

EVERYTHING ABOUT WATER ➤

India's First Water eMagazine: www.eawater.com/eMagazine

Follow us on: [f](#) [t](#) [in](#)

TREAT WASTEWATER NATURALLY

Resort to natural ways
to treat wastewater
efficiently

22 Mend a leaking pipe efficiently

59 What is special about Pappankuzhi village

The Past, Present, and Future of Water Quality Analysis
The Game Changer is Here!

900 Series



Conductivity, Resistivity, TDS,
pH, ORP, Salinity, ISE, Flow,
Pressure, +more with Touchscreen LCD



www.myronl.com
760-438-2021



THINK SPECIALITY CHEMICALS
Think Triveni

BASF
We create chemistry



**DON'T LET
SCALE → ERODE YOUR
PROFITS.**

Trilon B - Tetra Sodium salt of EDTA - Chelating Agent

APPLICATIONS

-  **Water Treatment** – RO, Boiler, Evaporator, Heat Exchangers – Prevent scale and deposits of Calcium Carbonate, Calcium sulphate, Calcium phosphate.
-  **I & I Cleaners** - Remove scale that consists of calcium carbonate, calcium phosphate or calcium oxalate.
-  **Textiles** - Prevent insoluble substances such as boiler scale and lime soaps from precipitating.
-  **Paper industry** - used as bleach stabilizers
-  **Detergents** - Prevent formation of lime scale & inorganic scale

Chennai • Mumbai • Coimbatore • Erode • Hyderabad • Mangalore • Ranipet

Triveni Global Pvt. Ltd. #2, 9th Street, Dr. Radhakrishnan Salai, Mylapore, Chennai 600 004
+91 99529 95777 | info@triveniglobal.com | www.triveniglobal.com

**REGULAR & SPECIAL LABORATORY
pH/ REDOX/ CONDUCTIVITY ELECTRODES**



SEMI
MICRO



5 POINT
CALIBRATION



PLASTIC
BODY



GLASS
BODY

**INDUSTRIAL
pH/ REDOX/ COND./ DO/ CHL**



pH/ REDOX



COND./ DO



CHL

ONLINE pH/ REDOX/ COND/ DO/ TURBIDITY/ CHLORINE/ ION - ANALYZERS



**µP CONTROLLERS (6587 SERIES)
pH/ REDOX/ CONDUCTIVITY/ CHLORINE**



**µP CONTROLLERS (7687 SERIES)
pH/ REDOX/ CONDUCTIVITY/ CHLORINE**



**µP CONTROLLERS (7685 SERIES)
pH/ REDOX/ CONDUCTIVITY/
CHLORINE/ DO/ TURBIDITY/ ION**



SZ 283



SZ 7251



SZ 7231



POLAROGRAPHIC MEMBRANE
SENSORS WITH FLOW CELL



ION SELECTIVE ELECTRODE
& CHEMISTRY MODULE

ONLINE BOD / COD / TSS MONITORING SYSTEM



UV
PROBE



MONITOR
with 4-20mA/ RS485

DOSING PUMPS, FULL VACU



DOSING PUMPS
TJ-MD SERIES
6-100 lph/hr



CHLORINATOR
TJ-C2212+
0-10 kg/hr

TOSHNIWAL INSTRUMENTS MANUFACTURING PVT. LTD.,

P.O.Gagwana - 305023, Distt: Ajmer (Raj.) INDIA

Phone: +91-145-2971131/ 2/ 3 CRM: +91-9829112345 E-mail: crm@toshcon.com Website: www.toshcon.com

REGD OFFICE: 401, Manish Chamber, Sonawala Cross Lane, Goregaon (E), MUMBAI - 400 063

TOSHCON - TOSHNIWAL, AJMER OFFERS

AL / ONLINE CHLORINE/ TURBIDITY SENSORS



TOROIDAL
E.CONDUCTIVITY



AUTO CLEAN
ASSEMBLY

LABORATORY pH/ CONDUCTIVITY/ DO/ ION METERS



CL54 DELUXE/ CL54/ CL46



TMULTI TOUCH



CONDUCTIVITY METER
TCM15



TP7/ TC7/ TD7/ TPC7



TMULTI27

/ TRANSMITTERS, ASSEMBLIES FROM M/S B&C ELECTRONICS, ITALY



UNIVERSAL CONTROLLERS
(BC7635/ BC7687/ BC6587)
DO / TURBIDITY / TSS



pH TWO WIRE TRANSMITTER (3436 SERIES)
pH / REDOX / CONDUCTIVITY / TDS /
CHLORINE/ DO



pH TWO WIRE TRANSMITTER (3630 SERIES)
pH / REDOX / CONDUCTIVITY / TDS /
CHLORINE



TU 8182

AUTO CLEAN TURBIDITY PROBE



TU 810



FLOW CELL TU 910 FOR
DO/ TURBIDITY/ TSS



OD8325

AUTO CLEAN DISSOLVED OXYGEN PROBE



OD8525

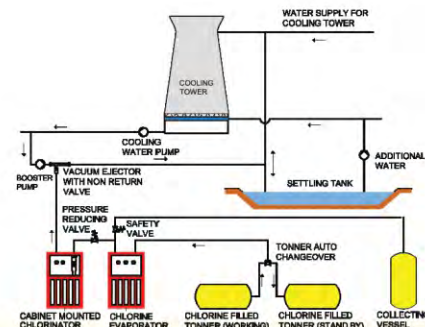
MUM CHLORINATORS & TURNKEY CHLORINATION SYSTEMS



TJ-C17
0-25 kg/hr



TJ-C27
0-25 kg/hr



TOSHCON JESCO, AJMER OFFERS

TOSHNIWAL INSTRUMENTS MANUFACTURING PVT. LTD.,

P.O.Gagwana - 305023, Distt: Ajmer (Raj.) INDIA

Phone: +91-145-2971131/ 2/ 3 CRM: +91-9829112345 E-mail: crm@toshcon.com Website: www.toshcon.com

REGD OFFICE: 401, Manish Chamber, Sonawala Cross Lane, Goregaon (E), MUMBAI - 400 063



Subscription form

1. Choose your magazine subscription(s)

Subscribers	Term	No. of Issues	Issue Price	% Savings	You Pay
Domestic	5 Years	60	Rs.24000	40%	Rs. 14400
International	5 Years	60	USD 3000	40%	USD 1800
Domestic	3 Years	36	Rs. 14400	25%	Rs. 10800
International	3 Years	36	USD 1800	30%	USD 1260
Domestic	2 Years	24	Rs. 9600	15%	Rs. 81600
International	2 Years	24	USD 1200	20%	USD 960
Domestic	1 Year	12	Rs.4800	10%	Rs. 4320
International	1 Year	12	USD 600	Nil	USD 600

2. Contact and postal details

Name _____
 Designation _____
 Company Name _____
 Address _____

 City _____ Pin/Zip Code (essential) _____
 State _____ Country _____
 Tel _____ Mobile _____ Fax _____
 E-mail _____
 Website _____

3. Payment details

NOTE: * 5% GST WILL BE APPLICABLE ON THE FINAL PRICE.

National Subscribers

Cheque No./DD No. (in favor of "Earth Water Foundation") _____

drawn on (bank name) _____

dated _____ for Rs. _____ (payable at Delhi/parl.)

Note:

- All payments to be made by DD/Cheque/NEFT/RTGS only, in favour of "Earth Water Foundation"
- Account details: IDFC First Bank
- Account Number: 10056535743, Swift Code: UBININBNDL, IFSC/RTGS/NEFT Code: IDFB0040101
- Branch: Gurgaon Golf Course Extension Road
- Bank Address: Unit No. 18- A, Ground Floor, Gurgaon- 122102

International Subscribers

Note:

- All payments to be made by T/T (Wire transfer) only, in favour of "Earth Water Foundation"
- For T/T transfer, bank and account details:
- Account Number: 10056535743, IFSC Code: IDFB0040101
- Branch: Gurgaon Golf Course Extension Road
- Bank Address: Unit No. 18- A, Ground Floor, Gurgaon- 122102

Date _____ Signature _____

Mail to: Earth Water Foundation

A-1/152, Neb Sarai, IGNOU Road, New Delhi 110 068, India
 M.: 91- 9650059996, E.: enquiry@eawater.com, W.: www.eawater.com





EA WATER CLUB

Life's now more
REWARDING at EA Water Club!
Simply subscribe to
EverythingAboutWater
magazine to enjoy exciting benefits.

As our valued Club member, you are entitled
benefit from exciting offers and rewards!

Subscribe



EA Water comes up with most popular monthly magazine on water and waste water management in India. Our Magazine is read by thousands of leading industries, government bodies, consultants, and contractors across the country.

IN THIS EDITION



REGULARS

- 04 From The Content Head**
- 06 Water News From India**
- 12 International water news**
Subscription card-EverythingAboutWater
- 58 Ozone Page-Column**
- 65 Advertisers Index**

EVENTS

- 20 WATER SECTOR UNDER ONE ROOF**
Between 4-6 August almost all the stakeholders from the water sector came under one roof for the 17th edition of the EverythingAboutWater Expo.

FOCUS

- 22 TRANSFORMING WATER LOSS INTO A WATER RESOURCE**
Presenting a revolutionary new paradigm for repairing distribution networks with losses, from 25% and above, from within the pipe without the need for leak detection and excavation.
- 24 WASTEWATER IS A RESOURCE**
In some cases, energy production has now reached a level where the energy recovered from wastewater treatment process not only ensures the plant's own needs, but also covers the energy needs for drinking, water production and so on.

INTERVIEW

- 29 "TREATED WATER WITH BEST TECHNOLOGIES IS 100% FIT FOR USE BY HUMAN BEINGS"**
Laxmikant Pathak, director-operations and BU head-surface water and irrigation at Zetwerk speaks about the challenges affecting the water sector both in terms of policies and infrastructure.

COVER STORY

- 34 VERMIFILTRATION: THE WAY FORWARD TO A SUSTAINABLE FUTURE**
There is increasing scientific evidence to prove that treatment systems with designs inspired by nature are highly efficient treatment technologies.
- 38 NEW IRON REMOVAL MEDIA : REDEFINING WATER QUALITY**
All about the extremely powerful silica sand based catalytic water filtration media that is designed for removal of Iron and Manganese without the use of potassium permanganate.

- 40 BIOAUGMENTATION: A BOON FOR YOUR SEPTIC TANK**
Increased levels of live bacteria and microorganisms in the treatment environment is how bioaugmentation works. Business owners may select cultures as per their need/requirement.

- 43 USE OF MICROBES AND HERBAL EXTRACTS TO TREAT WASTEWATER**
When the going gets tough and when traditional water treatment methods seem unsatisfactory then we should resort to the natural ways of cleaning wastewater.

INDEPTH

- 45 GEO-ENABLED AUTOMATION FOR BETTER MANAGEMENT**
About 80% of the water data has the context of location associated with it, and by not tapping this hidden power in the larger context of the water ecosystem we are denying ourselves its numerous benefits.

CASE STUDY

- 48 HIDROING DEVELOPS SMART WATER SOLUTIONS FOR 144-YEAR-OLD WATER SUPPLY NETWORK IN ZAGREB, CROATIA**
OpenFlows and OpenUtilities Save 16 Months when Delivering One of the Largest Digital Twins in Eastern Europe.
- 51 HDR ENSURES SAFE OPERATIONS AT DIABLO DAM WITH A DIGITAL TWIN**
Employment of Artificial Intelligence and Engineering Data, Helps Improving Maintenance and Decision-making.
- 54 SHANDONG METALLURGICAL ENGINEERING USES 3D MODELING TO DESIGN A LOW-CARBON EMITTING POWER PLANT**
Use of 3D modelling Helps Gain Economic and Environmental Savings and Improve Drawing Efficiency by 60%.

SUCCESS STORY

- 60 AN EXAMPLE TO EMULATE**
The efforts taken in Pappankuzhi village though at a micro-level needs to be emulated in other places so that the stress on water, in the country reduces to some extent.

UNWIND

- 63 MAKES SENSE TO INVEST IN WATER AND SANITATION**
Research by WaterAid, an international Ngo focused on water, sanitation and hygiene, states that companies which invest in water, sanitation and hygiene (WASH) for their employees, their business thrives.

Switch to a **reliable solution**
Approved by the toughest

15

International
approvals ensures
that you build in
approved quality in
your system

Wide range of Danfoss Pressure switches and Thermostats

See how tomorrow's solutions are ready today
visit www.danfoss.com

ENGINEERING
TOMORROW

Danfoss

LETTER FROM THE CONTENT HEAD



Earth Water Foundation

A1/152, Neb Sarai,
IGNOU Road,
New Delhi 110 068, India

www.eawater.com

MANAGEMENT

Managing Director & Group Editor:

Sunil Ghorawat

BUSINESS HEAD

AVP: Nisha Aggarwal

CONTENT HEAD : Pankaj Anup Toppo

Sr. Manager Content: Deepak Chaudhary

ART

Design Team @EAW

MARKETING & OPERATIONS

Manager: Rahul Mourya

PUBLISHER

Earth Water Foundation
A1/152, Neb Sarai, IGNOU Road
New Delhi 110 068, India
Tel: +91 11 4106 3970

For editorial contributions / press releases,

write to: editor@eawater.com

For advertising enquiries, write to:
enquiry@eawater.com

**For magazine & e-newsletter
subscription,**

write to: enquiry@eawater.com

OFFICE ADDRESS

A1/152, Neb Sarai, IGNOU Road
New Delhi 110 068, India
Tel: +91 11 4106 3970

Disclaimer: All rights reserved. No part of this publication may be reproduced in any form or by any means, whether electronic, mechanical or otherwise including photocopying, recording or any information storage without prior written consent of the publisher.

While every attempt is made to ensure the accuracy of the information contained in the magazine, neither the publisher nor the author accept any liability for errors or omissions. Opinions expressed in this publication are not necessarily those of the publisher or the editor.

TREAT WASTEWATER NATURALLY



Dear Readers,

Hope you are enjoying going through the new look magazine. We had taken efforts to bring to you the magazine, from our Anniversary issue (June 2022), in a new look and format with a few new additions, in the form of new sections.

In this issue we have tried to cover an important topic i.e. Going The Natural Way when it comes to treating wastewater. We may not realize it that but for years, ever since mankind has been on this Earth, even before the scientific revolution, added a dash of convenience to our lives, mother nature has been treating wastewater, in its own way, and giving it back to us. It does need to be mentioned that during those times, pressures of a huge population and the resultant pollution, on elements of the Earth was very low. However, even though the pollution levels and more so pollution of water has increased, over the years but the manner in which mother nature used to treat water, when pollution levels were not as high as in these times, certainly holds the key to a sustainable future. More so resorting to natural methods to treat water. In our cover story, in this issue, four experts share their views on how to treat wastewater through natural processes or through of natural methods.

Even the news section, especially the international news section has an interesting news item, in this issue. We all do speak and even experts, in the water sector, highlight the importance of judicious use of water, in our daily lives. In a recent development, a directive was given to the Indian cricket team when they were in Harare, in mid-August, i.e. they were advised to have quick showers, especially in light of the severe water crisis that the city faces. For more interesting news items, do read our news sections.

Between 4-6 August 2022, the 17th edition of the EverythingAboutWater Expo was held, in Pragati Maidan. The country partner for this year's Expo was the State of Israel. In this year's edition around 80 exhibitors participated, in the Expo and mention needs to be made of a large pavilion of companies from Israel at the Israel pavilion. Over the three days, 4-6 August, the Expo was visited by 8,674 visitors. For more details, please read the coverage of the Expo, in this edition.

In this issue we also dwell on the revolutionary technology from curapipe which helps in reducing water loss. Further there is a study by WaterAid which brings to light the fact that companies which invest in water, sanitation and hygiene (WASH) for their employees, their business thrives.

Do go through the pages of this issue and we would love to hear from you. If you have anything to say to us, please do drop in a mail at editor@eawater.com.

thanks & regards,
Pankaj Anup Toppo (Content Head)

India Water Intelligence

India's first monthly tracker on the municipal and industrial water markets, in a easy-to-read e-magazine format, keeping you updated on the latest projects and trends



- Municipal water supply and sanitation projects
- Water and effluent treatment projects in large industries like power, steel, refinery, metals, cement, fertilizers...
- Advanced technology projects in wastewater recycling and desalination
- Information on funding under JNNURM, JICA, World Bank, ADB for water projects
- Projects under conceptualization, projects sanctioned, project planned, projects tendered, projects awarded...
- Regulatory changes and new guidelines being planned / notified contact details of relevant decision - makers and project incharges.

For more information and a complimentary copy, please feel free to contact at Tel: +91 97188 24607, 98113 39374 | E-mail: editor@eawater.com

WATER NEWS

A LOWDOWN ON SELECT EVENTS RELATED TO THE WATER

10 crore rural households get drinking water through taps

As the country celebrates Azadi ka Amrit Mahotsav, to mark 75 years of India's Independence, Jal Jeevan Mission (JJM) achieves a new milestone by providing 10 crore rural households with safe and clean drinking water through taps. When the JJM was launched by Shri Narendra Modi, Prime Minister of India, on 15 August 2019, from the ramparts of the Red Fort, only 3.23 Crore households in villages had access to a piped water connection. The country achieved the landmark of 10 crore functional household tap connection on 19 August 2022.

As on date, three states (Goa, Telangana and Haryana) and three union territories (Puducherry, Daman and Diu and Dadra and Nagar Haveli and Andaman and Nicobar Islands), have reported 100% coverage. Punjab at 99.93%, followed by Gujarat at 97.03%, Bihar at 95.51% and Himachal Pradesh at 94.88% are also poised to achieve 100% coverage. On 17 August, 2022 Goa and Dadra & Nagar Haveli and Daman & Diu were the first 'Har Ghar Jal' certified state and UT, in the country respectively, where people in all villages confirmed availability of adequate, safe and regular supply of water for all households in their villages, through Gram Sabhas. The objective of the JJM is

to provide every rural household with drinking water, in adequate quantity, of prescribed quality, on regular and long-term basis. Despite various disruptions and challenges like the CoVID-19 pandemic, states/UTs are working relentlessly overcoming the challenges like harsh weather conditions, remoteness, tough terrain and so on to ensure tap water in every rural home. On many occasions, pipes and other equipment are transported on helicopters, boats, camels, elephants and horses.

The efforts of the Union and State governments have also resulted in ensuring provision of tap water supply in 8.67 lakh schools and 8.96 lakh anganwadi centres, in the country. In the 117 aspirational districts of our country, at the time of launch of the Mission, only 24.32 lakh household had access to tap water which has now increased to 1.54 crore. Three aspirational districts from Telangana (Komaram Bheem Asifabad, Jayashankar Bhupalpalli and Bhadrabri Kothagudem) and 1 district each in Punjab (Moga), Haryana (Mewat) and Himachal Pradesh (Chamba) have reported 100% tap water coverage.

JJM has brought huge socio-economic benefits to the rural population. Regular tap water supply relieves people, especially women and young girls, from carrying heavy bucket loads of water to meet their daily household needs thereby reducing



FROM INDIA

SECTOR FROM ACROSS THE COUNTRY



age-old drudgery. The time so saved can be used for income generation activities, learning new skills and supporting children's education.

In order to achieve long term sustainability of the schemes, community participation from the very beginning has been at the heart of planning, implementation, operations and maintenance of Rural Piped Water Supply schemes. A total of 5.08 lakh Village Water & Sanitation Committees (VWSC)/ Pani Samitis have been constituted in the country. Also, 4.78 lakh VAPs have been prepared which detail out the plans for drinking water source augmentation, greywater treatment and its reuse, and regular operation and maintenance of in-village water supply systems.

Water Quality under this mission is a very important aspect. A total of 2,070 water testing laboratories have been developed, strengthened and empaneled in the country during the Mission period. As on date, more than 64 lakh water quality tests have been conducted in 4.51 lakh villages through water testing laboratories. Water quality testing labs of states/ UTs are now open for the public for testing water samples at nominal rates. Till now, 10.8 lakh rural women have also been trained to use Field Testing Kits (FTKs). Over, 58 lakh water quality tests have been conducted by trained women in 1.7 lakh villages using FTKs.

Status of Projects Under Namami Gange Programme

Shri Bishweswar Tudu , Minister of State, Jal Shakti provided the following information in a written reply, in the Lok Sabha. The Namami Gange Programme (NGP) is dynamic and evolving in nature to address the emerging needs and priorities for rejuvenation of river Ganga and its tributaries. Under the NGP, state level annual action plans are prepared and projects are developed by the States and taken up for implementation after due approval process and efforts are made to complete the projects by their scheduled timelines. Under NGP, state level annual action plans are prepared and based on that it was

targeted that 127 sewerage and ghat/crematoria projects were to be completed from 2019-20 to 2022-23. Out of the targeted 127 projects 80 projects have been completed till date. During last three years, 122 projects have been completed resulting in creation/rehabilitation of 1,068 MLD STP capacity, laying of 1,580 kms of sewerage network, development/rehabilitation of 82 ghats and 20 crematoria, river front development at Patna, e-flow notification and so on.

Funds are being provided to the Ganga bank State Forest Departments of Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal for afforestation works along the Ganges based on APOs (Annual Plan of Operation) submitted by states. Till date, 30,071 hectares area has been covered with plantation under the Namami Gange programme.

Government of India releases funds to National Mission for Clean Ganga (NMCG), which is the empowered nodal agency for implementation of Namami Gange programme. NMCG releases funds to State Governments /State Missions for Clean Ganga/CPSUs/ other executing agencies.

NMCG has taken up scientific research/studies towards rejuvenation of river Ganga. Some of important studies are as follows.

1. Special and non-putrefying of properties of river Ganga by CSIR-NEERI.
2. Generation of High Resolution DEM and GIS ready database for part of River Ganga for NMCG- (By Survey of India).
3. GIS based mapping of microbial diversity across the Ganges for ecosystem service by CSIR- NEERI.
4. Rapid Assessment of sand mining and its impact on the Ganga river using Drone Technology by IIT-Kanpur.
5. Pilot TADOX technology in textile sector by TERI.

Further, for aquatic biodiversity conservation, seven projects at an estimated cost of INR 162.79 crore have been taken up under Namami Gange. These projects aim at planning and management for aquatic species conservation and maintenance of ecosystem services in the Ganga river basin. More than 56 lakh fish seed have been released in river Ganga for conservation and restoration of IMC & Mahseer. 930 turtles have been released in the Ganga River apart from supporting the conservation and breeding of freshwater turtles and gharial at Kukrail, Lucknow. In addition, four rescue and rehabilitation centres for aquatic species have been established.

Census of Water Bodies

The following information was provided by the Minister of State, Jal Shakti, Shri Bishweswar Tudu in a written reply in the Lok Sabha.

Ministry of Jal Shakti has launched the first Census of Water Bodies in convergence with the Sixth Minor Irrigation Census. Guidelines for repair, renovation and restoration of water bodies (RRR of WBs) component of Pradhan Mantri Krishi Sinchayee Yojana (PMKSY)-Har Khet Ko Pani (HKKP), under which the Ministry of Jal Shakti is providing financial assistance to states for identified schemes, were issued in January, 2022. These guidelines provide details regarding basic features of the scheme, funding pattern and the eligibility criteria for funding, planning and implementation of projects, procedure for submission of proposals and release of funds, and monitoring and evaluation arrangements under the scheme. Further, the Central Pollution Control Board has issued "Indicative Guidelines for Restoration of Water Bodies", which give general recommendations on augmenting capacity of water bodies and on improvement of water quality in them. Apart from issuing guidelines and providing financial assistance under RRR of water bodies scheme mentioned above, some of the major initiatives taken by the Government of India for conservation and restoration of water bodies are as follows.

1. Rejuvenation of water bodies is also a component under the water supply sector of the Atal Mission for Rejuvenation and Urban Transformation (AMRUT) scheme under the Ministry of Housing & Urban Affairs. AMRUT 2.0, launched in October, 2021, includes rejuvenation of water bodies and water conservation.
2. In 2019, Jal Shakti Abhiyan was launched by the Government. This was followed by the "Jal Shakti Abhiyan: Catch The Rain" (JSA:CTR) campaign, in 2021. The JSA:CTR campaign for the year 2022 was launched in March 2022, in all districts (rural and urban), in the country. The main theme of the campaign is "Catch the Rain, where it falls, when it falls". Focused interventions under these annual campaigns taken up by the Government of India and the State Governments, include renovation of traditional and other water bodies/tanks, enumeration, geo-tagging and making inventory of all water bodies, and removal of encroachments of tanks/ lakes, and de-silting of tanks, and protection of water catchment areas.
3. Mission on Amrit Sarovar, aimed at developing and rejuvenating 75 water bodies in each district of the country as a part of celebrations of Azadi Ka Amrit Mahotsav, has been launched in April, 2022. The Mission works through the states and districts, through refocusing of various ongoing schemes of the Government, as well as inclusion of citizen and non- Government resources. The Mission is to be completed by 15th August 2023.
4. Mahatma Gandhi National Rural Employment Guarantee Scheme (MNREGS) has provisions for public works relating to natural resource management, water conservation and water harvesting structures to augment and improve ground water like underground dykes, earthen dams, stop dams, check dams and roof top rain water harvesting structures in public buildings.

Planning, funding, execution and maintenance of water bodies, including their restoration, rejuvenation and conservation, is addressed by the State Government concerned. Government

of India provides technical support and in some cases, partial financial assistance under the existing schemes, to facilitate the State Governments.

Bureau of Indian Standards IS-10500: 2012 specifies 'acceptable limit' and 'permissible limit in the absence of alternate source' for various physio-chemical and bacteriological parameters for drinking water quality. The Central Ground Water Board generates ground water quality data on a regional scale during various scientific studies and ground water monitoring programme throughout the country. Data on ground water quality has been shared with concerned State Governments for taking remedial measures, awareness and monitoring of drinking water use.

To make provision of potable tap water supply in adequate quantity, of prescribed quality and on regular & long-term basis to every rural household by 2024, since August, 2019, Government of India in partnership with States, is implementing Jal Jeevan Mission (JJM) – Har Ghar Jal. Under JJM, while allocating the funds to States/ UTs, 10% weightage is given to the population residing in habitations affected by chemical contaminants.

Under JJM, while planning for potable water supply to household through tap water connection, priority is to be given to quality-affected habitations. Since, planning, implementation and commissioning of piped water supply scheme based on a safe water source may take time, purely as an interim measure, States/ UTs have been advised to install community water purification plants (CWPPs) especially in Arsenic and Fluoride affected habitations to provide potable water to every household at the rate of 8-10 litre per capita per day (lpcd) to meet their drinking and cooking requirements.

Under Jal Jeevan Mission, as per existing guidelines, IS:10500 is to be adopted for ensuring safe drinking water supply and States/ UTs have been advised to carry out testing of drinking water sources once in year for chemical and physical parameters, and twice in a year for bacteriological parameters. To enable States/ UTs to test water samples for water quality, and for sample collection, reporting, monitoring and surveillance of drinking water sources, an online JJM – Water Quality Management Information System (WQMIS) portal has been developed. The State-wise detail of water quality test reported through WQMIS is available in public domain on JJM Dashboard and can also be accessed at: <https://neer.icmr.org.in/website/main.php>

To encourage water quality testing to ensure potable drinking water supply, States/ UTs have opened water quality testing laboratories to general public for testing of their water samples at a nominal rate.

States/ UTs have been advised to identify and train 5 persons preferably women viz. ASHA workers, health workers, VWSC members, teachers, etc. in each village to conduct water quality tests using FTKs/ bacteriological vials at village level and report the same on the portal.



This information was given by the Minister of State, Shri Prahlad Singh Patel in a written reply in Lok Sabha today.

Thane Creek Gets Ramsar Site Status

The Thane Creek, in Mumbai, is now a Ramsar Site. Before getting into details of how this will impact wildlife at the Thane Creek, it is important to know what is a Ramsar site? A wetland of international importance under the Ramsar Convention is known as a Ramsar site. The Ramsar Convention is also known as "The Convention on Wetlands", and is an inter-governmental environmental treaty established in 1971 by UNESCO, that came into force in 1975. The conference/convention was held in Ramsar, in Iran, in 1971, hence the name Ramsar site. This convention provides for national action and international cooperation with regard to conservation of wetlands and sustainable use of their resources. Ramsar Convention identifies wetlands of international importance, especially those providing waterfowl habitat. As of August 2022, there were 2,453 Ramsar sites across the globe.

India became a part of the Ramsar Convention in 1982 and since then there are about 75 Ramsar sites in the country. The Thane creek being the latest addition, to the list.

Where is the Thane creek? The Thane creek is in Mumbai and is one of the longest in Asia. The creek connects with the Ulhas river through a narrow channel. The Thane Creek shares its borders with Mumbai and its suburban districts and the Thane district and Navi Mumbai. The creek is spread over an area of 6,521.08 hectares. A part of the creek (1,690.5 hectares) was declared the Thane Creek Flamingo Sanctuary (TCFS) and the balance was notified as an eco-sensitive zone around the TCFS, in October 2021.

Why is it important? The creek is surrounded by mangrove forests on both sides. These forests apart from supporting the rich biodiversity of that supports a wide variety of migratory birds also protect the land from the tidal waves. Not to forget that creeks help in improving water quality. Another first with the Thane Creek being notified, as a Ramsar site is that it would perhaps be the first time that a Ramsar site is located with an urban agglomeration. With the creek being made a Ramsar site,

apart from helping the ecology thrive could also give a boost to tourism and also jobs.

Good Bacteria in the Ganges Low

According to a study by the Wildlife Institute of India (WII) the water in the holy Ganges is not in good health. The two head streams that form the Ganga river, at Devprayag, are the Alaknanda, coming from the Alkapuri glacier, and the Bhagirathi coming from Gaumukh. The study done by WII has brought to light that the good bacteria, in both the headstreams of the Ganges was low. The good bacteria which is largely responsible for maintaining the purity of the water, in the Ganges, is Batriaphos. The parameters on which the study by WII was based were Ephemeroptera, Plecopetera and Trichoptera more commonly known as EPT. The water quality is considered to be good if the EPT index is 20%, and in case it is 30% then water quality is considered to be very good. In the study by WII, the EPT index was found to be below 15% at many places, in the river. There are many reasons that could be attributed to the decline in good bacteria, in the river. One of the reasons is dumping of debris from the development works along the river. The other is that dirty water from habitations along the river, flows into the river untreated.

Japanese Technology to Curb River Pollution

A recent study by the Central Pollution Control Board (CPCB) has revealed that nine river stretches in the state of Uttarakhand are among the most polluted stretches of the river in the entire country. Taking note of this report the State Government plans to make use of technology from Japan to treat sewage, especially from habitations along the river, before it meets the main channel.

Amrit Sarovar Unveiled in Chandigarh

The first Amrit Sarovar of Chandigarh was unveiled on 15 August, at Kaimbwala village. The primary aim of Amrit Sarovar's is to promote water conservation, which will in turn raise ground water levels. The Amrit Sarovar, in Kaimbwala village, was unveiled by Ms Sarabjit Kaur Dhillion, the mayor of Chandigarh. The unveiling of the Amrit Sarovar was a part of the "Azadi ka Amrit Mahotsav" celebrations wherein the deadline, to rejuvenate 75 water bodies, in each district of India is 15 August 2023. It is expected that the Amrit Sarovar, at Kaimbwala village, will not only help in conserving water but will also act as a tourist destination and will have fountains, lighting and seating arrangements for visitors. Two more Amrit Sarovar's are planned in for Sarangpur and Khuda Ali Sher.

The Tradition of Respecting Water Should Be Revived In Our Consciousness: DG, NMCG

National Mission for Clean Ganga (NMCG) in association with the APAC News Network organised the 9th edition of the monthly webinar series 'Igniting Young Minds, Rejuvenating Rivers'. The theme of the 9th edition was 'Rainwater Harvesting'. The session was presided by Shri G. Asok Kumar,

Director General, NMCG. The panelists of the webinar included Dr Bhanu Pratap Singh, Vice-Chancellor, Maharishi University of Information Technology, Lucknow; Dr Venkataramana Chitimini Reddy, Vice-Chancellor, KK University, Bihar; Dr Rajesh Naithani, Pro Vice-Chancellor, Himalayan University, Dehradun; Dr Manjula Jain, Associate Dean Academics, Teerthanker Mahaveer University, Moradabad and Shri Ramveer Tanwar, the Pond Man of India and an Expert on Rainwater Harvesting.

Highlighting the sheer need to ignite young minds about the significance of rainwater harvesting, Shri G. Asok Kumar had stated that the tradition of respecting water should be revived in our consciousness. Recalling the 'Catch the Rain' campaign, with tagline 'Catch the Rain', where it falls, when it falls', implemented by himself, as the Managing Director, National Water Mission, Shri Kumar mentioned that the programme was launched by the Shri Narendra Modi, Prime Minister of India, on the occasion of World Water Day on 22nd March 2021 in the virtual presence of over a crore people and that included sarpanches from all over the country. This, was perhaps the world's largest launch of any water conservation campaign. Shri Kumar further added that over 47 lakh rainwater harvesting structures were constructed in the country and several ponds were identified and revived. Around 500 Jal Kendras were also established as part of the campaign. The stakeholders were nudged to create appropriate rainwater harvesting structures that were suitable to the climatic conditions and subsoil strata before monsoon.

Mentioning about the integrated concept of conserving rainwater and preserving heritage, Shri Kumar talked about the traditional water harvesting structures, this included stepwells. Shri Kumar further added that stepwells are excellent pieces of architecture and must be preserved for ensuring a sustainable future for all of us. He further stated that not merely the construction, but also maintenance of rainwater harvesting structures is of utmost importance. He also emphasized that for the successful implementation of the Namami Gange Mission, there's a need to make the Jal Andolan into a Jan Andolan. He also mentioned that there is an urgent need for the younger generation to take up the mantle of water conservation and appealed to leading educators to ensure that not a single drop of water goes away from their campuses.



Sharing his insights on challenges and solutions with regards rainwater harvesting, Shri Ramveer Tanveer, the Pond Man of India, talked about the issues of direct garbage dumping, encroachments and multi-inlets, thereby also elaborating on technologies of bio-remediation, aqua culture, aeration and phyto-remediation for redressal. Through a presentation he depicted the before and after changes at various pond sights in the country. Shri Tanveer added that initiatives like 'SelfieWithPond' and 'NatureWalk' have done wonders to arouse consciousness of people about conservation of ponds, and thus water conservation. He emphasized on the importance of biodiversity and said that the main difference between a natural water body and an artificial water body is the healthy presence of biodiversity in the former. He said that community participation is central to making any public programme a success.

Speaking about the significance of conservation of water, Dr Bhanu Pratap Singh mentioned that Tamil Nadu is the first state, in the country, to make rainwater harvesting, compulsory. He said to prevent the loss of water and resources, we all need to act judiciously with regards its usage, in our daily lives.

Dr V. Chitimini Reddy talked about the importance of community participation in successful implementation of any large-scale campaign, while Dr Rajesh Naithani emphasized on the idea of adding a unique parameter in ranking of educational institutions in the country—the Sustainability Factor, which would ensure the practice of conservation of environment, especially water conservation, in the setup.

Dr Manjula Jain discussed the concept of a 'Water Budget', which the associated University was implementing in the direction of water conservation, and said that we all have a great role to play in such a noble cause of preserving water. She rightly added that it takes a lot of blue to stay green.

Cleanliness Drive Along the Yamuna

As part of the ongoing awareness campaign for the Yamuna river, NMCG and a group of NGOs had organized cleanliness drives at seven ghats along the Yamuna, in the National Capital. Students from schools participated in Shram Daan activities organized on the seven ghats, including Kalindi Kunj, Nigambodh Ghat, Signature Bridge, Sonia Vihar Pushta 1, Thokar #17 Sungerpur, Thokar #18 Gandhi Nagar and Thokar #21 Gandhi Nagar. Officials from Delhi Jal Board (DJB) and Municipal Corporation of Delhi (MCD) also joined the cleanliness drive, in large numbers.

The NGOs which were part of the cleanliness drive include Bharatiyam, Rotary Manthan, Earth Warriors, Yuva Parivartan Foundation, SYA and so on. This is a regular activity organized on the 4th Saturday of every month.

Executive Director (Technical), NMCG, Shri D.P. Mathuria took part in the event and interacted with stakeholders, especially young children, on the importance of keeping our rivers clean for a better and sustainable future. He motivated the



participants to become part of this Clean Yamuna movement that is gaining momentum.

The cleaning of tributaries of River Ganga, especially, Yamuna, is one of the focus areas of Namami Gange Programme. While 318 MLD STP at Coronation Pillar constructed under the Namami Gange Programme was commissioned in March, three other main STPs on Yamuna funded by the NMCG are targeted to be completed by December 2022. These include Rithala, Kondli and Okhla, which is one of the biggest STPs in Asia. This will help in preventing sewage from drains falling into Yamuna. A total of 12 projects for the treatment of 1,385 MLD sewage have been taken up at a cost of about INR 2,354 crore under Namami Gange Program in Delhi, to abate the pollution in River Yamuna.

Industrial Units and Local Bodies are Required to Install ETPs/CETPs/STPs

This information was given by the Minister of State, for Jal Shakti, Shri Bishweswar Tudu in a written reply in the Lok Sabha.

As per the Provisions of Environment (Protection) Act, 1986 and Water (Prevention & Control of Pollution), Act 1974, industrial units and local bodies are required to install effluent treatment plants (ETPs)/ common effluent treatment plants (CETPs) and Sewage treatment plants (STPs) respectively and treat their effluents/sewage to comply with stipulated environmental standards before discharging them into river and water bodies. Accordingly, CPCB, State Pollution Control Boards/Pollution Control Committees monitor industries with respect to effluent discharge standards and take punitive action for non-compliance under provisions of these Acts.

Central Pollution Control Board (CPCB) in association with State Pollution Control Boards/Committees in different States/Union Territories (UTs) have been monitoring water quality of rivers and other water bodies, across the country through a network of 4294 monitoring stations under the National Water Quality Monitoring Programme. Presently, there are 245 Government/Private Environmental laboratories recognized by the Ministry of Environment Forest &

Climate Change (MoEF & CC) and CPCB under the Environment (Protection) rules, 1986 in the country.

This Ministry supplements the efforts of State/UT Governments by providing financial and technical assistance in planning, designing and implementation of drinking water supply schemes and setting up drinking water quality testing laboratories through the Jal Jeevan Mission (JJM)-Har Ghar Jal. States/ UTs can utilize upto 2% of their annual allocation of funds under JJM for Water Quality Monitoring & Surveillance (WQM & S) activities inter-alia which includes setting up and strengthening of water quality testing laboratories, procurement of equipment, instruments, chemicals, glassware, consumables, hiring of skilled manpower, surveillance by community using field test kits (FTKs), awareness generation, educational programmes on water quality, accreditation/ recognition of laboratories and so on. As reported by States/UTs, Department of Water Supply/ Water & Sanitation/ Public Health Engineering has a network of 2,070 drinking water quality testing laboratories at different levels of the State/UT.

Use twin leach pit toilets for disposal of human excreta

This following information was given by the Minister of State, for Jal Shakti, Shri Prahlad Singh Patel in a written reply in the Rajya Sabha.

Sewerage system does not exist in rural areas of the country. Under the Swachh Bharat Mission (Grameen), for disposal of human excreta, use of safe and eco-friendly onsite sanitation technologies such as twin leach pit toilets is encouraged. Under this technology, human faeces automatically become manure in 1-2 years. In case of septic tank and single leach pit toilets, it is advised to retrofit them by converting the single pits to twin pits and connecting septic tank with soak pits. For treatment of faecal sludge from the septic tanks and single pit toilets, SBM (G) guidelines provide for mechanical emptying of the pits and transportation of faecal sludge to nearby Sewage Treatment Plant (STP)/ Faecal Sludge Treatment Plant (FSTP) in urban/rural area. Funding provision at the rate of INR 230 per capita is available under SBM (G) for setting up of FSTP in rural areas ■



INTERNATIONAL

A WRAP UP OF SELECT EVENTS IN THE FIELD OF WATER

Quick Showers For The Indian Team

In mid-August the Indian cricket team was in Zimbabwe for a three match one day series. When the team was in Harare, considering the severe water situation, the BCCI had asked the team members to take quick showers. Even their pool sessions were cut. This was done, as the city faces severe water crisis. These measures were taken so as to ensure that no water was wasted.

It needs to be noted that people in the city have to travel long distances to get water. What also needs to be noted is this situation in the city is not because of any drought but because the water treatment facility at Morton ran out of essential chemicals used in the water treatment process.

Sneakers That Contain Beer

Yes you read that right. You have shoes that have some beer in them and when you use those shoes you will actually be walking on beer. The launch of Heinekicks, the shoe with beer, is a result of a collaboration between Heineken and the CEO and the founder of "The Shoe Surgeon" Dominic Ciambrone. If you use these shoes you will actually be walking on beer because Heineken Silver beer is injected in the sole of these shoes.

British Water appoints Mark Fletcher as chair

Mark Fletcher, global water leader at Arup and an Arup Fellow, has been announced as British Water's new chair. The appointment was announced at the trade association's annual general meeting on 28 July 2022 and comes as Chris Loughlin steps down from the role.



Fletcher joined the British Water non-executive board in 2020 and is former chair of the Water Industry Forum, which merged with the organisation in April 2022. He has over 35 years' experience working across water in the UK and globally.

An international authority on urban water resilience, Fletcher



WATER NEWS

FROM ACROSS THE GLOBE



was made an Honorary Fellow of CIWEM in March 2021, a Royal Academy of Engineering (RAEng) Fellow in 2019 and an Honorary Fellow of the Society for the Environment in June 2018.

He has worked on the City Water Resilience Approach, developed to help cities grow their capacity to both anticipate and mitigate water-related shocks and stresses. Fletcher was also faculty leader for the Arup University - Massachusetts Institute of Technology Sloan Business School course, Resilience of Urban Systems from 2017 to 2020.

Other key appointments announced at the AGM were Rachel Lewis as UK Forum chair and Tom Williams as International Forum chair. Rachel is joint owner and director of IQ Engineers and was formerly vice-chair of the UK Forum. Williams is chief executive of Enebio and has been British Water's USA export mentor for 10 years, as well as vice-chair of the International Forum.

British Water's UK Forum supports members with an interest in the UK municipal and industrial market. The forum meets twice a year to review the water market, hear updates from leading industry figures and identify key challenges to be taken forward by British Water.

The International Forum enables members to connect with leading players in the global water industry. Services include access to business mentors, market briefings and businesses development meetings with key buyers.

Spring knowledge transfer service goes live

A knowledge-sharing and project showcase platform that will support the UK water sector with its innovation ambitions has

been launched. The Knowledge Transfer Service, from water innovation accelerator Spring, offers a central bank of information and case studies about projects and trials, as well as a programme of live showcase events to explore lessons learnt. The offering also gives utilities access to 26 global case studies from new partner WaterStart, a non-profit that has been solving challenges through innovation for utilities and other large consumers of water for almost a decade.

Spring is dedicated to water sector transformation through innovation and collaboration. It was launched in 2021 and is backed by all UK and Irish water and wastewater companies. Its Knowledge Transfer Service is organised around seven themes within the sector's Water Innovation 2050 strategy.

Project showcases

Spring's programme of best practice webinars will see utility project teams present their innovation initiatives. The platform's first showcase was delivered by SES Water on 28 June 2022 and focused on the company's smart network project, iDMA. Project partners joined the event, which included a live on-the-ground technology demonstration and recorded interviews with control room staff.

Incentives to share

Ofwat's PR24 draft methodology for the 2024 price review was published on 7 July 2022, proposing a new approach to offer greater rewards to any company that 'exceptionally pushes the boundaries on performance provided that it shares the knowledge gained with the rest of the sector'.

Automated timers halve blower power consumption

New energy saving measures developed by WCS Environmental Engineering (WCSEE) could reduce power consumption of its package wastewater treatment plants by as much as half. The water recycling specialist has introduced automated timers to operate blowers in the biological treatment section of its patented HiPAF (high performance aerated filter) package treatment plants. Blowers account for more than 95% of the energy used in a typical wastewater treatment plant. They usually operate 24/7 to blow air into biological treatment processes, providing oxygen to the bacteria that decompose organic substances in the wastewater, ensuring high standards of treatment are maintained.

Blowers in WCSEE's HiPAF range are now timed to pulse air into the process, rather than operate continuously. The timers will be built in as standard to the HiPAF range of treatment plants, cutting the amount of energy used to treat effluent by up to 50%.

Developments in hydraulic control and retention times have also enabled the patented process technology to consistently achieve final effluent ammonia concentrations of less than 1 mg/l on a 95%ile basis.

New Autonomous BioAugmentation Technology Delivers Rapid and Sustainable Results

As the fastest growing community in the greater Harrisburg, Pennsylvania area, Silver Spring wastewater operations managers have found an affordable, sustainable method for



staying ahead of population demands, reducing costs and maintaining compliance.

Silver Spring Township, Pennsylvania is currently the fastest growing community in the greater Harrisburg, PA area. The township's wastewater treatment plant serves a population of approximately 18,000 residents with an average treatment of .8 MGD and design capacity of 1.2 MGD. Knowing the number of customers to be served will continue to rise, they were looking for solutions to give their annual budget some breathing room while increasing the plant's overall efficiency and capacity to stay ahead of the increased demand. Lowering operating costs for aeration, sludge removal and structure maintenance were also the goals.

SOLUTION: Silver Spring accepted an opportunity to have a risk-free performance trial of a new autonomous bio-augmentation technology from Enbiorganic Technologies. The performance trial would last for 60 days and at the conclusion, the city would have the option to keep the technology on a TaaS (Treatment as a Service) basis. A single EBS-Di unit from EnBiorganic Technologies (EBT) was set up by ABEL RECON, a licensed installer of EBT in one of Silver Spring's lift stations approximately 4 miles from the treatment plant's headworks.

The EBS-Di unit utilizes a customized proprietary active state soil microbiology, custom-tailored by EBT to Silver Spring's wastewater, that is autonomously delivered into their collection system using a patent-pending process which generates and activates the microbiology consortium. The microbes perform

without oxygen, are highly adaptable and immediately went to work, rapidly dominating Silver Spring's system.

RESULT: Within 60 days after installation, Silver Spring realized visible evidence of 23% biosolids removal, 63% total solids reduction, nearly 100% odour eradication and a significant reduction in FOG. The majority of the collection system being treated downstream of the installation location is cleaner with the existing biofilm being removed and replaced with EnBiorganic's microbes in a very thin biofilm which is treating the flow on its way to the treatment plant.

Silver Spring collection system operators indicated that previous issues with FOG and overflows in this treated section of the system have all disappeared since the installation.

Also noted was a change in effluent chambers which are now noticeably cleaner and easier to maintain once treatment commenced. Algae growth which typically required pressure washing and physical scraping to remove, can now be eliminated by a normal water hose. Over time the microbes will continue to progress upstream and positively impact other portions of the system.

Compared to the 5 months prior to installation, the EBS-Di system is providing 37% KWh reduction at an estimated savings of about USD 1,600/month. Even compared to averages of the same months the year before or an aggregate of all KWh usage in 2021, this demonstrates a 28% reduction in energy consumption.

The second major impact is the reduction in water consumption utilized for sludge handling. Sludge processing has now become more efficient, and less water is being sent to the landfill. It is estimated that USD 18/ton reduction for sludge handling will be realized. The total sludge load has also been affected. Jim Stevens, operator at the plant noted that the plant may be down to as low as 7 loads from the usual 9. With this data trend, it is anticipated that a 62% reduction in monthly sludge handling costs will also be gained.

Due to the results, at the conclusion of the performance trial, Silver Springs decided to sign a long-term contract with ABEL RECON for the EBS-Di technology and service, realizing that the cost savings in sludge hauling, treatment energy needs and maintenance labor derived from having the unit would more than cover the expense for the service contract and put them on an excellent footing for meeting their growing community's needs.

Trip.Com Group Announces Long-Term Green Tourism Goals

Trip.com Group, a leading global travel service provider, has announced its long-term goal to build green tourism, covering three key areas, including: working with partners to launch over 10,000 low-carbon travel products; promoting sustainable travel concepts and engaging 100 million travellers in low-carbon practices; and, aiming to further reduce carbon

MANAGING EARTH'S MOST PRECIOUS RESOURCE WITH THE ZETWERK ADVANTAGE

Zetwerk is a universal manufacturing network powered by new-age technology, transforming the world of traditional manufacturing. We help customers reduce costs, optimise vendors and execute projects.

The Zetwerk Water Division was started in 2018 with the vision to bring safe drinking water to people's homes. Our expertise includes: Network and Hydraulic Modelling, Smart Water Management - SCADA, WTP, Drinking Water Supply, Wastewater/Sewerage, Irrigation, Solid Waste Management and Operation and Maintenance of plants. We are excited to be part of Everything About Water 2022 and look forward to connecting with you to collaborate on your aqua projects.

- Delivering pure drinking water to over 500,000+ households
- 5,500+ kms of water distribution pipelines underway
- Treating 60 million litres per day
- Reservoir storage of over 24.4 million litres
- Presence in 9 states
- Undertaking multiple water projects worth over INR 2,000 crores
- Turnkey projects capability of INR 50-1,000+ crores

The Zetwerk Advantage

Zetwerk's DNA is rooted in execution capability with technology at its core

Expertise of Execution

12+ projects under execution by an effective and efficient project team to save client's time and costs

Cutting-Edge Software and Applications

10+ inhouse software applications and proven real time documentation

WHY YOU NEED US

Client Connect

In-house softwares for effective communication and visibility on client projects

Robust Supply Network

10,000+ suppliers on board managing supply and logistics



Net zero water challenge innovations

Emission-cutting innovations from three global technology leaders are being accelerated through the UK water sector, thanks to new collaborative platform Spring. Technologies from Siemens, Xylem and Cobalt Water Global are being mobilised through a collaboration of 10 water companies, as part of the first Spring Accelerator challenge. Spring is dedicated to water sector transformation through innovation and collaboration. It was launched in 2021 to support the sector in delivering the ambitions of its Water Innovation 2050 joint strategy and is backed by all UK and Irish water and wastewater companies.

The Spring Accelerator sets challenges related to the Water Innovation 2050 themes, facilitating the end-to-end process from ideation and assessment to collaboration and adoption. The initial stages of the first challenge, which asked innovators to find ways to reduce operational emissions, have successfully completed, with three new innovations on the fast-track to scaling and adoption.

Siemens - Optimising performance and emissions reduction using a white-box digital twin of the wastewater treatment process.

Xylem - Xylem Treatment System Optimisation (TSO) digital twin-based control platform for process optimisation and greenhouse gas reduction in wastewater treatment.

Cobalt Water Global - N2ORisk Decision Support System to significantly reduce total greenhouse emissions at wastewater treatment plants by focusing on N2O.

The successful ideas were announced at a Spring webinar on 7 July. Reflecting on the process, Adam Cartwright, Siemens head of internet of things applications, had said that as a supplier, it is exciting to see your solution transparently and robustly tested.

Next steps

Mobilisation workshops with the three innovators and water companies, led by Spring, are now underway, and individual



trials are being progressed. Welsh Water, which is running trials of two of the innovations, has already hosted an information sharing session with other water companies. On the completion of individuals trials, a collaborative group trial will be led by Severn Trent.

Updates from award-winning Trial Reservoir initiative

Technology consultancy Isle has provided an update on three trials taking place around the world under its world-first Trial Reservoir (TR) initiative. The Trial Reservoir provides technology companies with risk-free access to a pool of loan funding to run trials, with the aim of increasing and accelerating uptake of clean technologies. End-users supporting the trials commit to adopting the technologies if pre-agreed outcomes are achieved – ensuring return on investment. Launched in November 2021, the fund is evergreen as the repaid loans from successful technologies are recycled into further trials. Seven trials are currently underway, three of which have been formally announced.

Trials update

The three trials being spearheaded by Isle's Trial Reservoir come from South Africa, France and the US, and range from a pre-pay water metering service for low-income communities, to an advanced filtration technology for agricultural applications.

1. Pre-pay water metering

HydroDrip is a South African start-up with a smart card-based water metering and billing system for users of a decentralised water treatment and supply system. Kusini Water is a social enterprise established in 2016, that works with South African and international companies to provide renewable energy powered drinking water.

Kusini Water's solar and gravity powered, modular water treatment systems are containerised and installed onsite. To date, the systems have been paid for by donors and sponsors, but they aim to become financially sustainable with the consumers paying for water.

Kusini Water HydroDrip's smart card system also works with an app and digital e-wallet, to buy potable water on tap 24/7 at

INNOVATIVE AND UNIQUE LARGEST RANGE OF FILTER HOUSING IN INDIA



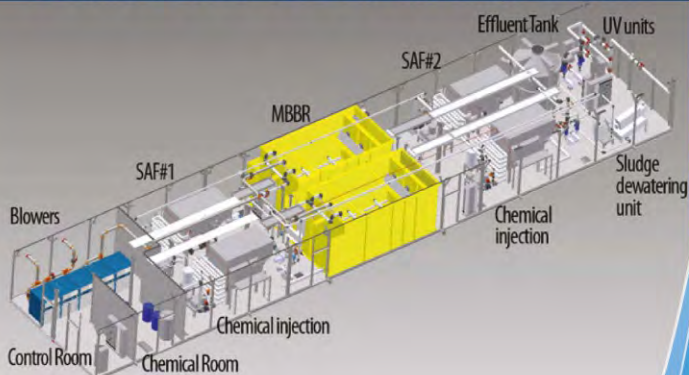
100%
VIRGIN PRODUCTS

**Aishwaryam
Filters**
Believe In the Best

Aishwarya Traders 7, River View Bungalow, Shreyash Colony,
Ashram Road, Ahmedabad-380009.

Sachin Ringwala: +91 93270 29224, 9429622288\99
waterfilter.co.in@gmail.com | www.waterfilter.co.in

Wastewater Treatment Systems



- ✓ Advanced wastewater plants in India from technologies in Canada
- ✓ EPCM and local support
- ✓ Containerized packaged water/wastewater plants
- ✓ MBR/MBBR/AOP/DAF/UF/RO treatment technologies

**BI Pure
WATER**

25
YEARS

World class Canadian
Technology in India

bi@biwater.com
Toll-free: 1-81-900-4000 10222

POLYELECTROLYTES (Flocculating Agents), DWPE, DOPE

ZETAG and MAGNAFLOC range of coagulants and flocculants

- Complete range of molecular weights and ionic charges flocculants and coagulants, for primary, secondary and tertiary clarification
- Significant dose reduction of up to 20%*
- Specially formulated polymers for high shear applications such as decanter centrifuges, Belt press filter and screw-press.
- Improved centrate quality with reduced suspended solids.
- Special grades of ultra-high molecular weight cationic polymers for chemical & biological sludge thickening and Dewatering.



Dosage
is more important
than the **Price**



Raybon Chemicals and Allied Products
Out Performing Polymers with Outstanding Service

813, Samanvay Silver,
Near Royal Orchid Hotel,
Mujmahuda Circle,
Akota, Vadodara - 390 020, India

Tel.: - +91 9081817998
E-mail: chemicals@raybonchemicals.com
Website: www.raybonchemicals.com

municipal tariffs. This is at a much lower cost than bottled water and does not require single-use bottles.

Credit can be added to e-wallet and cards at local shops and via the app. E-wallets are being trialled with 20 customers at two Kusini Water sites for six months.

A user survey will be conducted with all trial users and the data examined by both parties, with a target score of at least 80% satisfaction from a 30% response rate as one of the key performance indicators. If the trial is successful, Kusini Water plans to purchase the hardware and software for the card-based system.

The company will sign a contract with HydroDrip to be their exclusive provider for all locations, a target of 50 sites. Kusini Water currently treats approximately three million litres water per month; each litre saves some 3kg CO₂ equivalent (CO₂e) emissions in reduced fossil fuel use, compared with users buying bottled water or fetching and boiling river water.

The post-trial scale-up plan is for five million litres per month by January 2023, representing a saving of around six tonnes CO₂e per month.

2. Nitrous oxide reduction

Purecontrol, a French company providing automation for water management and energy optimisation, has joined forces with Cobalt Water to quantify emissions, optimise the treatment process, and eliminate nitrous oxide (N₂O).



Cobalt Water has developed the N2ORisk decision support system (DSS), an artificial intelligence (AI) technology for decarbonising water resource recovery facilities. The N2ORisk DSS combines expert knowledge on N₂O with machine learning to quickly quantify emissions, properly optimise the treatment process, and eliminate N₂O.

By focusing on and actually reducing N₂O, water utilities and municipalities can effectively reduce their carbon footprint. The N2ORisk DSS also improves process efficiency and stability, which can also save money.

The goal of this trial in Rennes, France, is to demonstrate repeatable and scalable results at multiple facilities. First, a historical data analysis is conducted, after which mitigation activities are defined, measurements are initiated, mitigation actions are undertaken, and reductions observed.

The full trial period will take two months.

3. Targeted water filtration

Advantageous Systems (ADS) is a US-based company that uses nanomaterials with highly specific targeting and adsorption characteristics to remove particular molecules from water.

The ADS system lowers brine production compared with conventional treatment such as reverse osmosis, eliminates membrane fouling, and lowers electricity demand. This in turn reduces Scope 2 emissions - which are indirect emissions from purchased energy - including electricity, steam, heating, or cooling.

The 12-month trial will see the installation of a containerised water treatment system at a cattle ranch near Fresno, California. Should the treated water meet the technology user's needs in terms of target water quality objectives and energy consumption, the trial unit will be purchased by the user.

With seven technologies currently being trialled as part of the TR programme, Isle says it is on track for its target to alleviate up to 120k tonnes carbon per annum, equivalent to the consumption of 30,000 average people on Earth, 10,000 UK citizens or 7,500 people in the US, in its first year.

Award winner

The potential of the Trial Reservoir is already being recognised, with the initiative winning the innovation in decarbonising category of the WEX Global Awards 2022, in València, Spain, in June. Judges were looking for case studies which unlock important energy potential, cut greenhouse gas emissions, and make water infrastructure efficient and resilient.

Davos briefing

The Trial Reservoir has also been cited in a briefing paper presented by Isle at the World Economic Forum (WEF) Annual

Meeting in Davos, Switzerland in May. The paper explains how the water sector can overcome barriers to innovation.

The report is the result of a collaboration between Isle and WEF and was presented by Isle chairman Dr Piers Clark. It focuses on how water can enable and accelerate the transition to a green economy and provides insight into how water can unlock multiple gains.

The paper argues that reaching the scale and pace of change required lies in leveraging existing collaborative platforms that support co-creation pathways, along with identifying the right partners, funding support, collaborative frameworks and conditions for scale. The Trial Reservoir is given as an example of best practise.

The paper states that including water in net-zero carbon strategies requires innovative technologies, know-how, governance and financial instruments. Rising to this challenge demands a paradigm shift, and the paper describes how this can happen, and how it has already been made by multinational corporations, utilities, municipalities and small companies across the world.

According to authors, the hope is to inspire a broader set of leaders to take action and create a groundswell of even bolder ideas in the lead up to the UN Water Conference in New York on 22-24 March 2023 - the first in over 40 years.

Global Submersible Pump Market to reach USD 20.58 BY 2026

Fortune Business Insights, in its report titled "Submersible Pump Market, 2021-2026" has stated that the global submersible pump market is expected to grow from USD 12.95 billion in 2018 to USD 20.58 billion by 2026, thereby registering a CAGR of 6.0% during the forecast period. In its report, it is further stated that the growing concerns regarding environment will subsequently aid the development of the submersible pump market during the forecast period. Moreover, the rising emphasis regarding wastewater discharges will fuel demand for

submersible pump, which in turn will boost the submersible pump market trends.

In addition, to the reasons highlighted above, growing focus of key players towards enhancing and improving the operational performance of submersible pumps will aid the expansion of the market during the forecast period. For instance, in May 2019, Caprari, a world leader in pumps and centrifugal electric pumps announced to increase the operational performance of its submersible motor's portfolio called MAC series. The improvement is achieved by using High Thrust (HT) bearings in the units to increase axial load resistance and durability of the products.

WaterIQ Technologies and Audubon International Announce New Partnership

WaterIQ Technologies, the leader in next-generation ultrasonic solutions to combat harmful algae and biofilm without the use of chemicals, announced its partnership with Audubon International. Through this partnership, the parties will mutually promote algae-free water sustainability practices for communities, municipalities, and golf courses.

Audubon International is a leading environmental sustainability organization committed to educating, empowering, and energizing its members to better manage land, water, wildlife, and other natural resources. Its award-winning educational and certification programs help golf courses and communities protect and preserve the environment.

WaterIQ Technologies' solutions control algae and biofilm and help restore water ecosystems to their natural state through industry-leading ultrasonic technology. The non-chemical solutions are safe and welcoming to wildlife, while being efficient and cost-effective.

The company's ultrasonic solutions are installed in Audubon International Certified Golf Courses such as Teton Pines Country Club in Wilson, Wyoming, Rockland Country Club in Sparkill, New York and other golf courses and resorts worldwide.

WaterIQ Technologies combines world-class go-to-market engagement, technical expertise, innovative technology, and business processes to sustainably address the world's growing algae crisis. The company works closely with its dealer partners to remediate dangerous algae growth in a variety of markets, including drinking water utilities, wastewater treatment plants, general agriculture, golf courses, and homeowners associations.

Manufactured in the United States, WaterIQ Technologies' technically-advanced solutions provide wide ultrasonic frequency ranges (2,000+) and advanced Industrial Internet of Things (IIoT) technology for real-time data capture of critical system and water quality data. Additionally, its use of advanced materials, such as Sharklet™ technology, enables continuous algae and biofilm remediation, over longer duty cycles ■



WHAT HAPPENED @EAW; WATER SECTOR UNDER ONE ROOF

Between 4-6 August almost all the stakeholders from the water sector came under one roof for the 17th edition of the EverthingAboutWater Expo.

By
Team EverthingAboutWater



With a semblance returning to our life, since the Covid-19 pandemic became a reality, things have slowly started to come back on track. We have slowly started to get our lives back on track and most of us has started to function, from our respective places of work, like we used to before the pandemic hit us. The 16th edition of the EverthingAboutWater Expo was held in 2019 and since then due the pandemic, things had come to a standstill. With things returning to some form of normalcy EverthingAboutWater organised the 17th edition of its EverthingAboutWater Expo, in Pragati Maidan, New Delhi recently.

The Expo. Between 4-6 August almost all the stakeholders from the water sector came under one roof for the 17th edition of the EverthingAboutWater. The country partner of EverthingAboutWater for the 17th edition of the EverthingAboutWater Expo was the State of Israel. Infact Expo was inaugurated by the Ambassador of Israel, in India, H.E. Naor Gilon. H.E along with Ms Nisha Aggarwal, Business Head and Assistant Vice President, EverthingAboutWater lit the lamp, at event to formally start the 3 day Expo.

Considering the event was being held



after 2019, the participation in the Expo and response good. Among exhibitors at the Expo, there were 80 companies. It needs to be mentioned that there was a large pavilion of companies from Israel at the Expo. Some of the companies that were part of the Israel pavilion include names like Watergen, Atlantium and curapipe. Some of the other companies that participated in the Expo included names like Borouge, Greencraft Labs, Huliot Pipes & Fittings Pvt Ltd, Jain irrigation Systems Ltd, Ozone Engineers Privet Ltd, Sahara Industry, Zetwerk Manufacturing Business Private Ltd, Thermax and Organic Solutions. Over the period of three days, the Expo saw attendance by 8,674 visitors.

Among the notable visitors to the Expo included officials from Delhi Jal Board, Government of Haryana, Government of Uttar Pradesh; Embassy of Australia; US Embassy; Embassy of Denmark;

Embassy of Norway; L&T; Tata Consulting Engineers Limited ; Hero MotoCorp; Arvind Kaigo; MSV International Inc; Kirloskar Brothers Ltd; Pentair; Esri India and Engineers India Limited.

In addition notable dignitaries like Mr Sanjay Sharma, Director, Delhi Jal Board; Mr Ajit Kumar, Sr. Pvt. Secretary to Water Member, Delhi Jal Board and Mr. Ankit Srivastava, Water Consultant to Government of Delhi also visited the Expo.

The Conference. While the Expo proved to be a healthy meeting ground for stakeholders from the water sector, a conference held on the sidelines of the Expo proved to be an important forum where experts educated the august audience on new developments in the water sector and also about the new trends and burning topics in the sector

EVENTS

that require attentions. Among the experts who shared their views at the conference included Shri G Asok Kumar, Director General, National Mission for Clean Ganga; Dr. Lior Asaf, Water Attache, Embassy of Israel, New Delhi; Dr Ajit Salvi, Dy. Chief Engineer, Municipal Corporation of Greater Mumbai; Mr Ben Shenkar, CEO, Curapipe System; Ms Sally Levy, CEO, Meniv Rishon Ltd, Israel and Ms Tahel Brandes, Adv., Senior Deputy Legal Adviser, The Governmental Authority. While there was a strong representation of experts from India, at this conference, luminaries from Israel and the United Kingdom also shared their thoughts.

Launch Of The Whitepaper. At the conference H.E. Naor Gilon also unveiled a whitepaper prepared by the content team of EverythingAboutWater. The paper speaks about the importance of adopting the three R's (reduce, recycle and reuse) in the water sector.

EverythingAboutWater would like to take this opportunity to thank its sponsors (Platinum Sponsor - Innozye, an Auto Desk Company; Gold Sponsor - Bentley Systems and Zetwerk; Conference Partner – Borouge; Silver Sponsor - Spray Engineering Devices), exhibitors, visitors and its team for success of the 17th edition of the Expo. And as an exhibitor and certainly many more would have the same opinion, when he remarked, "it is so good to finally see all of you in person, after what seemed to be such a long time." It was indeed a long time and certainly the next edition of the Expo will certainly not be that far way. As its commonly said, time flies. So see you all at the next edition of the Expo ■



TRANSFORMING WATER LOSS INTO A WATER RESOURCE

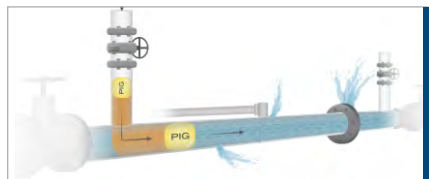
Presenting a revolutionary new paradigm for repairing distribution networks with losses, from 25% and above, from within the pipe without the need for leak detection and excavation.

By
Ben Shenkar

Leaks creating water loss in pressurized urban water distribution pipes run rampant both in the developed part of the globe and for India as well, where leakage levels can, in some cases, top even 50% of the water that is distributed. This widespread phenomenon has traditionally been ignored or, at best, token efforts have been made to reduce visual breaks or detectable leaks. But even when concerted efforts are employed, the result, for the most part, is only a modest reduction in water loss primarily from major breaks or large leaks leaving the lion's share of water loss intact.

Need to cut down on water losses.

However, the world has recently been subjected to a rude awakening with the onset of climate change which is creating major disruptions in precipitation patterns. This has led to more and more water stressed areas sometimes scaling to drought levels on one hand, and severe floods on the other. Ironically this has not even bypassed areas where water abundance has traditionally been the norm. In the past, most water supply systems could simply



rely on the traditional/standard sources of water i.e., rainwater, surface water and groundwater. However, utilities are now finding it harder and harder to provide resilient water supplies in cities and are looking for ways to augment current resources.

The revolutionary solution.

Curapipe Systems Ltd. from Israel is offering a revolutionary new paradigm for repairing distribution networks with heavy losses, i.e., ranging from 25% water loss

and above, from within the pipe without the need for leak detection and excavation. The core innovation is "transporting" a train of specially developed materials through water mains of 400-500 meters length from an insertion point to an extraction point, using a dedicated equipment, applying controlled conditions of pressure and flow (see video clip at



www.curapipe.com). Multiple leaks, large and small along the water mains and service connections, are sealed and cured by the special materials creating a virtual "new" water resource from the recovered water previously unavailable.

How we did it?

To date this has not been made possible since the onset of climate change has been so swift and abrupt that solution providers have not had the opportunity to develop new resilient technologies to address this problem. Curapipe on the other hand, has

gained a head start in this respect since its technology had initially been developed for the oil and gas industry allowing a relatively fast transition into the world of water distribution losses. The company already holds over 50 issued patents covering its innovation. Commercially applied and tested in several jurisdictions, operational results indicate a whopping 93% aggregate reduction of water loss in treated pipe sections. This holds much promise of enabling a fourth water resource if scaled and deployed by sufficient number of work teams, in one or more urban settings. An additional substantial benefit will be improved water quality, as sealing multiple leaks in water mains, will eliminate the pathogenic intrusion of contaminated ground water following floods.

How easy is it to use this technology?

Records show, that one operating team can repair around 2 kms of water mains per week. Given sufficient scale, within a single year water recovery could top 10% - 15% of the capacity of a full sized desalination plant, as a substitute for awaiting the 10 years it would take for a desalination plant to become operational if it were indeed to be implemented, at a fraction of the cost. Consider also that any new water resource would still be subject to the negative impact of heavy distribution losses, whereas Curapipe's solution cures the leaks in the distribution network as well as supplies a once abandoned water resource that can deliver 10 billion liters or more of recovered water for consumption, annually.

In summary, Curapipe's disruptive technology has enabled a one-of-a-kind solution that transforms lost water hemorrhaging from pressure pipes, into a much-needed good quality water resource for the benefit of Indian people ■



ABOUT THE AUTHOR

Ben Shenkar, is the CEO for Curapipe Systems. He has over 30 years of executive experience as a CEO and as an investor in manufacturing, industry, retail, renewable energy and high-tech sectors. Mr Shenkar holds a combined degree in Economics and Business Administration from the Hebrew University of Jerusalem, Graduate School.

**The only bad thing about good luck is..
you never know when it will favor you.**



**That's why smart
professionals
make informed
decisions.**

EverythingAboutWater
The Power of Knowledge
Over 21 years of expertise



As a professional when you develop specifications for next generation water treatment equipments or maintain and upgrade your current plants an systems, EverythingAboutWater helps you know how you can integrate best of water treatment products and services into your planning process. What's more - our real life case studies tell you about their long term feasibility in advance. Be ready for future...

Visit here to access 'Free E-Magazine' at www.eawater.com/eMagazine

WASTEWATER IS A RESOURCE

In some cases, energy production has now reached a level where the energy recovered from wastewater treatment process not only ensures the plant's own needs, but also covers the energy needs for drinking, water production and so on.

By
Mandar Vaijanapurkar

The worldwide consumption of drinking water is doubling every 20 years. At the same time, due to rapid industrialization and exponential growth in population, massive or huge amounts of wastewater is being discharged daily into our environment. However, only close to half of all wastewater is being treated globally¹. This means wastewater for nearly 6 billion people remains untreated. This not only poses sustainability challenges, depletes energy reserves, and undermines human water security and ecosystem health but the greenhouse gas (GHG) effect of letting the wastewater escape untreated into the neighbouring environment is far more detrimental than the GHG effect of additional energy consumption due to new wastewater facilities. Untreated wastewater running directly into the environment results in a GHG footprint three times higher than that of the GHG footprint when the same wastewater is treated in a traditional wastewater facility. The need for an alternative wastewater treatment measure to recover as much usable water as possible has become inevitable today.

The huge gap. In India, the treatment of municipal wastewater is the State Government's responsibility. Only about a third of urban Indian households have access to piped sewer networks that is connected to the State's sewage treatment plants². Although the benefits of wastewater treatment and reuse are well known, their application in the municipal wastewater management sector is still limited, especially in low and middle-income countries, like India. Rising population, variation in rainfall patterns, diminishing water availability, industrial development and rapid urbanization have together put the issue of water availability at the topmost priority for the Government. Factors such as water scarcity due to the increase in per capita consumption, technological development, environmental and economic challenges also necessitate the reuse of treated wastewater. In contrast, the main impediments against technology diffusion and a shift of the sector towards an integrated approach are a lack of cost recovery, vested interests in maintaining status quo, a deprivation of operation and maintenance skills, and



complex processes with many agencies and bureaucratic layers involved. There is a wide gap between wastewater generation and its treatment in India. Even the existing treatment capacities are also not effectively utilized due to inadequate operation and proper maintenance of existing plants and sewage pumping stations.

The required helping hands. The diffusion of energy-efficient technologies is determined by pricing, mandatory regulations and standard-setting that are being tightened gradually. The privatization of building, operation, and maintenance of treatment plants together with green procurement can be useful if designed carefully. Developing technology guiding frameworks and strengthening institutional and monitoring capacity is crucial to increase the confidence in the quality of recovered water resources, create demand, and safeguard human health and the environment.

Water Leakage is a Big Cause of Water Wastage

Every minute, around the clock, and throughout the year, water wastage occurs somewhere in the world. Water leakage can happen from many different sources including homes, farms, factories, hospitals, and businesses. Water installations in most homes do not comply with legislation. Nearly 3.4 trillion litres of water is wasted annually, in Indian homes. The most common cause behind the damage is water leaks from appliances that are linked directly to the water supply in rooms that are not water-proofed and thus do not have drains in the floor. It could be dishwashers, refrigerators with water dispensers or coffee makers in the kitchen, in office buildings that cause the damage. Appliances with overall poor quality and



¹<https://www.sciencedaily.com/releases/2021/02/210208085457.htm>

² <https://www.indiawaterportal.org/articles/urban-india-flushes-toilet-wastedirectly-or-indirectlyinto-its-water-bodies#:~:text=Only%20about%20a%20third%20of,total%20capacity%20of%2018%2C883%20MLD.>

installation lapses are some of the other causes of the soaring number of water leaks. Whatever the cause, water leaks pose a threat to an already limited water supply.

There are several options for tackling water leakage in homes and businesses. In general, utility meters, district heating system or moisture sensors can be used.

- Humidity sensors that can be strategically placed next to a Quooker tap, toilet, IT room and so on.
- The district heating system is used to perform tightness controls of the installation and valves during easymetric metering.
- Domestic hot water meters measure pressure loss which can be used to identify fluctuations in water consumption and thus ensure early action in case of water leak.

Danfoss Wastewater Treatment Solutions

Danfoss provides game-changing solutions to extend the precious water and energy resources. From desalination via reverse osmosis, to traditional water production, water distribution and wastewater treatment, Danfoss offers all round energy-efficient solutions for water and wastewater management. Today, it is even possible to generate energy during water processing, thus, fulfilling the energy needs of the entire water cycle.

Solenoid Valves for leak detection

The increased focus on water leaks on the part of both authorities and insurance companies has led to digital solutions that track water leaks immediately and turn off the water supply, thereby restricting the damage as much as possible. The solution consists of sensors that are linked to a control system that sounds an alarm if a water leak takes place. The system then conveys a signal to a turn-off valve, which automatically turns off the water supply and makes sure that no more water leakage occurs.

Danfoss closely monitors developments in water leakage control systems and can provide customers with services that are tailored to local conditions.

Solenoid valves from Danfoss meet the highest quality standards and have endured rigorous compliance tests including the European standards, the British WRAS, the Swedish RISE, the Norwegian SINTEF, the French ACS, the Polish PZH, and the German DVGW approvals for drinking water.

Dust Suppression Solutions for Wastewater Treatment

Dust is a critical health and production hazard in many industries. Thus, dust control is a significant factor in ensuring environmental, health, safety, and quality standards. High-pressure water mist is an efficient method of alleviating dust problems in lumber and paper mills, construction and demolition industry, mining industry and food industry.

Danfoss provides high-pressure pumps and valves for dust suppression through several water mist applications. The products are designed to withstand even the harshest environments and the finest dust particles, ensuring extended service life, great up-time, and minimal maintenance. At the same time, the performance levels of the components are tremendously high lowering energy bills and reducing CO2 emissions.

Drives in the Water industry - Built-in intelligence to keep your system running

Typically, water and wastewater treatment processes account for 25–40% of a municipality's electricity bill and are the equivalent of 4% of global electricity consumption. Thus, wastewater facilities are the single-largest electricity consumers for a municipality. However, water management does not have to be so energy intensive. The increased use of AC drives in the water industry has helped relieve this pressure. They control the speed of motors in a wide range of pumps, blowers, mixers, and dewatering applications to help boost performance and value while being energy and cost efficient. With extensive use of AC drives, energy-efficient components, and real-life online process control, the

first full-scale facilities are now in operation on a completely energy-neutral basis. This is obtained without adding extra carbon. The energy neutrality covers the whole water cycle, from water production to wastewater treatment.

Intelligence embedded in the VLT® AQUA Drive FC 202 by Danfoss automatically denotes baseline parameters for water and wastewater applications, at all speeds and real-life operating cycles. In the event an issue discovered, digital cascade control Hot Swap technology combined with back-up expert functionality ensures reliable, stable, and effortless operation to help you stay up and running.

Wastewater treatment plants

The current trend in wastewater treatment plants is 'Bio refinery' and 'Water Resource Recovery' Facilities. These ensure that wastewater is considered as a resource from which both energy and valuable resources can be obtained. In some of the most advanced cases, energy production has now reached a level where the energy recovered from wastewater treatment process not only ensures the plant's own needs, but also covers the energy needs for drinking, water production, distribution as well as wastewater pumping. Thus, going forward, the whole water cycle can be made energy neutral. Trend in India is towards Tertiary Water treatment, where wastewater is made suitable for high purity application (industrial or edible water). This promotes true circularity and better water reuse before discharging to rivers.

Danfoss technologies like VFDs, Controls & HPPs are used for tertiary treatment plan along with innovative solutions like back-channel cooling to



evacuate heat which improves the carbon footprint. The VLT® AQUA Drive has been the first preference for some of these most advanced facilities, where high installed efficiency of the drive and greater reliability and ease of operation have been the main selection benchmark.

Applications of Treated Wastewater in India

Depending on factors like wastewater quantity and quality, public awareness, market feasibility, type of treatment and distribution system, cost and so on, there are a variety of feasible options for wastewater reuse. However, misguided use of treated wastewater may lead to health concerns, thus, judicious understanding and risk assessments from time to time are extremely necessary.

- Agricultural Reuse

The highest percentage of wastewater reuse throughout the world consists of reuse in agriculture. Especially in developing economies with high population, like India, it is quite well-received. Agricultural reuse using sewage in India is in practice for a long time. It includes irrigation of both food as well as non-food crops like grass and fodder. However, it needs to be practiced with caution otherwise, it may lead to many negative implications such as public health risks due to presence of pathogens, increased soil salinity, eutrophication, and heavy metal accumulation. The source water quality plays a significant role in planning for reclaimed water reuse. Thus, disinfection and secondary treatment is the minimum prerequisite for agricultural reuse.

- Environmental Reuse

In India, environmental reuse encompasses the use of treated wastewater for wetlands, rejuvenation of existing lakes, creating artificial lakes, recreational purposes to enhance tourism, livestock maintenance and so on. The use of treated wastewater to supplement evaporation losses in the Hussain Sagar Lake, Hyderabad is one such example. Though, the scale of environmental reuse is limited as compared to other uses, it is expected to gain more attention in the coming future.

- Urban Reuse

Urban reuse has recently gained momentum in India. Water quality parameters for urban reuse are turbidity, fecal coliform, and residual chlorine. These make it compulsory for wastewater to go through tertiary treatment and advanced disinfection so that it is not considered as a threat to public health. Within the urban spectrum, water can be reused for golf courses, public parks, toilet flushing, horticulture, firefighting and landscape.

- Industrial Reuse

Reclaimed water has a huge scope in water intensive industries such as thermal power plants, pulp and paper, textiles, tanneries, oil/gas, pharmaceuticals, mining, metal processing and so on. Construction industries also use treated wastewater for purposes ranging from process water, boiler feed water, in cooling towers, toilet flushing and irrigation at site. Tertiary treatment including disinfection along with nitrogen and phosphorus control is necessary for industrial reuse.

- Indirect and Direct Potable Reuse

Water reclamation for non-potable applications is still in its nascent stages in India. It requires a great level of tertiary treatment making use of micro-filtration with reverse osmosis, nitrogen and phosphorus disposal, disinfection, and high-quality monitoring. Although, there are no guidelines for potable reuse in India, de-facto reuse of treated wastewater is being done in the country for a long time due to discharge of wastewater in the rivers and groundwater injection. However, planned potable water reuse is an area of future growth which needs a lot of planning and research before its promotion and implementation. Within this sector it can be reused for groundwater recharge, river/stream flow augmentation.

Acceptability of Wastewater Reuse in India

Despite a choice of proven technologies, many projects aimed at

wastewater reuse have been abandoned because the public at large was averse to it, and it is becoming increasingly clear that perception of public must be taken into consideration while designing the mechanisms to overcome water scarcity and formulating policies related to water.

The socio-demographic variables that potentially govern public perception in reusing wastewater for potable purposes include age, gender, race or religion, education, income, geographic location, type of dwelling (rented house, flat, etc.), nationality, level of public awareness and knowledge of water resources. Factors like attitude towards reclaimed water use, community willingness, consumer satisfaction and trust in health officials, utilities, media, Government, politicians are also key. Interests and past experiences unique to them also define the choices they make. Although some motivational factors such as closer engagement by policymakers with citizens will remain constant, understanding these factors can be immensely useful in promoting widespread reuse of wastewater in cities. With India's ever-increasing population, it is imperative for policymakers to understand the various limitations and opportunities to mobilize public acceptance of wastewater reuse in cities and to recalibrate policies accordingly to bring about a sustainable change.

In a 2021 study on acceptability of wastewater reuse in India by the World Water Council, most respondents were receptive to the idea of using it for purposes other than drinking, and water conservatives were bent towards using it even for drinking. Farmers were concerned about its quality and implications on human health if used for irrigation. This shows that a significant percentage of Indian urban residents are



The 9th WaterLossAsia 2022 Virtual Event

Conference • Workshop • Technical Tours
Tech Talks • Exhibition • Networking

8-10 Nov 2022

Controlling Non-Revenue Water through Digital Technology & Artificial Intelligence

The biennial Water Loss Asia (WLA) 2022 conference returns in a virtual format this year on 8-10 November. WLA 2022 will gather experts and leaders in the Non-Revenue Water (NRW) industry to bring you an exciting 3-day event on controlling non-revenue water through a deep exploration of digital technology and artificial intelligence available on the market today. Utilities must reconsider if the digital systems they quickly implemented are the best and most efficient, and whether they can be enhanced through the deployment of Artificial Intelligence to aid in the quicker and more effective analysis of massive data.

Conference &
Workshop
Registration



5
Keynotes



2 Days
Conference with 3
Streams



33
Speakers



12
Countries



Malaysia-Australia
NRW Dialogue



1 Day
Workshop

TRACK TOPICS ▶

Country
Experiences

Asset
Management

NRW
Management

Climate
Change

Outsourcing of
NRW Reduction

Pipeline
Monitoring

NRW Innovations &
Latest Technology

PROTEMP EXHIBITIONS AND CONFERENCES SDN BHD (SSM No. 199901017179)

+603 6140 6666

www.waterlossasia.com

+6012 3217 345

info@protempgroup.com

+603 6140 8833

@WaterLossAsia

Organised by



Supported by



Media Partners



aware of water sustainability risks and are ready to act. However, the quality of water supply was a major concern by all stakeholders in the study region.

The following steps can help increase the acceptability of wastewater reuse in India

- Effective information dissemination and making people aware of the relevant guidelines, Government policies, and framework.
- Monitoring treated wastewater on a regular basis at the community level. Training locals in conducting quality checks to build enough confidence in them about water quality and the related technology.
- Sensitizing people to the need to use treated water and educate them through effective campaigns.

It is obvious that water as a resource is crucial for continued human and economic development, and therefore must be protected. We cannot refill the world's freshwater reserves. But we can change the way resources are utilized. The past actions taken to close the widening water supply-demand gap in the country have been too little and too late. Alternative water augmentation strategies, especially, the use of treated wastewater has proven to be an effective solution to deal with the water crisis. Studies show that the reuse of treated wastewater is the most viable option as it has many environmental and economic gains with minimal resource exploitation.

The concept of treated wastewater reuse is still evolving in India. There is a huge scope for progression in treated wastewater reuse in the country along with agricultural and industrial reuse. Many governing frameworks and regulatory policies exist at the Central Government level, but the adjustment and execution at state and local levels still require a lot of push, planning and awareness. Due to some modifications in environmental legislation, the industrial reuse market capacity has grown remarkably in the past few years. Even though, there are a lot of opportunities that encourage the reuse of treated wastewater in the country, they are often neglected.

To ensure sustainable reuse of treated wastewater, there is a need to develop

and explore funding and revenue options through varied business models, technical infrastructure, and potential users of wastewater. The design, operation and maintenance considerations for wastewater reuse projects and tariff models for sale of treated water for different applications needs to be developed. There is a serious need to form a national reclaimed water reuse policy with targets, regulatory and financial measures. Further, the existing water laws need reforms and expansion to address the shrinking per capita availability, quality, and access of freshwater. To gain mainstream attention for reclaimed water reuse, it needs to be included in the existing and upcoming water supply and wastewater management programs through sustainable policy, regulatory framework, and functional institutions, especially in water sensitive regions.

Additionally, to make reclaimed water reuse a success in India, social factors like education levels and public perceptions on the wastewater reuse and their awareness towards the environment must be taken into consideration. Their willingness and ability to pay out and preserve the environment plays a crucial role in designing treated wastewater reuse systems. The political support and institutional will is also important.

We must comply with the law and work together to prevent water wastage. Only by bringing together the forces of industry, educational establishments and authorities can we secure ourselves against the serious problems and costs associated with water damage. Using

the Building Regulations' guidelines when installing water protection solutions is imperative while informing consumers and professionals of the legislation and the best solutions, including labelling for water protection solutions is another essential step in the process.

The good news is that technologies to minimize energy consumption and leakage at all stages of the water cycle already do exist – from production and distribution to wastewater pumping and treatment. The most advanced facilities are even equipped to clean the wastewater efficiently while producing surplus amounts of energy.

Today's challenge – Tomorrow's opportunity

With exceptional industry expertise and global customer service, Danfoss is uniquely positioned to support our customers within the water industry. The dedicated team of experts at Danfoss is committed to designing and manufacturing the best viable solutions for our customers. Our global service organization offers quick and reliable maintenance for all our applications, whether they are fixed, mobile, land or sea-based – anywhere in the world. All solutions have extremely low energy consumption, are simple to operate and offer minimal service and long service intervals.

Acknowledging the challenges within water scarcity, Danfoss has an eye on the future and is committed to innovation. We are engineering tomorrow for a world with energy-efficient wastewater solutions ■



ABOUT THE AUTHOR

Mr Mandar Vaijanapurkar is the Head of Danfoss Drives Sales & Services, the Indian subsidiary of global major in climate and energy solutions. Mr Vaijanapurkar joined Danfoss in 2005 and has handled multiple profiles internally over the years. Overall he has more than 17 years of experience in heavy industry sales, business development, OEM sales, key account management, business strategy & marketing and has worked with diverse sectors like textiles, plastics, energy, water, MH, chemical, oil & gas, mining and HVAC.



“TREATED WATER WITH BEST TECHNOLOGIES IS 100% FIT FOR USE BY HUMAN BEINGS”

Laxmikant Pathak, director-operations and BU head-surface water and irrigation at Zetwerk speaks about the challenges affecting the water sector both in terms of policies and infrastructure.

1. Considering Zetwerk is a major EPC player in the water sector, in India, what are your views on the infrastructure that is present, in the water sector, in India?

In the last 35 years, India has seen large demographic movement from rural to urban. As a result of this we can see some infrastructure in the urban areas but considering the concentration of people, it is not sufficient with the minimum standards.

Also, we don't have all the facilities in all the cities. Many times we concentrate on WTP but where is the sewage management? If the sewage plant is there, is it working? On the contrary rural areas are worst hit. I believe, that there is almost no infrastructure for clean water. Also, we lack in terms of technology upgrades.

Considering all this we need to revive our older projects, build technology equipped infrastructure and maximize the manufacturing and building of these facilities for all. So as far as infrastructure in considered we have to develop and deliver end-to-end solutions.

I sincerely believe, we at Zetwerk are delivering our best in all this, with specific focus on rural areas.

2. It is a known fact that India is one of the most waters stressed nations, in the world, what in your view does India lack—infrastructure, policy direction or the necessary systems?

Yes, we are a water stressed nation, but we need to dive deeper into our analysis because we are not water scared country. We have ample amount of rainfall, ample number of waterbodies

and multiple sources for water. However, we lack in water management.

So as far as focus of Government from the last 5-10 years has shown that their interest is in providing water facilities to every household, and with the special governing body like the Ministry of Jal Shakti, we see a very positive policy driven initiatives from the Government side.

However, we also need to understand that the policy driven initiatives won't fulfill the objectives to the fullest. We as a country need to bring behavioral changes among individuals as well.

3. Could you throw some light on the major challenges that you face, especially in India when it comes to implementing irrigation projects?

The ecosystem required for development of water in infrastructure projects is diverse and it throws many challenges. These would include areas like land acquisitions, payments with regard to compensation are some of them. Also considering that Indian agriculture, where there are two crops in a year, it is very hard for us to go on the field and execute the irrigation network during the crop cycle. As a result, we only get four-five months a year to execute the project on the ground. We need to hold sufficient resources as well as micro-plans in all our operations. Thanks to the focus of Zetwerk wherein an in-house manufacturing capability takes care of replacement for the field activity.

4. Considering the agriculture sector is the major consumer of water and that Zetwerk is a major player





in creating the necessary infrastructure, through its irrigation projects. How can water use efficiency be increased in the Indian agricultural sector?

We have to move towards closed or piped irrigation to reduce the evaporating losses initially. Further technology is the ultimate answer for enhancing the use efficiency. Optimal distribution and usage of water as an irreplaceable resource is possible with few of the distribution and flow management tools such as DMS – data management and monitoring tools, distribution analytics and so on.

At a times, the use of drip-irrigation by farmers will also increase the efficiency of the overall irrigation systems.

Apart from this we also need to have intra-zonal distribution strategy where we can utilize water from surplus areas to areas where water is scarce. (Here interlinkage of rivers and canals is one of the promising strategies we have on the table)

5. What is the kind of problems/challenges that you face, when Zetwerk undertakes projects that aim to provide clean drinking water?

India as a nation has seen surge in water strategies and water projects. The industry is overloaded with work and opportunities. But the policies are basically based on the conventional ways of execution which is time consuming, considering the involvement of multiple agencies, socio-political elements and so on.

Now since Zetwerk's focus is on the rural water mission, we come across lot of logistics and operation-based challenges. But as experts of replacing field operations more by in-house

casting and building capacities and we are trying to overcome them in best possible way.

6. Zetwerk has experience of undertaking has experience of undertaking projects that provide clean drinking water in 4-5 states. Are the challenges that you face across states similar, or do they vary across states?

Every geography has its own challenges as well as they offer different advantages. Setting foot in a new territory gives us a bunch of opportunities, learnings, and failures as well. Along with that every state has some similar problems which an EPC industry faces since its inception.

7. Considering India is one of the most water-stressed nations in the world, how difficult is it to provide clean water to the relevant stakeholders?

We need to reach diverse parts of the country where the source of water comes in different forms. Such as the sources of water are naturally available, manmade, water abundant, water scarce, water with non-potable quality and so on. Treatment of this water, storage at a certain height and distribution to households through millions of tap connections comes as next part of the operations. I suppose you understand the complexity of the task where power and other resources are still not perennial (especially in remote areas).

Here Zetwerk brings in it's operational excellence and innovative solutions to deliver projects to the best of its capability keeping in mind its core mission and motive. At last, no matter how much complex or challenging it is, we are companions of a mission to provide clean water to everyone.

8. Is the treated water produced in India, fit for use by humans? If yes, why is it that use of treated water is not that common in the country? What are the challenges that inhibit its use?

Yes, treated water with best technologies are 100% fit-for-use by human beings. Also, I would like to counter that the use of such potable water is common. We can see the zero-wastewater industrial plants, green building projects where the treated water is used.

However, in case the treatment of water is not up to the drinking water standards, use of such water is done for alternate activities like washing, flushing and so on.

While talking about the hesitations in using such treated water I would like to bring to your attention that many times fresh water is available, in abundance, at cheap rates than the treated water. So, we need to bring in more cost-effectiveness in treatment and keep on raising the treatment standards so that the treated water too can be used for drinking.

9. Any message that you would want to give to our readers about the importance of water conservation?

The message is very simple and that is, there is limited speed of nature to make water available to us for our use. Now we need to control the usage and treatment of this natural resource such that the natural self-sufficient cycle should not get interrupted. At last, water is shared a resource and thus need to be shared responsibility. We Zetwerk are there to take care of water; we

appeal to you to do the same.

10. Is enough being done towards conservation of water, in India? What more needs to be done?

We are doing good, but we need to bring in our best as Indians when it comes to water conservation. We are active with policies and initiatives from the Government side. We have seen a few self-motivated efforts from NGOs and individuals. However now we need to put in multi-layered efforts.

At the macro-level we need to refine our policies, increase technology-driven infrastructure, improve the scalability of such projects to across the country.

At a micro-level we need to be more conscious on water usage and bring in behavioral changes. Increased adaptability of water conservation techniques like drip water irrigation, rainwater harvesting and so on will help us conserve water in longer run. So, moving forward we as country need to focus on multi-layered effects ■

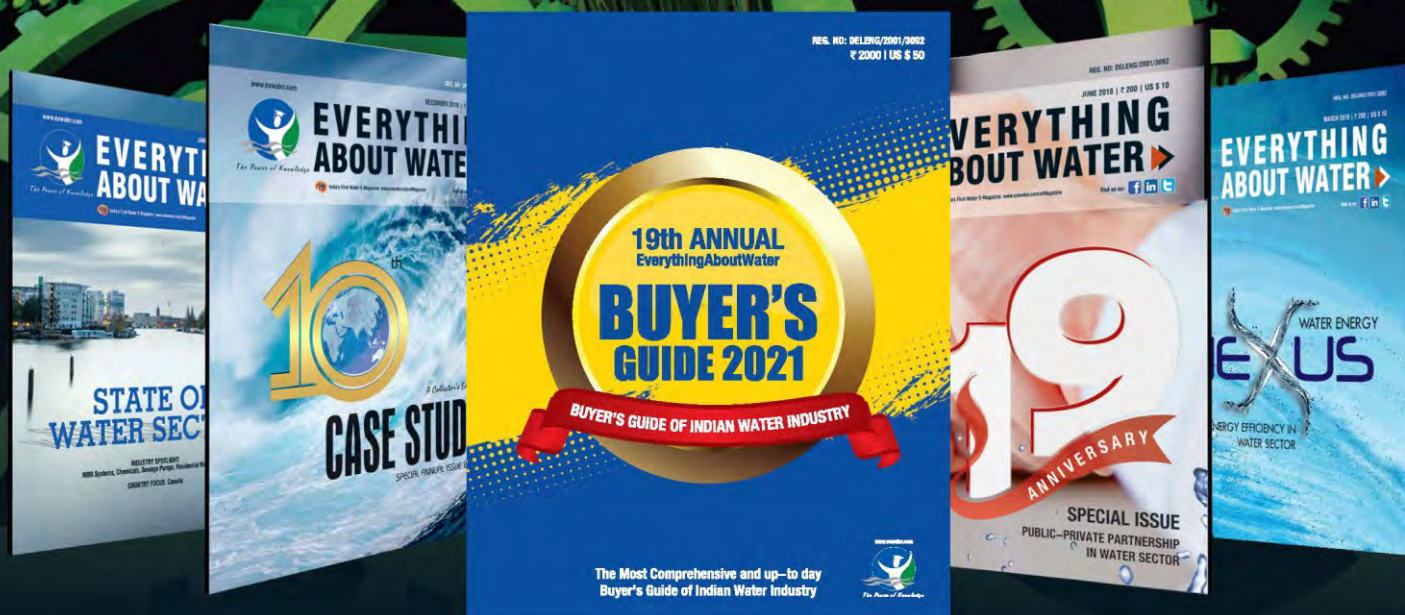
ABOUT THE AUTHOR

Laxmikant Pathak has over 16 years of experience in the water sector from the concept stage to commissioning of a project. He has worked in various senior level roles in the areas of project management, contract management, strategic management and so on. In his previous assignments, Mr Pathak has been associated with companies like Shapoorji Pallonji and Tata Projects.





Knowledge That Keeps The Gears Going...



With a readership of over 77,000, EverythingAboutWater is India's first and only monthly magazine that addresses key issues facing the water industry. Through its reach to decision-makers on water and wastewater management, the magazine helps to shape the industry policy and practice.

As an ideal reference tool for water professionals, the magazine covers case studies, technical articles, news about technological advancements, updates on the upcoming water events and much more.

Subscribe Now

Indepth Researched Content | Practical Information | Impactful Presentation



Earth Water Foundation

A-1/152, Neb Sarai, IGNOU Road, New Delhi 110 068, India.

Mob: +91 96500 59996, E-mail: enquiry@eawater.com, Web: www.eawater.com

Join us at:



VERMIFILTRATION: THE WAY FORWARD TO A SUSTAINABLE FUTURE

There is increasing scientific evidence to prove that treatment systems with designs inspired by nature are highly efficient treatment technologies.

By
Aditi Agarwal

India generates about 7,200 crore litres of sewage every single day. Out of this only 2,000 crore litres is treated, rest is discharged directly either into the ground water or fresh water resources. This practice has led to most of our ponds, lakes and rivers being severely polluted. Even the sewage that does get treated does not get completely recycled and is often discharged into water bodies where it mixes with untreated waste water. This vicious cycle is the root cause for the increasing water crisis in the country. Centralized treatment systems face tremendous challenges as laying and maintaining a huge grid of pipelines is an expensive and cumbersome proposition. Also, pumping wastewater from different parts of the city to a

centralized location involves huge energy costs and also adds exponentially to the carbon footprint of the wastewater treatment plant. In a developing country like India, connecting all parts of the city to a centralized WWTPs is next to impossible. This creates a huge gap between demand and supply with only 30% of India's sewage being treated currently, as per the Central Pollution Control Board (CPCB) reports.

Thinking out of the box

With policy changes and increasing push by the Government towards decentralized sewage treatment plants, on-site treatment reuse of water is gaining momentum in our country.



However, centralized systems have been blindly miniaturized in the context of decentralized infrastructure. Unfortunately, most decentralized projects carry out only the capital cost analysis during selection of the technology. A thorough life cycle cost assessment of different technologies is not carried out which leads to eventual abandonment of assets after installation, as the operation and maintenance of STPs becomes difficult for communities, municipalities and institutions. The current landscape is filled with power and labour intensive mechanical technologies that face numerous challenges, especially in the Indian context, like lack of constant power supply, lack of skilled manpower, heavy sludge disposal costs, low social acceptance, high energy usage, high O&M costs to name a few.

How to make a sustainable decentralized waste treatment system

We need to rethink our strategy about choosing decentralized waste treatment systems. The criteria for choosing appropriate technologies should be based on the following criterion to ensure sustainability:

- The STP should function optimally at variable hydraulic and organic loads.
- The STP should be able to function even if power supply is erratic.
- The STP should have a low carbon footprint.

- It should consume low power.
- There should be powered by diesel genset backups.
- Reduced Aerosols.
- Reduced Sludge disposal to landfills.
- Local manpower and maintenance support.
- Low O & M or LCC costs.
- The STP needs to produce high quality water that can be recycled.

Change in perspective required

In the last 100 years or so human development and growth has been very linear, but nature doesn't work like that. Nature is cyclic. There is a start, growth,



maturity and then dying and then there is a reboot. That is the default design of nature around us. Byproducts are always the starting point for new life. That is the essence of a circular economy or closed loop recycling. If we look at water and the water cycle, we know water is a finite source but nature has been carrying out the water cycle process so well for billions of years and has created this illusion of infinity, about water. Every time it rains we feel we have got new water. But the reality is that there is no more water on earth today than there was 4 billion years ago. So fundamentally nature has been recycling water for billions of years and what we are drinking today could have been used by dinosaurs, at one point in time. What we need to do is to replicate nature and recycle our water over and over again. Nature doesn't generate waste; we humans call it waste. And what happens when you call something waste then you just have the attitude to get rid of it or make it invisible. But if you don't consider it a waste and call it a resource you start seeing the value.

Need to lean on nature

There is increasing scientific evidence to prove that treatment systems with designs inspired by nature are highly efficient treatment technologies. The cost-effective design and implementation of ecosystems in wastewater treatment is something that exist and has the potential to be further promoted globally as a sustainable and practical solution. When we learn from nature to re-imagine, re-think, and re-design the future of our world. And focus on the intersection of nature, biomimicry, circularity, and ecological design thinking, we go beyond sustainable towards regenerative

solutions. Nature based solutions use plants, earthworms, soil, bacteria, and other natural elements and processes to remove pollutants from wastewater. This reduces chemical use and saves energy. These approaches can treat wastewater in a sustainable, low-cost, low-impact manner, and can be designed to have a long performance life.

There is a well established evidence in practice, that demonstrates the effectiveness and efficiency of nature based solutions. For example, 'Vermifiltration'. What is important to emphasise when considering such systems is not only the ability to deliver the primary function of treating wastewater, but also possible co-benefits that can generate greater overall societal advantages. The benefits include improvement of water quality, as well as benefits beyond this for people and nature, such as increasing biodiversity, providing social co-benefits, such as recreational

areas and wellbeing through green spaces, reducing carbon footprints and enabling water reuse.

What is Vermifiltration?

It is nature's most powerful wastewater treatment system. Eisenia Fetida (Red worms) is an earthworm species long known for its capability to digest organic matter. These worms thrive in moist soil with abundant organic matter like fecal waste and have an inherent capability of consuming pathogens. Worm ecosystem operates on self regulating basis. Population increases or decreases based on resources available making it a sustainable system. The earthworm's body acts as a 'filter' and reduces pollution load in the effluent stream. These worms break down solids trapped in the vermifilter and excrete smaller particles and a consortium of microbes. These microbes form a biofilm on the attached growth surface. As they burrow, the worms create channels that provides passive aeration throughout the system, making the system naturally aerobic. As water trickles down the various layers of the vermifilter, it gets filtered and biologically treated in the natural ecosystem.

In the last two decades there has been extensive research both in the lab and on the field regarding vermifiltration which is in line with the changing landscape with regards combating climate change. Earthworms change the properties of biofilm present in the active layer through their burrowing activity and ingestion. They also help in degradation of organic matter by symbiotic and synergistic interactions with the indigenous microbes. It has been successfully applied for the treatment of municipal and industrial sewage. Taking



into account the pro-environmental politics worldwide, vermifiltration emerges as an eco-innovation in the field of wastewater treatment. If applied on a full scale, vermifiltration technology would help the society reach the triple bottom line of sustainability: good for the environment, good for the economy and good for the people.

Benefits of Nature based technology – Advanced Eco Reactor STP based on Vermifiltration

- ✓ Bio-mimics the structure of healthy soil.
- ✓ Naturally aerobic – does not require external/mechanical aeration.
- ✓ Can handle minimum hydraulic and organic loads.
- ✓ Natural reduction in pathogen levels.
- ✓ No Sludge related pollution.
- ✓ Beneficial end-products: high quality water for reuse and vermicompost.
- ✓ Can be developed as a green area/ garden.
- ✓ Silent operation
- ✓ TSS handling capacity due to earthworms.
- ✓ Low power consumption, can be catered via solar panels.
- ✓ Can work in continuous or intermittent mode.

Is this technology meant for India?

The technology is very well suited for the Indian context and can be applied at urban, peri-urban and/or rural landscapes. The focal area is to provide high quality water for re-use consistently with minimal operational hassles. Successful installations have been made in various terrains and climatic conditions across India. In the advanced eco-reactor (AER) STP the process of vermifiltration has been adapted to suit the varied climatic ranges and operational challenges faced in India. The treatment system can be installed by communities, residential societies, educational institutions, hospitality sector, hospitals, offices, tourist complexes, training camps, IT parks, SEZs etc and the treated water generated, meets all the latest CPCB and NGT standards for reuse and can be

recycled for non potable purposes like irrigation, flushing, ground water recharge, construction, car washing, water body rejuvenation and so on. The STP is built to be operated hassle free for generations and requires minimal supervision and maintenance. It is so easy to operate that even a semi-skilled part time operator is sufficient for its operation.

Water from vermifiltration to irrigate public parks in Gurgaon

Six AER STPs have also been deployed in public parks, in Gurgaon where the nearby sewer line is tapped, 30,000 litres of wastewater in each park is directed into natural a vermifiltration based sewage treatment system, where it is treated using natural methods and then recycled for irrigating the park. This initiative has made the parks self-reliant even during peak summers and they do not require fresh water for irrigation. Being a green and natural system the STPs have been integrated seamlessly into the landscape of the parks ■



ABOUT THE AUTHOR

Aditi Agarwal has over 12 years of experience in the water and wastewater industry. In her present capacity, Ms Agarwal is a partner in Organic Solutions, an organization committed to transform how wastewater is viewed in our society, to move away from a single use, flush and forget culture and stop depleting our finite water resources. Organic Solutions provides sewage treatment plants based on the natural principles of vermifiltration for recycling of wastewater on site for communities, establishments and institutions thereby reducing the burden on fresh water resources and enabling water sustainability.

EXPERIENCES FROM WHICH ONE CAN LEARN

Vermifiltration to treat wastewater in a village in Haryana

Wastewater of the village was getting accumulated in the local pond, that was on a land belonging to the gram panchayat. Water, in the pond, was getting contaminated due to constant discharge of sewerage water from the village, through proper drainage lines directed into the pond. The pond is surrounded by farm lands, and sometimes the farmers used the sewage water, from the pond, for irrigation purposes also. Due to improper management of sewage the entire neighbourhood/village was at the risk of water contamination and the related health issues. The authorities were looking to employ a solution that was not highly dependent on power and could be operated easily by the village community. Deploying a conventional power and labour intensive water treatment scheme was not feasible for the community as the area suffered from long power cuts and there was lack of skilled manpower, in the area. ACR STP based on the natural principles of vermifiltration was constructed and commissioned to treat 1,50,000 litres of waste water daily. The treatment plant has been functional for more than two years now and the treated water is being used to rejuvenate the village pond and is also used for irrigation. Compared to conventional systems it requires up to 70% less power and does not require daily/weekly/monthly sludge handling. The entire STP area is developed as a recreational area for the village residents and has a park and a children's play area next to the vermifilter STP. The plants on the top of the reactor adds to the aesthetic value of the treatment plant and also increases the social acceptance of the WASH asset by the community. The biggest testimonial of the integration of the STP in the community life is the fact that the villagers chose the STP site for the flag hoisting ceremony to commemorate India's 75 years of independence on 15th August 2022. This is a big boost in the vision of using nature to convert sewage into an asset rather than a liability.



The 3rd Indonesia International Pump, Valve System & Equipment Exhibition 2022

www.pump-valve-indonesia.net



Organized by:

GEM INDONESIA
Subsidiary of GEMISEN GROUP

Indonesia's Most
Influential Trade show for
**Pump, Valve System &
Equipment Industry**

19-21 October 2022

JIExpo Kemayoran, Jakarta - Indonesia

Info:



+62 21 - 54358118



info@gem-indonesia.net

NEW IRON REMOVAL MEDIA : REDEFINING WATER QUALITY

All about the extremely powerful silica sand based catalytic water filtration media that is designed for removal of Iron and Manganese without the use of potassium permanganate.

By
Praveen Kumar S

The character of water is changing across India and hence adopting new measures of quality is highly important. Ground water in India is now getting affected by heavy metals which are beyond the permissible limit. Presence of Fe (iron), Arsenic, Manganese, in water, to name a few are quite detrimental for human consumption. We have plenty of water resources, but in a polluted form thereby making them usable with less financial input is a question that is in the air already. DMI65, a revolutionary iron removal medium produced by Quantum Filtration Pte Ltd, Australia is the new solution for this problem.

Conventional mediums.

There are conventional mediums like sand, anthracite, green sand and so on which could be used when the resultant water quality is not critical and when the feed water is not complex. These mediums were originally used and still hold a good market share in cleaning ground water. This was followed by treated sands mainly with manganese

oxide (MnO_2) as a medium applied to a basic natural mineral to form a filtration medium. This works with the principle of oxidation. The technology behind those mediums date to at least 40 years before. The operating conditions of those medium were too complex in some cases, whereas some mediums did not render constant results in water chemistry. There are few mediums that work technically outstanding but their pricing methodology makes them somewhat an expensive affair to deal with.

The technology on offer.

DMI65 on other hand is a technology developed about 20 years ago in R&D level and got into commercial production in the last 10 years. The technology behind is "infusion" of MnO_2 onto the microporous structure of Silicon Dioxide. DMI-65 is an extremely powerful silica sand based catalytic water filtration media that is designed for removal of Iron and Manganese without the use of potassium permanganate.

The unique microporous structure of DMI-65 efficiently removes dissolved iron to almost undetectable levels as low as 0.001 PPM and manganese to 0.001 PPM. DMI-65 acts as an oxidation catalyst with immediate oxidation and filtration of the insoluble precipitates derived from this oxidation reaction. DMI-65 can also remove Arsenic, Aluminium and other heavy metals and Hydrogen Sulfide under certain conditions. DMI-65 is infused technology and not just a surface coating technology unlike other catalytic water filtration media, giving DMI-65 the advantage of a long life span between 5 to 10 years and powerful performance. It also removes the chance of any chemical leaching into the water stream. It is a media that utilises an oxidation, adsorption and filtration process similar to Greensand and Birm, but at a much higher level of performance and capacity and significantly lower whole of life cost. The media has been used extensively in many countries for drinking water applications and in a wide variety of other applications to prevent nuisance iron and manganese bio fouling in water treatment systems. DMI-65 has been certified to the US Standard of NSF/ANSI 61 for Drinking Water System Components and for use in England and Wales Under Regulation 31(4)(a) of the water supply (Water Quality) regulations 2010 and has also been tested by many other water treatment authorities and laboratories.

WHAT ARE THE ADANTAGES OF DMI65

REGENERATION NOT REQUIRED

The media operates with a continuous injection of sodium hypochlorite at low residual levels (0.1 to 0.3 ppm) which eliminates the need for regeneration with Potassium Permanganate which are both cost and time expensive. LONG LIFE DMI-65 is not consumed in the process giving it an expected operational life of up to 10 years, providing considerable advantages over other processes or media. The media does not display a decaying capacity to do its catalytic work. Over the 5 to 10 year period, through many backwashing operations of the bed to remove retained solids, an attrition loss of the media occurs by contact between particles and mechanical abrasion.



HIGH LOAD CAPACITY

Because of the increased surface area owing to the micro-porous structure of the matrix material, DMI-65 has higher iron and manganese load capacity which can extend the duration of filter runs and the time between backwashing, thereby reducing downtime, operating expense and wastage. Reduced Total Water Treatment Solution costs The use of DMI-65 in a water treatment solution for the removal of iron and manganese contributes to a reduction in the capital investment cost of the water filtration solution:

HIGH FLOW RATES

The infused technology of DMI-65 promotes the highest oxidation rate of any catalytic filtration media. This permits a significantly higher water flow rate to achieve the same level of iron and manganese removal. DMI-65 can operate at linear filtration velocities up to twice that of conventional media with a corresponding reduction in capital equipment costs.

REDUCE REDUNDANCY

Iron and Manganese contamination can materially reduce the performance of water treatment systems. The effectiveness of DMI-65 in removing iron and manganese contamination levels allows the water filtration system to function closer to rated levels thereby reducing the amount of costly overcapacity that would be acquired to achieve required output levels.

WIDE OPERATING ENVIRONMENT

Stable and satisfactory performance at pH 5.8 to 8.6. and a maximum operating temperature of 113° F (45°C) reduces the need for investment to alter the operating environment

HOW THIS WORK?

DMI-65 Advanced Oxidation Process

Our Advanced Oxidation Process ("AOP") uses the highly reactive catalytic material DMI-65 to boost the reduction/oxidation (redox) processes in water. This material promotes stronger

oxidation than molecular oxygen and ordinary oxidants. Under certain conditions heavy metals may be difficult to oxidise to insoluble hydroxides, however our DMI-65 based AOP increases the rate of reaction and achieves a higher degree of purification. In essence, the oxidants and the media work together to oxidize a dissolved solid into a suspended solid that is then filtered out in the depth of the media bed. If an element can't be oxidized and precipitated the media can't remove it. The media "helps" chemical reactions to occur by interacting with the oxidation reaction without being permanently altered. Iron and manganese exist in bore water as bicarbonate. DMI-65 acts as an oxidation catalyst in the true meaning of the word and facilitates oxidation – precipitation – filtration. Strictly speaking, the media facilitates chemical reactions and does not explicitly remove anything, though once oxidised, the depth filtration aspect of the media removes the solids created by the oxidation that are then periodically backwashed out of the filter vessels. Chlorine, fed as sodium hypochlorite or bleach (12.5% NaOCl), is the preferred oxidant since it is relatively inexpensive, readily available around the world and it is effective. Other oxidants such as hydrogen peroxide (H₂O₂), chlorine dioxide (ClO₂) or ozone can also be used so long as a residual can be measured and maintained. Choice of oxidants needs to be subject to detailed analysis as performance varies according to the operating environment. Another function of the chlorine is that it keeps the media free from bacterial bio-fouling or slime growth which reduces its performance. The need to add an oxidizer as part of the DMI-65 process also means that the final stage of the disinfection process of water treatment is also addressed.

Key DMI-65 operating conditions

Treatment processes have to be conducted in such manner so that the catalytic surface of the material is kept clean and available to ion from water to contact. Water with a large amount of suspended solids has to be clarified before passing it through the catalytic filter with DMI-65. Acceptable levels of suspended solids depends on their nature. A larger amount of mineral suspended solids than organic suspended solids could be handled. Bacteria could grow and deposit slime on DMI-65. Thus disinfectant and oxidation conditions have to be maintained. Water containing clays and large organic molecules may result in deposition of such material on the surface of DMI 65 and blinding of the catalytic surface. Treatment for removal of such contaminant before the catalytic filter is needed.

Polymer flocculent could also stick to the DMI-65 and blind catalytic surface. Hard, unstable groundwater could cause scale deposition in the catalytic filter and blind the material in a solid mono bloc. In such case the DMI-65 material in the bed is lost and would have to be replaced. Treatment for stabilizing the water to prevent scale formation in the catalytic filter has to be carried out. Both low acidic pH and anoxic conditions could cause dissolution of manganese from catalytic layer of DMI-65 and loss of its capacity. Excessively high pH means excessive concentration of hydroxyl ions (corrosive to metals) and could also cause dissolution of manganese from the catalytic layer. Do not use demineralized water, distilled water or water known to be strongly corrosive to metals for activation of DMI-65. DMI65 is now actively sold in Indian sub-continent and MEDIO based out of Kerala, is its exclusive dealer in India ■



ABOUT THE AUTHOR

Praveen Kumar S is the Founder Director in MEDIO, a water treatment company based out of Kollam, Kerala India--an exclusive dealer of the product DMI65, a revolutionary Iron Removal Medium in Indian territory. Mr Praveen Kumar S has worked in many projects, focused on solution based approach using state-of-the-art filtration techniques. His areas of interest are design, production and operations on filtration.

BIOAUGMENTATION: A BOON FOR YOUR SEPTIC TANK

Increased levels of live bacteria and microorganisms in the treatment environment is how bioaugmentation works. Business owners may select cultures as per their need/requirement.

By
Neeraj Kumar

Septic tanks are wastewater management systems at a smaller and/or personal scale. These are on-site, economical sewage disposal solutions that work well in areas without sewer networks. We can use them in various industries, houses situated in hilly areas, hospitals, outlier buildings, or a group of four or five houses. It handles solid and liquid organic waste that is drained and flushed down through toilets, bathrooms, kitchens, and other type of drains. There are two ways in which septic systems work. They are either aerobic septic systems or anaerobic septic systems. The write up below will help us to understand more about them, septic treatment, and what problems septic tanks face. This will help most of us to resolve the issues related to septic tanks.

Aerobic Septic Systems

In typical septic systems, wastewater flows to the leach field after leaving the

septic tank, where oxygen-philic bacteria start to work. Aerobic bacteria in the soil eliminates any dangerous substances in the effluent as it is drawn downhill by gravity, preventing them from mixing with clean groundwater. The soil must be in ambient condition with maintained pH. The fundamental distinction between an aerobic treatment system (ATS) and a conventional septic system is that the former generates treated effluent of higher quality. At the same time, the latter needs smaller leach area.

Anaerobic Septic Systems

Water flushed down the toilet or drain enters your septic tank, which is impermeable. Since there is no oxygen present here, anaerobic microorganisms operate there. The bacteria will disintegrate the waste materials, preparing the wastewater for its next stop—the leach field.

In the process of anaerobic digestion, microbes turn solid waste into treated and cleaner effluent. This technique is energy-efficient and is less expensive. It is typically used for high-strength industrial effluent with large amounts of biodegradable organic matter.

Everything that is alive in this world has a purpose to serve. The bacteria, too, serves a great objective. The organic and fecal matter already consists of good bacteria. When we flush the waste or drain it, many bacteria stick on the surface of the pipelines.

WHAT YOU NEED TO KNOW ABOUT BACTERIA FOR A SEPTIC TANK?

As we have read earlier, bacteria are tiny invisible microbes yet the most vital part of any type of septic tank system. Over the course of septic tank usage, these bacteria colonize everywhere in the system. When solid or liquid waste matter enters the tank, these bacteria help to degrade the matter in the tank. Thus, the need and perfect balance of healthy bacteria is necessary for maximum septic system efficiency. With repeated actions, they expand their population, the better the colonization of bacteria, the more efficient degradation of organic matter. But this is not how the system works. There are numerous reasons why the community of bacteria for septic tank gets affected.

When the microbial population gets compromised, solid waste begins to accumulate. This causes problems in the septic tank and its functioning; hence, clogging becomes a major issue. Therefore, keeping your septic tank healthy is mandatory for the good health of these bacteria and, overall, for our health as well. Therefore, septic tank cleaning is done.

What Affects Microbial Community?

The harsh chemicals that we use

The chemicals we use to clean toilets, bathrooms, sinks, or various other components contain several elements that are harsh for us as well as these bacteria. The substances may include drain opener powder or liquid, bleach, strong acids or bases, ammonia, various



surfactants and so on. This causes adverse effects on the bacteria.

Usage of anti-bacterial soaps

Anti-bacterial soaps contain triclosan, triclocarban benzalkonium chloride, benzethonium chloride, and chloroxynol. These products are used to kill germs from our bodies, but these chemicals end up killing the good bacteria present in the septic tank.

Disposal of medications

Many medicines are composed of substances that are not good for bacterial life. This especially include antibiotics. They are used to treat bacterial infections or fever in humans and animals. There are many instances where medicines are flushed down the drain, when they expire, in other words when they are of no use and so on.

Disposal of non-biodegradable matter

People carelessly drain/ flush out non-biodegradable substances like cigarettes, pen ink, sanitary pads, tampons, and so on. Unfortunately, this causes hefty damage to bacterial lives, making them less in count and less effective.

How to restore the lives of good bacteria?

For starters, avoid using harsh chemicals like bleach, drain opener powder, ammonia and so on. Avoid draining excess water, medicines, and non-biodegradable matter. To maintain the effects of good bacteria, septic treatment needs to be done efficiently. To increase the microbial population, we can even go for bioaugmentation. But before that, let us understand the meaning of bioaugmentation and how it is done.

What Is Bioaugmentation?

Bioaugmentation incorporates organic culture (microorganisms) with the capacity to biodegrade resistant compounds in a polluted environment. Comparing this strategy to physiochemical approaches, it is less expensive and more eco-friendly.

Increased levels of live bacteria and

microorganisms in the treatment environment is how bioaugmentation works. Business owners may select cultures as per their need/requirement. For example, they may go for the one known to be particularly effective when handling a particular contaminant. Or they may choose specific microorganisms that are considered to be having high levels of effectiveness in this area.

Benefits of Bioaugmentation

- Compared to other types of methods of restoration of bacteria, this method seems more cost-friendly.
- This process involves additional leverages like septic tank odour removal, working in most environmental conditions and so on.



- Since there is no use/wastage of energy, bioaugmentation reduces carbon footprint.
- They are self-sufficient as once they are added, they do not require any additional type of manpower.
- Once added, the bacteria keeps on doing its function.
- You don't need extra containers or reactors to clear up the mess. Bioaugmentation can be done at the site.

How Can You Do Bioaugmentation?

Now you don't have to worry about how septic treatment can be done with the help of bioaugmentation. With our renowned Bio Reme Septic, you can restore microbial life with many other benefits. Bio Reme Septic consists of a wide variety of naturally selected

anaerobic and facultative bacterial consortium that degrades organic waste from septic tanks. It is a single celled microorganism that rapidly increase their population once they get their food (organic matter). The product has a shelf life of 24 months. This product can be used in households, commercial spaces, portable toilets, soak pits, holding tanks and so on. Below mentioned are some of the products that one can look at.

Benefits Of Bio Reme Septic

- Septic tank odor removal - Over the course of time, the septic tank begins to produce odour. This product helps eliminate odour.
- Prolongs their existence- These microbes can withstand the cleaning chemicals like bleach, detergent, grease, oil and so on.
- Effective under most environmental conditions.
- Naturally restores the biological health of the bacteria.

With advancements in the world, there has been much awareness about waste management. Hence, we also need to know how to maintain these waste treatment plants. Different Bio Reme products can act as an aid in the maintenance of different waste treatment plants. For example, when discussing septic tank cleaning and maintenance, Bio Reme Septic will help keep septic lines and drain fields clean by reducing presence of undigested organic debris. It also improves the life span of the septic tank and lets it work efficiently.

Bio Reme Just Drop

Bio Reme Just drop is a scientifically selected dry formulated bacteria culture that contains billions of active bacteria in a “self-dissolving packet” that produces various enzymes needed to decompose solid waste such as (fat, oil & grease, hair, toilet paper, soap scum, organic materials, toothpaste, shampoo residue, body oils, calcium & lime buildup, rust, flushable baby wipes, iron buildup) from kitchen drains.

These self-dissolving packets produce various enzymes that are needed to reduce and decompose solid waste and maintain proper functioning of septic tanks, portable toilets, bio toilets and

domestic toilets.

The Bio Reme Just drop is a maintenance dose sachet that maintains the efficiency of kitchen drains, septic tanks, portable toilets, bio toilets and domestic toilets. This sachet comes in packets of 30 gm and has a self-dissolving tendency. There is no measuring and guessing or hit and trial method regarding how to use the same. These are quick to use.

Bio Reme Just Drop is safer and is the best alternative compared to toxic and corrosive liquid drain chemicals that can generate heat which can damage plastic pipe joints.

Benefits of Bio Reme Just Drop

- Naturally safe and concentrated with no chemical additives.
- Self-dissolving packet- easy to use, handle and store.
- Remove blockage from kitchen drain pipelines.
- Removes nasty smell from toilets,

bathrooms, septic tanks and drain pipes.

- Removes accumulation of organic sludge from pipelines.

Areas of Application

- Bathroom and kitchen sinks.
- Hotel, restaurants, and community kitchens.
- Public toilet of municipal corporations.

- Portable cabins and bio toilets.
- Domestic toilets and long sewer lines.
- Common toilets in factories and large institutions.

Dosage

- One pouch per toilet/per week.
- One pouch in kitchen sink at night after use of kitchen/week ■



ABOUT THE AUTHOR

Neeraj Kumar, completed his MBA in 2014 from Pune University and started working in wastewater industry and has more than 8 years of experience in the wastewater industry. As a technical sales specialist in the wastewater, solid waste, and lake remediation industries, he has a proven track record in reaching out to the Government, municipal corporations, chemical companies, food companies, pharmaceutical companies, textile businesses and pulp and paper mills. His vision is to make the people understand the importance of bio-culture in wastewater industries.



USE OF MICROBES AND HERBAL EXTRACTS TO TREAT WASTEWATER

When the going gets tough and when traditional water treatment methods seem unsatisfactory then we should resort to the natural ways of cleaning wastewater.

By
Sanjay Bahl



If water was a Sadhu or Yogi then he would go to his ashram in the morning as a bright, smart, clear-headed gentleman and come back in the evening to his hut as a fat, lethargic, tired man and then would get into an intense tapasya to rejuvenate himself again for the next day. Similarly, technically speaking water is a universal solvent and accumulates all toxins it passes through. Wastewater consists of total dissolved solids (TDS), total suspended solids (TSS), biological oxygen demand (BOD), chemical oxygen demand (COD) oil and grease, heavy metals and many such impurities that need be removed before it can be reused again. Here we will speak about the natural ways of removing various forms of impurities from wastewater.

Water rejuvenation.

Before getting into the rejuvenation cycle of water, it needs to be understood

that freshwater has no odour, it has plenty of dissolved oxygen, has low TDS, almost zero TSS, and near zero BOD, COD. This water rejuvenation cycle needs to be done by industries on a daily basis and a perfect balance between economical operations, profitmaking and ecological sustainability needs to be found. However, when the going gets tough and when traditional water treatment methods seem unsatisfactory then we should resort to the natural ways of cleaning wastewater.

Going the natural way.

While it is all very good and nice to say that going the natural when other methods and technologies do not work but it is more important to know what those natural processes are. To keep it simple we can cover two significant natural techniques to purify water. One way is to make use of beneficial

microbes and the other method is to employ herbal extracts.

Beneficial microbes: microbes are biochemical factories that can intake BOD, COD and build biomass. This biomass consists of microbial colonies bound by polysaccharide glue which then settles down and brings with it impurities and suspended solids. Among microbes, there are selected species that can do this work in a very efficient manner with low dosages, thereby providing economies in wastewater treatment.

Herbal extracts: these are extracts made from plants which can purify water. To give an example, the Moringa (Moringa oleifera often known as the drumstick tree, the miracle tree, the ben oil tree, or the horseradish tree) seeds extract is one such natural coagulant and flocculant which works on the basis of charge neutralization and settles down all suspended impurities in water. Similarly extract of Methi (fenugreek) and Yucca (a genus of perennial shrubs and trees in the family Asparagaceae, subfamily Agavoideae) can adsorb strong odours like H₂S, Ammonia and also acts as a carrier of beneficial microbes which further digest the odorous organics and reduce sludge volumes.

In short, a product that is formulated such that it has select microbes, enzymes and herbal extracts works wonders in wastewater treatment. Such formulations are the need of the hour and should be used by industries to maintain a balance between realizing operational profits and aid in maintaining the ecological balance. Superweld Eco solutions has a decade-long experience



FEW EXAMPLES OF GOING THE NATURAL WAY

INDUSTRY	PROBLEM THEY FACED	EARLIER APPROACH	NATURAL APPROACH	BENEFITS THEY HAVE ACHIEVED
PAPER MILL ETP	- Inadequate reduction of BOD, COD. - Low dissolved oxygen in aeration system	- More reliance on physiochemical methods of treatment. - Use of expensive air blower equipment	Use of advanced bio culture formulation with the capability to work in low DO environment and enhance settleability.	- Their effluent is now meeting discharge guidelines. - Improved D.O. From 0.3 to 1.9 - Improved settleability from 950ml/l to 450ml/l
MUNICIPAL STP	They were getting inlet BOD load less than the design standards, because sewage infrastructure was still in process before the STP was commissioned. As a result a stable MLSS was not getting generated	Use of PAC (poly aluminium chloride) in the secondary clarifier to settle down the suspending solids	Use of vermicompost derived micronutrients to enhance the microbial flocs and produce well settling MLSS.	They have achieved a stable MLSS which is giving clear effluent and the use of PAC has been stopped completely.
FOOD INDUSTRY	Oil and grease were getting difficult to treat, the MBR membranes were getting clogged very often.	Use of MBR system to filter out water	Use of fat oil and grease digestion microbial culture.	The whole floating grease was dissolved within a weeks time and now the systems give clear effluent without any clogging or odour complaints.



in the development of biological products to improve wastewater treatment, the present-day treatment methods are unsatisfactory and we feel that our products can bring a big change in terms of economics and performance. Our herbal extracts enzymes and microbes can be deployed in septic tanks, industrial wastewater treatment, grease trap management BOD, COD reduction ammonia reduction odour

elimination oil spill management, algae control composting solid wasteway management

Easy-to-use these formulations provide quick results and performance at low dosages and have made our products well accepted by wastewater professionals, For example our products like SUPER 24 and OXYSUPER are well known in the ETP industry ■



ABOUT THE AUTHOR

Sanjay Bahl is a post graduate from Symbiosis College, Pune. Mr Bahl and his team act as technical advisors and trouble shooters to 900+ clients. They help companies improve their biological wastewater treatment. Mr Bahl strongly believes that Indian biotechnology is among the best in the world. Along with his passion for transforming the course of companies, he likes to read about the latest technologies and does social work in his free time.

GEO-ENABLED AUTOMATION FOR BETTER MANAGEMENT

About 80% of the water data has the context of location associated with it, and by not tapping this hidden power in the larger context of the water ecosystem we are denying ourselves its numerous benefits.

By
Agendra Kumar

Much has been talked about the precarious water situation we are likely to have, in the next few years, and hence the urgent need for an integrated water resource management that addresses the entire water value chain from “source to tap” holistically is the need of the hour. It is no secret that we are racing against time in our pursuit to achieve universal and equitable access to safe and affordable drinking water, adequate sanitation, and hygiene for all, notwithstanding the inevitable threat to economic growth due to depleting water resources. Automation is undoubtedly the way forward to protect and secure our future.

The reality.

Easier said than done, implementation of “digital water” technologies is laden with challenges and unknowns. Water challenges are multi-disciplinary in nature, intricately related to the

economy, environment, and the society with interactions at local, regional, national, and global levels. As we steer our way ahead with automation, our approach needs to be well informed that unravels the intricacies, interrelationships and interdependencies that are critical to ensure equal justice to all the stakeholders while protecting the precious natural resource.

Efforts by the Government.

Over the years, the Government of India has launched multiple initiatives towards strengthening the nation's water security and resilience. While its ambitious program - “Jal Jeevan Mission” is envisioned to cater to rural India, Atal Mission for Rejuvenation and Urban Transformation (AMRUT), Smart Cities Mission, Swachh Bharat Mission and the Heritage City Development and Augmentation Yojana (HRIDAY) are

some of the schemes that address urban segments. Through various automation initiatives, increasingly governments and water boards are making efforts to acquire, process, manage and maintain the “water data” in “real-time” to address challenges to take informed decisions.

These central initiatives supported by state level programs are by and large well designed to embrace the water challenges holistically addressing all the aspects from source to tap, namely infrastructure, water-use efficiencies, water quality, source sustainability, black water/grey water management, water conservation and so on through a collaborative and participatory approach. Notwithstanding the prohibitive cost and multi-jurisdictional operational scenarios, addressing these individual challenges in isolation is often resulting in “technology myopia”, delivering suboptimal outcomes. To overcome this, there is a dire need for “Mapping a Common Ground” that brings together all the subjects and actors, provides actionable intelligence, fosters a collaborative environment for finding solutions and reaches agreements for positive action.

The possible solution.

While GIS mapping and geo-tagging happens to be one of the key features of these programmes, its suboptimal usage has been a cause of concern, which warrants immediate attention to bridge the implementation gaps and improve the ROI on these huge investments. Interestingly, about 80% of the water data has the context of location associated with it, and by not



tapping this hidden power in the larger context of the water ecosystem, we are denying ourselves its numerous benefits. It is incumbent on us to harness this untapped power to strengthen our water resilience. Below are some ways in which the current efforts of GIS mapping and geo-tagging can be harnessed for larger benefit using geo-enabled automation:

- Provides a bird's eye view of water infrastructure from source to tap, with the ability to drill down to individual tap at a click of the mouse.
- Access data that is contextualized, can be intuitively visualized, and analyzed for location specific temporal patterns and trends.
- On-demand location specific operational picture and actionable intelligence for decision support.
- Real-time, non-intrusive monitoring of resources and assets, improved prevention of pilferage and safety of assets.
- Anywhere, anytime contextualized and real-time information for customers and other stakeholders.
- Improved outage management and reduced down-times, and tailored predictive maintenance.
- Optimized mobile workforce management, improved operational fleet management, optimized routing and fuel savings.
- Targeted energy consumption management and costs, predictive modelling, and simulation.
- Better disaster preparedness and emergency response.

Globally geo-enabled automation is proving to be an irreplaceable tool for demystifying intricacies while providing “contextualized” insights. The seamless flow of data and information from location intelligent sensors and smart devices are enabling utilities to respond faster to operational contingencies. GIS platform integrated with IoT, SCADA and other components of the distribution systems by leveraging machine learning (ML) and artificial intelligence (AI) offers numerous opportunities for advanced applications including predictive modelling and simulation.

Utilizing the potential of data to find solutions.

By streaming the water quality



information to a central environment in real-time, location intelligent water testing devices are facilitating rapid action and targeted interventions in the water quality affected areas. Real-time data delivered via easy-to-understand maps and mobile applications fosters transparency and improves citizen engagement. By getting all the data on a GIS platform – geo-enabled automation is strengthening integrated water resource management efforts.

While helping to avoid “data traps” geo-enabled automation aids in deciphering and democratizing ever-increasing volumes of location rich data for strategic and operational decision support including management of – assets, leakages/pilferages, outages, workforce, revenue, compliance, network integrity, and emergency response through a single window. At the same time, such infrastructure also supports efforts in improving water quality, increasing water-use efficiencies, protecting, and restoring the water ecosystems and strengthening community participation in water and sanitation management.

Urban Water

Increasing urbanization, population explosion, changing climate patterns and increasing expectations are constantly adding pressure on the urban local bodies. Leveraging the context of location GIS aids in design, model, planning and maintenance of urban water distribution networks helping the utilities to optimize costs and improve turnaround times. Geo-enabled DMA approach aids in better management of the water distribution systems by enhancing situational awareness while providing actionable intelligence for improving operations. These benefits in reduction of non-revenue water, lesser leakages/pilferages, improved grey water management, better water quality and optimized energy consumption.

Geo-enabled urban water systems around the world have vastly improved the management of complex water utility operations, thereby reducing non-revenue water (which is almost 40%) and improving efficiencies and workforce management (by up to 30%). With Esri's ArcGIS at the center stage, bodies like Thrissur Municipality and Orange City Water (Nagpur) have taken lead in geo-enabling automation of their water operations. These utilities are now providing location specific insights with actionable intelligence for quick decision support to their stakeholders while addressing operational contingencies.

Rural Water

For ensuring a long-term 'assured service delivery' of safe drinking water to rural households, and village level institutions to work like 'public utilities' they need to be armed with granular information that can be easily visualized, understood, and analyzed in the context of a village. For Village Water and Sanitation Committee (VWSC) or Pani Samitis to come up with effective community programs to promote gram swaraj, they need data and insights that are contextualized and easy to understand.

While arming the villagers with contextualized actionable intelligence, geo-enabled automation of village utilities can empower the stakeholders in improved planning, design, operation, and maintenance of water supply schemes. Location intelligent sensors and IoT devices for water testing aid in safeguarding rural health and preventing the spread of water borne diseases, while helping gram sabhas to take up targeted interventions.

While mapping a common ground for the village, through its simple, easy to use map-based language geo-enabled automation helps communities to overcome the literacy barriers and encourages larger participation and collaboration including women and weaker sections of the society. This will be a critical success factor for long term sustainability of the community owned water supply schemes.

A map-based Village Action Plan (VAP) and dashboard for their water resources can be an invaluable tool in the hands of

communities to understand and appreciate the intricacies and interdependencies of various factors from source to tap. Geo-enabled tools can be a force multiplier that empowers the gram sabhas and every villager in the participatory decision-making process. Geo-enabled village action plans can be easily aggregated at district and state levels for decision support, financial planning, and policy formulation.

In Closing

While the pace of automation is picking up, due to poor awareness geo-enablement has been lagging, which is rather unfortunate. As governments and water agencies pump in their efforts for GIS mapping and geo-tagging, there is also a need for harnessing this geo-enablement for the larger good and enhancing the ROI on investments being made. Continuing to address the challenges in isolation will be a trap we will be forcing ourselves into and regret later.

As the Cloud-based GIS, Platform-as-a Service (PaaS) and smartphones make access to GIS easier, faster, and affordable, stakeholders have more incentives at their disposal for integrating their automation efforts with ever increasing volumes of geo-data from source to tap and enrich the contextualized intelligence for informed decisions and iterative improvements.

With the prowess of innovative minds and a large talented resource pool, there is no reason why we cannot harness the geo-location to make the best of our water resources and set an example for others to follow ■



ABOUT THE AUTHOR

Agendra Kumar has been associated with Esri India since 2013. In his present capacity Mr Kumar is the Managing Director of Esri India. An industry veteran with over three decades of experience in the IT industry, Mr Kumar has been promoting the use of geospatial technologies in the country. Under his leadership, Esri India has partnered with various government and private organizations to execute critical and transformative projects using Esri's Geographic Information System (GIS) technology.



**WATER METERING
& WATER QUALITY MONITORING**

Badger Meter M2000

ModMAG

Badger Meter

.....

We help customers measure their water usage. Measurements help customers determine where they can reduce costs, identify losses, detect leakages and comply with water use restrictions. We help manage the **entire process of manufacturing water**, help ensure that the water is safe and its supply is conserved.

Badger Meter is a global provider of industry leading water solutions encompassing **flow measurement, water quality** and other system parameters. These offerings provide our customers with solutions essential to optimize their operations and contribute to the sustainable use and protection of the world's most precious resource.

www.badgermeter.com

f i+ t in

HIDROING DEVELOPS SMART WATER SOLUTIONS FOR 144-YEAR-OLD WATER SUPPLY NETWORK IN ZAGREB, CROATIA

OpenFlows and OpenUtilities Save 16 Months when Delivering One of the Largest Digital Twins in Eastern Europe

Modernizing One of the World's Oldest Water Supply Systems

Originally constructed in 1878, the 144-year-old Zagreb water supply system is one of the oldest functioning water networks in the world. At that time, the capacity of the constructed system was 53.2 liters per second via a 4-kilometer-long pipeline that provides water to 11,150 of the 30,000 inhabitants in Zagreb, the capital and largest city of Croatia. ViO Zagreb has been responsible for the city's public water supply since its inception, including construction and rehabilitation of the network infrastructure. The organization ensures reliable water distribution to the growing number of residents. To cover water services for now over 900,000 people across 800 square kilometers, the water supply network was expanded, spanning 3,500 kilometers with seven water sources, more than 400 components, and a daily water intake of 310,000 cubic meters.

Over the last two decades, water loss has grown significantly and sharply worsened after the occurrence of earthquakes in 2020. To resolve these losses and modernize the network, ViO Zagreb retained Hidroing to develop a detailed master plan and water loss program, digitalizing the system for optimal water distribution over the next 30 years of operation. "The project was developed to be used as a statistical and reporting tool, [where digital] protocols were developed for direct data analysis in activities of water loss reporting," said Igor Dundović, project manager at Hidroing.

Striving to Optimize Network Operations

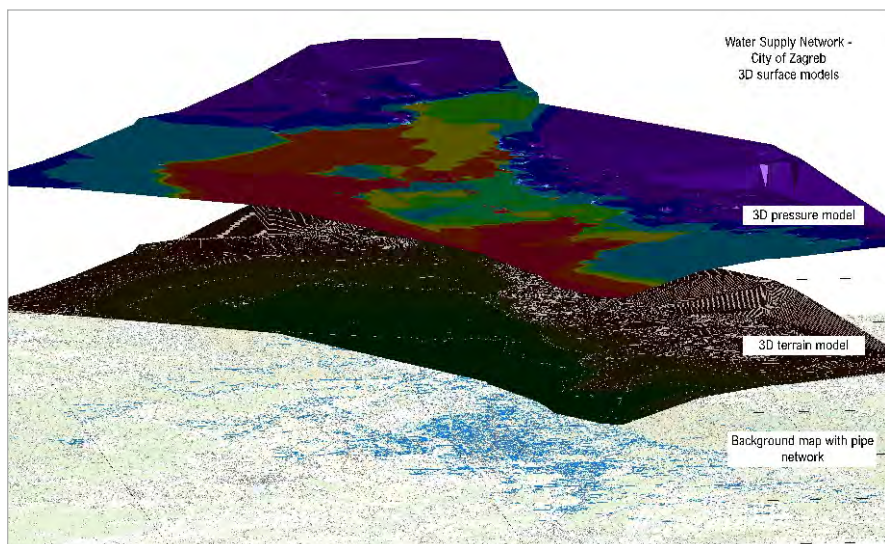
The EUR 1 million project required Hidroing to develop a detailed hydraulic model based on an updated GIS model that enabled water loss analysis and detailed diagnosis of the supply system, including modeling of district meter area

(DMA) zoning and numerous measurement points. "Our final goal was to establish a hydraulic model with all GIS data to be used for conceptioneering by ViO Zagreb development sector, and as a digital twin for ViO Zagreb's operational sector," said Dundović.

However, Hidroing faced significant data collection challenges and difficulties measuring flow, pressure, and chlorine levels. To meet the owner's digital expectations, streamlining access to reliable network data and optimizing network operations, they realized that they needed an integrated technology solution to facilitate smart water management.

Bentley Applications Support Digital Twin Solution

After considering their options, Hidroing selected Bentley's OpenFlows and OpenUtilities applications for GIS development, 3D modeling, hydraulic modeling, and on-site operations and facility management. "As a big project with a big database, our company decided to use Bentley products for all tasks," said Dundović. They modeled 3,000 measurement points, 144 DMA zones with individual scenarios and water balance management, and 3,500 kilometers of pipeline, creating and calibrating a hydraulic model. Using Bentley applications, they linked water loss calculation input data, including pipe length, the number of service connections, flow, real water loss, and average pressure. They stored and reported this statistical network data through the GIS platform and transferred it directly to the hydraulic model, providing a single source of truth to extract data based on real-life changes in the system and resolve water loss.



Hidroing was tasked with developing a GIS system and hydraulic model of one of the world's oldest water supply systems. Image courtesy of Hidroing d.o.o.

Bentley's hydraulic modeling solution enabled them to combine all network analyses into a digital twin, simulating system operations and more than 150 scenarios, including scenarios for every DMA zone. The established model is one of the largest digital twin models in Eastern Europe, facilitating smart water solutions.

A Digital Twin Industrializes Network Management

Using Bentley's advanced digital platforms, Hidroing established a digital twin to improve processes and development of the Zagreb water supply system. The integrated modeling and analysis solution enabled real-time processing of input data, eliminating time-consuming manual data manipulation and validation, accelerating model calibration and delivery by 16 months. Using OpenFlows and OpenUtilities, the team delivered a final model and digital twin, pinpointing 50 actions to reduce water loss. "Final delivery time was reduced from an estimated 36 months to 20 months. This time reduction enabled faster digital twin implementation and an earlier start to the water loss reduction program," said Dundović. The digital twin solution brings direct savings in water loss and minimizes environmental impact by reducing water intake and electricity usage.

Given the recent earthquakes and



frequent ruptures of the Zagreb water pipes over the last few years, ViO Zagreb recognized the importance of digitalizing their water network and implementing smart water management processes. To meet the owner's technology expectations, Hidroing delivered a digital twin that can be used for ViO Zagreb to make more informed decisions regarding their supply system's development, operations, and future planning, industrializing network management of the capital city's water infrastructure. "After devastating earthquakes during March 2020 in the city of Zagreb, these kinds of projects are even more significant in a way that during development of master plans, water safety and distribution alternatives are now mandatory," said Dundović ■



Using OpenFlows and OpenUtilities, they finalized the hydraulic model in just 20 months instead of the expected 36 months. Image courtesy of Hidroing d.o.o.

PROJECT SUMMARY

Organization: Hidroing d.o.o.

Solution: Water, Wastewater, and Stormwater Networks

Location: Zagreb, Croatia

PROJECT OBJECTIVES:

- To combine all network analyses into a digital twin.
- To provide a single source of truth for improved decision-making and optimal water supply operations.

PROJECT PLAYBOOK:

ContextCapture, MicroStation, OpenFlows HAMMER, OpenFlows WaterGEMS, OpenFlows WaterOPS, OpenUtilities

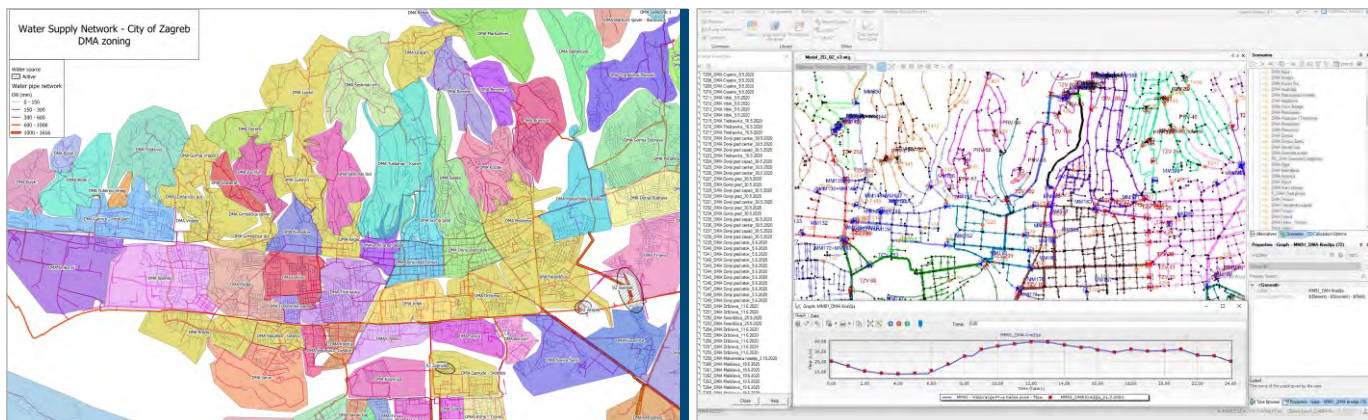
FAST FACTS

- Recent earthquakes and significant water loss prompted ViO Zagreb to digitalize their water supply system for better network management.
- Hidroing was retained to develop a master plan and water loss program for the network's next 30 years of operations.
- Hidroing used Bentley applications to combine all network analysis into one of the largest digital twins in Eastern Europe.

ROI

- Using OpenFlows and OpenUtilities, Hidroing modeled 3,000 measurement points and 3,500 kilometers of piping, creating a calibrated hydraulic model.
- Bentley's applications streamlined data integration between the GIS system and model, saving 16 months while delivering a network digital twin.
- The digital twin facilitates better decision-making and smart management for one of the world's oldest water supply systems.

“Bentley products helped us in reducing [resource] hours, which directly increased the speed of final product implementation and the usage of the hydraulic model for water loss reduction.”
— Igor Dundović, Project Manager, Hidroing d.o.o.



The digital twin provides a single source of truth for the owner, improving decision-making and driving smart water management over the next 30 years. Image courtesy of Hidroing d.o.o.



Fact sheet:

- ~ 900 000 population covered
- ~ 322 000 customer meters
- ~ 800 km squared area
- ~ 3 500 km water pipes
- ~ 310 000 cubic meter of water daily intake
- 7 water sources
- 84 water tanks
- 148 water pumps
- 25 800 hydrants

Project results:

- 144 DMA zones
- ~ 3000 measuring points (flow, pressure, chlorine)

ABOUT THE AUTHOR

Sandra DiMatteo is the Industry Marketing Director, Water Infrastructure at Bentley Systems. She has more than 25 years of experience in reliability and asset performance management software, asset lifecycle information management, and is an expert in digital twin cloud solutions in the water and wastewater, energy and process industries. Sandra holds an honors degree in accounting and is a Certified Reliability Leader. She sits on the Reliability Leadership Institute Board of Advisors and founded the Ontario Chapter of the Society of Maintenance and Reliability Professionals.



HDR ENSURES SAFE OPERATIONS AT DIABLO DAM WITH A DIGITAL TWIN

Employment of Artificial Intelligence and Engineering Data, Helps Improving Maintenance and Decision-making.

Seeking to Prevent Dam Disasters

In February 2017, heavy rainfall in northern California overwhelmed the Oroville Dam. Officials discovered that erosion over time caused a crater to form in the main spillway, limiting the amount of water that could be discharged and contributing to Lake Oroville's rising water level. As a result, water flowed over the previously unused emergency spillway, causing significant ground erosion and damage to the dam. Since the dam faced the possibility of collapse, more than 180,000 people living downstream were evacuated as a precaution. Though Oroville Dam ultimately remained intact, the incident alarmed dam owners and operators across the country and reinforced the need for more effective maintenance to avoid potential disasters.

One such owner-operator is Seattle City Light, which conducted major safety reviews to prevent a near-disaster at six

of their own facilities, including the Diablo Dam built in 1936 along the Skagit River in northwestern Washington. To improve inspection techniques beyond traditional methods on Diablo and gain a more thorough understanding of the aging dam's current conditions, they wanted to establish virtual inspections that could gather more information while minimizing safety risks on the 160-foot-high facility and lowering inspection costs. Seattle City Light tasked HDR with conducting a survey of the dam and its surroundings with unmanned aerial vehicles. The survey had to include detailed imagery of the dam's structure, spillways, rock abutments, and concrete arch. Though HDR would collect abundant information on the current state of the dam, they needed a way to arrange and present that data in an intuitive, easily comprehensible fashion, helping operators improve decision-making and quickly respond to changing conditions.



All dam stakeholders can share information quickly, which provides a single source of truth and speeds decision-making. Image courtesy of HDR.

Combining a Digital Twin with Machine Learning

HDR determined the most effective way to manage the gathered data and put it to work for more effective inspections was to create a digital twin. A virtual replica of the dam would give the operators another reference point for understanding the state of the facility and provide a new way to maintain awareness of any changes with intuitive visualization of the data. Ideally, the digital twin would be able to incorporate data gathered from traditional rope-access inspections, as these manual inspections still provide key perspectives that UAV surveys could miss. Once developed, the digital twin would establish baseline conditions, then become updated as real-world conditions change.

However, the project owner wanted to go beyond an accurate reflection of real-world conditions. To meet these goals, HDR needed to completely merge Diablo Dam's architecture, engineering, and construction data into the digital twin. Additionally, the owner wanted to incorporate artificial intelligence and machine learning into the model. With these capabilities, dam workers could perform predictive analysis and determine how asset and geotechnical conditions would change in the future, such as natural shifting and erosion of the surrounding soil over time. They also wanted to automatically identify cracks and spalls, allowing operators to take corrected action swiftly to prevent them from developing into bigger problems. With this information, the owners could further improve their targeted maintenance scheduling, helping ensure safe operations. HDR sought a digital twin platform that could imbue their reality model with the advanced capabilities needed to provide confidence that Diablo Dam wouldn't experience a disaster.

Incorporating all Data and Capabilities with Bentley Applications

HDR determined that ContextCapture and the Bentley iTwin platform could help them develop a digital twin that would incorporate the analysis and machine learning capabilities needed to ensure the dam's safety. During a six-

hour UAV flight, they collected 82 million data points covering all elements of the dam and its surroundings. Then, they used ContextCapture to combine that data with data gathered from rope surveys to create a detailed, survey-grade reality mesh of the area. In the process, the data helped engineers identify geologic features that would be difficult to access manually, which would help improve the accuracy of future assessments.

The team then used the iTwin platform to create a detailed digital twin of the dam and its surroundings. All project information, no matter the discipline, was incorporated into the federated model. Due to the open nature of the iTwin platform, HDR incorporated their preferred artificial intelligence and machine learning technology. As a result, the digital twin can automatically detect cracks and spalls, as well as differentiate them from harmless shadows, discoloration, and algae growth. With predictive analytics incorporated into the digital twin, dam engineers can compare data of a given year against that of other years. By observing changes in the surroundings over time, such as soil shifts, they can predict that the structure will continue to shift at a similar rate over time, barring unusual seismic activity.

Taking Corrective Action Faster

Integrating all information about the state of the dam's assets, structure, and surroundings into a digital twin has greatly improved access to and understanding of project data.



Combining the digital model, which has survey-grade accuracy, with traditional on-site rope inspections gives inspectors much more detailed insight into current conditions. HDR estimates the initial reality capture for the digital twin was just a quarter of the cost of traditional surveys. With accuracy within two centimeters, dam operators can detect much smaller anomalies and take corrective action before they grow into larger problems. Additionally, numerous operators can keep track of the dam's current conditions from their offices or remote workstations, which improves safety as well as convenience.

Now, all dam stakeholders can share information quickly, which provides a single source of truth and speeds decision-making. By applying artificial intelligence and machine learning, the owners can now automatically identify areas of concrete with anomalies, then differentiate between cracks and spalls to better determine the corrective action needed and prevent problems from becoming worse. At the same time, filtering out shadows and discoloration prevents unneeded maintenance activities. Dam operators plan to add

more capabilities to the digital twin—such as additional hydraulic engineering, uplift analysis, and change and anomaly detection—to further improve the dam's ongoing safety and provide additional sources of ROI ■

PROJECT SUMMARY ORGANIZATION HDR

SOLUTION

Reality Modeling

LOCATION

Whatcom County, Washington State, United States

PROJECT OBJECTIVES

- To create a detailed digital twin of Diablo Dam.
- To improve insight into dam conditions for more effective maintenance.

PRODUCTS USED:

ContextCapture, ContextCapture Insights

FAST FACTS

- To prevent potential disasters, the owners of the Diablo Dam wanted greater insight into conditions of the aging facility.
- HDR was tasked with creating a digital twin of the dam that could incorporate engineering and geotechnical data.
- With machine learning and artificial intelligence, the digital twin can automatically detect cracks and filter out shadows and discolorations.

ROI

- HDR estimates the initial reality capture for the digital twin was just a quarter of the cost of traditional surveys.
- With accuracy within two centimeters, dam operators can detect much smaller anomalies and take corrective action before they grow into larger problems.
- Dam operators plan to add more capabilities to the digital twin, such as additional hydraulic engineering, uplift analysis, and change and anomaly detection.



Using OpenFlows and OpenUtilities, they finalized the hydraulic model in just 20 months instead of the expected 36 months. Image courtesy of Hidroing d.o.o.

ABOUT THE AUTHOR

Aude Camus is a senior solution marketer with Bentley Systems, responsible for ContextCapture, Orbit 3DM, OpenCities Planner, Descartes, and Pointools. She is part of Bentley's digital cities business unit and focuses on Bentley's reality modeling products. Graduated from SKEMA Business School in France, Camus has nearly 15 years of experience in selling and marketing engineering and geospatial software.

“

“What's inspiring to me is that the digital twin provides more access to high-fidelity imagery and data. The dam is safer, and the ability to get data is safe and efficient.”

– Carlos Femmer, Associate Vice President/Data Acquisition Cross Sector Director, HDR

”



SHANDONG METALLURGICAL ENGINEERING USES 3D MODELING TO DESIGN A LOW-CARBON EMITTING POWER PLANT

Use of 3D modelling Helps Gain Economic and Environmental Savings and Improve Drawing Efficiency by 60%

Promoting Green Development in China

Shandong Province Metallurgical Engineering Co., Ltd is an international engineering smelting company that integrates investment, consulting, design, construction, and operations. After more than 60 years of development, the organization has grown into one of the top 10 design institutes and engineering, procurement, and construction (EPC) contractors in the metallurgical sector of China. Smelting iron and steel often produces by-products such as blast furnace gas, converter gas, and coke. The gases are used in the production process or consumed through chemical product recovery. Remaining gases not used in the smelting process waste energy and could cause great harm to the environment.

To mitigate the risk and limit the amount of pollutants that enter the atmosphere,

the Chinese government is promoting smart and green production of smelting plants. Seizing the opportunity, Shandong Province Metallurgical Engineering is developing a new power generation plant in Jinan, Shandong province, a city of over 9 million that is well-known for its natural springs. It is also home to two integrated steel plants with an annual production of over 20 million tons.

High energy consumption and heavy pollution produced by the steel conglomerates contaminates the natural environment, which means a poorer quality of life for residents. To mitigate the environmental impact, Shandong Province Metallurgical Engineering is undertaking the CNY 480 million EPC project. Covering an area of 46,000 square meters, the project involves simultaneously constructing two sets of condensation type steam turbines with ultrahigh temperature and ultrahigh pressure reheat gas boilers, as well as

two sets of 65 megawatt ultrahigh temperature and ultrahigh pressure reheat turbo generator units and supporting facilities. The plant also includes a mature recirculating water cooling system with a circulating water pump house, suction well, and cooling tower.

Among the challenges they were facing included a tight project area, a complicated pipeline layout, and a potential for pipeline and structural clashes. Given these restrictions they could not guarantee a high-quality design or their client's requirement of digital delivery using 2D design. "If we continue to adopt a conventional 2D design method, we won't be able to guarantee the quality of design required by the owner nor the design schedule," said Tao Zhou, senior engineer and project manager with Shandong Province Metallurgical Engineering. "Instead we adopted 3D models to achieve a high-quality and high-efficiency collaborative design using digital applications."

Digital Design Increases Efficiency

Shandong Province Metallurgical Engineering commonly uses 2D software to design power generation facilities, which often lead to errors in the plan layout. Because of the complex design required on this project, they decided their conventional 2D power generation design methods would not suffice. Therefore, they opted for 3D modeling applications and a robust collaboration solution to increase efficiency and properly manage the design.

Shandong Province Metallurgical Engineering turned to Bentley's factory digital design applications to quickly adjust the plan and maximize their use of vertical space so that they could work within the tight construction area. They also used LumenRT to visualize the project realistically. Using OpenPlant Modeler, they were able to easily arrange the facilities' massive piping systems and complicated electrical and instrument control circuits under the steam turbine to avoid clashes and improve accuracy. In addition, they used Bentley's AutoPIPE for pipeline stress analysis. Lastly, the team used



ProjectWise to enable the multidiscipline design team to collaborate seamlessly, which improved design efficiency. Bentley applications helped the team track design progress and identify clashes and other design issues.

Visualization Ensures a Reliable Design
Bentley's 3D modeling applications allowed the design team to visualize the project in the schematic stage, enabling the specialists in multiple disciplines to intuitively compare and select the plan, ensuring the final design is safe and reliable while reducing project costs for the owner. Other benefits included constructing the main factory's structure in advance, enabling the civil design team to position the steam turbine and auxiliary engine beforehand to improve clash detection and save time and investment. Moreover, using Bentley Raceway and Cable management, electrical and cable disciplines arranged cable trays, ducts, and cable routes in advance in a 3D space, which improved design efficiency by more than 50%.

The piping team made use of data from the component library to automatically generate bills of material for water and gas pipes, which reduced resource hours and ensured accuracy. Using OpenPlant Modeler to grade and accurately position the pipeline height improved design quality by 13%. Applying OpenPlant Isometric Manager to extract the pipeline ISO diagram from the models reduced time and resource hours by 30% compared to using traditional design methods. The innovative 3D modeling technology also helped Shandong Province Metallurgical Engineering save 20% in



work days, enhance drawing issuing efficiency by 60%, increase material statistic efficiency by 50%, and improve communication by 20%.

In addition to economic payoffs, implementing Bentley's factory digital design applications contributed to environmental gains. For example, Shandong Province Metallurgical Engineering designed the plant to use flue gases to produce clean electricity. Further, during the smelting production process, the plant generates very low concentrations of exhaust, dust, and sodium sulfate, a by-product of the desulfurization process that can be used as a raw material for other industrial production. Shandong Province Metallurgical Engineering will continue to use innovative technology on their future projects to help stem the environmental impact of power generation plants and to demonstrate the organization's social responsibility. **Project Playbook:** AutoPIPE, Bentley Raceway and Cable Management, LumenRT, MicroStation, OpenBuildings, OpenPlant, OpenRoads Designer, ProjectWise, ProSteel, ProStructures ■



The complex design required the design team to implement 3D design applications rather than use conventional 2D design methods. Image courtesy of Shandong Province Metallurgical Engineering.

PROJECT SUMMARY

ORGANIZATION

Shandong Province Metallurgical Engineering

SOLUTION

Power Generation

LOCATION

Jinan, China

PROJECT OBJECTIVES:

- To build a low-pollution power generation plant in Jinan, China.
- To simultaneously construct two sets of condensation type steam turbines with ultrahigh temperature and ultrahigh pressure reheat gas boilers.

FAST FACTS:

- Shandong Province Metallurgical Engineering is building a new power generation plant in a city of over 9 million that is well-known for its natural springs.
- The complex design required the design team to implement 3D design applications rather than use conventional 2D design methods.
- Using OpenPlant Modeler helped Shandong Province Metallurgical Engineering easily arrange the facilities' massive piping systems to avoid clashes and improve accuracy.

ROI:

- The 3D modeling technology helped Shandong Province Metallurgical Engineering save 20% in work days.
- Using 3D modeling, the project team improved drawing issuing efficiency by 60%.
- Bentley applications helped the team increase material statistic efficiency by 50% and improve communication by 20%..

“Using OpenPlant Modeler, we can rationally arrange the massive piping systems and complicated electrical and instrument control circuits under the steam turbine to effectively avoid clashes and improve design accuracy.” — Tao Zhou, Senior Engineer and Project Manager, Shandong Province Metallurgical Engineering.

ABOUT THE AUTHOR

Richard Irwin is solution marketing manager with Bentley Systems. He can be reached at Richard is a Senior Solutions Marketer for Bentley System's Asset and Network Performance group, with over 15 years' experience in working within the industrial analytics space. In his role, Richard works with the sales and industry teams to coordinate marketing opportunities across a wide variety of industries applicable to AssetWise, OpenComms, and PlantSight. Based in the United Kingdom, Richard holds a master's degree in Sociology from Aberdeen University and a Masters in IT from Heriot Watt, Edinburgh.



Explore the future trends and solutions in Taiwan's foremost water tradeshow!



**PRE-REGISTER
NOW!**



TAIWAN INTERNATIONAL WATER WEEK

2022/10/13-15
TWTC Hall 1



Exhibit Areas

- 💧 Reclaimed Water & Treatment
- 💧 Transport & Storage
- 💧 Smart Water Technology
- 💧 Water Purification Equipment & Drinking Water
- 💧 Process Control Technology & Automation
- 💧 Green Infrastructure, Public Sector & Related Services

Contact TIWW 2022 Team



+886-2-27255200 #2858 / #2783



tiww@taitra.org.tw

ORGANIZER



Taipei World Trade Center

CO-ORGANIZERS



Taiwan External Trade Development Council
Water Resources Agency, MOEA, Taiwan

COOLING TOWER WATER OZONATION: OZONE WONDER

The use of ozone in cooling tower water treatment is well known, In India there are many large cooling towers, that are using ozone. The world's largest cooling tower ozonation is in India, at Yerrmarus (near Raichur). KPCL as well as Mahagenco are pioneers in this field. Yerrmarus has a 3 x 38 kg ozone system. In Europe (Germany) we find companies like Shell use ozone for many of their cooling towers. Unfortunately, we do not find too many industrial houses using ozone in cooling towers, mostly because they are comfortable sticking to the existing treatment methods and show resistance to change.

It is a well-known fact that cooling tower operators use large quantities of toxic chemicals to keep the cooling water clean to protect the cooling towers. They discharge highly polluted blow down water that needs to be treated before discharge. Thus, there is tremendous pressure from environmentalists.

Users of Ozone Technology around the globe have always accepted the benefits of Ozonation. However, the viability of using ozone in India has always been a question due to lack of quantified studies and working references. Ozonia (SUEZ) has undertaken extensive studies in the use of ozone in cooling towers in the past and they have

published papers on the matter.

The use of ozone provides the following benefits in a nutshell:

1. Completely eliminates Biocides, making the discharge water cleaner.
2. Reduces more than 90% of Sulphuric acids and de-scalents for large towers.
3. No hazardous chemical storage and handling such as gas chlorine.
4. Enables the CT to be operated at higher COC, eliminates controlled blow down.
5. Prevents scaling, corrosion and reduces algal growth
6. Saves energy in operation of the Cooling tower
7. Finally Saves water, saves chemicals costs, allows the power plant to comply with environmental needs and makes them environmentally friendly.

Using ozone the same quality of MUW (make up water) allows the cooling tower to more than double the COC (cycles of concentrations) of a chemically treated tower.

Studies have revealed that a buildup of 0.1 inch (0.25 cm) of calcium carbonate scale on heat exchanger surface will reduce the heat transfer by as much as

40%. The energy savings accrue due to the fact that virtually limited scaling are noted with ozone treatment, and reduction in scale thickness improves the heat transfer efficiency of an ozonated cooling tower, thus saving power. Anticipated power savings can be upwards of 10%.

Quality of make up water. MUW quality is the most important criteria that can influence the performance of the cooling tower. If it is of good quality then the design can be to introduce ozone directly into the CT tower basin. By using ozone, the user can ensure the tower water will be of very good quality. Ozone is capable of removing many dissolved organics—mostly the long chained organic compounds that are responsible for odor and color. Presence of organic matters in cooling towers will contaminate the entire cooling tower loop including the condenser and could be a main reason for bio fouling that induces scaling and corrosion.

The presence of SRB bacteria would also increase anaerobic reactions within the cooling tower. It is an accepted fact that ozone in MUW and a side stream filtration in a cooling tower can resolve more than 60% of the problems faced by cooling tower operators.

ISSUED IN PUBLIC INTEREST BY:

**OZONE TECHNOLOGIES & SYSTEMS INDIA PVT LTD
262 II MAIN ROAD, NEHRU NAGAR, KOTIVAKKAM OMR,
CHENNAI 600096**

Tel.: 9840149184 Web: www.otsi.net



EA WATER CLUB



Life's now more
REWARDING at EA Water Club!
Simply subscribe to EverythingAboutWater magazine and enjoy exciting benefits.

As our valued Club member, you are entitled to benefit from exciting offers and rewards!

Subscribe



EA Water comes up with the most popular monthly magazine on water and wastewater management in India. Our Magazine is read by thousands of leading industries, government bodies, consultants, and contractors across the country

1. Choose your magazine subscription(s)

Subscribers	Term	No. of Issues	Issue Price	% Savings	You Pay
Domestic	5 Years	60	Rs.24000	40%	Rs. 14400
International	5 Years	60	USD 3000	40%	USD 1800
Domestic	3 Years	36	Rs.14400	25%	Rs. 10800
International	3 Years	36	USD 1800	30%	USD 1260
Domestic	2 Years	24	Rs. 9600	15%	Rs. 8160
International	2 Years	24	USD 1200	20%	USD 960
Domestic	1 Year	12	Rs.4800	10%	Rs. 4320
International	1 Year	12	USD 600	Nil	USD 600

2. Contact and postal details

Name _____
 Designation _____
 Company Name _____
 Address _____
 City _____ Pin/Zip Code (essential) _____ State _____
 Country _____
 Tel _____ Mobile _____ Fax _____
 E-mail _____
 Website _____

3. Payment details

National Subscribers

Cheque No./DD No. (In favor of "EARTH WATER FOUNDATION") _____

Drawn on (bank name) _____

dated _____ for Rs. _____ (payable at Delhi/par).

Note:

- All payments to be made by DD/Cheque/NEFT/RTGS only, in favour of "EARTH WATER FOUNDATION"
- Account details: Bank Name: IDFC First Bank, Golf Course Extension Road Branch
- Account Number: 10056535743, Swift Code: IDFBINBBMUM, IFSC/RTGS/NEFT Code: IDFB0040101, PAN No.: AAACE7028F, Account Type: Current

International Subscribers

Note:

- All payments to be made by T/T (Wire transfer) only, in favour of "EARTH WATER FOUNDATION"
- For T/T transfer, bank and account details:
- Bank Name: IDFC First Bank, Golf Course Extension Road Branch
- Account Number: 10056535743, Swift Code: IDFBINBBMUM, IFSC/RTGS/NEFT Code: IDFB0040101, PAN No.: AAACE7028F, Account Type: Current

Date _____

Signature _____

Mail to: Earth Water Foundation, A-1/152, Neb Sarai, IGNOU Road, New Delhi 110 068, India,
 Call: 91- 85958 45490, Email: subscription@eawater.com, Web: www.eawater.com/in



AN EXAMPLE TO EMULATE

The efforts taken in Pappankuzhi village though at a micro-level needs to be emulated in other places so that the stress on water, in the country reduces to some extent.

*By
Team EverythingAboutWater*

When it comes to the water sector, more so in India, most experts are of the view that wastewater that is generated needs, to be treated and recycled. This is more so important considering that India is one of the most water stressed countries in the world. While most agree that the wastewater needs to be recycled and put to proper use so that the stress on traditional sources of water is less and that there are less chances of them getting contaminated. The reality in India is however very different. Of the total wastewater that is generated, only about

30% gets treated. There is however a ray of hope that one day things will improve and certainly with the active involvement of the community. One such example that the needs mention is the efforts taken in the small village of Pappankuzhi, Sriperumbudur block, Kanchupuram district, Tamil Nadu. With the efforts of community members and guidance from Government officials a system to treat grey water has been developed in the village. Read on for more details.

What is greywater?

Before getting into details of what has been done in the village with regards management of grey water, it is important to understand what greywater. To put it simply, grey water is a form of wastewater that is devoid of or is not contaminated, in any form, by faecal matter or urine. So this will include wastewater that is generated while bathing, doing laundry and work in the kitchen.

Where is this village?

As already mentioned Pappankuzhi village is located in, Sriperumbudur block, Kanchupuram district, in the state of Tamil Nadu. The village has two main habitations—Pappankuzhi and Pappankuzhi colony. The village has a population of about 1,016 and has approximately 474 households. Water supply in these habitations is provided through two overhead tanks with a capacity of 30,000 litres each. About 60,000 litres of water is consumed in the village daily about 42,000 litres of greywater gets produced daily.

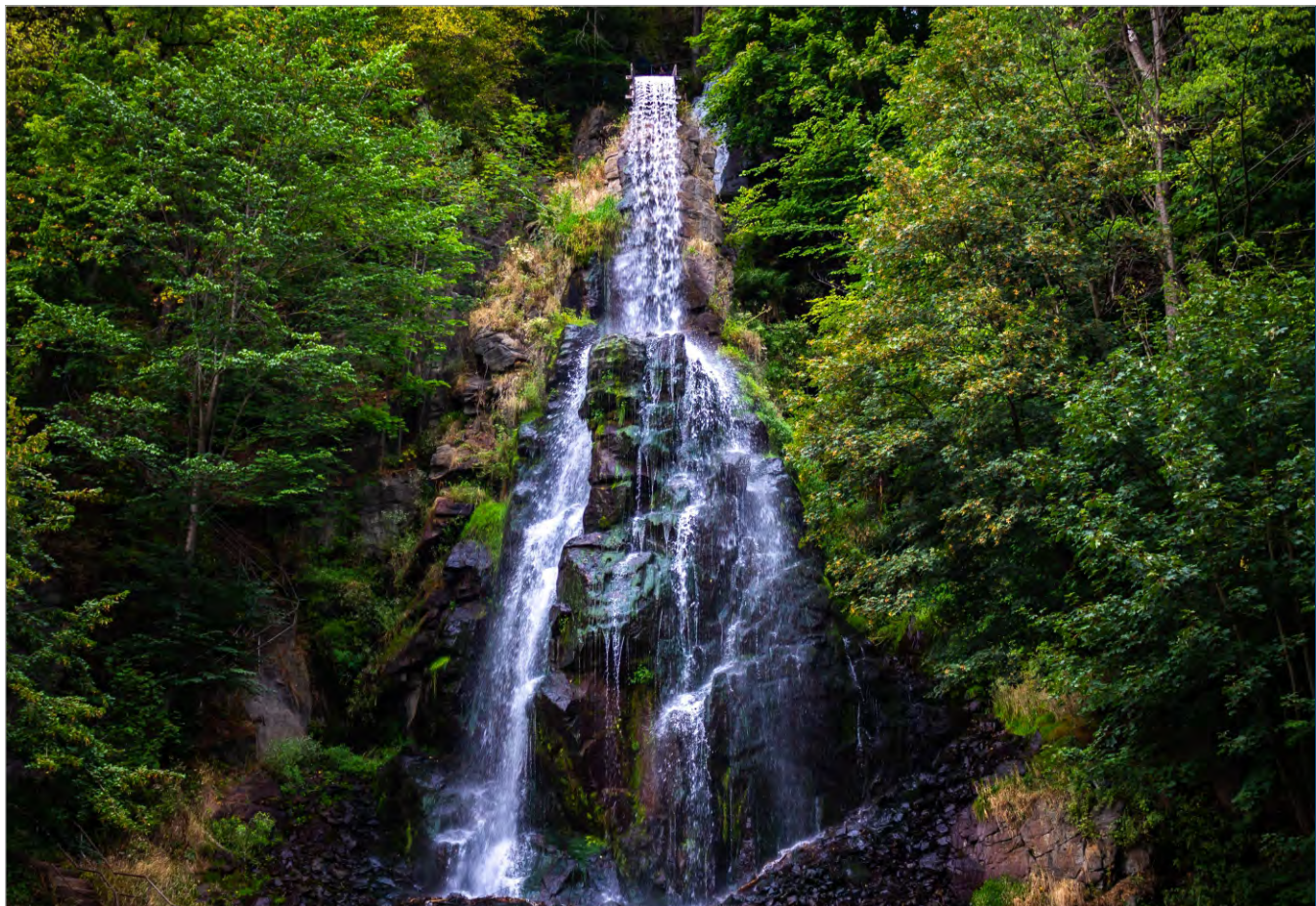
What happened in the past?

Before the villagers with the help of Government officials put a system in place to treat grey water, it was common to see grey water being discharged out in the open which would then go and contaminate fresh sources of water in the village. In other cases the discharged greywater would stagnate which would

then be a breeding ground for mosquitoes, microbes and parasites. Such a situation often led to spread of diseases like dengue, malaria and cholera. To make matters worse, there was open dumping and discharge into water bodies which contaminated both the surface and groundwater in areas with a high-water table. The community was also unaware that treated greywater could be used to provide relief from acute water stress, in the village.

How it all started?

It was Swachhagrahi, Ms. A. Sarla Devi who played a crucial role in creating awareness about the importance of solid and liquid waste management, in the village. She also highlighted the need for grey water management in the village. Though her efforts, she made people aware of what grey water constituted and the hazards of improper management of grey water. Thereafter, the president of the village, Mr Ganesan





households is collected, an inspection chamber where solid and other floating material suspended in the greywater get filtered and the soak pit that consists of a concrete tub that is placed within where suspended particles settle, allowing greywater to overflow into the filter media where it gets filtered and safely percolates into the ground.

Both horizontal and vertical type filter soak pits are efficient for treatment of grey water generated from households that have space constraints. They are usually constructed at the discharge points of the drainage systems. Drainage systems have been built in Pappankuzhi village up to the grey water disposal point. Given that horizontal type soak pits are suitable for places with high water table where the treated water can be recovered and reused for agricultural activities; two such soak pits were constructed in Pappankuzhi village.

On the other hand, vertical type soak pits require less land area when compared to horizontal type soak pits and can be constructed in areas with low water table, where the treated water will help replenish the ground water table. Pappankuzhi has one vertical soak pit that was constructed near the Sivan Koil Street at a cost of INR 1,27,000.

The efforts taken in Pappankuzhi village though at a micro-level needs to be emulated in other places so that the stress on water, in the country reduces to some extent. Thanks to efforts of the villagers at Pappankuzhi, the village in the present day treats almost all the grey water that is generated daily ■



and the Panchayat Secretary played a vital role in advocating the need for greywater management and allocated the necessary funds to establish a system in Pappankuzhi, in November 2021. While the Panchayat took care of the operations and maintenance of the system, the community was encouraged to follow certain precautions to ensure better management. This included ensuring that waste was not dumped into the drainage channel, desilting was carried out to prevent stagnation of grey water and cleaning of the storm water drain was done on a regular basis.

The path adopted.

Individual household soak pits which are suitable for managing grey water at an individual household level were constructed in 93 households at a cost of INR 9,300 each. Further, two community soak pits with horizontal type filter were constructed at disposal points of drainage systems at a cost of INR 1,33,000 each. Such soak pits are

suitable for clusters with high groundwater table and the treated water can be used for agriculture purposes. Additionally, one community soak pit with a vertical type filter which is suitable for clusters with low water table was constructed at a disposal point of the drainage system at a cost of INR 127,000.

Individual household soak pits are simple to construct with locally available materials. Under this system greywater can be treated at source, preventing the flow of greywater onto the village paths, open land or leaving them to stagnate in low lying areas. In Pappankuzhi village, 93 households could not be connected to the drainage channel and hence were provided with individual household soak pits to manage grey water.

Components of an individual household soak pit.

These would include a collection pipe or platform where greywater generated in

MAKES SENSE TO INVEST IN WATER AND SANITATION

Research by WaterAid, an international Ngo focused on water, sanitation and hygiene, states that companies which invest in water, sanitation and hygiene (WASH) for their employees, their business thrives.

By
Team EverythingAboutWater

It is a well known fact that water is the essence of life and access to clean drinking water is the key to a healthy and fruitful life. While we can control, what we consume, when we are at home and that even includes the water that we drink but what does one do when one steps out. Even when it comes to going to office. While the pandemic did make work from home an accepted norm in most organisations, except those engaged in providing essential services, now some sense of normalcy has started to prevail and that means offices have opened up and people have started working from office. In this context a new research by WaterAid, an international Ngo focused on water, sanitation and hygiene, states that companies which invest in water, sanitation and hygiene (WASH) for their employees, their business thrives.

Productivity, punctuality, health, morale and loyalty all improve. Absenteeism and staff turnover decreases which ultimately drives business profits through increased productivity.

Facts to know.

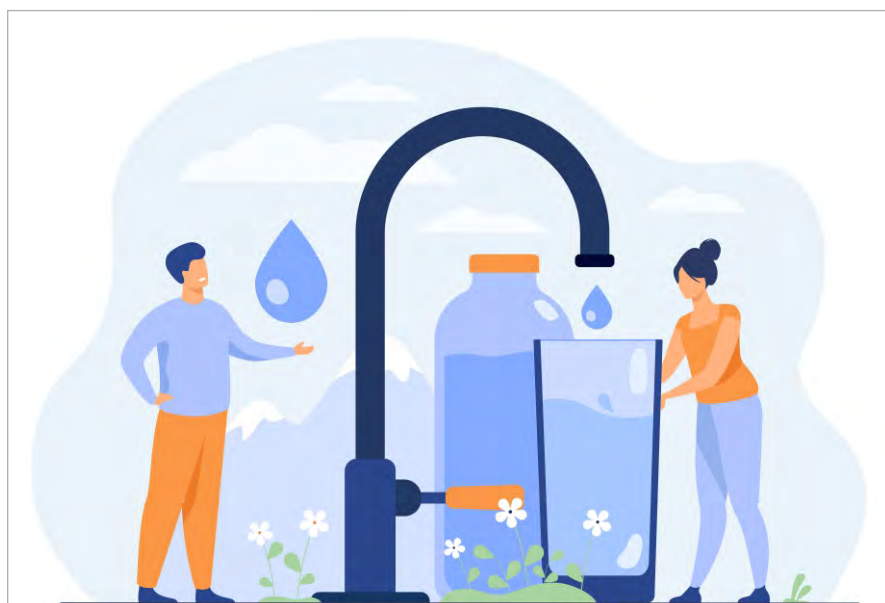
India is the fifth largest exporter of leather goods globally and has an estimated 3,000 tanneries providing jobs for more than four million people. Bangladesh on the other hand is the world's second-largest apparel exporter, with its ready-made garments sector accounting for 83% of the country's export earnings. Kings International Ltd tannery in Unnao, India, struggled with employee absenteeism, particularly during monsoons when flooding causes contamination of water



leading to poor hygiene and a rise in cases of diarrhoea and dysentery. The factory joined WaterAid's project, installing toilets and handwashing points, and renovating water stations. Hygiene messages and jingles played near the toilets, and hygiene promotional films were screened in the common rooms. All of which encouraged employees to share with their friends and family at home, thereby improving community-level hygiene awareness.

The study.

The new data, released in two reports titled "Boosting business: why investing in water, sanitation and hygiene pays off," supported by HSBC, was done in the apparel and leather industries across six workplaces in India and Bangladesh over a two-year period. The reports include projections for the next ten years. It is for the first time that the impacts from WASH investments on both employees and businesses has been documented and analysed, and where the return on investment (ROI) is so clear. With trends showing that consumers increasingly care how their clothing is made and seek out products and brands that prioritize employee welfare, health of employees should be on top of any business leaders' mind, and investments in WASH should become a core part of any companies' economic, social and governance strategies and action. The key to success is to deliver these basic essentials in workplaces, employees' communities and throughout business supply chains.



Key Findings.

Investments in WASH paved the way for a host of business benefits and trends both for employees and the management. The findings are mentioned below.

IN CASE OF INDIA

As mentioned earlier, among the positive signs seen in India, were fall in absenteeism which fell by 29% and 83% employees stated that they had improved their behaviour of washing hands. Further, employees' access to drinking water rose by 30%, and to handwashing stations by 13%. The availability of toilets at home increased by 10 percentage points (from 70% to 80%).

IN CASE OF BANGLADESH

Even in case of Bangladesh, the benefits were very similar to as seen in India. In Bangladesh too absenteeism fell by 15%, punctuality improved by 5%, and attrition decreased by 2%. In employee communities, almost a third of the

households (31%) now have safely managed water, and 26% of households now have decent toilets, compared to zero access for both of these before the project.

A climate resilient rainwater harvester installed by Fakir Fashion (one of the ready-made garment factories, in Bangladesh) provided significant environmental benefits and cost savings in terms of water supply and treatment.

Impact on ROI.

Productivity is the most influential and important indicators contributing to ROI across the six workplaces. In Bangladesh, productivity improved across the three factories, resulting in the biggest business benefit – an estimated \$7.8 million (738 million BDT) over ten years with a continued investment in WASH. Assuming a continued investment in WASH over a ten-year period, the factories in Bangladesh showed an estimated overall ROI of USD 6.79 for every USD 1 invested (ranging from USD 9 to USD

30); in India, the figure showed an overall ROI of USD 2 for every USD 1 invested (ranging from USD 2 to USD 8).

While the ROI for each of the six workplaces varied, depending on a range of factors – such as the impact of COVID-19, product value and previous WASH standards – the benefits for both employees and companies are staggeringly clear.

Impact on the ground.

Staff across all six workplaces were pleased with the impact of the WASH investments, with 100% of employees across the three ready-made garment factories saying that the facilities had brought positive changes, and 83% thought the project had significantly contributed to better health in their communities.

The study by WaterAid clearly shows that proper investments towards providing proper water and sanitation for employees is a win-win situation for the stakeholders ■



ADVERTISERS' INDEX

SR. NO	COMPANY	PAGE NO.	TELEPHONE	E-MAIL	WEBSITE
1	Aishwaryam Filters	17	+91 93270 29224	waterfilter.co.in@gmail.com	www.waterfilter.co.in
2	B2B Meetings and Webinar	66	+91 96500 59996	enquiry@eawater.com	www.eawater.com
3	Badger Meter	47	-	-	www.badgermeter.com
4	BI Pure Water	17	+1 (888) 901-3111	-	www.bipurewater.com
5	Danfoss Engineering Tomorrow	03	+91 80010 09289	-	www.eawater.com
6	EAW India Water Intelligence	05	+91 9718824607	deepak.chaudhary@eawater.com	www.eawater.com
6	Enki Water	Back Cover	+91 98711 52621	enwecoindia@gmail.com	www.enkiwater.in
7	Free eMagazine	23	+91 85889 11033	enquiry@eawater.com	www.eawater.com/eMagazine
8	Free eMagazine- 2	68	+91 85889 11033	enquiry@eawater.com	www.eawater.com/eMagazine
9	Jay Water Management Pvt. Ltd.	67	91-79-48461051	info@jaywater.com	www.jaywater.com
10	Magazine Subscription	33	+91 85889 11033	enquiry@eawater.com	www.eawater.com
11	Magazine Subscription- Form	Double Page	+91 85889 11033	enquiry@eawater.com	www.eawater.com
12	Magazine Subscription- Form	59	+91 - 96500 59996	enquiry@eawater.com	www.eawater.com
13	Myron L Company	Front Cover - Inside	+1 - 760 438 2021	-	www.myronl.com
14	Pumps & Valves Indonesia	37	62 21 54358118	info@gem-indonesia.net	www.pump-valve-indonesia.net
15	Raybon Chemicals and Allied Products	17	91 9081817998	chemicals@raybonchemicals.com	www.raybonchemicals.com
16	Taitra	57	+886 2 27255200	tiww@taitra.org.tw	www.taitra.org.tw
17	Toshniwal	Double Page	+91 98291 12345	crm@toshcon.com	www.toshniwal.net
18	Triveni Global Pvt. Ltd.	01	91 99529 95777	info@triveniglobal.com	www.triveniglobal.com
19	Water Loss Asia 2022	27	603 6140 6666	info@protempgroup.com	www.waterlossaisa.com
20	Web Banner Ads	69	+91 85889 11033	enquiry@eawater.com	www.eawater.com
21	Zetwerk	15	91 95136 31868	bdwaters@zetwerks.com	www.zetwerk.com



CUSTOMIZED WEBINAR WITH B2B MEETINGS

LET'S CONNECT DIGITALLY VIA WEBINAR

EverythingAboutWater offers customized

WEBINAR & B2B MEETINGS



THROUGH OUR DIGITAL PLATFORM.

BENEFITS

Connect with your target audience
at one platform

Direct interaction with
decision-makers

Get contact details of all attendees
for future follow ups

Showcase your presentation and
talk about your product in detail
without worrying about travel,
meetings & other concerns

Resolve on spot queries related to
your Products & solutions

Undivided attention from audience

Free product promotion through
digital marketing tools

**EARTH WATER
FOUNDATION**

E-mail us on:
enquiry@eawater.com

CASE STUDY

TORAY (ROPUR) Antiscalant Chemicals

ROPUR

antiscalants

Made in Germany



Client : **Huber Group Ltd.**

Location : Vapi / Silvsa, Gujarat

RO Plant Application : **Effluent Treatment**

Background

Huber commissioned a RO plant for their processing of Effluent generated after manufacturing Ink in the year 2019, to meet discharge standards of Pollution Control Board/partial reuse of discharge water. Huber management explored various options to reduce this cost over last 2 years but their efforts were not successful. Either the quality of chemicals supplied by alternate manufacturer was too low and could not meet their standards, or price was too high.

Jay Water was approached by Huber to help them reduce this recurring cost. We conducted a detailed study of their feed water, plant operations and discharge norms. We then used Ropur design tool to select best antiscalant model for their application and also to decide on appropriate dosage rate.

We offered to conduct a free trial at site for 3 days, to demonstrate superiority of our product with regards to both quality and quantity. The same was accepted by Huber and trial was conducted in month of October 2020.

After successful completion of trial, Huber decided to switch completely to Ropur model 3000A. Mr. Praveen, Plant Manager at Huber, was very impressed with the quality of product and service offered by Jay Water team. Due to this, they have recommended our chemicals for use in their other three manufacturing locations within Gujarat.

A brief comparison of actual on site performance of ROPUR 3000A against other brand is given below.

Make	Antiscalant		Saving
	Other Brand	Recent ROPUR 3000A	
Consumption in PPM	15	12	—
Yearly consumption of Antiscalant in Kg	9372	7498	₹ 7,68,504
Cleaning frequency once in every	7 days	18 days	—
Number of Cleaning frequency times per Year	51	20	31
Cost involved per cleaning in INR.	1605	1605	—
Cost involved for cleaning in a year in INR.	₹ 81,396	₹ 31,654	₹ 49,742
Effluent generated per cleaning in m ³	40	40	—
Effluent generated per year in m ³	2045	795	1250
Cost of treating effluent in INR/m ³	170	170	—
Yearly Cost of treating effluent in m ³	₹ 3,47,616	₹ 1,35,184	₹ 2,12,432
	₹ 354/- Per Kg	₹ 340/- Per Kg	₹ 10,30,678

Plant Operating Data

Feed Flow	80 m ³ /h
Recovery	75%
Feed TDS	14303
Reject TDS	55648
Operating hours per day	22



**Jay Water
Management
Pvt. Ltd.**

"Jay House",
House No.4, Magnet Corporate Park,
B/h. Intas House, Near Sola Flyover,
Thaltej, Ahmedabad - 380059, India.

+91-79-48461051 / 52
+91-79-48461055 / 56
info@jaywater.com
www.jaywater.com

Branches : Rajkot | Surat | Vadodara | New Delhi | Mumbai

Complete Water Management Solutions



Features:

- » Free access
- » Available online 24X7
- » Fast delivery by e-mail
- » Direct web links
- » Print what you want
- » Search by keywords
- » Forward articles
- » Share on social networks

NO MORE WAITING for the print copy to arrive
EverythingAboutWater E-Magazine is now live!

INDIA'S FIRST

water & wastewater magazine



To Read & Subscribe for FREE visit www.eawater.com/eMagazine



www.eawater.com



**SOUTH ASIA'S NO. 1
WATER MAGAZINE**



BANNER ADS ON WEBSITE

Be Seen Where It Really Matters!!
Create the buzz in water market.

Advertise with us on our website:

www.eawater.com

and reach out to 5,000 readers daily!

EARTH WATER FOUNDATION

Email us on: enquiry@eawater.com, for further details.



End-to-End Solutions of
Water & Wastewater
Projects & Services



Quality Control
Timely Execution
World Class Technology
Value Addition & Cost Reduction

Our Prestigious Clients



Write back or call us for
Health check up of your existing plants for FREE

Tel: +91-11-40529388, 9871152621, E-mail: enwecoindia@gmail.com, Web: www.enkiwater.in