Line At Various Location Of Military Station Agartala			
Authority	Central Public Works Department		
Location	Tripura, Agartala		
Bid Open Date	5 Dec 2023	Tender Value	43 Lac
Doc Collection Date	28 Nov 2023	FTID	2311184440770
Supply Of Various Disinfectants For Water Treatment At Mh Filtration Plant Under Ge (Utilities) Udhampur			
Authority	Central Public Works Department		
Location	Jammu & Kashmir, Udhampur		
Bid Open Date	11 Dec 2023	Tender Value	30 Lac
Doc Collection Date	7 Dec 2023	FTID	2311184437520
Engineering, Procuring, Constructing And Commissioning (Epc) Of 15mld Output Capacity Sewage Treatment Plant At Ghanteshwar, Rajkot Along With Comprehensive Operation And Maintenance Of The Entire Sewage Treatment Facilities For Five (05) Years Under "Amrut 2.0" Scheme.			
Authority	Zilla Parishad		
Location	Gujarat, Rajkot		
Bid Open Date	4 Dec 2023	Tender Value	22.36 Crores
Doc Collection Date	4 Dec 2023	FTID	23111332110
Provn Of Sewage Treatment Plant At Af Stn Dadri Under Ge (Af) Faridabad.Authority			
Authority	Public Health Engineering Department		
Location	Uttar Pradesh, Ghaziabad		
Bid Open Date	21 Nov 2023	Tender Value	1.45 Crores
Doc Collection Date	14 Nov 2023	FTID	231013436170

T E N D E R

Construction Of Cement Concrete Road, Storm Water Drain, Street Lighting, Truck Parking And Sewage Treatment Plant Works At Industrial Area Dmic Vikram Udyogpuri Limited, Ujjain.

Authority	Public Health Engineering Department		
Location	Madhya Pradesh, Ujjain		
Bid Open Date	21 Nov 2023	Tender Value	12.23 Crores
Doc Collection Date	20 Nov 2023	FTID	231031481530

Work Of Anti-Algae Treatment (Anti Scale Coating) To Sump Tank Of The Water Supply Scheme 100 Lakh Liters At Babhaleshwar Under Ehv (O&M) Division, Babhaleshwar.

Authority	Directorate Of Medical Education And Research		
Location	Maharashtra, Ahmednagar		
Bid Open Date	22 Nov 2023	Tender Value	24.91 Lac
Doc Collection Date	22 Nov 2023	FTID	23111732200

Supply Of Various Disinfectants For Water Treatment At Mh Filtration Plant Under Ge (Utilities) Udhampur

Authority	Nagar Palika Parishad		
Location	Jammu & Kashmir, Udhampur		
Bid Open Date	11 Dec 2023	Tender Value	30 Lac
Doc Collection Date	4 Dec 2023	FTID	2311184437520

Replacement Of Modules For An Existing Membrane Of 850 Kld Mbr-Based Sewage Treatment Plant Installed At AiiMS- Jodhpur.

Authority	Central Public Works Department		
Location	Rajasthan, Jodhpur		
Bid Open Date	01 Dec 2023	Tender Value	87.71 Lac
Doc Collection Date	01 Dec 2023	FTID	23111732200

EVENT CALENDAR



October 2023

Wetex

Mon, 02 - Wed, 04 Oct 2023
Dubai, UAE
www.watex.ae

AWT Convention and Exposition

Wed, 04 - Sat, 07 Oct 2023
Grand Rapids, USA
www.awt.org/events/annual-convention

Envitech

Tue, 10 - Fri, 13 Oct 2023
Brno, Czech Republic
<http://envitech.co.in>

VietWater

Wed, 11 - Fri, 13 Oct 2023
Ho Chi Minh, Vietnam
mwww.vietwater.com/en

Minnesota Water Resources Conference

17 - 18 Oct 2023
Saint Paul, USA
wrc.umn.edu/events/conference-2023

IFAT India

Wed, 18 - Fri, 20 Oct 2023
Mumbai, India
www.ifat-india.com

Pak Water & Energy Expo

Wed, 25 - Fri, 27 Oct 2023
Lahore, Pakistan
pakwaterexpo.com

Aqua Ukraine

17 - 19 Oct 2023
Kiev, Ukraine
10times.com/aqua-ukraine

Water In Industry

Tue, 31 Oct 2023
Moscow, Russia
www.aquatechtrade.com/news/industrial-water

November 2023

Water Loss Forum

01 - 03 Nov 2023
Lutfi Kirdar International Convention & Exhibition Center, Istanbul, Turkey
www.waterlossforum.org

Bangladesh Water Expo 2023

02-04 Nov 2023
Dhaka, Bangladesh
www.bangladeshwaterexpo.biz

Aquatech Amsterdam

06 - 09 Nov 2023
RAI, Amsterdam, Netherlands
www.aquatechtrade.com/amsterdam

The International Water Conference

12 - 16 Nov 2023
San Antonio Marriott Rivercenter, San Antonio, USA
iwconf.org

Smart City Expo - Dubai

14 - 15 Nov 2023
The Ritz-Carlton, Dubai, UAE
10times.com/smart-cities-nh

WETEX and Dubai Solar Show

15 - 17 Nov 2023
Dubai World Trade Centre, Dubai, UA
www.watex.ae

Myanwater

16 - 18 Nov 2023
Myanmar Expo, Yangon, Myanmar
myanwater.com

Sand Water Rv Expo

17 - 18 Nov 2023
Lake Havasu State Park, Lake Havasu, USA
sandandwaterexpo.com

Cairo Water Week

29 Oct - 02 Nov 2023
Cairo, Egypt
www.cairowaterweek.eg

East Africa Water Summit

29 Nov - 01 Dec 2023
Nairobi, Ikoo, Kenya
www.eawaters.com/

December 2023

East Africa Water Summit 2023

29 Nov - 01 Dec 2023
Nairobi, Ikoo, Kenya
www.eawaters.com/

Water Bangladesh International Expo

07 - 09 Dec 2023
International Convention City Bashundhara (ICCB), Dhaka, Bangladesh
www.water-exhibition.com

SRW India Water Expo 2023

20 - 22 Dec 2023
Chennai Trade Centre, Chennai, India
www.waterexpo.in

World Conference on Sustainability, Energy and Environment 2023

08 - 09 Dec 2023

City Hotel Berlin Mitte, Berlin, Germany
www.steconf.org/conference/world-conference-on-sustainability-energy-and-environment/

Malaysian International Water Convention 2023

05 - 07 Dec 2023
Putra World Trade Centre, Kuala Lumpur, Malaysia
www.miwcc.tech/home

GoGreen Summit 2023

29 - 30 Dec 2023
Bali, Indonesia
www.gogreen.bioleagues.com

January 2024

Water India Expo

17 - 19 Jan 2024
Pragati Maidan, New Delhi, India

Water & Wastewater Equipment, Treatment & Transport

24 - 27 Jan 2024
Indiana Convention Center, Indianapolis, USA
www.wwetshow.com/en/home.html

WWT Wastewater Conference and Exhibition

25 - 26 Jan 2024
The National Conference Centre, Solihull, UK
www.10times.com/wwt-wastewater

Nevada Water Resources Association

Annual Conference Week
9 Jan - 01 Feb 2024
Tuscany Suites & Casino, Las Vegas, USA
www.nvwra.org/2024-symposium

Local Water Management Crossroads

31 Jan - 01 Feb 2024
Parc Expo Rennes, Rennes, France
www.10times.com/carrefour-des-gestions-locales-de-leau

InterAqua

31 Jan - 02 Feb 2024
Tokyo Big Sight, Koto, Japan
www.interaqua.jp/eng/

Smart Energy India Expo

17 - 19 Jan 2024
Pragati Maidan, New Delhi, India
www.smartenergyindiaexpo.com

Utah Green Conference & Trade Show

22 - 24 Jan 2024
Mountain America Expo Center, Sandy, USA
www.10times.com/utah-green-trade-show

EVENT CALENDAR



February 2024

Annual Water Expo

06 - 08 Feb 2024

Delta Hotels by Marriott Fargo, Fargo, USA
www.10times.com/water-system-expo-fargo

Mountain States Ground Water Expo

08 - 09 Feb 2024

Aquarius Casino Resort, Laughlin, USA
www.mountainstatesgroundwater.com

AquaFarm

14 - 15 Feb 2024

Pordenone Fiere, Pordenone, Italy
www.aquafarm.show/en/aquafarm-program

World Water Tech Innovation Summit

20 - 21 Feb 2024

Hilton London Bankside, London, UK
www.worldwatertechinnovation.com

E-World Energy & Water Exhibition

20 - 22 Feb 2024

MESSE ESSEN GmbH, Essen, Germany
www.e-world-essen.com/en

Pacific Water Conference

20 - 22 Feb 2024

Hawaii Convention Center, Honolulu, USA
www.hiawwa.org/2024-pacific-water-conference

UF Water Institute Symposium

20 - 21 Feb 2024

J. Wayne Reitz Union, Gainesville, USA
www.conference.ifas.ufl.edu/waterinstitute

WATER TODAY'S WATER EXPO

28 Feb - 01 Mar 2024 Chennai Trade Centre, Chennai, India

www.waterexpo.biz

Water Garden Expo

28 Feb - 01 Mar 2024

Grand Casino Hotel & Resort, Shawnee, USA
www.wgexpo.com

WAPTAG Water Expo

29 Feb - 02 Mar 2024 Mahatma Mandir

Exhibition Hall, Gandhinagar, India

www.waptag.org

March 2024

Roorkee Water Conclave

03 - 06 Mar 2024

Indian Institute of Technology Roorkee, Roorkee, India
www.iitr.ac.in/rwc

New England Water Well Expo

07 - 09 Mar 2024 Best Western Royal Plaza Hotel

& Trade Center, Marlborough, USA

www.newwassociaation.org

WaterReuse Research Conference

10 - 13 Mar 2024

Hilton Denver City Center, Denver, USA

www.watereuse.org/event/2024-watereuse-symposium

Start by this : Water Policy Conference

18 - 20 Mar 2024

Washington Hilton, Washington DC, USA

www.10times.com/e1zk-rr53-h02x

Rural Water Conference

18 - 21 Mar 2024

Penn Stater Conference Center Hotel, State

College, USA

www.prwa.com/annual-conference

Aqua Netherlands

19 - 21 Mar 2024

Evenementenhal Gorinchem, Gorinchem,

Netherlands

www.aquanederland.nl/en/

KRWA Conference & Exhibition

26 - 28 Mar 2024 Century II Performing Arts &

Convention Center, Wichita, USA

www.krwa.net/TRAINING/Conference

April 2024

Florida Water Resource Conference

02 - 05 Apr 2024

Gaylord Palms Resort & Convention Center,

Kissimmee, USA

<https://www.fwrc.org/>

Texas Water

09 - 12 Apr 2024

Fort Worth Convention Center, Fort Worth, USA

www.txwater.org

AZ Water Conference & Exhibition

10 - 12 Apr 2024 Phoenix Convention Center,

Phoenix, USA

www.azwater.org/group/annualconference

Water Expo & Forum

16 - 18 Apr 2024 Abu Dhabi National Exhibition

Centre - ADNEC, Abu Dhabi, UAE

www.worldfutureenergysummit.com/en-gb/water.html#/

IE Expo China

18 - 20 Apr 2024 Shanghai New International

Expo Centre (SNIEC), Shanghai, China

www.ie-expo.com

Asia Water

23 - 25 Apr 2024

Kuala Lumpur Convention Centre, Kuala Lumpur,

Malaysia

<https://www.asiawater.org/>

SDARWS Rural Water Expo

24 - 25 Apr 2024

Best Western Ramkota Hotel, Rapid City, USA

<https://www.sdarws.com/>

International Green Energy Expo

24 - 26 Apr 2024

EXCO, Daegu, South Korea

<https://www.greenenergyexpo.co.kr/eng/>

Water Expo Bangladesh

25 - 27 Apr 2024

International Convention City Bashundhara (ICCB),

Dhaka, Bangladesh

<https://www.limraexpo.com/water/index.php>

Green Vision Summit & Expo

30 Apr - 02 May 2024

MFCC - Malta Fairs & Conventions Centre, Malta

<https://10times.com/e15k-f3dd-4fx4>

May 2024

Maryland Rural Water Association Conference

06 - 09 May 2024

Roland E. Powell Convention Center, Ocean, USA

<https://10times.com/mrwa-ocean>

Power of Water Canada Technical Conference & Trade Show

08 - 10 May 2024

Niagara-on-the-Lake, Canada

<https://www.owa.ca/conference/>

IFAT Munich

13 - 17 May 2024

Exhibition Munich, Munich, Germany

<https://ifat.de/en/trade-fair/>

Renewable Energy Show

16 - 18 May 2024

International Convention City Bashundhara (ICCB),

Dhaka, Bangladesh

<https://10times.com/renewable-energy-show>

Water Management Show

16 - 18 May 2024

International Convention City Bashundhara (ICCB),

Dhaka, Bangladesh

<https://10times.com/water-management-show>

West Africa Water Expo

21 - 23 May 2024

Landmark Centre, Lagos, Nigeria

<https://elanexpo.net/waweexpo/>

BAYWATCH

Malaysia International Water Convention 2023



Date: 4-7 December 2023
Venue: World Trade Centre, Kuala Lumpur
Website: <https://www.miwcc.tech/>

Welcome to the Malaysia International Water Convention 2023! We are excited to host this year's event from December 5-7 at the World Trade Centre Kuala Lumpur. Our theme this year is "Sustainability: Transforming Vision into Action," which speaks to the importance of turning ideas and aspirations into tangible results that can make a difference in the world.

The Malaysia International Water Convention is the premier event for water industry professionals in the region. It brings together thought leaders, innovators, and practitioners from various sectors to share ideas, best practices, and solutions for the challenges facing the water industry today.

WORLD WATER-TECH INNOVATION SUMMIT London, February 20-21, 2024

 WORLD WATER-TECH
INNOVATION SUMMIT
London, February 20-21, 2024

#WorldWaterTech
worldwatertechinnovation.com

Date: 20 - 21 February 2024
Venue: London
Website: worldwatertechinnovation.com

The 13th annual World Water-Tech Innovation Summit is back in London, gathering global disruptors in the water sector. Against a backdrop of rising weather extremes, aging infrastructure, and emerging contaminants, the summit aims to accelerate collaboration, investment, and innovation. Scheduled for February 20-21, the event will bring together progressive water enterprises, regulatory bodies, engineering firms, technology giants, investors, and visionaries to address the decade's most pressing challenges. Discussions will focus on proactive asset management and circular solutions as the industry seeks to increase its resilience to climate events.

Through a partnership with the UK Department for Business and Trade, the summit attracts diverse delegations from Europe, Asia, North America, South America, the Middle East, Africa and Australia. These delegates assemble to share knowledge, showcase project opportunities, and foster enduring business partnerships.

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19th EVERYTHING ABOUT
WATER EXPO
SOUTH ASIA'S LARGEST WATER
EXHIBITION AND CONFERENCE **2024**

10-12 | **IICC**
SEPTEMBER 2024 | New Delhi, India

The 19th EverythingAboutWater Expo 2024 stands as a remarkable and all-encompassing annual event in India, spotlighting cutting-edge technologies and solutions within the water sector. This event serves as an exceptional gateway for stakeholders worldwide to immerse themselves in the expansive and dynamic realm of the Indian Water management Industry, facilitating the exchange of business opportunities, networking, and the exploration of innovative Water solutions.

India is currently on a trajectory towards severe water stress, with projections indicating a critical situation by 2025. The rapid pace of Industrialization and the burgeoning population have significantly widened the gap between water supply and demand, a matter of deep concern for both the Central and State Governments. Within the framework of the 19th Everything About Water Expo 2024, unparalleled business prospects will emerge for both domestic and international players in the Water Industry. Attendees will have the opportunity to gain valuable insights, discover future trends, and navigate the evolving landscape of the Indian Water market.

Date: 10 - 12 September 2024

Venue: IICC, New Delhi

Website: www.eawaterexpo.com

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UtilityWeek

The WWT Wastewater 2024 Conference & Exhibition is the UK's largest wastewater event, covering wastewater networks, infrastructure, treatment and net zero. With representation from all of the UK's WASCs, the event is a one-stop, comprehensive showcase of case studies and thought-leadership designed to tackle all of the current wastewater challenges in one place.

As the industry gears up for AMP8, find out how your peers are accelerating the reduction of stormwater overflows, mainstreaming catchment and nature-based solutions, reducing process emissions and investing in smart networks and low-carbon treatment. Plus, hear how industry experts have navigated DWMPs, how government plans to protect the environment for future generations, and how the UK's WASCs and their partners are tackling p-removal, biorecovery and net zero.



Date: 30 - 31 January 2024

Venue: NCC Birmingham

Website: event.utilityweek.co.uk/wastewater2024/3423168

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10-12
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Join us at the Water Expo and be the part of the solution
for a sustainable future. Together, we can make waves of positive change.
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Where the
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