Recognizing Excellence in
Water Management & Conservation

9th Edition of FICCI
WATER
AWARDS
2021

Compendium of Best Practices

FICCI Federation House Tansen Marg New Delhi - 110001 Website - www.ficci.com

This report is a compilation of best practices received as part of the 9th Edition of FICCI Water Awards. The case studies of the awardees are published in the report.

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Acknowledgements

FICCI acknowledges the eminent members of the Jury for their exceptional guidance in the final selection of the awardees. FICCI also acknowledges the valuable contributions of the Expert Screening Panel in assessing and evaluating each nomination. We also extend our gratitude to the organizations who participated under the various categories of the 9th Edition of FICCI Water Awards.

Team's Contribution to the FICCI Water Awards and Compendium

The entire process of the FICCI Water Awards and development of Compendium has been executed by the FICCI Water Mission Secretariat- Rita Roy Choudhury, Assistant Secretary General, FICCI; Kirtika Arora, Senior Assistant Director, FICCI.

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FOREWORD

FOREWORD

India is the biggest consumer of freshwater in the world today, accounting for about 750 billion cubic metres annually, according to the World Bank. The water crisis is a looming danger for our country which accounts for only 4 per cent of the world's water resources and hosts 17 per cent of the world's population. The Central Pollution Control Board (CPCB) estimates that by 2030, India's water demand is expected to rise to 1.5 trillion cubic metres. To bridge this gap between the availability and requirement of water, a holistic approach to water management is required.

Lack of proper infrastructure and awareness with regard to wastewater recycling in India has resulted in over exploitation of India's water resources. In India, only 30% of the wastewater is being recycled and used for other purposes. Wastewater is and should be considered as a valuable additional resource of water, from which even energy and nutrients can be extracted. Wastewater can be treated up to different qualities to satisfy demand from different sectors, including industry and agriculture.

Advances in water technology and innovation, and approach to water stewardship are certainly important going forward for the business and economy. Corporates are accepting major responsibility in addressing environmental problems and through their initiatives are striving towards positive water balance and are committed to reducing freshwater intake and eliminating wastewater.

FICCI believes in creating awareness of models and technologies that are robust, scalable and replicable. In this regard, the FICCI Water Mission was constituted in 2011 to promote awareness, thought leadership, policy advocacy and best practice sharing in sustainable water management with a special focus on water use efficiency, urban wastewater management and corporate water stewardship. The Mission has instituted the India Industry Water Conclave and Awards on an annual basis to recognize excellence in water conservation and sustainable water management practices.

The 9th edition of the FICCI Water Awards assessed a wide range of entries across six different categories - Industrial Water Use Efficiency, Community Initiatives by Industry, Innovation in Water Technology, Initiatives by NGOs, Urban Wastewater Management and Best Start-up in Water Innovation. The Awards acknowledge businesses and NGOs for their exemplary initiatives and endorsing their efforts in the way they use and manage water in their businesses, going beyond compliance and providing benchmarks for others to follow.

This Compendium of Best Practices is a collection of the award-winning case studies which exemplify water use efficiency and sustainable water management. It also aims to raise awareness of the scale and urgency of the water challenges facing business and industry in India and enables the engagement of new players in the discourse on the future management of water.

I am deeply grateful to the eminent Jury of the FICCI Water Awards for their invaluable contribution and for continuously raising the standard of the Awards. I am also thankful to the Expert Screening Panel for their scrutiny and technical evaluations. Last but not the least, I would like to thank all the organisations who sent their nominations for the Awards and applaud the winners for setting high benchmarks for others to emulate. Although awardees can only be a select few each year, the Awards process enlightens us through all nominations received, with the plethora of good initiatives taken up by industry and NGOs in India. Each nomination serves as a case study for the positive difference being made by enlightened companies and organisations towards sustainable water management in India.

Naina Lal Kidwai

Past President, FICCI
Chair, FICCI Water Mission

SPECIAL MESSAGE BY CHAIR OF JURY

SPECIAL MESSAGE

All over the world, which is witnessing unprecedented challenges posed by climate change in this era of the Anthropocene, as also with the coming of COVID-19, there is a growing recognition that we need to focus on nature-based solutions for the problems facing humanity. The President of India, writing in the context of the COVID-19 pandemic has said: "Respect for nature may be the next lesson intended for us. Faced with an extraordinary crisis, most people tend to be selfish, but this is a crisis that teaches us to think equally of others. Nature is reminding us to acknowledge, with humility, our quintessential equality and inter-dependency."

The Committee to draft the new National Water Policy, which I had the privilege to Chair, has also placed great emphasis on changing the relationship of development initiatives with Nature, from command-and control towards leveraging the power of Nature to serve our purposes. What we need to acknowledge is the profound inter-connectedness and inter-dependence that characterises the world we live

in and to be humble in our approach to natural systems, showing them the respect, they deserve and recognise that prakriti rakshati rakshita (Nature protects those who protect her).

The FICCI Water Mission is a unique initiative to recognise and showcase precisely these kinds of best practices and innovations so that national policy could benefit from them. Many of our water solutions are still largely based on the mid-20th century paradigm of water resource development, which is now reaching its limits and causing more problems than it solves. We urgently require a multi-pronged paradigm shift in the way we manage our water resources. We need to decisively move towards a trans-disciplinary approach to water that focuses on demand-side solutions rather than endlessly trying to increase supply

There are many unsung heroes who are making brilliant contributions in this direction. This compendium will give you a glimpse into some of this work, which is showcased here after a very rigorous process of scrutiny and appraisal. The aim of the Water Awards jury has been to reward those efforts that embody truly cutting-edge innovation, while also providing the best chances of replication on a large scale.

I heartily congratulate the winners and hope that FICCI Water Awards will continue to make this invaluable contribution in moving India towards a 21st century paradigm of water management.

Dr Mihir Shah

Chair of Jury – FICCI Water Awards 2021

MESSAGE

Demand for fresh water is exponentially growing across all user groups, namely agriculture, domestic, industry, the energy sector and ecosystems. Exacerbated by the effects of climate change, the pressure to meet both the water quality and supply needs for all users is creating an increased risk for businesses, governments, communities and the environment. Sustainable water management will not only contribute to SDG 6 (clean water and sanitation) but have significant impact on several other sustainable development goals such as SDG 3 (good health and wellbeing), SDG 12 (responsible consumption and production), SDG 13 (climate action), SDG 14 (Life below Water) and SDG 15 (Life on Land). As we begin to formulate solutions and systems to tackle water insecurity and work towards meeting the Sustainable Development Goals (SDGs), the need for a framework that supports multi-stakeholder solutions to complex water challenges becomes necessary.

Businesses, community and government can best work together to achieve shared development goals and address water risks for both their own needs and the watersheds in which they operate. Intensive efforts are being made by industry to conserve water

in its ecosystem by using different innovations and technologies through direct operations, supply chain and wider basin health. We have shining examples from industry and other organisations undertaking exemplary work in sustainable water management.

The need for holistic approach to water management is being increasingly recognised by FICCI at the highest level. The FICCI Water Mission highlights the need for sustainable initiatives in the management of water resources across different segments of water use. I am glad that FICCI Water Mission has taken up this task by recognizing efforts and leadership and helping to develop a knowledge base on sustainable water management practices adopted by different stakeholders as well as disseminating these best practices to encourage many other organisations to replicate or generate new ideas.

I am thankful to the eminent Jury whose time and guidance are invaluable in guiding the process and making difficult decisions while selecting the winners., and to the Expert Screening Panel for their immense effort in the scrutiny and assessment of each nomination. I would like to congratulate all the winners of the 9th edition of FICCI Water Awards for their exemplary work and thank all organisations who applied for the awards. Last but not the least, I commend the FICCI Water Mission secretariat for their hard work behind the scenes.

Arun Chawla

Director General
FICCI

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FICCI WATER AWARDS CATEGORIES

FICCI WATER AWARDS CATEGORIES

FICCI WATER AWARDS

FICCI launched the Annual Water Awards in 2012. The awards were initiated with the following objectives:

- To recognize efforts and leadership in the area of water efficiency and conservation; and
- To develop a knowledge base on sustainable water management practices adopted by different stakeholders and disseminate best practices for encouraging their adoption.

AWARDS CATEGORIES

Industrial Water Use Efficiency

Efficiency (Industrial units belonging to the water intensive sectors)

Community Initiatives by Industry

(Industrial Units – CSR related but community focussed initiatives only)

Water Initiatives by NGO

(NGOs (Registered as a society, trust, not for profit organization) working in the area of watershed management, drinking water and sanitation)

Innovation in Water Technology

(Product developer/technology supplier in the area of innovative tools, techniques, products, technologies and technology application in Water Technology and Management)

Urban Wastewater Management

(Any unit involved in water and waste-water supply and management in the urban space like, Urban Local Bodies (ULBs), Jal Boards, Water Intensive Industries etc. including the extraction, treatment, and distribution of water, and collection and treatment of wastewater activities which are directly managed by Water and Wastewater Utilities (WWUs))

Best Start-up for Water Innovation

(Start-ups offering water efficient product or equipment or technology)

SELECTION PROCESS

PHASE 3
Expert Screening Panel

The expert screening panel screened each nomination to check the authenticity of the data and information presented. Then the expert panel presented the screened applications to the jury at its first meeting.

PHASE 2
Preliminary Screening

Initial screening by the FICCI Water Secretariat, to ensure adherence to eligibility criteria.

PHASE 4
Jury Meeting

Each application under all the six categories were presented by the Experts Panel to the Jury.

Jury upon thorough review and discussion over three meetings, shortlisted applicants to make presentation to the Jury and answer additional questions.

PHASE 1
Call for Applications

The call for awards is put up through print and online advertisements, and nominations for the different categories are received. A standard template for sending information is developed for every category. Through its network and database, FICCI Water Secretariat reached out to organizations working in the areas of water and wastewater.

PHASE 5
Final Awardees Selected

Post the presentation with the shortlisted applicants, the Jury finalized the winners in each category in forth & final meeting.

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WATER AWARDS THROUGH THE YEARS

FICCI

WATER AWARDS THROUGH THE YEARS

2020

1. Tagros Chemicals India Private Limited (Joint 1st Prize) in the Industrial Water Use Efficiency Category
2. Trident Limited (Joint 1st Prize) in the Industrial Water Use Efficiency Category
3. ITC Limited (1st Prize) in the Community Initiatives by Industry Category
4. Daiki Axis India Private Limited (1st Prize) in the Innovation in Water Technology Category
5. Konark Fixtures Limited (2nd Prize) in the Innovation in Water Technology Category
6. JS Water Energy Life Co. Private Limited (3rd Prize) in the Innovation in Water Technology Category
7. Water Resources Department (WRD) Rajasthan (Special Jury's Award) in the Innovation in Water Technology Category
8. Aga Khan Rural Support Programme (1st Prize) in the Water Initiatives by NGOs Category
9. Jan Jagran Kendra (2nd Prize) in the Water Initiatives by NGO Category
10. Vishvaraj Environment Private Limited (1st Prize) in the Urban Wastewater Management Category
11. Vadodara Municipal Corporation (Special Jury's Award) in the Urban Wastewater Management Category

Winners of the Water Awards being felicitated virtually by Mr Pankaj Kumar, Secretary, Department of Water Resources, River development and Ganga Rejuvenation, Ministry of Jal Shakti, Government of India; Mr Rajiv Ranjan Mishra, Director General, National Mission for Clean Ganga, Department of Water Resources, River development and Ganga Rejuvenation, Ministry of Jal Shakti, Government of India; Dr Mihir Shah, Chair of Jury - FICCI Water Awards 2020, Distinguished Professor, Shiv Nadar University; Ms Naina Lal Kidwai, Chairperson, FICCI Water Mission, and Past President, FICCI; Mr Mukund Vasudevan, Co-Chair, FICCI Water Mission and Managing Director & Country Head, Ecolab India and Ms Rita Roy Choudhury, Assistant Secretary General, FICCI.

1. Arvind Limited (1st Prize) in the Industrial Water Use Efficiency Category
2. SSP Private Limited (1st Prize) in the Innovation in Water Technology Category
3. Water, Sanitaation and Hygiene (WASH) Institute (Joint 1st Prize) in Water Initiatives by NGO Category
4. Pratiks Enviro Foundation (Joint 1st Prize) Water Initiatives by NGO Category

2019

Winners of the Water Awards being felicitated by Mr Gajendra Singh Shekhawat, Hon'ble Minister, Ministry of Jal Shakti; Mr U P Singh, Secretary, Department of Water Resources, River development and Ganga Rejuvenation, Ministry of Jal Shakti, Government of India; Dr Mihir Shah, Chair of Jury - FICCI Water Awards 2019, Distinguished Professor, Shiv Nadar University; Ms Naina Lal Kidwai, Chairperson, FICCI Water Mission, and Past President, FICCI; Mr Mukund Vasudevan, Co-Chair, FICCI Water Mission and Managing Director & Country Head, Ecolab India and Ms Rita Roy Choudhury, Assistant Secretary General, FICCI.

2018

1. ITC Maurya (1st Prize) in the Industrial Water Use Efficiency Category
2. HSBC (1st Prize) in the Community Initiatives by Industry Category
3. Transchem Agritech Private Limited (1st Prize) in the Innovation in Water Technology Category
4. WATSAN Envirotech Private Limited (1st Prize) in the Innovation in Water Technology Category
5. NTPC Ltd (3rd Prize) in the Innovation in Water Technology Category
6. Surat Municipal Corporation (1st Prize) in the Urban Wastewater Management Category

Winners of the Water Awards being felicitated by Shri U P Singh, Secretary, Department of Water Resources, River Development and Ganga Rejuvenation, Ministry of Jal Shakti, Government of India; Dr Mihir Shah, Chair of Jury - FICCI Water Awards 2018, President, Bharat Rural Livelihood Foundation, and Former Member, Planning Commission; Ms Naina Lal Kidwai, Chairman, FICCI Water Mission, and Past President FICCI and Ms Rita Roy Choudhury, Assistant Secretary General, FICCI.

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2017

1. Sterlite Copper Vedanta Ltd (1st Prize) in the Industrial Water Use Efficiency Category
2. Aga Khan Rural Support Programme (1st Prize) in the Water Initiatives by NGOs Category
3. Akhil Bhartiya Samaj Sewa Sansthan (2nd Prize) in the Water Initiatives by NGOs Category
4. Hindustan Ecosoftt Pvt Limited (1st Prize) in the Innovation in Water Technology Category
5. Technorbital Advanced Materials Pvt Limited (2nd Prize) in the Innovation in Water Technology Category
6. SM Sehgal Foundation (3rd Prize) in the Innovation in Water Technology Category

Winners of the Water Awards being felicitated by Shri Parameswaran Iyer, Secretary (DWS), Ministry of Drinking Water & Sanitation, Government of India, Dr Amarjeet Singh, Secretary, Ministry of Water Resources, Government of India; Dr Mihir Shah, Chair of Jury - FICCI Water Awards 2017, President, Bharat Rural Livelihood Foundation, and Former Member, Planning Commission; Ms Naina Lal Kidwai, Chairman, FICCI Water Mission, and Past President FICCI and Ms Rita Roy Choudhury, Assistant Secretary General, FICCI

2016

1. ITC Ltd. Saharanpur, Winners, Industrial Water Efficiency Category
2. TATA Motors Ltd., 1st Runner - Up, Industrial Water Efficiency Category
3. ITC Ltd. Jalahobli, 2nd Runner - Up, Industrial Water Efficiency Category
4. ITC Ltd., Winners, Community Initiatives by Industry Category
5. Self Employed Women's Association (SEWA), Winners, Water Initiatives by NGOs Category
6. Group Photograph for the FICCI Water Awardees for 2016

Winners of the Water Awards being felicitated by Shri Shashi Shekhar, Former Secretary, Ministry of Water Resources, River Development and Ganga Rejuvenation, Government of India; Dr Mihir Shah, Chairman of Jury, FICCI Water Awards 2016; Ms Naina Lal Kidwai, Past President, FICCI; Dr Didar Singh, Former Secretary General, FICCI; Ms Rita Roy Choudhury, Assistant Secretary General, FICCI.

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2015

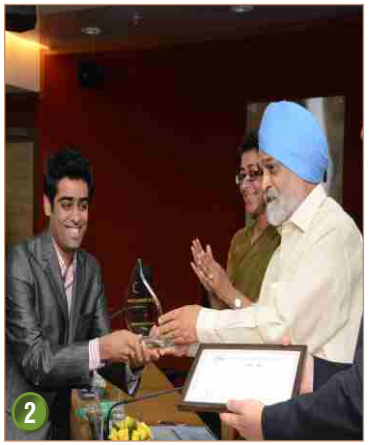
1. ITC Munger (1st Prize), Industrial Water Use Efficiency Category
2. Ambuja Cements Ltd (2nd Prize), Industrial Water Use Efficiency Category
3. Infosys Limited, Bangalore (3rd Prize), Industrial Water Use Efficiency Category
4. Ambuja Cements Foundation (1st Prize), Community initiatives by the Industries Category
5. Ultratech Cement Ltd (2nd Prize), Community initiatives by the Industries Category
6. Ramkrishna Jaidayal Dalmia Seva Sansthan (1st Prize), Initiatives by NGOs Category
7. SIRUTHULI and Watershed Organization Trust (joint 2nd Prize), Initiatives by NGOs Category
8. Sanjeevani Institute for Empowerment and Development (3rd Prize), Initiatives by NGOs Category

Winners of the Water Awards being felicitated by Ms Jyotsna Suri, Past President, FICCI.

2013

1. Noamundi Iron Ore Mine - Tata Steel Limited, Winners, Industrial Water Use Efficiency Category
2. ITC Ltd – Bangalore, 1st Runner-Up, Industrial Water Use Efficiency Category
3. JSW Steel Limited, Vijayanagar Works, 2nd Runner Up, Industrial Water Use Efficiency Category
4. Ambuja Cement Foundation, Winners, Community Initiative by Industry Category
5. ITC Limited, 1st Runner Up, Community Initiative Category
6. Vikram Cement Works, 2nd Runner Up, Community Initiative by Industry Category
7. IRRAD (An Initiative of S. M. Sehgal Foundation), Winners, Initiatives by NGOs Category
8. Watershed Organisation Trust, 1st Runner Up, Initiatives by NGOs Category
9. KGDS RE Pvt. Ltd., DST & NIOT, Winners, Innovation in Water Technology Category
10. Ortho Clinical Diagnostic, J&J Company, 1st Runner Up, Innovation in Water Technology Category

Winners of the Water Awards being felicitated by Shri Montek Singh Ahluwalia, Former Deputy Chairman of the Planning Commission, Government of India, Ms Naina Lal Kidwai, Chairman, FICCI Water Mission, and Past President, FICCI and Mr Atul Singh, Group President, Asia Pacific, The Coca-Cola Company.



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1. Essar Steel India Limited, Hazira, Winner, Industrial Water Use Efficiency Category
2. ITC Limited, 1st Runner Up, Industrial Water Use Efficiency Category
3. Tata Chemicals Limited, Winners, Community Initiatives Category
4. Hindustan Unilever Limited, 1st Runner Up, Community Initiatives Category
5. HSIL Limited, Winners, Innovation Category

2012

Winners of the Water Awards being felicitated by Shri Montek Singh Ahluwalia, Former Deputy Chairman of the Planning Commission, Government of India, Smt Shiela Dikshit, Former Chief Minister of Delhi, Ms Naina Lal Kidwai, Chairman, FICCI Water Mission, Past President, FICCI and Dr Arbind Prasad, Former Director General, FICCI.

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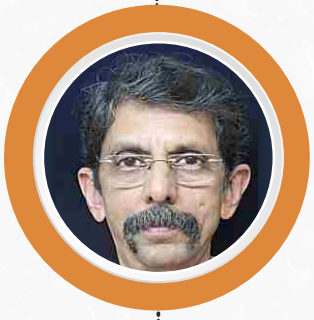
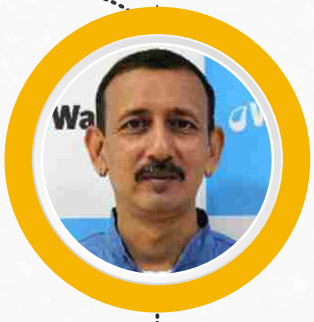
JURY

Dr Mihir Shah
Chair of Jury

Prof AK Gosain
Member of Jury



Dr Himanshu Kulkarni
Member of Jury



Mr VK Madhavan
Member of Jury

Dr Dipankar Saha

EXPERT SCREENING PANEL

Dr Manoranjan Hota

Dr Mihir Shah

Chair of Jury, FICCI Water Awards 2021
Distinguished Professor, Shiv Nadar University
Chair, National Coalition for Natural Farming
Former Member, Planning Commission,
Government of India

CHAIR OF JURY, FICCI WATER AWARDS 2021

Dr Mihir Shah has spent the past three decades living and working in remote, central tribal India, forging a new paradigm of inclusive and sustainable development, and strengthening Indian democracy through initiatives for people's empowerment, led by women.

From 2009 to 2014, he was Member, Planning Commission, Government of India, holding the portfolios of Water Resources, Rural Development and Panchayati Raj. He is the youngest ever Member of the Planning Commission. Dr Shah was chiefly responsible for drafting the paradigm shift in the management of water resources enunciated in the 12th Five Year Plan. He also initiated a makeover of Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), the largest employment programme in human history, with a renewed emphasis on rural livelihoods, based on construction of productive assets.

In 2019, the Government of India asked him to chair the committee to draft the new National Water Policy (NWP). The draft NWP is under active consideration of the Government of India

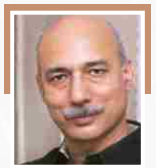
Dr Shah graduated in Economics from St. Stephen's College, Delhi University (where he won the prestigious KC Nag Economics Prize) and did his post-graduation from the Delhi School of Economics (where he was Merit Scholar) in the 1970s, before going on to complete a much-acclaimed doctoral dissertation at the Centre for Development Studies, Kerala. After teaching for some years at the Centre, he resigned to explore fresh terrain beyond the ivory towers of conventional academia, which culminated in 1990 in the formation of Samaj Pragati Sahayog (SPS), headquartered in a remote tribal village of MP. Inspired by the life and work of Baba Amte, SPS is today one of India's largest grass-roots initiatives for water and livelihood security.

Dr Shah is Distinguished Professor, Shiv Nadar University, where he has designed a globally first-of-its-kind Masters Program on Water Science and Policy. He is a Founding Signatory of the Geneva Actions on Human Water Security, 2017. He was a Member of the International Steering Committee of the CGIAR Research Program on Water, Land and Ecosystems (WLE) from 2012 to 2018.

His research papers have been published extensively in pre-eminent journals such as Economic and Political Weekly, Current Science, Ambio, Hydrogeology Journal, Journal of Hydrology, Contributions to Indian Sociology, Review of Development and Change, Seminar and Indian Journal of Labour Economics.

Dr Shah has addressed audiences on his life's work all over the world from Stanford University to the World Bank in Washington, the OECD in Paris, the Arctic Circle in Iceland, Chatham House and University College, London, University of Cambridge, England, UNESCO-IHE, Delft, International Institute for Applied Systems Analysis, Austria, the EAT Forum, Stockholm, the Himalayan University Consortium in Chengdu, China, International Water Management Institute, Colombo, the Asian Development Bank, Manila and the Singapore Water Week. He was the Keynote Speaker at the Global Water Summit at Rome in 2012 and the International EcoSummit Congress at Montpellier in 2016.

JURY MEMBERS



Prof A K Gosain

Professor, Department of Civil Engineering
Indian Institute of Technology- Delhi

Dr. Ashvani K. Gosain, is an Emeritus Professor in the area of Water Resources Engineering and GIS Technologies, in the Civil Engineering Department, IIT Delhi. Prof. Gosain pioneered the climate change impact assessment on Indian water resources that was incorporated in the NATCOM I & II – two National Communications made to the UNFCCC. He has also been reviewer for AR4 and AR5 of IPCC.

Prof. Gosain has served on many prestigious assignments within and outside the country. Twenty-six students have completed their Ph.D. under his supervision. Prof. Gosain contributed to the formulation of the Ganga River Basin Management Plan (GRBMP), of which he was the Team Leader of the Water Resources Management group. He has also formulated the Drainage Master Plan of NCT of Delhi for the Delhi Government. He is part of the expert committees appointed by the National Green Tribunal to suggest solutions to deal with the ever-increasing pollution levels in Ganga and Yamuna. Prof. Gosain has to his distinction the formulation of the Ganga Act on behalf of the Ministry of Water Resources, River Development & Ganga Rejuvenation, as a member of the committee. Recently, Prof Gosain served as member on the Task Group on "Water, Agriculture and Food Security" constituted for formulation of India's new Science, Technology, and Innovation Policy (STIP 2020).

Dr Himanshu Kulkarni

Founder Trustee and Executive Director,
Advanced Center for Water Resources
Development and Management (ACWADAM)

Dr Himanshu Kulkarni leads ACWADAM, a not-for-profit knowledge institution and think-tank working on groundwater since 1998. He is a hydrogeologist by qualification and has been working on aquifers and groundwater across India's diverse groundwater typology for more than 35 years. ACWADAM has partnered with a variety of organisations on piloting and mainstreaming the ideas of participatory groundwater management and springshed development across India, neighbouring Nepal, Bhutan, Vietnam and has begun work in Africa. ACWADAM's work under Dr Kulkarni has followed the principle of bringing communities closer to their aquifers and managing groundwater as a common pool resource through the process of Aquifer-based Participatory Groundwater Management. He has, through ACWADAM, steered the concept of hydrogeology based 'springshed' management that has now become so important from local to national levels in India and its neighbouring regions.

Dr Kulkarni has, before co-founding ACWADAM, worked at Pune University for 13 years, after which he also worked with the corporate sector for a couple of years. Through ACWADAM's collaboration with educational institutions, Dr Kulkarni works as adjunct faculty and course advisor at Shiv Nadar University for the post-graduate course on Water Science and Policy. He is also visiting faculty and a member of the Board of Studies at TISS, Mumbai. He is also on the BOS of one of Pune's and India's oldest institutions, the Fergusson College in Pune. He actively continues to teach, guide and mentor students, also publishing his key research findings while working at the grassroots and in policy domains. He has supervised 2 PhDs and many post-graduate dissertations. Dr Kulkarni continues to advise various State Government Agencies and the Central Government. He has held many advisory positions on various committees of the Government. He was also a member of the committee that is drafting India's new National Water Policy during 2019-20. Dr Kulkarni has anchored several international action research collaborations in the subject of groundwater, particularly in his lead role at ACWADAM. He has also been on several juries for water related awards in India.

Mr VK Madhavan

Chief Executive
WaterAid India

Madhavan has spent fifteen of the last three decades living and working in rural India. First in the desert districts of North-Western Rajasthan with the Urmul Rural Health Research and Development Trust till 1998 and then from 2004 to 2012 in the Kumaun Himalayas with the Central Himalayan Rural Action Group (CHIRAG). In the interim period, Madhavan worked on policy issues with ActionAid, worked as an independent consultant and then on women's leadership and governance with the Hunger Project. Since May 2016, Madhavan has been the Chief Executive of WaterAid India. In the past three decades, Madhavan has worked on an integrated rural development – community health; primary education; investing in young people and particularly adolescent girls; natural resource management – community forestry, watershed development, recharge of springs, water conservation, drinking water and on-farm and off-farm livelihoods.

EXPERT SCREENING PANEL

Dr Dipankar Saha

Former Member (HQ), Central Ground Water Board,
Ministry of Jal Shakti
Former Member Secretary, Central Ground Water Authority

Dr Saha is a former of Member (Head Quarters), Central Ground Water Board, under Ministry of Jal Shakti, Government of India. He had also served as Member Secretary, Central Ground Water Authority and Head of Rajiv Gandhi National Ground Water Training and Research Institute, Raipur. He spearheaded the National Aquifer Mapping and Management Programme, the largest ground water mapping endeavour in the world, as National Coordinator. He obtained PhD on Ground Water Management from IIT-ISM, Dhanbad.

He has authored 48 papers published in International Peer Reviewed Journals and delivered more than 300 lectures and keynote addresses in national and International Seminars. Professionally trained from Asian Institute of Technology, Bangkok and from JICA, Tokyo, he represented the country and presented papers in World Bank session at Kathmandu, International Atomic Energy Agency at Ho-Chi Minh City, and Vienna, World Water Week – Stockholm, India-UK Water Security Exchange- Wallingford, Oxfordshire, IAH Congress in Dajeon, Korea, Lincoln University UK, led the Govt of India Delegation to Myanmar and remained part of the Govt of India Delegation to IEH, England . He edited two books on to water exploration, monitoring and policy issues, published by Springer and special volume of Journal of Hydrology-Regional Studies.

He is the recipient of National Geoscience Award – 2010, conferred by Ministry of Mines and Excellence in Ground Water conferred by International Association of Hydrogeologist-Indian Chapter in 2014. He has also conferred with Eminent Engineers Award 2019 by Indian water Resources Society, Roorkee. Post Superannuation he worked as Advisor Ground Water, Govt of Gujarat, Adjunct Professor IIT Kharagpur, Consultant to International Water Management Institute. He is presently Chairman of the Committee on Accreditation of Groundwater Consultant Organisation under Quality council of India.

Dr Manoranjan Hota

Member, Expert Appraisal Committee of MoEFCC,
Member, EIA Accreditation Committee of QCI-NABET
(Former Adviser/Scientist "G", Ministry of Environment,
Forest and Climate Change, Government of India)

Dr. Manoranjan Hota, M.Phil; Ph.D., worked in Ministry of Environment, Forest and Climate Change (MoEFCC) and Central Pollution Control Board (CPCB), has 38 years of professional experience in the field of Environmental Management which include Environmental Impact Assessment, Pollution Control, Chemicals & Waste management, Sustainability and Environmental Governance, Environmental Health, Environmental Management & Environmental Audit, Policy planning, Research, Life Cycle Assessment, Biosafety, environmental law enforcement, monitoring and compliance.

He is an Expert Member in Expert appraisal Committee of MoEFCC, EIA Accreditation Committee of QCI-NABET, and OECD Expert Group on Best Available Technology (BAT).

He has professional trainings which include Environmental Management & Audit, Impact Assessment in University of Aberdeen, U.K.; Pollution Control training in the University of Ottawa, Managing Global governance at InWent and DIE in Germany, Life Cycle Assessment, etc.

He was National Project coordinator of the World Bank projects on Pollution Control; Hazardous waste management and implementation of the WHO country programme in Environmental Health in India.

Besides, He was the UNEP Regional Advisor for Biosafety Clearing House and also has experience of other Multilateral Environment Agreements (MEAs) in chemicals and wastes by representing India in negotiations in the Minamata Convention, Rotterdam Convention, ICCM.

He was the Regional Coordinator for Strategic Approach for International Chemicals Management (SAICM) for the Asia-Pacific region; Member, Chemicals Review Committee, Rotterdam Convention of Prior Informed Consent on international trade of hazardous chemicals; Chair, UNEP Asia-Pacific Mercury Storage Programme Member, UNEP Mercury Global partnership Programme and represented India in the UNEP Intergovernmental Negotiating Committee meetings on Mercury.

9th Edition of FICCI
WATER
AWARDS
2021

AWARDEES 2021

FICCI

AWARDEES 2021

CITATION FOR THE AWARDEES

CATEGORY
Industrial Water Use Efficiency

1st Prize

Tata Steel Limited
(Jamshedpur)

Tata Steel Limited (Jamshedpur) is being awarded the first prize in this category for significantly reducing its freshwater consumption as well as discharge by adopting 3R's (Reduce, Reuse & Recycle) principle and by implementing cutting edge technologies like CDQ in coke plant, INBA in BF's, CO2 injections in LD-GCP circuit and IOT based smart water management systems. The initiatives led to the reduction in freshwater requirement by 60% and effluent discharge by 65% in last 7 years.

CATEGORY
Industrial Water Use Efficiency

2nd Prize

Vardhman Fabrics
(A Unit of Vardhman Textile Ltd.)

Vardhman Fabrics is being awarded the second prize in this category for significantly reducing freshwater consumption by process innovations, investment in technology and heightened awareness among employees. They have achieved downward trend in freshwater per unit of produce in their spinning, weaving and processing division. Implementation of in-plant control techniques is employed for achieving significant reductions in water use, raw material and energy consumption, wastewater production and in some cases, even wastewater load.

CATEGORY
Industrial Water Use Efficiency

Joint 3rd Prize

Asian Paints
(Khandala)

Asian Paints is jointly being awarded the third prize in this category for demonstrating enormous efforts towards water conservation. They have implemented Automated Water Management through Distributed Control System (DCS), 100% re-use of rainwater in utilities, Sensor-based taps and water-less urinals, High-efficiency Reverse Osmosis (RO) systems and Zero Liquid Discharge operations for effluent management along with rooftop rainwater harvesting and recharge systems and Integrated watershed development in nearby villages.

CATEGORY
Industrial Water Use Efficiency

Joint 3rd Prize

Delhi International Airport Limited

Delhi International Airport Limited is jointly being awarded the third prize in this category for demonstrating various process improvement initiatives being taken to reduce water consumption, increase water reuse, reduce water loss, increase rainwater recharge, apply integrated water management system and create awareness by training & education. They adopted sustainability framework mapped with United Nation sustainable development goals (SDGs).

CATEGORY
Innovation in Water Technology

1st Prize

Green Lantern Engineering Private Limited

Green Lantern Engineering Private Limited is being awarded the first prize in this category for introducing water recycling plant (STP) which is designed and executed to meet the requirement of circular economy with sustainability. The designed STP is odourless, noise free, has good aesthetics, consumes less power, easy for automation, required less skilled labour, easy to operate and meets the mandatory effluent standards.

CITATION FOR THE AWARDEES

CATEGORY
Water Initiatives by NGO

1st Prize

Himmotthan/ Tata Trusts

Himmotthan is being awarded the first prize in this category for adopting Participatory Springshed Management approach to provide water security in the Himalayan and other mountain region of the country.

CATEGORY
Water Initiatives by NGO

Joint 2nd Prize

Biome Environmental Trust

Biome Environmental Trust is jointly being awarded the second prize in this category for their initiative 'Digging a million recharge wells' in the city of Bengaluru to help increase the water table and to help people revive in their memories, the knowledge and the management of the shallow aquifer and to ensure the livelihoods and the keeping of the skill and knowledge of the traditional well digger communities while digging a million wells.

CATEGORY
Water Initiatives by NGO

Joint 2nd Prize

People's Service Society, Palakkad

People's Service Society is jointly being awarded the second prize in this category for their flagship project 'Sustainable Access to Safe Water in Palakkad (SAS)'. The project was implemented in Pudussery and Elappully Gram Panchayaths, the most drought affected locations of Palakkad district. The unique interventions of the projects have attributed a 180-degree change in the water sector of the project area.

CATEGORY
Water Initiatives by NGO

Joint 2nd Prize

Watershed Organisation Trust (WOTR)

Watershed Organisation Trust is jointly being awarded the second prize in this category for their project 'Building Adaptive Capacities and Resilience to Climate Change of Tribal and Marginalized Communities in Odisha' which is implemented in 11 villages in 4 Gram Panchayats, namely, Jaltar, Kulusing, Puttasing and Tolana. The project contributed to an improved climate adaptive and resilient livelihood for rural communities and the dissemination of participative climate change adaptation strategies at the national level.

CATEGORY
Urban Wastewater Management

1st Prize

Primove Infrastructure Development Consultants Private Limited

Is being awarded the first prize in this category for their technology Tiger Bio Filter Technology (TBF) which offers expert treatment of sewage and wastewater. Their products – the Tiger Toilet and the Tiger Biofilter Sewage Treatment Plant, are based on their proprietary Tiger Technology, which uses a unique combination of worms, bacteria, and natural filtration materials to effectively treat faecal and sewage waste. The technology has proven to be effective in faecal sludge and wastewater treatment, is cheap to operate and maintain, uses negligible power and consumes far less space compared to comparable technologies.

CITATION FOR THE AWARDEES

CATEGORY

Urban Wastewater Management

2nd Prize

Center for Water and Sanitation (CWAS) at CRDF, CEPT University

Center for Water and Sanitation (CWAS) is being awarded the second prize in this category for their initiative of providing citywide inclusive sanitation services in Wai and Sinnar towns in Maharashtra. In both the cities, septic tanks are now desludged through 1st of its kind scheduled desludging model in India by involvement of private sector and financed through a local sanitation tax. This service is being provided in an equitable manner as it covers all the households (slum and non-slum). The collected faecal sludge is treated in a safe and efficient manner at the dedicated Fecal Sludge Treatment Plant (FSTP). These services are also measured and monitored using innovative mobile based tools such as SaniTab and Sanitrack. Both these cities are reusing the treated wastewater for landscaping and urban forest at the FSTP site, thereby saving on the consumption of fresh water.

CATEGORY

Best Start-up in Water Innovation

1st Prize

Digital EcoInnovision

Digital EcoInnovision is being awarded the first prize in this category for their innovation DigitalPaani, which is a workflow management tool that leverages software powered by sensors and 75+ algorithms to scale the expertise needed to manage treatment plants to frontline workers. DigitalPaani is a lifecycle management tool with hardware and software components to not just monitor and automate but rather manage and transform operations of wastewater treatment plants comprehensively.

CATEGORY

Special Jury's Award

National Mission for Clean Ganga

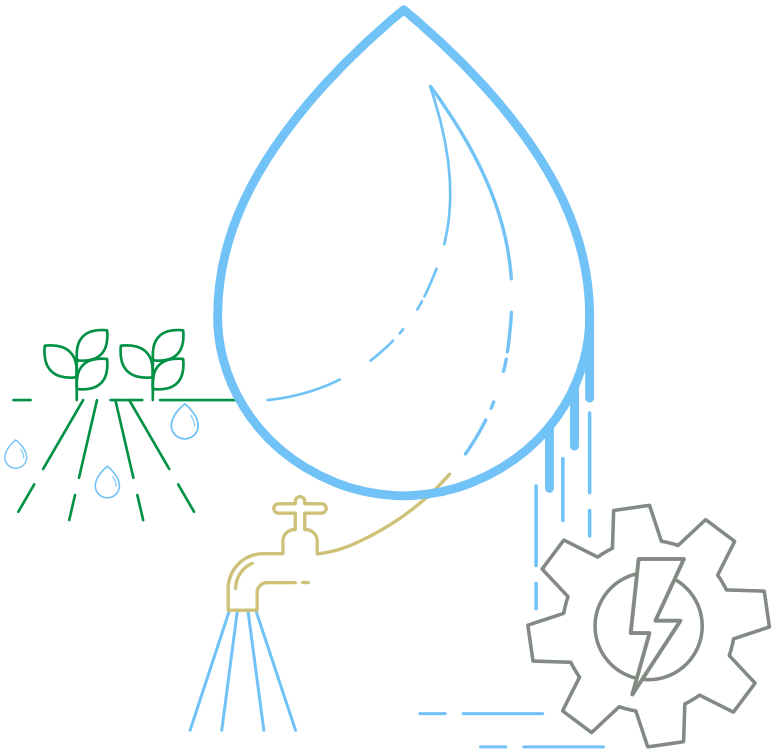
National Mission for Clean Ganga (NMCG) is being awarded Special Jury's Award for their unique intervention which is the Hybrid Annuity based Public Private Partnership (PPP) Model (HAM) developed for Sewerage Treatment Plants (STPs) in the Ganga River Basin. The model comprises of 100% central government funding through NMCG, for both development as well as operation & maintenance of the STPs for a period of 15 years. The exclusivity of HAM stems from the various advantages it offers viz. assured government funding, continued performance, distinct accountability and ownership for performance over an extended period of time.

WATER AWARDS 2021

9th Edition of FICCI
WATER
AWARDS
2021

INDUSTRIAL WATER USE EFFICIENCY

Industrial Water Use Efficiency



Tata Steel

1st PRIZE

T. V. Narendran
CEO & MD, Tata Steel

"Tata Steel wants to attain global benchmark in specific freshwater consumption of less than 1.2 m3/tcs (tonnes of crude steel) by 2025 at Jamshedpur steel plant."

"Water remains to be a major global challenge, especially for the water stressed areas, wherein most of the people live in towns and cities than in rural areas. The primary objective of Tata Steel has been to conserve water through optimum use and minimizing the freshwater consumption by adopting the 4R principles of Reduce, Recycle, Reuse and Recover. In its endeavor towards water stewardship, Tata Steel has been able to provide better water resources for industrial use as well as societal use within its areas of operations. As a Responsible Corporate, the company has plans to achieve water neutrality through its structured management approach, technological intervention and awareness."

Tata Steel: Water Efficiency Journey

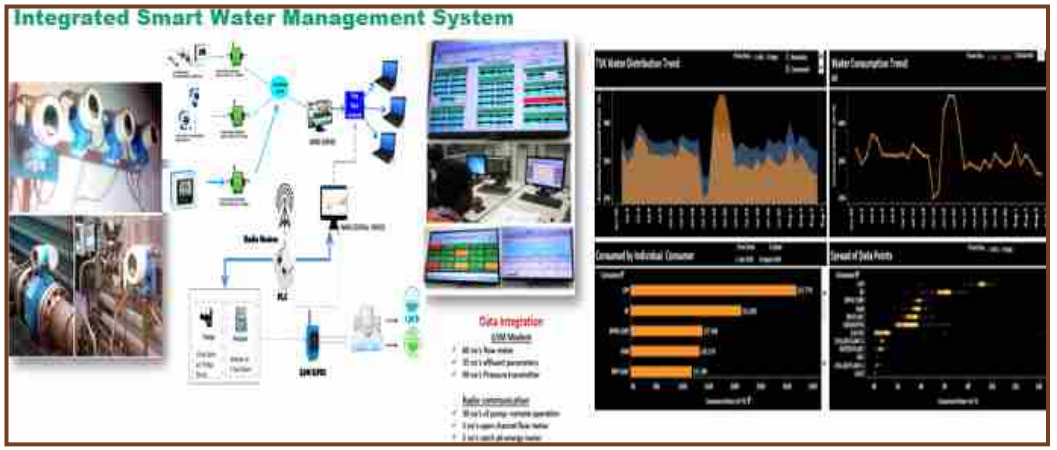
Tata Steel group is among the top global steel companies with an annual crude steel capacity of 33 million tonnes per annum. It is one of the world's most geographically diversified steel producers, with operations and commercial presence across the world. The group recorded a consolidated turnover of US $21.06 billion in the financial year ending March 31, 2021.

Over years Tata Steel Jamshedpur (TSJ) has increased its crude steel production capacity up-to 11 MTPA by bringing in modern technologies. During our 3 MTPA capacity enhancement, we proactively started working towards conservation of precious natural resources 'water' by reducing the dependency on fresh water from river for sustainable operation.

For this 4R's principle of Reduce, Reuse, Recycle & Recharge were adopted.

TSJ started monitoring the water consumption of each production unit online. Digital flow meters were installed from withdrawal point river to the smallest consumer unit and connected the same with central SCADA system.

This helped in identifying the losses as well as generate enough data for bench marking and target setting.



4R Initiative

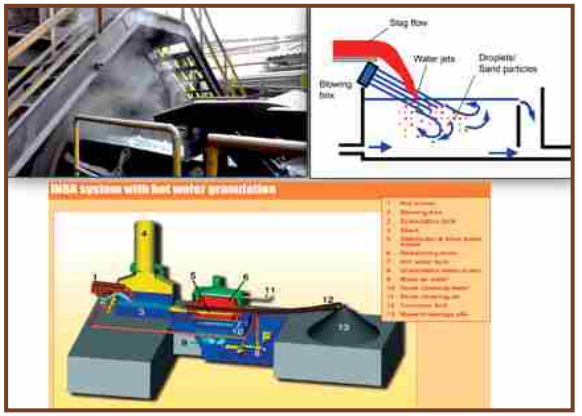
1. Reduce:

To reduce water usage in the processes, TSJ bought in cutting edge technologies having low water footprint wherever possible.

5 CDQ (Coke Dry Quenching)

CDQ eliminates wet quenching of hot Coke & also generates power

5 INBA System at Blast Furnaces

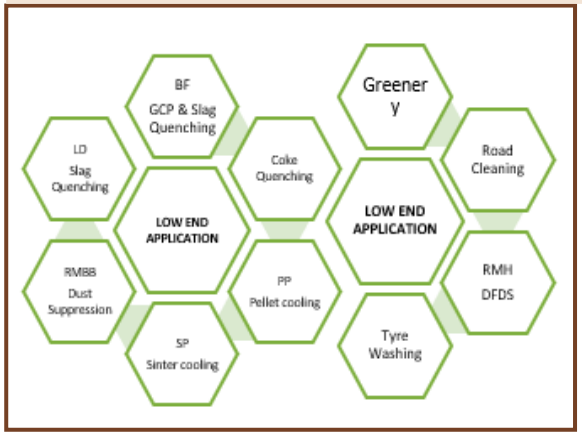


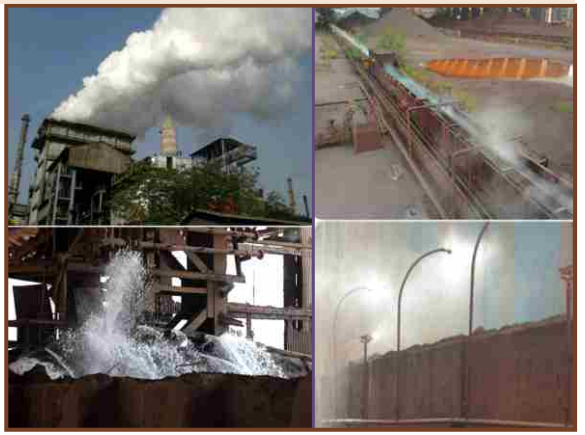
INBA is closed loop slag granulation system which helps to reduce water losses in the form of steam.

2. Reuse:

Reusing of process discharge water for low end application, helped TSJ to reduce freshwater consumption significantly as well as effluent discharge from the Works.

Grading of low-end processes





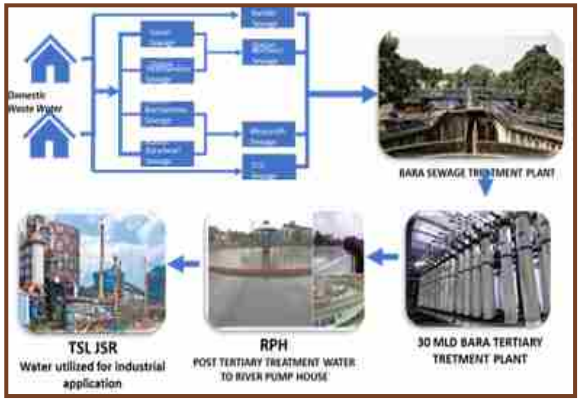
3. Recycle:

A.) Recycling of industrial effluent at CETP and convert it to process grade water.

B.) Recycling of City sewage water for industrial usage to reduce dependency on river water

5 MGD (22.75 MLD) CETP
(Common effluent treatment plant)

6.6 MGD (30 MLD) Tertiary
Treatment Plant for city sewage



4. Recharge:

Apart from the lakes and dams created long back by TSJ, we are developing rainwater harvesting structures inside the works as well as at the Subarnarekaha water basin to increase the water table for sustenance.

- Nos. of pond constructed -1162
- Nos. of household roof rainwater structure made at ruler area -33
- Nos. of roof rainwater structure in township-20
- Nos. check Dams -16 nos. at rural areas
- Nos. of roof rainwater structure inside TSL works- 7

TSJ is declared as water positive by DNV.GL

Impact

1. Reduce:

To reduce water usage in the processes, TSJ bought in cutting edge technologies having low water footprint wherever possible.

Way Forward/ongoing projects

Way Forward/ongoing projects

- Increase inhouse recycling by enhancing the CETP capacity up-to 9 MGD (41 MLD) by FY23.
- Achieve ZED at Coke oven by putting up BOT-Tertiary Treatment Plant with evaporator & crystallizer.
- Achieve ZED plant by FY25.
- Maximize the recycling of sewage water from city for industrial application (from 30 MLD to 60 MLD) by FY26.

Vardhman Fabrics, Budhni
(A Unit of Vardhman Textiles Ltd.)

2nd PRIZE

S P Oswal
Chairman & Managing Director
Vardhman Group

Suchita Oswal Jain
Vice Chairman &
Joint Managing Director,
Vardhman Textiles Ltd.

"At Vardhman, it has been our consistent endeavour, for over five decades, to enhance the positive impacts of our textile operations as much as possible.

Sustainability is not a fad for us, rather it is an ongoing journey towards holistic excellence. And the sustainability mind-set is deeply embedded across our organization, from boardroom to shop floor."

The sustainability ethos has been integral to Vardhman's DNA since its inception. With the introduction of our framework – 'PRO', we have set higher sustainability benchmarks, and now hold ourselves to even more stringent standards of environment management, resource conservation, community care and corporate governance.

Water is used at our production sites for process and non-process activities. Our technology upgrades, conservation initiatives, rainwater harvesting and scientific management, has ensured continual availability of this precious resource for business activities and provided easy accessibility of potable water for the neighboring communities. These efforts have brought social, economical, and environmental prosperity to neighboring areas around our manufacturing facilities.

Vardhman Group has always believed in the power of future vision and long-term actions. “Ethics in practices” and “Innovation in Process” have been part of our ethos since inception. We have integrated sustainability into our business and given a framework to our philosophy.

As a key supplier to larger apparel manufacturers and global brands, we are not only aware of the need of the hour but also mindful of the future. We strongly believe that waiting for legislation will be too late and as a responsible organization, we need to proactively take accelerated action to stem the damage for a better tomorrow.

Water is the foundation of all forms of life, but globally, freshwater is being consumed unsparingly and its sources are depleting at an alarming rate. The Textile industry is the third-largest user of water globally (after oil and

paper). From the irrigation of cotton crops at one end of the supply chain to the domestic washing of clothes at the other, fashion is a thirsty business.

In a world in which around 2 billion people are already living in water-stressed areas, there's an important role for industry to play in minimizing water use in production. We at Vardhman are consciously finding and implementing ways to reduce, reuse and recycle. Sustainability is an integral parameter in all our business decisions. From ethical sourcing of raw material to reducing recycling of waste; from reducing consumption of freshwater to rejuvenating its sources; and from decoupling growth from black energy to eliminating hazardous chemicals, we are continuously working towards circularity.

Our goal for sustainable fashion is to create flourishing ecosystems and communities through its activity. This includes increasing the value of local production and products; prolonging the life cycle of materials; increasing the value of timeless garments; minimizing the amount of waste; and reducing the harm to the environment that occurs as a result of production and consumption. Another of its aims is to educate people to practice environmentally friendly consumption by promoting the "green consumer." Going green for us is to choose green fibers and green processes to create a green portfolio that does good to the people, environment and industry.

Case Study

Water is used in their production sites for process and non-process activities. Their technology upgrade, conservation initiative and scientific management, has ensured continual availability of this precious resource for business activity and provide easy accessibility of potable water for the neighbouring communities. These efforts have brought social, economic and environmental prosperity to neighbouring area around their manufacturing facilities.

There are several new developments taken by their unit aimed at conserving water in their plant. This note outlines the water requirement of their plant, the water utilization pattern and relation to equipment, the different processes adopted for sustainability of water, and water conservation techniques.

Over the years due to persistent efforts, process innovations, investment in technology and heightened awareness among employees they have achieved downward trend in freshwater per unit of produce in our spinning, weaving and processing division.

Significant reductions in water are achieved by preventing unnecessary water consumption in their plant. Selection of new technology over conventional and older one, implementation of in-plant control techniques is employed for achieving significant reductions in water use, raw material and energy consumption, wastewater production and in some cases, even wastewater load.

Water Conservation Measures

1. Reduction in Cooling Tower & H-plant Blowdown Water by using of Mixing of water (Soft Water + Filter water) instead of soft water

Due to soft water, sodium forms a hard scaling in the system. So they have started using of blended water (mix-up soft and filter water) and are able to maintain COC 5-7.

Soft Water →

Filter Water →

Water Storage Tank

Hardness: 18-25 ppm

→ **Supply to H-Plants and Cooling Towers**

Water Saving - 219000 KL/Year

2. MGF Backwash Water in Water Treatment Plant taken back to raw water tank

In the water filtration plant, the back washing water of MGF is being treated in ETP. Now the back washing water have been diverted to raw water tank for the recycling after treatment.

Water Saving - 219000 KL/Year

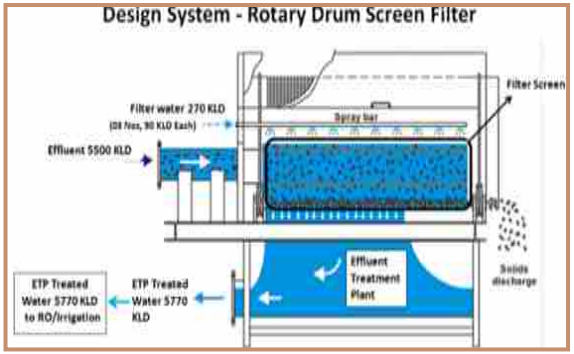
3. Reduction in UF reject water from 12% to 6% in DM Plant

In the Operation of DM plant, around 12% water rejected from Ultra Filter (UF) for removal of Colloidal Silica. To reduce rejection, they have replaced UF membranes with lesser rejection technology.

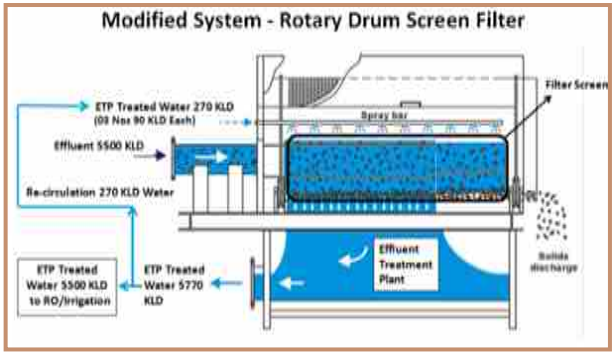
Water Saving - 25550 KL/Year

4. Reuse of ETP Treated Water for Effluent Screening in Effluent Treatment Plant

Reuse of ETP Treated Water in Drum Screen Filter instead of freshwater which results in reduction in freshwater consumption and effluent generation.



BEFORE

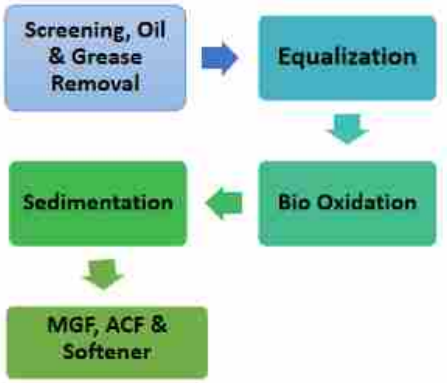


AFTER

Water Saving - 98550 KL/Year

5. Recycling of STP Treated Water in Process

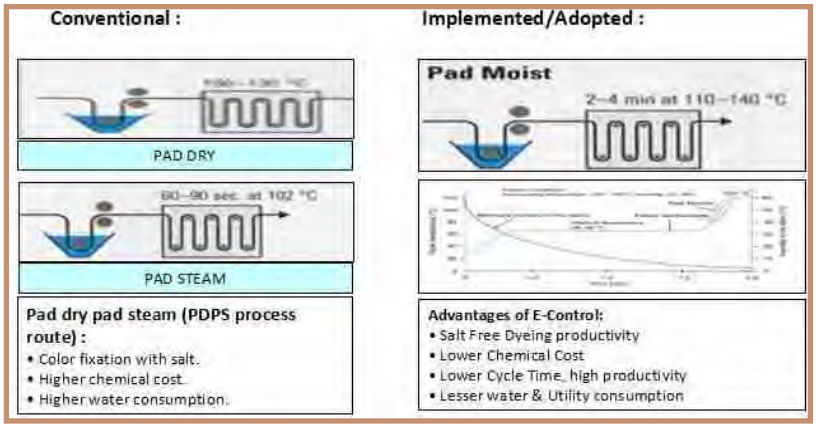
Reuse of STP Treated Water in Fabric Production after softening.



Water Saving - 365000 KL/Year

6. Fabrics Processing - Salt Free Dyeing (E-Control Dyeing Process)

Installed E-Control dyeing process instead of Pad Dry Steam Process.



Water Saving - 32850 KL/Year

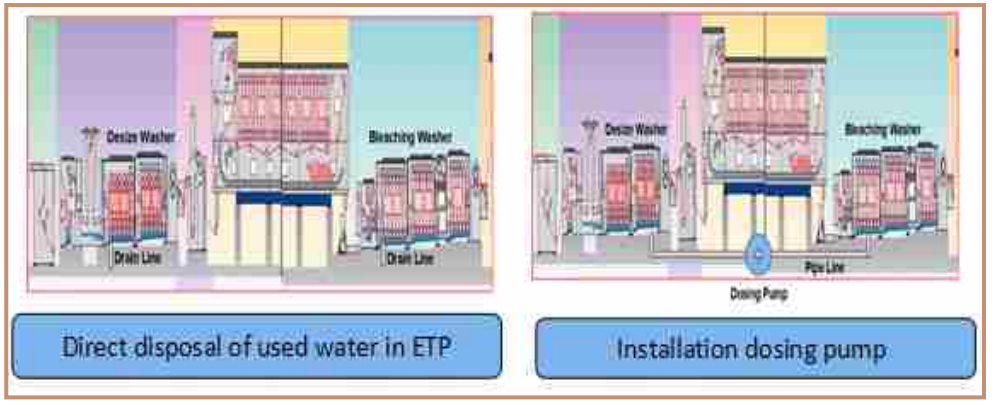
7. Fabrics Processing - Wider width singeing

Installed wider width singeing in place of washing range.

Water Saving - 14600 KL/Year

8. Fabrics Processing - Re-use of Bleaching Wash Water

In PTR Machine, reuse of wash tank water to scouring wash tank water by installing pumps.



Water Saving - 40880 KL/Year

9. Fabrics Processing - Double Screen Rotary Drum Filter

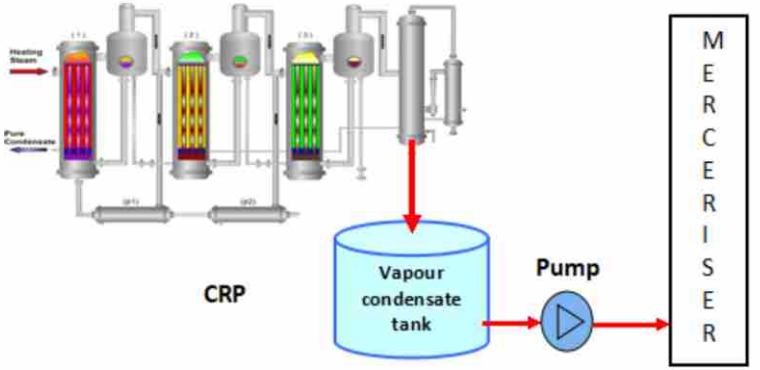
Installed double screen rotary drum filter.

Conventional	Implemented/Adopted
▪ Single Rotary Mesh filter ▪ Less efficient ▪ More water consumption process route (Peach wash route) ▪ Total installation are 10 numbers	▪ Micro filtration of extremely small particles In washing compartment of machine ▪ Self cleaning rotating filter mesh. No extra water of cleaning ▪ Filtered water re-use for mesh cleaning 15 % saving in soft water consumption of machine. ▪ Less water consumption due to better washing efficiency in peach wash machine

Water Saving - 40880 KL/Year

10. Fabrics Processing - Caustic Recovery Plant

Reuse of vapour condensate of caustic recovery plant.



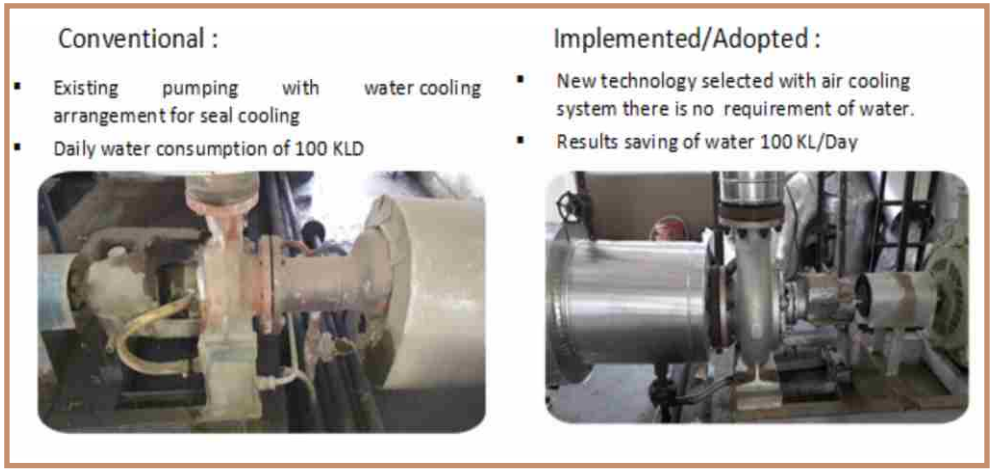
Total water saving in amount - 350 KL per day

Water Saving - 127750 KL/Year

11. Fabrics Processing - Air cooled thermic fluid booster pump in place of Water-Cooled Pump

Installed cooling pumps without water sealing in Thermic Fluid Booster System.

Water Saving - 36500 KL/Year



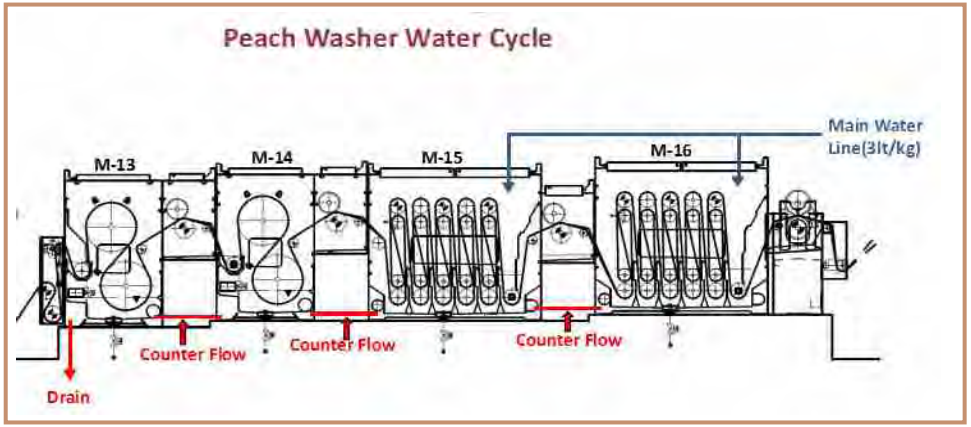
12. Fabrics Processing - Recycling of Process Steam Condensate

Reuse of Process Steam and Flash Steam Condensate in Boiler after polishing.

Water Saving - 73000 KL/Year

13. Fabrics Processing - Recycling of Process Steam Condensate

Reuse of water in peach washer machine by recollecting used water and pumping again to the machine.

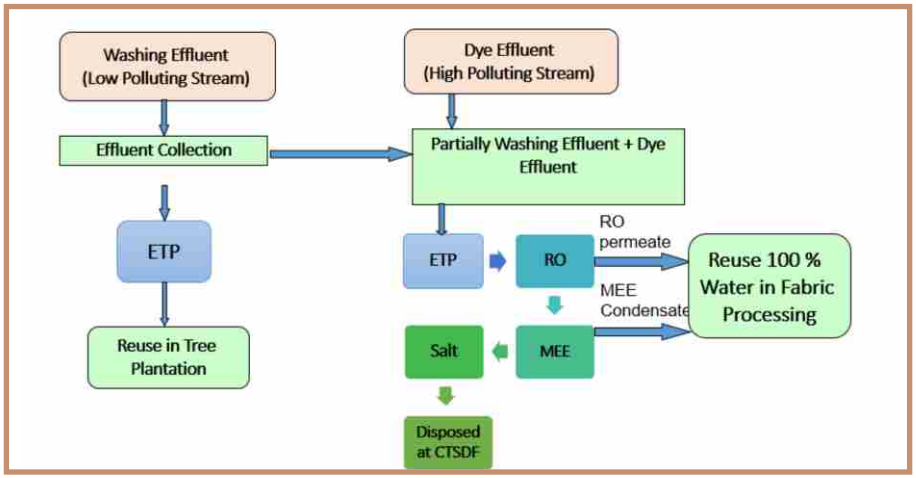


Water Saving - 36500 KL/Year

Wastewater Treatment Technology Adopted

14. ETP: Segregate Low & High polluting effluent stream .

Treating high polluting stream separately followed by RO and MEE and treated water recycle to process. Treating low polluting non color effluent separately and treated water utilized for gardening and tree plantation.



15. Reverse Osmosis Plant (RO)

- Recovery of plant is 92.5 %
- Softening process added before RO
- Less power consumption i.e. 1.5 Kwh/KL
- Less Operation & Maintenance cost
- Fully PLC operated and user friendly

16. Multi Effect Evaporator (MEE)

- Based on Forced circulation
- High evaporation rate
- Low steam consumption i.e. 0.260 MT/KL
- Scaling rate is less resulting chemical cleaning frequency less also reduction in cleaning chemical & wastewater generation

IMPACT:

- Reduction of freshwater consumption by 1801675 KL/Year of total water consumption.
- Reduction of polluting load (dissolved Salt) by 150 MT/Year to ETP by installation of salt free dyeing process
- All the modification done on machine to improve water efficiency has been implemented in all similar machines within the unit and also within the group.
- Our best practices in operation to save water consumption has been implemented in different industry.
- Many of our modification to make water efficient machine has been replicated in design by our machine suppliers.
- RO & MEE plant design is one of the best technologies in the world and same is replicated in many of the Indian industries.
- Fabric processing production capacity has increased without hampering or increase in the intake water for production and also resulted in economic prosperity within organization's operations & in the community.

Asian Paints (Khandala)

JOINT 3rd PRIZE

Amit Syngle
Managing Director & CEO
Asian Paints Limited

"An Integral Part of our Journey in Sustainable Development is our Continuous Endeavour to Conserve Water and Optimise its Use"

Brief Message

At Asian Paints, the philosophy of sustainable and inclusive development is deeply embedded in our strategic priorities and forms the foundation of our values and brands. Our products and solutions not only have unique features but are also sustainable for the environment. We are committed to not only reducing the water that we consume within our manufacturing units but also replenish more than what we consume through our offsite watershed management projects.

Globally, water scarcity is perceived as a major climate related risk. It becomes important to source and utilise this scarce resource in a responsible manner. We understand that the intensity of water usage in our operations is limited however, the overall consumption is still significant in the local context. Appreciating that water is a shared resource with the community, we have been focused on water management in the following three categories:

- Our efforts of reducing the overall specific water consumption for non-process water
- We reuse or recycle wastewater back within the factories such that all our decorative manufacturing sites are zero liquid discharge facilities
- We implement watershed management and community outreach programmes thus recharging more water back into the earth than what we consume every year.

Over the years water management processes have evolved across all factories, and it reflects in the improvements made in key metrics of water consumption and water neutrality. As responsibility towards environment is now institutionalized in our

operating framework, we will continue enriching the lives of our customers by developing safe and sustainable products while also reducing the water footprint of our manufacturing processes.

Case Study

At Asian Paints, emphasis is laid on conservation initiatives, especially on water, energy, waste and effluent reduction. Water is essential to life on Planet earth, every drop of water saved is water produced. Asian Paints's constant endeavor is to make water conservation an essential habit which employees have imbibed as environmentally acceptable behavior. Employees act as ambassador for driving this positive change and always practicing it. There are multiple ideas, process improvement suggestions and new technological interventions made by their employees to improve Water Footprint which has helped Asian Paints in constantly taking up challenging promises to deliver world class performance as regards to water consumption per kl of paint produced. Water, being a crucial natural resource that is shared with the communities, they as a responsible corporate continue to replenish water that is used over time. As a part of socially responsible organization the major emphasis is on fostering water conservation initiatives in and around society which has helped to make the plant water positive/neutral and active participation of local people in Water Mission -Jal Sashakt

Key Performance Indicators as of 2021

0.59

Process Water
M of Water/KL of Paint

0.12

Domestic Water
M3/ Person/
Day-Consumption

10,896

Rainwater
M3- Annual Harvest

Asian Paints, Khandala is one of the biggest and most automated Integrated Paint Manufacturing Facility in the World. The Plant employs more than 1000 persons and uses water for manufacturing and domestic purpose.

Responsible water usage is a key constituent of their commitment to resource conservation. They have taken numerous steps such as:

- Automated Water Management through Distributed Control System (DCS)
- 100% re-use of rainwater in utilities
- Sensor-based taps and water-less urinals
- High-efficiency Reverse Osmosis (RO) systems
- Unit is ISO 14001 certified and have zero liquid discharge operations for effluent management.


Water Treatment Plant

PROMISING ASPECTS: The practice of responsible water usage is being the key mission and water conservation strategies have been initiated from as far back as 2013 itself. Their most conscious, celebrated and promising water conservation aspect is Zero effluent discharge.


Multiple Effective


Reverse Osmosis Plant


Effluent Treatment Plant

Key Water Saving Measures in Process Water: Reduction in freshwater consumption and wastewater generation is being reduced effectively through the process of pigging. The reject of wastewater treatment plant is being reused in Production, utilities and fire water network through effective water treatment system. As the facility widely spread over a large plot area, the potential quantity of harvested rainwater is immense. This collected roof rainwater and run-off water is collected, treated and re-used for Production & Utilities. The reject of ETP (effluent treatment plant) is recycled through effective water treatment system and used for cooling tower makeup water, production and utilities. The incorporation of DCS (Distributed control system) for water management aids in analysis of water usage patterns in each type of manufacturing process, that in-turn helps to optimize the future water consumption.

As water conservation is a complex and a never-ending challenge, they also invest and support community water projects across all our manufacturing locations in India through:

- Rooftop rainwater harvesting and recharge systems
- Integrated watershed development in nearby villages

Community Efforts: Awareness drives are being carried out by the Environmental, Health and Safety (EHS) Department of the plant as well as through Corporate EHS drives. World Environmental Day celebrations are organized every year in June, to spread awareness among employees in themes of Water Conservation, Effluent reduction, Plastic Pollution Prevention, Hazardous & Non-Hazardous Waste reduction. Corporate Environmental cell called as Supply Chain Resource Centre (SCRC) is instituted. Dissemination of all applicable environmental-statutory requirements across key stakeholders is practiced. Conducting of environmental awareness training programs and webinars.

Delhi International Airport Limited

JOINT 3rd PRIZE

Videh Kumar Jaipuriar
CEO- Delhi International Airport Limited (DIAL)

"Water is essential for the very existence of life and one of the key resources for sustainability. Over the years, with our efforts we have reduced our specific water consumption (litres/pax) by more than 50% in FY 20 as compared to FY11. Our objective is to become water positive by optimizing water consumption and maximizing water harvesting at Delhi Airport. We will continue to improve our water resource management and will make Delhi Airport a global benchmark."

Organisation

Delhi International Airport Limited (DIAL)

Initiative:

Sustainable Water Resource Management Program (SWRMP) at Delhi Airport

Location

Delhi Airport, New Delhi

The Initiative

Delhi International Airport Limited (DIAL), a GMR Group led consortium that Operates and Modernize Delhi Airport. DIAL took over IGI Airport through a concession agreement in 2006 and commissioned new "Terminal-3" in 2010.

DIAL has brought various global recognition to Delhi Airport in environment sustainability by adopting various environment management initiatives with a dedicated focus on resource conservation.

Water management is one of the material aspects for Delhi Airport's business operation. In order to ensure effective water management, DIAL has developed Sustainable Water Resource Management Program (SWRMP) for Delhi Airport. This program is designed to conserve water resource by adopting smart design and operational excellence for water sustainability.

DIAL has adopted smart design by integrating technological solutions whereas the operational excellence approach focuses on water resource conservation.

Smart Design

- The Smart design includes development of efficient water utility & layouts, piping network, use of efficient fixtures & fittings, adopt reuse & recharge infrastructures, pollution prevention units and integration of smart technologies such as automation, use of sensors etc.

Operational Excellence:

- Operational Excellence includes measures to reduce water consumption, increase water reuse, reduce water loss, increase rainwater recharge/ storage, apply integrated water management system and create awareness by training & education.

Action Plan:

The key elements of DIAL's action plan to implement SWRMP are-

- Leadership & Strategy: Top Management focus towards Water Conservation.
- Water Efficient Infrastructure & processes
- Promoting water reuse, rainwater harvesting and storage.
- Continuous monitoring, accounting & review of water consumption
- Employee involvement through Knowledge Sharing & Idea Factory Groups, CIP, KAIZEN, BE, BLIP programs etc with reward and recognition
- Developing efficient and competent team
- Training and capacity building.
- Stakeholders partnership
- Networking and collaboration with expert agencies

Landscape managed with treated water and drip irrigation system

Measures:

Some of the key measures implemented by DIAL are -

- DIAL has implemented water efficient fixtures, water efficient process, sensor-based drip irrigation, cooling tower water management through improved cycle of concentration, water monitoring, continuous review and improvements on water conservation.
- DIAL has 16.6 MLD zero liquid discharge sewage treatment plant for Delhi Airport to ensure that entire wastewater is treated and reused in application such as horticulture, toilet flushing and HVAC make up water. The integrated water management system and approach of DIAL has led to resource optimization and reduction in overall water consumption at Delhi Airport.
- DIAL has installed > 350 rainwater harvesting structures (RWHS) that has a potential to recharge >63% of DIAL's overall annual water consumption. More RWH structures (>250 numbers) along with two rainwater storage tank facility of total capacity 6.7 ML are being added with an objective to increase the recharge potential to >100% of water intake and make Delhi Airport water positive.
- DIAL has also adopted green infrastructure elements such as open pavers, porous turf etc. to further increase rainwater recharge.

Impact and Savings

DIAL's sincere efforts in water management have achieved significant water saving and helped in contributing towards sustainable future. Following are few key achievements of DIAL's water conservation initiatives

- DIAL is able to recharge more than 63% of DIAL's overall annual water consumption with its existing rainwater harvesting structures.

DIAL 16.6 MLD STP Plant

RO System of DIAL STP Plant

Rainwater Harvesting Structure at Delhi Airport

- DIAL achieved more than 50% reduction in specific water consumption (litres/pax), in FY20 as compared to FY 11.

Award and Recognition

- The water management initiatives of DIAL are recognized by Government of India. DIAL has won the National Water Award- 2019 by Ministry of Jal Shakti (GOI) in January, 2021. DIAL also received Voice of Customer honor.
- Water management initiatives adopted by DIAL has received Gold Level recognition in Airports Council International's Green Airport Recognition Program in 2020.
- DIAL has also received CII National Water Management Award in 2019
- Water management initiatives also enabled DIAL to achieve GreenCo Platinum award from CII Green Business Centre in 2016.
- Water Management Initiatives also helped Terminal 3 of IGI Airport to achieve LEED India Gold and new construction (2011) and IGBC Platinum as Existing building facility (2016).

Rainwater Harvesting Structure at Delhi Airport

9th Edition of FICCI
WATER
AWARDS
2021

INNOVATION IN WATER TECHNOLOGY

Innovation in Water Technology

GREEN LANTERN ENGINEERING PVT LTD

1st PRIZE

Dr. D. N. Ravi Shankar Ph.D.
(Environmental Engineering)
Technical Director
Green Lantern Engineering Pvt. Ltd.

One's waste is one's wealth!

Our sustainability goal is by creating decentralized sewage treatment facilities integrated with biodegradable kitchen waste management systems based on circular economy in residential, commercial, industrial establishments to produce useful end products of biogas, recycled water, and manure.

Brief Message

Exponential population growth with unmatched infrastructure in developing countries like India has resulted in a significant gap in the supply and demand of potable water. This is also coupled with water pollution and water-borne diseases. Management of biodegradable liquid waste (sewage) and biodegradable solid wet-waste is not addressed scientifically and is an absolute need of the hour. Residential communities, commercial complexes, hotels, hospitals, schools, colleges and industries produce both liquid and organic wet-wastes daily. Generally, both of these wastes are managed in different treatment chains and in many cases, completely mismanaged. There is a critical need to handle both, the liquid and organic wet waste in an decentralized integrated facility to extract useful by-products like recycled water, biogas and organic manure that can be used within the premises. It is vital for us to design systems based on circular economy to combat climate change issues.

Case Study

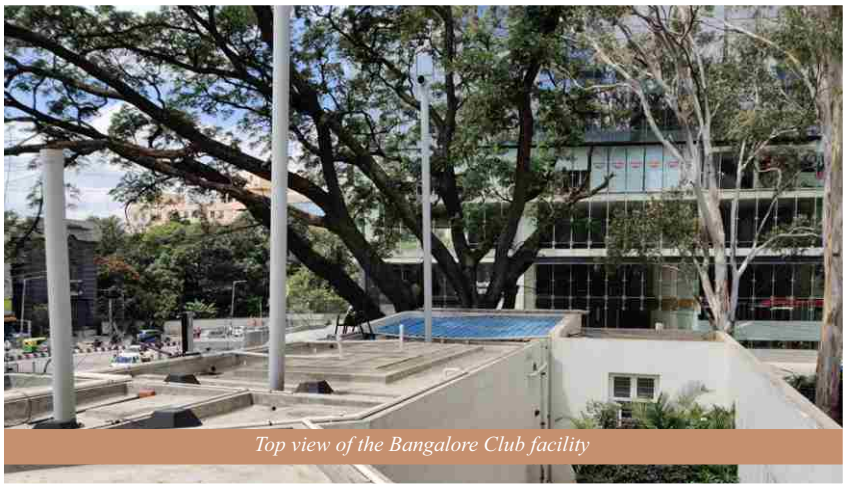
Green Lantern considers waste management to be an industry, where raw materials are free (sewage and wet organic waste), reliable in supply and end products of treatment have demand and significant monitory value. Recycled water, manure and biogas are the final products of wastewater treatment. Similarly, biogas and manure are the final products in the organic wet waste management system. The treated water from the system is recycled, the biogas and manure from both the systems are combined and utilized within the facility to ensure a circular economy and a significant reduction in resources like freshwater and fossil fuels (LPG).

The biodegradable organic wet-waste is grinded with water to convert it into liquid waste. This is treated in a similar process as the sewage in the sewage treatment plant. The innovative concept is to treat both liquid and organic wet waste in the same integrated treatment facility. The treatment chains are designed to ensure no inconvenience is caused to the occupants of the building or neighbours. Mitigating Methane emissions from both wastes also combats climate change issues.

Anaerobic technology is used to treat both wastes that require no energy and Methane is generated as a by-product. This gas has an energy coefficient and the potential to replace fossil fuels like LPG. Aerobic technology is used for further treatment after the anaerobic process to refine the treated water to comply with the statutory treated water recycling standards specified by the Central Pollution Control Board.

The treatment facilities are designed to not expose waste/wastewater during the treatment process. No noise or vibrations are created from the systems. With an aesthetically appealing design and an odour management system, the facility can be located near to the community without causing nuisance. The treatment facilities are designed with a low footprint and consumes very low power to make it economically sustainable. This system can easily be scaled from very low to high capacities. The plants are designed to handle shock loads making it vital for sustainability of the system. There is absolutely no need for external additives like enzymes or bacteria required for the treatment process. Gravitational forces and sunlight (as a source of heat) are used in the treatment to enhance the performance. The odour generated from the system is contained, collected, treated and then discharged to ensure an odour-free operation.

Front elevation of the Bangalore club STP



Top view of the Bangalore Club facility

Green Lantern Engineering has established and is operating numerous integrated treatment plants across the country to recycle water and also utilize the biogas for thermal application within the premises. As organic waste has the potential to generate biogas, they have been aiming to redefine the organic waste management to a fuel generation system. Treating high volume of organic wet waste has the potential to generate significant volume of biogas that can be converted to Bio-CNG. As bio-CNG based engines has started to replace diesel and petrol engines, such waste management facilities can become the future fuel stations for many vehicles. This concept addresses the issues of global warming/climate change and also significantly reduce our dependency on fossil fuel imports.

Green Lantern Engineering also has a mobile app - Tankerwala. It is a platform to list excess treated water from a water recycling plant and also a marketplace to purchase recyclable water for secondary applications like irrigation and construction. Tankerwala is India's largest network of tankers to move freshwater and recyclable water across the country hyper-locally. This concept has already shown traction and impact in reducing the demand for freshwater across the country.

Innovation

Innovation is the backbone of Green Lantern Engineering. It is highly important to innovate to solve the technical and social issues of the wastewater treatment.

First and foremost, is combining the anaerobic and aerobic technologies with multiple biological reactors. This has shown significant dominance and performance enhancement when compared to the existing conventional technologies which use single process and reactor. This concept has solved the shock-load issues and proved the sustainability in operation & maintenance.

Anaerobic technologies adopted in the beginning of the treatment process removes majority the of pollution and also generates biogas as a by-product. The remaining pollution is further treated in an aerobic treatment technology. This has significantly reduced the power requirement of the treatment process as aerobic systems consume high energy to treat sewage. As majority of the pollution is removed in the form of biogas in the anaerobic reactor, there will be reduction in the sludge production in the treatment.

Conventional technologies use blowers and diffusers for aerobic treatment process to degrade the organic pollution. They have innovated and reversed the conventional aerobic treatment by breaking the water into billions of water droplets using non-clogging nozzles in the presence of air. Fresh air is supplied through fans in a closed biological aerobic reactor. This significantly reduces the power required for the aerobic process and also avoids noise and vibrations. Fixed media is provided within the aerobic tank to

facilitate the attached bacterial growth to enhance the biological degradation. There is no need for MLSS testing facility and SVI, making it simple to operate and maintain the water recycling plants. Only sewage submersible pumps are used for entire treatment process to avoid noise and vibrations. The water recycling plants can easily be automated as it has very few electro-mechanical equipment involved in the treatment process.

Treatment of odour

Hydrogen Sulphide is an odour producing and a corrosive gas emitted during a sewage treatment process. They have innovated in containing the odourous gases, collecting and scrubbing it with the Chlorinated treated water available at the facility. Chlorine as well as water neutralizes the odourous gases and the exhaust is vented out from the facility making the installation free from corrosion as well as odour.

Replacement of blowers

As indicated earlier, by the reversal of aerobic treatment process, they have eliminated the use of blower and diffusers needed for the aerobic treatment process. Stainless Steel centrifugal fans of 375 watts (0.5 HP) can supply up to 1,500 Cubic Meters of air per hour. This substitution reduces the power required to operate the water recycling plant by 70% when compared to a conventional technology.

Front elevation of FOXCONN STP

Top view of FOXCONN facility

Screens

Mild Steel based bar screens are generally installed at the pre-treatment phase of a conventional sewage treatment plant. Mild Steel has a high tendency to rust in such an environment and the bar design also allows for macro particles and plastics to enter the treatment facility. They have innovated to replace this Mild Steel bar screen by a Stainless-Steel sheet screen with circular perforations. This ensures effective blockage of inorganic impurities from entering the treatment process and also avoids corrosion. The screening tank is also fully covered by FRP chamber covers to contain the odour within the tank to ensure an odour-free operation.

Statutory requirements

The basic designing of each of these tanks within the water recycling plant is derived from the CPHEEO manual published by the Government of India and globally referred water recycling books such as Wastewater Treatment written by Metcalf & Eddy. The Central Pollution Control Board (CPCB) as well as State Pollution Control Board (KSPCB) have approved this technology and is implemented across various states of the nation.

Impact of product on water management

By making the system highly profitable and also convenient, the communities are motivated to establish such water recycling plants. This significantly impacts the battle against climate change, prevents water pollution, reduces the load on landfills, reduces our dependency on fossil fuels and also saves water by recycling.

Economical operations of the STP

Green Lantern Engineering has executed water recycling plants from as low as 1,000 Litres per day to Millions of Litres per day plants across the country. In a case study, the BioHYBRID water recycling plant was compared to a MBR water recycling plant. The production cost of recycled water was found to be Rs. 21 per KL in MBR technology and Rs 7.8 per KL in BioHYBRID technology for similar quality of the treated water. This has shown significant evidence towards economic viability and sustainability.

Case study- Bangalore Club

A BioHYBRID water recycling facility integrated with organic waste management was installed in 2018 at The Bangalore Club on Residency Road in Bangalore. The facility is aesthetically designed and is absolute free from odour, noise and vibrations. The generated biogas is used in the kitchens at the club to substitute LPG and the treated water is used for landscape irrigation. Under full load conditions, 60,000 Litres of water is treated and recycled each day. Around 300 - 500 kg of wet waste is generated at this club each day and the organic waste management system has avoided this volume of waste from entering the landfills. About 100 cubic meters of biogas is produced from this integrated BioHYBRID system.

The commercial price of municipal water from BWSSB is Rs. 70/KL. This saves around Rs. 70 x 60 KL = Rs. 4,200/- per day. The 100 cubic meters of biogas produced replaces around 50 kg of LPG each day. At the present cost of commercial LPG of Rs. 90/kg, this will save an additional Rs. 90 x 50kg = Rs. 4,500/- per day. The total savings to the club by operating the plant is Rs. 8,700. The capital cost of this facility was recovered within a year from the date of installation. This has proved the economic viability and sustainability of systems designed on the principle of circular economies.

Front elevation of KREA University STP

Top view of KREA University STP

9th Edition of FICCI
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2021

WATER INITIATIVES BY NGO

Water Initiatives by NGO

HIMMOTTHAN SOCIETY

1st PRIZE

Dr. Yashpal Singh Bisht
Executive Director

"Water demand is constantly increasing. Wise management of water resources with community participation is only way ahead for water security"

Brief Message

Traditionally, in the mountainous regions, water governance is in the hands of rural communities, however over the last few decades due to the decentralization process, community ownership becomes a bit defused. The Mountain region has a glorious tradition of water harvesting and communities have developed their spring-based hydraulic technology, which is unique in its usefulness. The inherent technological simplicity and cost-effectiveness of "Spring" based gravitation flow drinking water systems makes them the preferred drinking water option in mountain areas and known as the lifeline of mountain peoples.

About Himmotthan:

In 2002, the Sir Ratan Tata Trust (SRTT) initiated the Himmothan Pariyojana (HMP) in Uttarakhand, to focus on causes of rural poverty in the Indian central and western Himalayan region. In 2004 this involvement was strengthened by a Memorandum of Understanding (MoU) signed between the state government of Uttarakhand and the SRTT. In 2007 the Trust set up Himmotthan Society, to act as a nodal agency for the initiative in the State and to initiate work in the adjoining state of Himachal Pradesh. Himmotthan's programme has grown over time from an initial focus on Watershed programmes, WATSAN and Livelihoods, to education, agriculture and community institutions. The programme has spread across over 1,800 villages 15 districts of mountain blocks of Uttarakhand, Himachal and Leh covering approximately 10% of the rural households of Uttarakhand.

Water Programme:

"Water" is one of the flagship programmes of Himmotthan/Tata Trusts and has been working on the community water issues almost for two decades in Uttarakhand. Water is becoming scarce resource even for mountain states, although most of the central and western Himalayan states of India are blessed with mighty glaciers, perennial rivers and average rainfall appears to be sufficient. However, the unique topography of the region implies immediate runoff of maximum precipitation downhill, and straight out of the state. Water flows are rapid and almost impossible to restrain. The lack of flat land implies the lack of storages, which in turn implies local water scarcity. The issue is more severe for Uttarakhand State in north-west part of India is getting around 90% of rural drinking water from spring fed water systems. Mountain springs are the primary source of water for the rural households, whilst for many people springs are the sole sources of water. An estimate there are 5 million springs across India, out of which nearly 3 million are in the Indian Himalayan Region (IHR). Despite the fact, springs are facing threat of getting dried up. Spring discharge is declining because of land use change, ecological degradation also Climate Change effect manifested rising temperature, rise in rainfall intensity and less number of rainy days, reduction in temporal spread and decline in winter rain.

Moreover, safe water and sanitation are fundamental to life and everyone has a right to these basis services. However still people jostle to get adequate water and safe sanitation, compounded by lack of good hygiene practices, the result is extreme poverty and ill health, impacting the quality of life at such single household level.

Initiative: Participatory Springshed Management

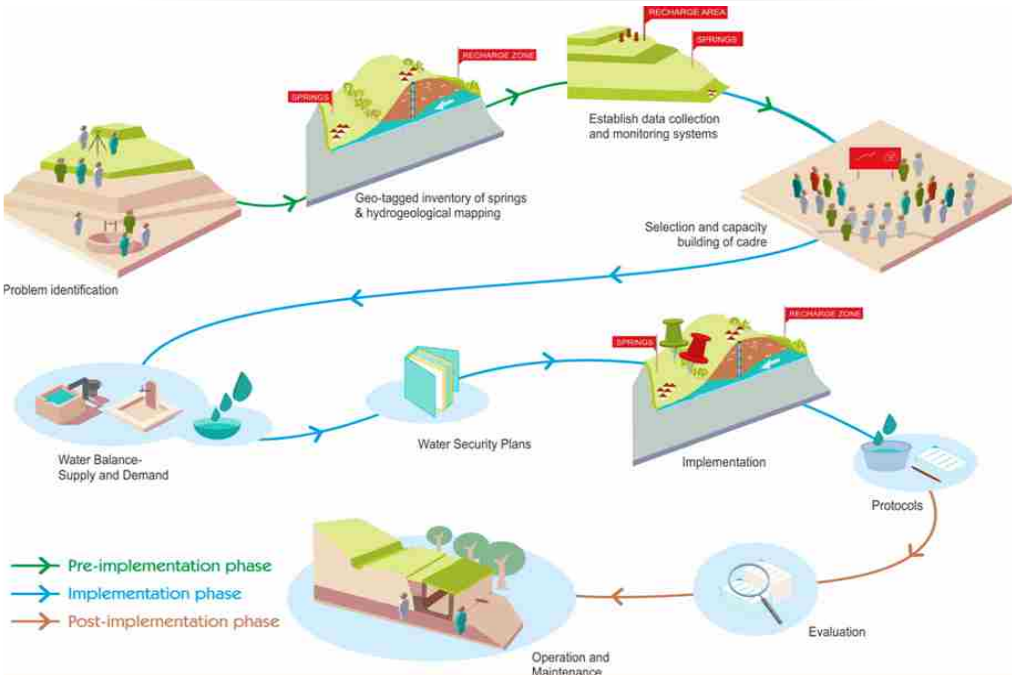
The key Objectives are: (i) To strengthen a decentralized water governance system; (ii) Management of water resources on scientific basis; (iii) To utilise spring water for livelihoods and income generation activities; (iv) To improve ecosystem services through Springshed management and (iv) To develop a cadre of para-worker for Springshed Management.

Location: Pithoragarh, Almora, Nainital, Tehri and Rudraprayag districts of Uttarakhand. The project covers around 460 villages.

Project Intervention and Process:

- Hydrogeological Survey and mapping
- Village Water Security plan preparation

- Capacity building of Users water and Sanitation Committee (UWSC)/Gram Panchayat
- Preparation of cadre of para worker
- Implementation of recharge work through UWSC/ community
- Data collection & analysis (MIS)
- Operation and maintenance by UWSC
- Advocacy for scale up springshed initiative in other Himalayan states
- To improve ecological system through lake revival



Outcomes and Impact:

1. Hydrograph analysis were made to assess the impacts of Springsheds and a significant increase up to five folds in the discharge was noticed during lean season (April –June) in three years in the springs of those areas where recharge activities were carried. Average increase in the spring discharge is 48-60% after Springshed recharge works.
2. A cadre of para-hydrogeologists is being created in the selected villages through training and capacity building programme
3. Before the spring recharge works intervention, a household used to spend around 3 hours every day to collect water as low discharge from springs used to lead to long queues for water. Now, their waiting time has been reduced to 15 minutes.

4. During pre-project period average quantity of water supplied per capita per day was 20 litres in villages. Execution of source strengthening works in combination with the restoration of the water supply schemes has substantially improved the quantity of water supplied in all the project villages. At present average quantity of water supplied per capita per day are 73 liters. Thus the quantity of water available in the villages has been significantly increased with the completion of the intervention
5. On an average, time required to collect water has reduced to 5 minutes against base data of 35 minutes in villages with water supply scheme.
6. 500 million cubic meters' annual groundwater recharge.
7. More than 8000 man-days work has been created through programme activities.
8. To ensure the long term sustainability, linking the programme with Jal Jeevan Mission (JJM) for water resource sustainability
9. To provide scale to the programme Springshed management Consortium (SMC) has been created in Uttarakhand. The SMC is headed by the Principal Chief Conservator of Forest (PCCF)/HOFF, the consortium has currently 18 members which included civil society organizations, line department and experts of the fields .Coordinator Water and Sanitation from Himmotthan Society is Member Secretary and responsible for taking forward the SMC objective in a planned manner, around 70 micro springshed has been treated through scientific planning in forest area through SMC .

Field Activities Photos:

Spring Catchment activity in participatory manner in Bailgaon Village

Lake revival works in Pithoragarh district of Uttarakhand

District Level Coordination Committee meeting in Tehri district

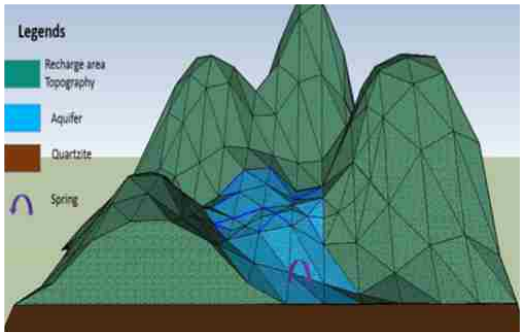
Behaviour change activity for water management in Pithoragarh

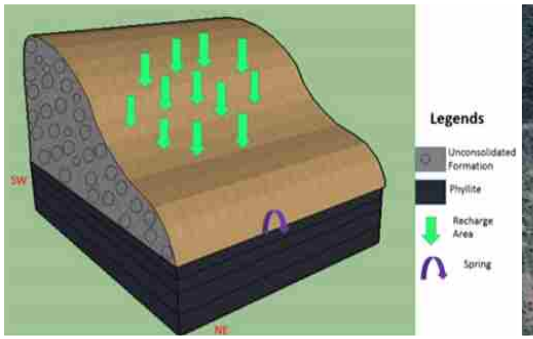
Inaugration of Springshed Management programme by Mr. Gajendra Singh Sekhawat, Jal Shakti Minister Govt. of India under Jal Jeevan Mission, workshop organized by Himmotthan in Collaboration with ATI Nainital.

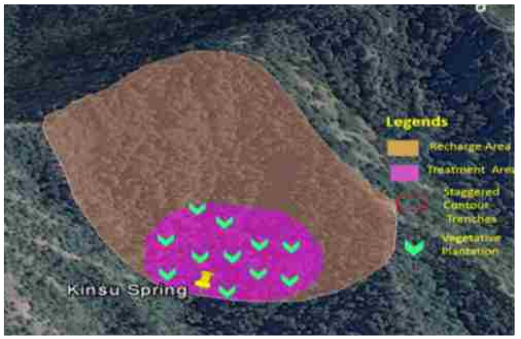
Participants of the national level training workshop on Springshed Management

State level meeting of Springshed Management Consortium in Dehradun

Hydrogeological Approach







Biome Environmental Trust

JOINT 2nd PRIZE

Vishwanath Srikantaiah
Founder-Trustee
Biome Environmental Trust

"Potable water is a scarce resource and being efficient with its use only means more of it will be available to distribute equitably to ensure the human right to water for all. Water use efficiency is a steppingstone to water sustainability."

Brief Message

"Long term water sustainability will depend on drawing up water security plans at all levels from the micro-watershed to the river basin. Maintaining the health of rivers, river basins, lakes and aquifers is crucial to water sustainability. Refuse, reduce, reuse, recycle should be the mantra of our times. Rainwater harvesting, groundwater management and recycled used water will be the approach in an Integrated Urban Water management framework for urban areas and Integrated River Basin management framework for the river basins."

Organisation:

Biome Environmental Trust has been set up with the aim to conduct research, public education, practice-to-policy bridging and policy advocacy in the areas of land-use and land-use planning, energy, water and sanitation.

Initiative: 'Million wells for Bengaluru' campaign

The explicit objective of the intervention is to increase the groundwater table in the city while providing livelihoods to the traditional community of well diggers called Mannu Vaddars.

The implicit objective is to build a water culture in the city, where people value water availability and also take responsibility for managing groundwater collectively. They should look at groundwater not only as a resource to be extracted but as one that should be managed with community participation.

Location: Bengaluru city

Initiative:

Bengaluru has always been a city that relied on groundwater for its sustenance. Till the late 1980s people would first dig an open well, before starting any kind of construction on their site.

Over the last two decades, as out-of-control "development" became rampant in the city, water, like many of its other natural resources, took a major hit. With increasing demands to support an ever-growing population, and reduction in permeable land that can soak up rainwater due to roads, roofs, and other paved areas, the shallow aquifer (that sustains open wells and other surface water sources) could no longer be recharged. Soon issues of local droughts as well as urban flooding in low-lying areas started to stress the city out.

In desperation, people resorted to digging multiple and deeper borewells while abandoning and even closing off their open wells. But water always flows from top to bottom. While borewells would extract water from the deep aquifers to depletion, there was no chance of their recharge from the already depleted shallow aquifer. Currently, borewells remain the primary source of water for a large number of the city's inhabitants.

Meanwhile, the livelihoods of thousands of traditional well-diggers from the Mannu Vaddar community (a scheduled community) were also affected adversely as they were unable to support their families with their profession. As a society, it also risked losing the traditional knowledge in the field that has been passed down through their generations.

Well digger digging a well

The 'Million Wells for Bengaluru' campaign aims at restoring this balance between extraction and recharge of groundwater quite literally, by encouraging the digging / rejuvenation of a million recharge / open wells across the city. It has been doing this through sensitization and consulting while keeping the Mannu Vaddar community in the forefront, empowering them in the process and ensuring the preservation of their traditional knowledge of the subject.

For the campaign to work successfully, the residents of the city need to appreciate the availability of water and feel responsible for the preservation of their groundwater. Every individual / community / industry / agency / institution of the city is a stakeholder in this campaign.

The “Million Wells for Bengaluru” campaign developed very organically as they started receiving positive feedback and support from the areas, they had previously worked in for well digging and water management. As interest in our work grew, they began to understand the feasibility of this initiative and the impact it would have.

While the initiative looked ambitious, it was important to keep the design of the recharge well simple. The wells are lined with concrete rings for structural stability. The rings are commercially available in most parts of the country. The well-diggers have been roped in for work that they traditionally know. This, they believed, has been the most innovative tool of the campaign.

Beautifully landscaped recharge well

Impact

The "Million Wells" campaign was launched in July 2015. While they are proud of the impact it has created thus far, they also know that there is still a long way to go before its estimated closure in 2025. Since the advent of the campaign, they have seen a significant increase in the water table in the localities that it was successfully implemented. Apart from providing water security in these localities, there has been also seen a reduction in cases of local flooding.

Rainbow Drive is a gated residential layout of 400 plots set on 36 acres. In 2005 as people started building their homes, the existing borewells went dry and they needed to dig new borewells. Soon all the borewells were dry and they became completely dependent on water tankers. They approached Biome in 2008 and decided to dig recharge wells. The residents' association made rainwater harvesting compulsory for all houses. What started with 3 and then 10 wells in 2008 grew to 300 recharge wells by the year 2015. The layout now has about 360 recharge wells, and this has resulted in the revival of some of their shallow borewells. The layout now gets over 100,000 litres a day from a depth of 360 feet! And this is in an area of Bengaluru which otherwise has very low groundwater tables. The Rainbow Drive community is now water positive, as they are completely self-reliant for water, and recharge more than they withdraw. They also invite other communities and groups to visit their layout and learn about groundwater recharge from them. Here is the Rainbow Drive story in the form of a comic book and as a technical paper.

In-drain and off-drain recharge wells

Cubbon Park and the IIM Bangalore campus are also two examples of places where groundwater recharge has worked well.

The well-diggers are from the Mannu Vaddar or Bhovi community. They stay in villages called Vaddarpalya or Bhovipalya. Being a scheduled community, they often face discrimination in society. This campaign has not only improved their financial conditions allowing them to have a fairly comfortable life and provide basic education to their children, it has also elevated their self-respect and confidence in their work.

They now proudly show off their work on social media, sometimes consulting independently with their immense knowledge. Society has also started to value their knowledge, bringing many of the community back to the traditional skill of well digging.

Well digger digging a well

We estimate that digging and maintenance of about 2 lakh wells has generated revenues of about Rs 800 crores (200,000 wells at Rs 40,000/- each) for the well-diggers and their associated networks. Some of the well-diggers have invested this money to purchase tools and vehicles that make their work easier.

There are several small enterprises associated with the well-making process. An important one is the production of concrete rings of different sizes that are used to line these wells. Another enterprise involves hiring out pumps to pump out water from the wells being dug. In cases where rooftop water is needed to be channelled into wells, plumbing and civil work are required, as well as rainwater filters. These involve professional workmanship as well as material supplies, supporting several livelihoods in their turn.

All of these local enterprises have benefitted from the "Million Wells" campaign.

People's Service Society, Palakkad

JOINT 2nd PRIZE

Fr. Joseph Justine K.C.
Executive Secretary

"Water is precious, scarce, indispensable and unique gift of nature without which life on earth is impossible and its judicious use and conservation is the need of the hour"

Brief Message

The fragile ecological conditions due to global warming and climate change impacts the overall livable atmosphere and livelihood of the people of Elappully and Pudussery Grama panchayaths of Palakkad district, Kerala State, India. Elappully and Pudussery Grama panchayaths have been categorized as the highly critical and semi critical water scarce areas respectively by the Central Ground Water Board CGWB). Average rainfall of the area is 1700 mm which is comparatively lowest in the State.

According to CWRDM "About 50% of the population in urban areas and 80% in the rural areas depend on open wells for the domestic water needs in Kerala"

Providing uninterrupted supply of water to the inhabitants of the State of Kerala is one of the greatest challenges before the water supply managers. Rapid economic growth and human interventions in the past 4-5 decades has drastically reduced the natural resilience of almost all water bearing systems like hills, forests, wet lands etc.

People's Service Society, Palakkad have demonstrated admirable models in the water sector of Pudussery and Elappully Grama Panchayaths to uplift the water table of the locality to a justifiable level. Sustainable Access to Safe Water in Palakkad, the project implemented in the above said Grama Panchayaths with the support of WaterAid India have achieved replicable interest from many Grama Panchayaths and Government Agencies. The software and hardware interventions in letters and images with its engineering, methodology and participatory approach with sustainability measures are worth replicable to combat with the summer water demand in all areas of the state.

The software and hardware components of the project has been able to achieve remarkable success in water conservation, water management and water quality

management of the region. Water is the base of life as it is the most blessed resource in nature. Water abundance has often led to public perception that water conservation is not a necessary intervention. It is our moral responsibility to give back the water we are taking from the nature's groundwater source. The interventions really support the communities to tide over the climatic challenges like floods and severe summer with a natural cult.

Lack of adequate knowledge on the status of the fresh water resources, environmental threats and mitigation measures are the main challenges faced by the water sector. The project Sustainable Access to Safe Water in Palakkad has made its concerted efforts to find out solutions in these areas by implementing replicable models of water conservation, water management and water quality managements systems with the ensured participation of the people.

Name of the Initiative: Rapid Action to Enhance Sustainable Access to Safe Water in Palakkad

Location: Elappully and Pudussery Grama Panchayaths in Palakkad District, Kerala, India

The Initiative

People's Service Society, Palakkad (PSSP) is one of the committed and most admired Non-Governmental Organizations in India. It has the expertise and experience in the multi-sectorial social developmental activities with people's participation for the last 42 Years. Programs for upliftment and welfare of the marginalized and downtrodden were given priority in its service sectors since its inception in the year 1978.

WaterAid International and its Indian reach WaterAid India extended its services in Kerala through People's Service Society, Palakkad through the project for a “Sustainable Access to Safe Water in Palakkad”. “Sustainable Access to Safe Water in Palakkad” (SAS) the flag ship project in water sector of Pudussery and Elappully Grama panchayaths, the most drought affected locations of Palakkad district completed its implementation by March 2021. The unique interventions of the projects have attributed a 180 degree change in the water sector of the project area.

The intervention to change the mind-set of the inhabitants and the public is very important to uphold the motto, 'Just Use of Water, Only to Serve the Purpose'. The moral responsibility of the human beings on Earth is to keep the equilibrium of the natural system. The water which falls on the surface of the earth by rain showers is to be percolated to the shallow and deep aquifers. Measures and

interventions for Judicious water management, sustainable water conservation and systematic water quality management executed in the SAS project ensured the safe access to drinking water in the project area and started to act as replicable models, in the Water and Sanitation sector.

The entire project was funded by WaterAid India as CSR initiative. People's Service Society, Palakkad was the implementing partner. The experience and expertise of PSSP helped to mobilize the local stakeholders. The other stakeholders are:

- Grama panchayths
- Kerala Water Authority
- Janakeeya Kudivella Suchithwa Samithees as grass root level action groups
- Housing colonies
- Asha Workers of health department
- Health Department
- Anganwadi management committees
- School PTAs
- Farmers organization

Community participatory approach

Community mobilization felt as highly essential to raise people's awareness for a specific programme and it is a process of bringing together or networking of many stakeholders who are in the development scenario. The SAS Palakkad mobilized the project area communities in collaboration with the existing grass root level stakeholders. These existing institutional arrangements are the easy entry points to introduce all the project activities covering all the remote locations. The JKSSs have been promoted in 340 hamlets of these two project area Grama panchayaths and they have been nurtured and empowered to handhold all the project interventions and to sustain the results.

Innovative Initiatives

a. **Ground water recharge:** Interventions to ensure ground water sustainability is the most urgent step of every human being on earth which is to begin today itself. In this juncture, SAS water in Palakkad project uphold the goal in all components to recharge maximum rainwater as ground water in the project locations.

b. **Dug well recharge with roof water :** Rainwater recharging through dug wells and bore wells ensures source strengthening and aquifer loading as ground water storage. Well recharging with rainwater in the due course has achieved high water purity levels especially in the case of dissolved solids and metallic impurities. Every structure in the surface of the soil inhibits the area from rainwater recharging. The moral responsibility and the intake volume of water can be compensated through roof water recharge to dug wells or bore wells. Almost 80% of the open dug wells of these two Grama Panchayaths have been recharged using the roof top water.

c. **Pond Storm Water Recharge and Restoration :** Ground water level in the bore wells and the dug wells were going down year by year. So they complemented multifaceted interventions of storm water recharge like check dams, pond restorations, gully plugs, injection wells, and infiltration galleries to effect a change in the ground water level of the project area.

Pond Storm Water Recharge with Injection Well

d. **Rainwater Harvesting :** The rainwater is the purest of the pure water available on earth. The rainwater can be stored and kept for five to eight months without any structural change. SAS Palakkad project supported construction of RWH units in all the schools, Anganwady centers, Govt. Institutions etc.

The roofs of buildings, houses and other structures which are located above the surface of the earth can be made as harvesting area for rainwater. The harvested rainwater can be utilised in summer season and also can be used to recharge the aquifer. The Package of practices which may be very useful for the recharging and harvesting measures are as follows.

- **Rainwater Harvesting area**

Roofs with tiles, GI sheets, concrete etc., can be used as the rainwater harvesting area. But it needs to ensure that the area is not a place where decomposition of leaves and other biological waste are placed.

When there are rain showers after some interval, the dust and other biological waste in the roof area have to be removed. The washing of roofs to remove the dust and other waste items by cleaning the waste and dust with a brush and flushing out the waste without entering the filtering unit is the first package the beneficiary should take care of.

- **Rainwater Channelizing, Gutter and Down Pipe**

The next reach of rainwater from the roof is to the Gutter. Gutter needs to be fitted along the roof to collect the rainwater to the harvesting tank. The gutter slope that is 1 centimeter and placing nylon net above it to avoid the deposit of leaves and other bio materials should be ensured while fitting the system. Before the onset of the rainy season the net and gutter should be cleaned. The flow of roof water from the gutter is arranged to the filter unit through the down pipe. The size of the down pipe should be in proportion to the roof area to ensure the free flow of water from the gutter.

- **Flush out Valve**

The provision to flow out the roof water from the down pipe without entering the filter media is fitted with the flush out valve. This valve is opened to flush out first and occasional rainwater without entering the filter unit as a defensive mechanism to avoid contamination. This flush out valve fitted at the end of the down pipe is to be opened by the beneficiary in the occurrence of first rain and once a while rain.

- **Filter Tank**

Filter tank can be fabricated in concrete, PVC or plastic buckets. Two third of the inside volume and height is to be filled with equal proportion of 12mm gravel, activated carbon and 8 mm gravel. The components of the filter media should be separated with nylon net. These have to be washed once in a year or can be replaced in a year. The top of the filter media should be covered with close knitted nylon net or cotton cloth to avoid the entering of dust and other biological deposits from the roof. One third of the inside heights and volume of filter unit should be vacant to avoid the overflowing the rainwater. In RWH structures filter tank is to be fitted on the top of the tank.

Rain Water Purification — Components and Stages

e. Dug Well Restoration : A dug well was crowned as the centre stage of community life of each hamlet. The restoration of these abandoned dug wells in the parental care of the villagers mobilise through community awareness and sensitization programms. These orphaned, abandoned assets restoration and parenthood generation have been taken as a challenge of reverse innovations for recapturing the forgotten tile of "Pure water and perennial source of the village.


BEFORE

AFTER


BEFORE

AFTER

f. Online chlorination systems in piped water supply schemes : To ensure the quality of water, based on the water quality test report of 4300 water sources, online chlorination system were introduced in the necessary locations of micro Water Supply Schemes.

g. Domestic level solid waste management system established : SAS Water Palakkad introduced a bio degradable model in all the houses of the project area to decompose the domestic wastes. Thus, the domestic biodegradable waste is converted at organic manure (conversion of waste into wealth) for kitchen garden and farming operations. This technology is approved by Suchitwa Mission Kerala."

Solid and Liquid Waste Management

Bio Clean Solid waste management at household level. This technology is approved by Suchitwa Mission Kerala

Grey Water Treatment Unit (WIP) at Chullimada Hamlet

h. Technology Resource Centre : Major interventions undertaken under the SAS project have been demonstrated in miniature models and exhibited for replication and advocacy in the Technology Resource Centre (TRC) which was established in Elappully Panchayath building. The live museum of water recharge models, RWH unit, Online chlorination unit, filtration models and Visual presentations of all interventions attached with an open-air conference area in the TRC is supported with renewable energy. The officer in charge of TRC is providing technical advice and other inputs support in the project area to ensure the sustainability measures.

Sustainability plan of the project

To effect a change in the mind-set and habit of a community through the set of activities were sequentially and serially arranged to achieve the best outcome implemented in all hardware execution of SAS project. These set of activities for each intervention have been sequentially and systematically executed through Operation and Maintenance Training (O&M Training) of SAS water in Palakkad project. Developing a responsible ownership of the beneficiaries for the upcoming activities was given priority in all hardware interventions. The Operation and Maintenance of all systems have been entrusted to the concerned grass root level action groups (JKSSs/Beneficiary Groups) after thorough training. The operation and maintenance training organized for all the hardware beneficiaries are in a three-tier training module. Pre intervention training to mobilize and establish JKSS/BG, the training for the execution of intervention and final day training on O & M plan were included in all operation and maintenance training module. Operation plan based on duties and chart of responsibilities and duty bearers were explained in the final training and entrusted to the JKSS. A monthly prefixed collection of user fee for sustainable financial components ensured with all JKSS O&M Training.

An Operation and Maintenance hand book printed in local language have been given to all JKSS/BGs. The reference book helps in keeping record and other maintenance protocols of hardware structures. The asset has been entrusted and handed to the concerned JKSS in the patronage of Grama Panchayath. The input support and other repair needs for operation and maintenance of all JKSS are also linked to the Technology Resource Centre in Elappully. All the project level hardware structures were geo tagged and an asset register at Grama Panchayath level have been prepared and handed over to the concerned Grama Panchayaths.

Water Supply Structure in a tribal colony

Checkdam

Impact

- Demonstrated replicable models of rain drop conservation approach through well recharging units and RWH structures
- The Gram Panchayaths of the state of Kerala came forward to understand the models and replicated it using their own funds
- Facilitated the Gram Panchayats to avail the Government of Kerala Scheme for well recharging that complements project interventions work
- Private institutions and industries started their enquiries for rainwater recharging and conservation at their own cost by seeing these successful models in place
- The innovative water conservation / recharging methods implemented by this project were exhibited and implemented by Govt. and Non-Government Institutions as a part of their project activities.
- The project could create water neutral geographical locations by conserving and recharging rainwater equally with the pumping out of water. The project's novel idea of promoting 'Water Security Wards' has created much attention at different levels.

Watershed Organisation Trust (WOTR)

JOINT 2nd PRIZE

Prakash Keskar
Executive Director
Watershed Organisation Trust (WOTR)

"At WOTR, we holistically address water-related issues through interventions on the supply side as well as on the demand side. Supply-side interventions cover soil and water conservation measures like building drainage line treatments, water harvesting structures and afforestation. Demand-side interventions look into water budgeting, ecosystem-based crop planning, and introduction of water-efficient technologies like drips, sprinklers etc. Our strategic focus is on reviving groundwater levels, conserving natural vegetation and enabling rural communities-building their capacities to efficiently manage the land, water, and forests surrounding them."

Brief Message

The increasing demand for water from a booming economy, a burgeoning population, and intensive agriculture are rapidly outstripping water stocks in the country and putting immense stress on the sustainability of rural communities and their livelihoods. Water thus is a catalytic entry point into rural communities as their greatest point of need. Our work in Odisha promotes integrated watershed development and sustainable livelihood programs. The southern belt of Odisha receives high and erratic rainfall. Due to this, the community is vulnerable to both drought & flood like situations. By helping tribal households enhance their livelihood security through sustainable management of natural resources, we tackle poverty at the root. Currently in Odisha, we are working in 108 villages across Rayagada, Ganjam and Gajapati districts. In addition, we have supported other NGOs-implementing watershed projects in 118 villages of Gajapati district, covering an area of 25,773 hectares and impacting over 29,256 people.

Since 1993, we have been enabling rural communities across India with 'Integrated Watershed Development' to:

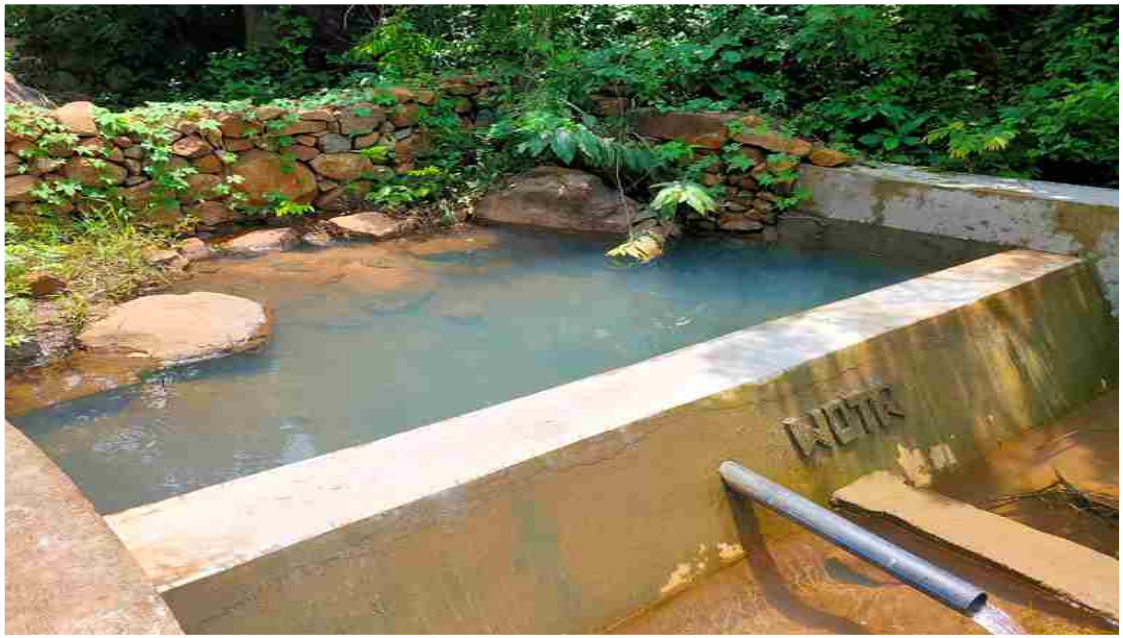
- Capture and conserve water via rainwater harvesting structures
- Treat degraded soils
- Undertake soil and water conservation measures such as water absorption trenches, continuous contour trenches, farm bunds, gully plugs and check dams, among others
- Undertake afforestation to bring barren lands under tree and grass cover
- Establish local representative bodies to manage water assets better through demand

side interventions such as Water Stewardship, Water Budgeting and Water Governance Initiatives

WOTR cumulatively has worked in 3,970 villages and has impacted over 3.95 million people since 1993 across 10 states, creating over 1500 million litres of water storage capacity, while also building capacities of over 456,484 + people from 27 states of India and 63 countries. Our larger mission involves making rural communities resilient to Climate Change and its effects.

Name of the Initiative:
Building adaptive capacities and resilient to climate change of tribal and marginalised communities in Odisha

Location: Rayagada District, Odisha



Diversion Based Irrigation (DBI) system enables farmers to grow the second crop

Water from a perennial stream is made available to farmers using the DBI system. Amina Sabaris is one of the farmers who benefitted from this initiative. He is from Bubarsing hamlet of Kadasi village of Gunupur in Rayagada district of Odisha where WOTR is implementing the project "Building adaptive capacities and resilient to climate change of tribal and marginalised communities in Odisha, with the support of Bread for the World. The project began in August 2018 with the goal of improving and expanding livelihood possibilities for residents in 11 villages in the Gunupur block of Odisha's Rayagada district.

Amina Sabar is a 55 years old farmer living with his family of nine in Bubarsing hamlet of Kadasi village. Bubarsing is a remote village with an extremely difficult road to reach. Accompanying the WOTR team to the village, he narrated an intriguing tale of the efforts taken by the WOTR team, especially Anshuman Panda and Jalandar Parida, in introducing a Gravity Feed Diversion Based Irrigation system.

In this irrigation system, pipelines are used to carry the water from the source, usually a perennial stream, to the target land. While there is sufficient runoff to irrigate the cultivable land, the streams are at a lower altitude of more than 4m from the cultivable land.

So, for irrigation, mechanical means such as a pump sets are required, which are expensive. To overcome this, an intake chamber is constructed at the opening of the spring, and pipes are fitted. The water from the spring enters the pipes and the levelled pipes carry the water to the collection tank. The collection tank is at a height above the cultivable land. Water fills the collection tank from where it is then distributed throughout the land. Where the stream would have flown directly into the river, it is now diverted by constructing an obstruction in its way and the runoff is diverted through pipes.

In Bubarsing where rainfall is erratic's, the system would help cultivate up to 10 acres of land in the Rabi season and provide assured irrigation for 15 acres during the Kharif season. The idea was discussed with the group of farmers through several village meetings. In this process, the farmers were informed about the concept of community contribution. The beneficiaries were asked to construct two stone bunds just above the intake storage so as to avoid siltation.

The survey was completed in January 2020. It was done with the help of an auto level as it is always important to know that the height of the storage tank where the pipe will be fitted should be below the level of the collection tank. This was a totally new experience for the villagers as they have never seen such a type of survey and, were very curious to know about it. As a result of their curiosity, they were also practically trained to measure the two-point level through an auto level.

"The remarkable thing about this work was everyone was paid the same amount regardless of gender. Rs. 200 was paid and my family earned around 6,000 Rs during its construction. Now, thanks to the water availability in this storage tank, I am taking a rabi crop for the first time. This was also useful to irrigate my paddy field during a dry spell in July in Kharif season 2020" Says Amina Sabar

This Diversion Based Irrigation system benefits six farmers and an area of 10 acres is irrigated through this system. Even though this has benefitted Amina Sabar with assured irrigation for his paddy and is now growing his first-ever rabi crop, this activity witnessed several challenges. The first challenge was to ensure that the system would work and provide water to the outposts/pipelines. It was taken care of by the technical team at WOTR who planned meticulously by considering many factors that would ensure water would reach farmers' fields after storing it in the tank first. After the planning stage, execution itself was a challenge. The road leading to Bubarsing was in such a precarious condition that the tractor used to carry only half the load of pipeline and cement to avoid the possibility of being toppled over onto its side. The other challenge was posed by the lockdown in which their strict restrictions were in place.

Amina has grown sunflowers on 1 acre for the first time and expects the harvest in the last week of March. WOTR provided 2 kg seeds for this. Amina converted 0.6 acres of land into cultivable land through the land development initiative in this project. He grew cotton on this patch of land and earned Rs. 3,000 by selling 60 kg of cotton. He now has an optimistic outlook on the future. He plans to grow vegetables next year or grow short-duration crops, and practice zero tillage farming.

9th Edition of FICCI
WATER
AWARDS
2021

Urban Wastewater Management

Urban Wastewater Management

Primove Infrastructure Development Consultants Pvt Ltd

1st PRIZE

Ajeet Oak
Director

Recycling of wastewater and treatment of faecal waste is a non-negotiable requirement in the context of ever-increasing demand for water. At the same time, it is clear that many of the high end and high energy intensive solutions being adopted today for wastewater treatment and recycling are simply not appropriate and affordable to the thousands of small urban and peri urban areas across the country. To ensure sustainability of wastewater and faecal waste treatment projects, we need smarter, more elegant and environment friendly solutions that are affordable and easy to manage. We need solutions that can be effectively implemented at decentralised scale, to ensure ease of maintenance and reuse of the effluent closer to point of generation. We need to provide solutions that close the loop.

Primove' innovation in the sewage and faecal waste treatment sector, called the Tiger Biofilter (TBF) is environmentally responsible, founded on natural processes using biomimicry, is very easy to operate and maintain and has a minimum lifecycle cost.

The ambitious Swachh Bharat Mission launched by GoI has put in place a favourable policy framework and ecosystem to take up the massive challenge of ensuring treatment of wastewater and faecal waste across the country. Technology like the TBF technology provides a powerful tool in the hands of urban and rural service delivery mechanisms to utilise the opportunity and ensure delivery of sustainable solutions in the water and sanitation sector.

PriMove has been providing water and sanitation solutions and services in rural and urban habitats for more than 25 years. They strive to optimise sanitation technology to address the most pressing challenges faced by rural and urban communities and stakeholders, nationally and internationally.

Environmentally responsible and sustainable management of faecal matter and wastewater is a critical contemporary challenge. Recycling of wastewater is a non-negotiable requirement in the context of ever-increasing water demand and supply stresses. The nature of these challenges differs as per the size, geography, and composition of the habitations as well as the level of water supply. Any technological solution to recycle wastewater for further use must acknowledge and respond to these varied conditions. Additionally, it is crucial to recognise the absence of comprehensive sewage networks or conveyance systems. In most habitations, especially peri-urban and developing cities, it is grossly inadequate and yet to be developed.

PriMove has answered these critical logistical and treatment questions. They have developed and implemented their novel, worm-based Tiger Biofilter (TBF) technology. TBF technology is a decentralised, cost effective, and easy to operate faecal waste and wastewater treatment technology which can be adapted to various scales. The technology has been evolved over a period of seven years, to respond to the demands of multiple stakeholders.

TBF technology is environmentally responsible, founded on natural processes using biomimicry, with a minimum lifecycle cost and is very easy to operate and maintain. Operational sustainability and service delivery are the main drivers for the evolution of their technology. Their technology is aligned with the Swachh Bharat Mission of the Government of India.

About Vemifiltration based Tiger Biofilter technology

A typical sewage treatment system is highly power- and labour-intensive and requires complex equipment. The primary mechanism in traditional systems is to treat the sewage by promoting the growth of a large quantity of beneficial bacteria within the wastewater. These bacteria decompose the organic waste and convert it into activated sludge. This resulting sludge is then allowed to settle and separated from the liquid. This process needs to be managed carefully and requires complex equipment (such as large-scale blowers, pumps, and diffusers) and trained manpower.

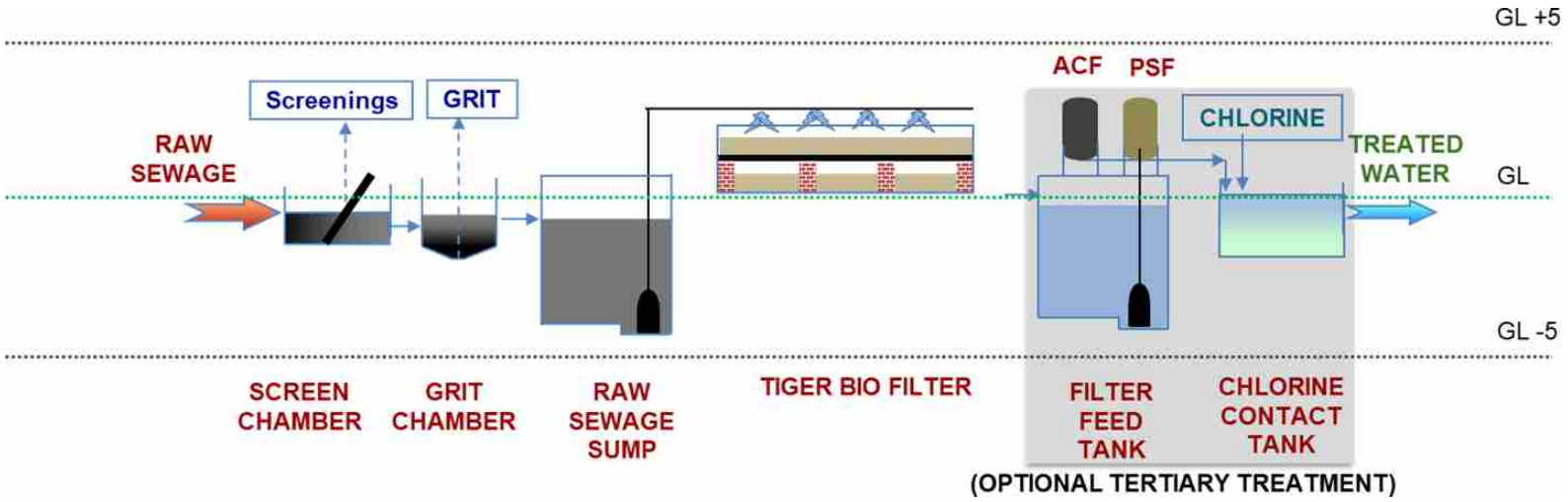
In a departure from conventional approach, the vermifiltration process utilizes biomimicry to treat wastewater. The wastewater is passed through bacteria enriched bio-media, which contains a complete living ecosystem of earthworms and microorganisms to consume the organic waste and convert it into nutrient-rich vermicompost. The driver behind the process is the humble earthworm, which is one of nature's most efficient decomposers of organic matter. The waste decomposition is achieved by a consortium of bacteria in earthworms' guts and in the vermicast. Being an ecosystem, the process requires no additional aeration, is highly efficient, and adaptive to different loads. The solution uses Tiger Worms in the process and has been named as Tiger Biofilter Technology.

The first solution with this technology was a waste digester for single household toilets. This waste treatment system, called Tiger Toilet, consists of a digester containing filter media and earthworms. The Tiger Toilet is a highly efficient digester which very rapidly decomposes waste in-situ. In the last 6 years, their Tiger Toilets have been successfully implemented across the country. Based on the success of this solution, they have developed solutions across the domestic wastewater and faecal sludge treatment sector at scales ranging from single households to STPs for large urban settlements and centralized faecal sludge treatment plants for unsewered urban and peri urban areas.

The Vermifiltration technology was cited in the Manual on Sewerage and Sewage Treatment (Second Edition) by CPHEEO and Ministry of Urban Development, 1993 under chapter 26 - Emerging Technologies for Sewage Treatment, point no. 26.3 Vermiculture Technology.

The two solutions for urban and peri-urban areas, the Tiger Biofilter Sewage Treatment Plant (TBF-STP) and Tiger Biofilter Faecal Sludge Treatment Plant (TBF- FSTP) have been successfully implemented as centralized wastewater and faecal sludge treatment solutions by a number of urban local bodies and private clients. The technology is being implemented under the Swachh Bharat Mission program of the Government of India.

Tiger Biofilter Sewage Treatment Plant



Typical Configuration of TBF- STP

The screened and de-gritted raw sewage is passed through specially designed Tiger Biofilter beds. The filter unit provides a habitat and respiration zone for earthworm growth and propagation. This set-up forms an ecology to treat the wastewater aerobically. Organics from the wastewater are consumed by Tiger worms and bacteria to promote metabolism, providing energy for living and reproduction. The earthworms' burrowing activity further stabilizes the filter media, which improves the effectiveness of the filtration systems. The filtration bed material is specifically curated depending on characteristics of wastewater to be treated.

Thus, in the Vermifiltration based Tiger Biofilter process, the entire secondary treatment and sludge handling part of a conventional wastewater treatment system is replaced by a simple biofilter through which the wastewater is passed. The system also 'closes the loop' by converting the organic matter straight to vermicompost which is nutrient rich fertilizer.

10 KLD STP in New Delhi

1 KLD single family sewage recycling unit

They have so far implemented TBF – STPs of scales ranging from single household units to those treating swage from urban local bodies. The technology has been approved under Swachh Bharat Mission Liquid Waste Management Solution by Government of Maharashtra and is being implemented in a wider range of settlements.

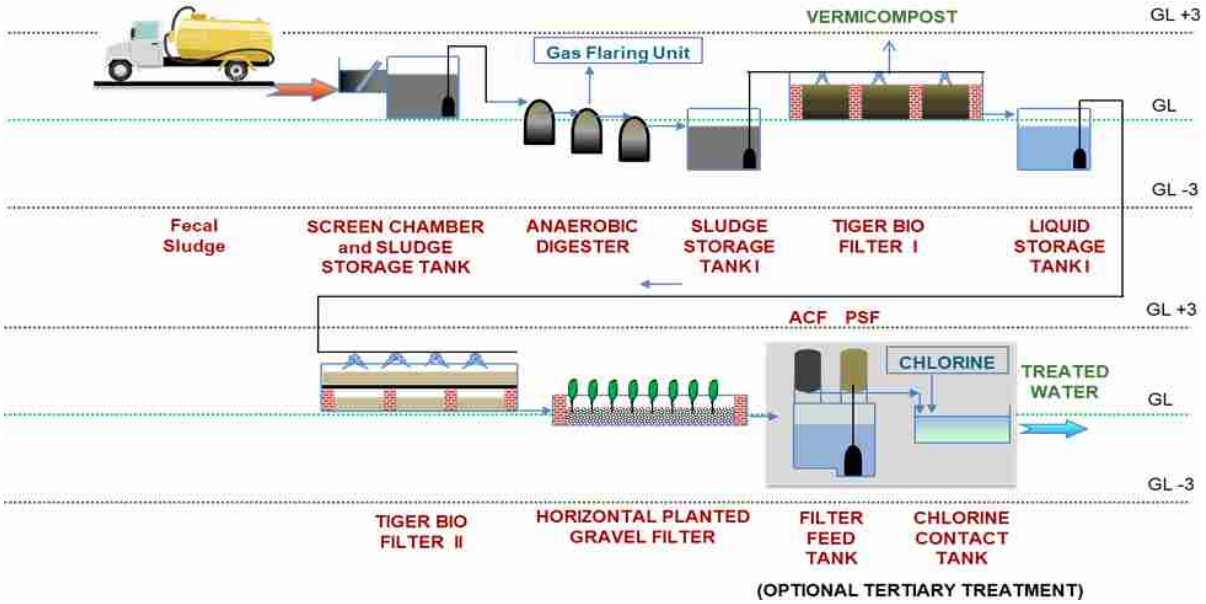
Tiger Biofilter Fecal Sludge Treatment Plant (TBF- FSTP)

Pit latrines and septic tanks are common solutions for waste containment in unsewered urban and peri-urban areas. The septic tanks and pits fill up every few years and are typically emptied using vacuum-suction trucks. The septage pumped out from full

septic tanks and pits is emptied in agricultural fields or water bodies, as there are no waste treatment facilities available in most urban areas. It is widely acknowledged and evident that such indiscriminate dumping of polluted waste into water sources is a great risk to the environment and public health.

Adopting a conventional activated sludge process approach would require large, expensive, and energy-intensive treatment plants to manage the septage waste. A vermifiltration based system is highly suited for treating such high organic waste stream as the living system is capable of handling large organic loads.

The TBF faecal sludge treatment plants are designed to treat septage extremely efficiently and at a fraction of conventional operating costs, as the treatment process itself requires no external power.



Typical Configuration of TBF- FSTP

The typical TBF- FSTP has an initial anaerobic stage which also acts as an equalisation chamber for the incoming septage. The anaerobic stage is followed by two stages of Vermifiltration (Tiger Biofilter I and Tiger Biofilter II). The TBF designed process

optimises a great deal on space and operational expenses due to active decomposition by earthworms at each stage of the process. The TBF FSTP plant outputs treated effluent and nutrient rich vermicompost.

The TBF – FSTP can also be installed at existing sewage treatment plants to ensure effective co-treatment of Septage along with sewage. Providing a TBF co-treatment unit at STPs ensures that the sewage treatment plant process is not disturbed due to shock loads caused by addition of septage. It also generates a by-product in the form of useful Vemicompost.

They have successfully implemented the technology both as co-treatment nit and as standalone FSTP in urban centres in Kerala, Maharashtra and UP, providing a quick and efficient faecal waste management solution for unsewered urban areas.

Case study: Bagul Udyan Tiger Biofilter STP, Pune

Location	Vasantrao Bagul Udyan, Sahkarnagar, Pune
Implementing Agency	Pune Municipal Corporation (PMC), Pune
Scale of implementation	Ward level - serves 5,000 households.
Capacity (KLD)	500 KLD
Year of installment	September 2017
Capital Cost (INR)	0.99 crore
O&M Cost Annual (INR)	Approx. 10 lakhs
Area Covered (SQM)	400 Sqm

The project includes the collection of wastewater from 3 slums, located approximately 1 km upstream from Bagul Udyan, Pune, where the STP is located. The collected wastewater is conveyed to the STP via gravity with HDPE piping. Before construction of the STP, the untreated wastewater and sewage was directed into a nalla called Ambil Odha, which in turn added the polluted wastewater to the Mutha River.

At Bagul Udyan, they have developed a 500 KLD Tiger Biofilter (TBF) based wastewater treatment plant in accordance with the latest MPCB/CPCB standards. The Tiger Biofilter Sewage Treatment System provides rapid, safe, and efficient sewage treatment.

The TBF system has been assembled in three stages: a sewage sump, leading to the biofilter (loaded with layers of waste treating biomedia and earthworms) where the wastewater is treated and tertiary pressure sand and activated carbon filters. The unique set-up of the treatment plant introduces a "trickling" action of the wastewater as it passes through the biomedia, which dissolves oxygen into it. The organic waste matter is digested and metabolized by the earthworms and microorganisms.

The treated wastewater from the Bagul Udyan TBF STP unit is being recycled for irrigating a large garden and a cricket ground developed by PMC on Taljai Hill nearby. The use of treated wastewater is saving the PMC millions of litres of fresh water. This is a clear example of how treated wastewater from a TBF plant can be upcycled for gardening, irrigation, and other non-potable purposes. The TBF based STP at Bagul udyan has been under operation since Sept 2017

Current performance of the system

The treated wastewater is sampled and tested regularly at their in-house lab. Current test reports as below.

Parameter	Inlet	Outlet	Unit
pH	6.18	6.70	-
Turbidity	707	87	NTU
BOD	140	20	Mg/Litre
COD	407	48	Mg/Litre
TSS	242	70	Mg/Litre
TDS	537	200	Mg/Litre
TS	779	270	Mg/Litre

Case study: Tiger Biofilter Fecal Sludge Treatment Plant, Kalpetta, Kerala

Location	Kalpetta, Kerala, India
Implementing Agency	UNICEF, Municipality Of Kalpetta
Scale of implementation	City level. Provides coverage to the town of Kalpetta, of approx. 50,000 souls
Capacity (KLD)	10 KLD
Year of installation	May 2019
Capital Cost (INR)	Rs 80 lakhs
O&M Cost Annual (INR)	Rs 6 lakhs
Area Covered (SQM)	200 sqm

With support from the UNICEF, they designed and implemented the world's first Vermifiltration-based centralised faecal sludge treatment plant. The novel TBF Faecal Sludge Treatment plant has been operational in Kalpetta, Kerela since 2019, with a capacity to treat 10 KLD of faecal sludge and servicing the needs of the entire town of nearly 50,000 souls.

The plant operates on a 4-stage treatment process to ensure a complete and rapid breakdown of faecal waste. The primary technology used to aid the breakdown is this Tiger worm-based technology. After initial screening to remove inorganic and floating matter, the septage is processed in anaerobic digesters. The second and third stage involve specially engineered vermifiltration beds that first separate the solids and liquids and then, process the solids and liquid into treated effluent and nutrient rich vermicompost. Lastly, the liquid effluent is polished through a Pressure Sand Filter (PSF) and an Activated Carbon Filter (ACF) and is finally disinfected using chlorine.

The plant has been operating successfully for over 2 years now, and faecal waste in Kalpetta is no longer dumped on open ground for treatment. The plant cuts the risk of faecal contamination in Kalpetta's water sources entirely and will continue to do so even in the event of natural disasters.

Septage treatment plant at Kalpetta

10 KLD FSTP at Thrissur, Kerala

Impact/ conclusion

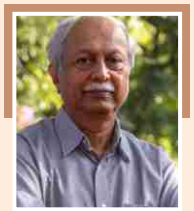
PriMove's indigenously developed Tiger Biofilter technology is paving the way for decentralized, modular, cost-effective, and efficient wastewater and faecal sludge treatment. The use of worms and biomedia to mimic the natural waste decomposition process to reduce the footprint of sewage treatment means that their solutions can be retrofitted into the complex existing infrastructure of Indian cities, towns, and villages. Their solution is highly scalable, with various STPs established that treat a wide range of daily wastewater volumes. The various TBF - Sewage treatment plants have recycled over 700 million litres wastewater and have converted over a 1.5 million litres of septage into water for irrigation and nutrient rich fertiliser.

The unique treatment mechanism also eliminates the need for manual scavenging and the production of vermicompost provides access into the circular economy. The Tiger Biofilter STP is a sure step to providing comprehensive wastewater and faecal waste treatment solutions to the underserved Indian population. With its obvious advantages of low power consumption, efficient treatment process and low O&M costs, the technology is receiving much traction in the present nationwide push for waste treatment through the Swachh Bharat Mission. Tiger Biofilter technology is poised to scale up across the country and become a leading solution for sewage and faecal sludge treatment option.

Center for Water and Sanitation (CWAS) at CRDF, CEPT University

2nd PRIZE

Dr. Meera Mehta
Executive Director – Center for Water & Sanitation – CRDF – CEPT University



Dr. Dinesh Mehta
Executive Director – Center for Water and Sanitation – CRDF – CEPT University

"If we really want to achieve the full scope of sanitation that is envisaged under SDG 6.2, then we have to think beyond toilets. We need to collect all the septage and used water and treat it safely. Faecal Sludge and Septage Management is a simple and cost-effective solution for small and medium towns to safely manage sanitation"

Brief Message

Wai and Sinnar are representative of over 4000 small and medium towns in India. These are towns that have demonstrated that they are able to manage their used water effectively and through their own funds. They have taken huge strides in ensuring safe, equitable and inclusive sanitation. Lessons from Wai and Sinnar are already being replicated in similar cities all over Maharashtra and can be easily picked as a model up by all cities in India."

- Organisation: Center for Water and Sanitation (CWAS), CRDF, CEPT University
- Initiative: Citywide Inclusive Sanitation Services in Wai and Sinnar
- Location: Wai, Sinnar – Maharashtra
- The Initiative

The Centre for Water and Sanitation (CWAS) at Ahmedabad is a part of CEPT University's Research and Development Foundation (CRDF). CEPT's core focus is human habitat and through its education, research and advisory activities, it strives to improve the impact of habitat professions in enriching the lives of people in India's villages, towns and cities.

CWAS has been supporting two small towns Wai and Sinnar in Maharashtra to provide city-wide safe, inclusive and sustainable sanitation services across the value chain. Wai and Sinnar are medium-sized towns, representative of most small and medium Indian towns in India that are home to nearly 40% of India's population. Wai is located at the foothills of Panchgani and has a population of 43,000; Sinnar is located near Nashik and is a fast-growing industrial town, with a population of 72,000.

With CWAS support, these two cities overcame a myriad of sanitation issues such as open defecation, untreated disposal of faecal waste and growing environmental pollution to be declared ODF++ by MoHUA.

Faecal sludge and septage management: Both cities are fully dependent on onsite sanitation systems like septic tanks. In order to tackle the issues of growing environmental pollution caused by infrequent desludging of septic tanks and unavailability of adequate treatment facilities, both Wai and Sinnar Municipal Councils devised a Faecal Sludge and Septage Management (FSSM) plan. As per the plan, all the septic tanks in the city would be emptied once in three years through a scheduled desludging service and the collected septage would be treated at a dedicated septage treatment facility. To treat the septage, Faecal Sludge Treatment Plants were set-up on land allocated by each council. The Wai FSTP was funded by a BMGF grant, and the Sinnar FSTP was funded by Sinnar Municipal Council. The operations of both these FSTPs were carried-out by a private operator.

Resource recovery after FSSM: As the volume of treated wastewater from the FSTPs was quite high, the cities decided to explore on-site and off-site reuse options. Based on the detailed assessments, the cities decided to reuse the by-products on-site. At Sinnar and Wai FSTP, both the councils allocated additional land to set-up resource centres with landscaping and urban forest. Treated

water and solid products from the treatment units are used to maintain and grow the landscaping. In Sinnar, the council engaged with the SHGs groups through a tender for O&M of this landscaped and urban forest area, whereas in Wai this was managed by the FSTP operator.

Resource recovery for Greywater: Sinnar is now going one step further by addressing greywater i.e. water from kitchens and bathrooms. The pilot greywater management project, capitalized on a river development plan where all existing "nallas" or drains in the city are intercepted before they reach the river. This interceptor network leads to a grey water treatment plant situated in a municipal garden and like the FSTP, it will use treated water for landscaping.

Wai and Sinnar have shown that it is possible for cities, dependent on on-site sanitation systems, to deliver high quality, affordable, equitable, and inclusive sanitation services to its citizens.

Impact

- With several Faecal Sludge Treatment Plants (FSPTs) constructed across the country, there is great potential of reusing the by-products generated from FSTPs. The reuse and resource recovery approach helps in viewing treated waste as a valuable resource and can help move towards a more circular economy. This is helping both cities move towards a Water+ certification as defined by Ministry of Housing and Urban Affairs (MoHUA).
- The scheduled desludging services have ensured safe, timely and equitable services for all in the city. Wai and Sinnar are first cities in India to implement such a service. In Wai, it is seen that the quality of supernatant from septic tanks has improved due to scheduled desludging. Ground water quality and in drains leading to the river also have improved. The grey water pilot is expected to further impact this quality.
- Over 38 million litres of septage have been treated so far at the FSTPs. This is used water that would have otherwise been dumped on open land. Instead, it is not treated and the by-products are actually useful for the city. Sinnar's urban forest - grown with this water - especially stands out as an oasis in a barren and rocky landscape. The forest was planted with diverse species of plants for ensuring a strong ecosystem and is already thriving and attracting bird species.
- With many FSTPs coming up in India, there is a huge potential for scaling up the reuse options explored in Wai and Sinnar. In Maharashtra, around 311 FSTPs are being constructed as per a state level directive, and cities have been instructed to reuse the by-products. Many cities like Khopoli and Vita have implemented landscape gardens at their FSTP and have started to reuse the by-products. Similarly, in Satara, reuse options are being planned.

9th Edition of FICCI
WATER
AWARDS
2021

Best Start-up in Water Innovation

Best Start-up in Water Innovation

Digital EcoInnovision

1st PRIZE

Mansi Jain
Co-Founder and CEO

"India's water crisis is a wastewater management problem. The day we get our treatment plants working and our treated water reused at scale, we will win the battle against growing scarcity and sanitation issues."

Brief Message

Today, freshwater is scarce: 21 Indian cities are predicted to run out of groundwater this year, and 54% of the country faces severe water stress. Water is critical to our survival, and the need for devising systems to conserve it has never been as pressing.

Thankfully, we as a society have the solution to this crisis. In our view, the current water crisis is fundamentally a wastewater management problem. In fact, treating and reusing wastewater properly can meet 60-70% of urban water needs! Unfortunately, today nearly 75% of wastewater treatment plants are dysfunctional because operations are manual and reactive in nature and handled by low-skill operators who lack the expertise to manage complex operations. These plants not only produce unusable treated water so freshwater needs to be used instead, but also, their untreated sewage often contaminates water bodies. Finally, even when plants produce usable water, a lot of it goes down the drain as it cannot be completely reused on site while others use expensive freshwater instead.

Our team's experience of over 25 years managing 380+ wastewater treatment plants has allowed us to create DigitalPaani, a technology ecosystem to solve these problems and unleash the potential of wastewater to meet 65% of water needs in developing cities. Our flagship product uses software to scale the expertise needed to operate complex treatment plants to frontline workers, ensuring 24 x 7 proactive, transparent management based on the best technical expertise in each plant. Our eventual vision is to create water positive buildings that in turn significantly improve quality of life in our cities.

Case study:

Organization: Digital EcoInnovision

Initiative: DigitalPaani pilot in a commercial complex with 4,000 employees

Location: Jal Vayu Vihar, Sector 30, Gurugram, Haryana 122001

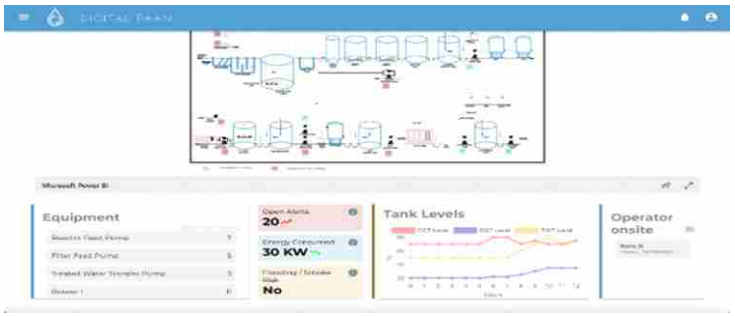
Innovation: The STP was 14-years old and had standard manual operations led by low-skill operators whose actions weren't based on the plant's design or the real-time needs of the plant. As a result, the plant experienced reduced throughput and constant operational challenges such as frequent breakdowns and issues such as filter choking and frequent pump breakdowns.

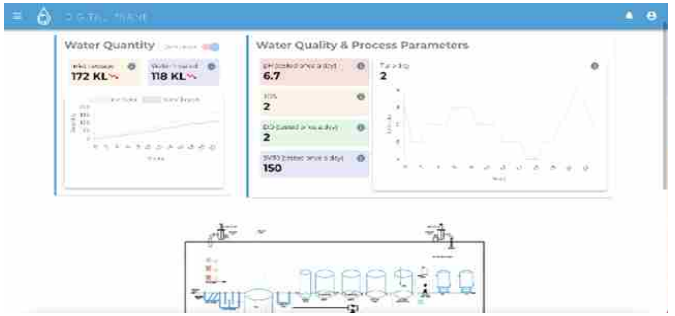
Through a combination of award-winning sensors, automation and software the innovation ensured early detection of problems, provided advanced process troubleshooting and ensured work onsite is based on correct technical guidance, provided full visibility on operations, and improved the reliability of operations. They also recommended energy-saving measures at key points of inefficiency.

Impact:

The plant has now been functioning effectively treating 100% of its water for activities such as horticulture and cooling tower use even as the overall operating costs have come down significantly, including a reduction of 33% in energy consumption. This has even enabled the building complex to offset consumption of over 75,000 liters of freshwater every day and save over Rs 25,000 each month just in reduced energy bills. Finally, breakdowns have almost been eliminated.

“The plant has been working well for months and we are now able to treat 100% of water. Even my energy bill has gone down a lot. The reports are very helpful and there is complete transparency in our operations.”





9th Edition of FICCI
WATER
AWARDS
2021

Special Jury's Award

Special Jury's Award

National Mission for Clean Ganga (Namami Gange)

Special Jury's Award

Mr G Asok Kumar
Director General
National Mission for Clean Ganga
Department of Water Resources,
River Development & Ganga Rejuvenation
Ministry of Jal Shakti
Government of India

"In the past, we used to pay for construction of STPs and operations were neglected. But with the introduction of key innovations such as HAM and One City One Operator Model, we have now included performance-based payment for both construction and O&M. This has resulted in a paradigm shift in terms of life cycle costs as well as productive usage of assets created thereby resulting in role alignment of the stakeholders in the sector with the government's objectives. Further, the HAM model addresses the issues of time and cost overrun and ensures quality of materials used for construction very effectively."

Brief message on initiatives/actions on the long-term water sustainability plan

National Mission for Clean Ganga (NMCG), Government of India is the implementing agency for Namami Gange, which is an integrated mission that operates in conjunction with various Departments and Ministries for protection, conservation, and rejuvenation of River Ganga. Guided by a holistic river centric and basin-based approach, the focus has been on the riverine ecosystem, including components such as pollution abatement, solid and liquid waste management, biodiversity, afforestation, wetland conservation, groundwater, etc. Due to the integrated approach undertaken by NMCG, it has received wide recognition to the extent that the word 'recognition' is now associated with Namami Gange/ NMCG/ Government of India and has led to a paradigm shift in terms of naming, thinking and approach.

In parallel to the transformative changes which took place for river rejuvenation, another breakthrough was led by NMCG in the Indian wastewater sector, i.e. introduction of the Hybrid Annuity based Public Private Partnership Model (HAM-PPP) and One City One Operator (OCOP) Model. These innovative best practices enabled NMCG to enhance infrastructure creation, service delivery, ownership and accountability for the delivery of wastewater treatment services.

- **Name of the Organization: National Mission for Clean Ganga, Ministry of Jal Shakti, Government of India**

- **Name of the Initiative: Hybrid Annuity Based Public Private Partnership Model and One City One Operator Model**
- **Location: Ganga Basin Cities**
- **The Initiative/Innovation**

1. Hybrid Annuity Based Public Private Partnership Model (HAM-PPP)

Launched in 2016, the HAM-PPP is a unique intervention developed for Sewerage Treatment Plants (STPs) in the Ganga River Basin. In alignment with the PPP procurement process followed by the Government of India for infrastructure, a suitable concessionaire for the development & operation of STPs is selected through competitive bidding under HAM. Under the model, the concessionaire gets 40% of the CAPEX and the remaining 60% is indexed to interest rates in 15 years after completion of construction. This results in the issues of time over-run and hence huge cost-over run normally associated with government projects being addressed. Also, as the concessionaires are responsible for operating the STPs for 15 years after construction, the quality of construction and the quality of equipment used is ensured. Moreover, since only 40% of the CAPEX is required to be spent initially, the government can take up more projects, spreading the resources more efficiently.

Unlike the conventional Design Build Operate and Transfer (DBOT) / Engineering, Procurement and Construction (EPC) contracts, HAM-PPP model offers various advantages such as assured government funding, continued performance, distinct accountability and ownership for performance over an extended period of time.

By prioritizing accountability and ownership, the model ensures that the concessionaire not only creates assets but also operates it for its entire life cycle. Moreover, it complements the efforts undertaken by the Urban Local bodies (ULBs) which lack financial, technical and manpower capacities for the design, development, and operation of the STPs using latest technologies.

Today, HAM-PPP model adopted by NMCG has been recognized as the standard bid documents for all HAM projects by Niti Aayog.

Salient Features of the HAM-PPP Model

1. **Performance Linked Payment:** Both the annuity and O&M payments are linked to the performance of the STP. The payments are subjected to the achievement of Key Performance Indicators (KPIs) which include treated effluent quality parameters such as BOD, COD, pH, coliform level, etc.

2. **Assured O&M Payouts:** The model has an assured O&M payments system, which the concessionaire is paid in accordance with the O&M amount quoted in the bid, subject to inflation index. The concessionaire is responsible for the maintenance of the project till the end of concession period.

3. **Reduction of Sponsor's Risk in Funding Equity Commitment:** The model considerably mitigates funding risks of the sponsors, as forty per cent of the construction cost is paid by NMCG during construction. Moreover, there is also a provision for advances which gives some support to the concessionaire in the initial phase of construction. The bid documents have been accepted by the World Bank as the standard bid document for HAM project for World Bank Funding.

Case Study

In Haridwar, two projects have been sanctioned, 68 MLD at Jagjeetpur and 14 MLD at Sarai. With its successful completion, the project marks the first ever HAM-PPP project in the sewage sector in India as well as one of the fastest and successful bid process management. The project was awarded to M/s HNB Engineers Private Limited and NMCG has appointed independent project engineer for close monitoring of the project and quality of work.

On 5th December 2019, the 14 MLD Sarai STP was inaugurated by Their Majesties, the King and Queen of Sweden, in the presence of Hon'ble Union Minister of

Jagjeetpur STP, Haridwar

Jal Shakti, Shri Gajendra Singh Shekhawat; Chief Minister of Uttarakhand, Shri Trivendra Singh Rawat and Director General NMCG, Mr Rajiv Ranjan Mishra. Additionally, Hon'ble Prime Minister on 29th September 2020, dedicated the 68 MLD Jagjeetpur STP to the nation. With the commissioning of this plant, the water quality in Haridwar has reached standard A, the highest that can be achieved.

Both STPs meet the Key Performance Indicators, as per the contract and performance linked annuity payments have also started.

Sarai STP, Haridwar

2. One City One Operator Model (OCOP)

The OCOP model refers to the development of new STPs, along with the existing treatment infrastructure in the ULBs to ensure ownership of treatment at city level and prevent the flow of untreated sewage into the River Ganga. The projects have been rolled in various cities such as Kanpur, Prayagraj, Mathura, Howrah-Bally-Kamarhati-Baranagar Bhagalpur, Farrukhabad, Mirzapur, Ghazipur, etc. and are under various stages of completion. It is expected that the Mathura projects will be commissioned by March 2022 and Prayagraj projects will be commissioned by June 2022.

Salient Features of the One City One Operator Model

1. Singular accountability and ownership for the operation of entire sewage treatment assets of a city.
2. Integration of existing assets, along with new assets, to ensure rehabilitation and accountability of long-term operation and maintenance.

3. Identification of Key Performance Indicators for both existing and new infrastructure to ensure compliance of treated water with prescribed quality standards
4. Opportunities to explore the possibilities for reuse of treated water
5. Increased control by ULBs/ Jal Nigam for performance monitoring.

Case Study

The city of Prayagraj is one of the oldest cities in India, which is situated at the confluence of 3 rivers - Ganga, Yamuna and the invisible Saraswati. With an approximate population of 13 lakh, the city generates over 280 MLD sewage daily. Under NMCG, the entire core town area has been provided with sewerage network and sewage treatment facilities.

The project was awarded to Prayagraj Water Pvt. Ltd. (Adani JV with Organica Water) for Rs 908.3 Cr. Two packages have been sanctioned for sewerage management in the trans Ganga/ Yamuna and operation and maintenance of the existing projects. This has led to the creation of Interception and Development network and 3 STPs with 72 MLD total capacity, i.e., 42 MLD STP in Naini, 14 MLD STP in Phaphamau and 16 MLD STP in Jhunsi. Along with this, the rehabilitation and O&M work of 6 existing STPs with a total treatment capacity of 254

Naini STP, Prayagraj

MLD has been undertaken. While the rehabilitation of all existing STPs are completed, the development of new STPs will be completed by June 2022.

The key features of the project include - adoption of latest green technologies such as Food Chain Reactor to treat the sewage for greenfield projects; installation of a solar based power plants; replacement of traditional sludge drying beds: by mechanical dewatering units; and installation of manual screens to curb plastic pollution. Moreover, the success of the project has also yielded unexpected benefits-3 STPs are achieving KPI at a higher operation flow compared to the actual design and capacity, and this is primarily attributed to the operational excellence of the STPs.

Impact

The NMCG led interventions have resulted in a number of significant achievements such as

i. Dissolved Oxygen (DO): DO is maintained at more than 5 mg/l throughout the length of the river

ii. Biochemical Oxygen Demand: BOD levels are under the set standard, i.e., below 3 mg/l except at 2 stretches where the range is between 3-5 mg/l.

iii. In Haridwar, the water quality has reached class A, which is the highest standard – a big achievement for the mission.

iv. Visible improvement in surrounding ecosystem, especially a rise in numbers of species such as Turtles, Ghariyals, Dolphins, Hilsa, amongst many others.

Visit by Thier Majesties, Sweden

FICCI Water Mission

FICCI constituted a 'Water Mission' in 2011, to promote and provide thought leadership in the area of water efficiency and sustainable water management. It aims to facilitate the sharing and dissemination of best practices across industry sectors in order to encourage corporate and industry players to imbibe a culture of water conservation within their organizations. The Mission focuses on industrial water use efficiency, PPP in urban wastewater and corporate water stewardship.

The Mission is working to create awareness on the existing situation pertaining to water scarcity, quality and generate a discourse on sustainable use of water amongst various users. With growing and extensive depletion and pollution of our water resources, our current work is being restructured to bring this issue back in focus to provide a sense of urgency to the debate of water management.

The objectives of the Mission are:

- To advocate policy direction towards sustainable water management
- To document and disseminate best practices on water conservation, management, reuse and recycling across various sectors and create a forum to facilitate exchange of information and experiences in the country
- To promote through leadership and policy advocacy on sustainable water management including market for wastewater

FICCI Water Awards & India Industry Water Conclave

The FICCI Water Mission has instituted the India Industry Water Conclave and Awards on annual basis to recognize excellence in water conservation and sustainable water management practices. The Conclave and Awards brings together diverse stakeholders from the corporate sector, government, academia, non-governmental organizations, civil society, and financial institutions to showcase best practices, deliberate on policy issues, and propose solutions to surmount challenges in sustainable water management.

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