

COMPENDIUM OF BEST PRACTICES



11th Edition of FICCI
WATER
A W A R D S
2023

Recognizing Excellence in
Water Management & Conservation

© Federation of Indian Chambers of Commerce and Industry, December 2023

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 11th Edition of FICCI Water Awards. The case studies of the awardees are published in the report.

Though utmost care has been taken to present accurate information, FICCI takes no responsibility for the completeness or correctness of the information contained herein. This document is for informational purposes only.

This publication is not intended to be a substitute for professional, legal or technical advice. FICCI does not accept any liability whatsoever for any direct or consequential loss arising from use of this document or its contents.

Rights and permissions

The material in this publication is copyrighted. Reproduction/ transmission of all or any part of this work without acknowledgement may be a violation of the applicable law. Please acknowledge the source of this report while producing portions of this work. Inquiries in this regard can be addressed to FICCI Water Mission, at watermission@ficci.com.

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 11th 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- Hemant Seth, Senior Director, FICCI; Kirtika Arora, Senior Assistant Director, FICCI.

COMPENDIUM OF BEST PRACTICES



11th Edition of FICCI
WATER
A W A R D S
2023

Recognizing Excellence in
Water Management & Conservation



CONTENTS

CONTENTS

Foreword by Chairperson, FICCI Water Mission	2
Special Message by Chair of Jury, FICCI Water Awards 2023	4
Message by Secretary General, FICCI	6
FICCI Water Awards 2023	9
Selection Process	11
Water Awards through the Years	13
Jury Members	28
Expert Screening Panel	31
Category: Industrial Water Use Efficiency	35
Category: Innovation in Water Technology	53
Category: Community Initiatives by Industry	63
Category: Best Startup for Water Innovation.	67
Category: Water Initiatives by NGO.	77

FOREWORD

Water security is a crisis in India that we have to mitigate. According to a NITI Aayog Report, 600 million Indians are facing extreme water stress and by 2030, water demand could be twice the existing supply which could lead to severe water scarcity for millions of people and a ~6% loss to the country's GDP.

This realisation highlights how urgent it is to understand and manage our water needs and resources in an efficient manner. This entails reduction of wastage, optimising water use, and use of cutting-edge technology to treat and recycle wastewater. Reusing and recycling our water resources is the only way to reduce this burden on freshwater resources and ensure a sustainable future. Sustainable water management practices are proactively implemented by Industry bodies across their operations and nearby communities and must be prioritised by everyone in order to achieve a zero-water footprint.



FICCI believes in creating awareness of models and technologies that are robust, scalable and replicable. I set up the FICCI Water Mission 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 instituted the India Industry Water Conclave and Awards on an annual basis to recognize and document excellence in water conservation and sustainable water management practices.

The 11th 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 the Best Start-up in Water Innovation. The Awards acknowledge businesses and NGOs for their exemplary initiatives and endorses their efforts in the use and management of 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 on the future management of water.

I am deeply grateful to the eminent Jury of the FICCI Water Awards, so ably chaired by Dr Mihir Shah, for their invaluable contribution and for continuously raising the standard of the Awards. I would also like to thank the Expert Screening Panel for their scrutiny and technical evaluations- the energy and time committed by our jury and experts is an indication of their commitment to the cause. 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

Naina Lal Kidwai

Past President, FICCI

Chair, FICCI Water Mission

SPECIAL MESSAGE BY CHAIR OF JURY

The old assumptions of stationarity are no longer valid in this era of the Anthropocene and climate change. The past is no longer a reliable indicator of what is to come. Changing patterns and intensity of precipitation, as also rates of discharge of rivers, show that it can no longer be assumed that the water cycle operates within an invariant range of predictability. This demands an emphasis on agility, resilience and flexibility as the foundational principles of water management, so that there could be an adequate response to the heightened uncertainty and unpredictability of the future, based on new design-driven approaches, which are able to foresee incalculable outcomes and provide novel, alternative solutions to be experimented with and tested in practice.



All over the world, which is witnessing unprecedented challenges posed by climate change in this era of the Anthropocene, there is a growing recognition that we need to focus on nature-based solutions for the problems facing humanity. Such solutions have been shown to be economically viable and socially appropriate, based as they are on collective action by concerned stakeholders. They leverage the power of Nature to find cost-effective, sustainable solutions to the emerging water crisis, which deepens by the day.

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. 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 2023

MESSAGE

The global economy faces a rising threat from freshwater scarcity, driven by escalating demands, depleting reserves, pollution, and climate change. India, constituting 18% of the world's population but with only 4% of freshwater, is classified as 'water stressed.' Factors include groundwater misuse, surface water pollution, and inadequate wastewater management. Urban areas generate 72,368 MLD of sewage, but treatment capacity is only 37%, with 40% not fully operational.

Despite commendable efforts, a significant gap exists in wastewater treatment capacity. Reclaimed water emerges as a



pivotal solution, aligning with circular economy principles. The private sector, recognizing water scarcity urgency, actively manages resources sustainably, creating shared value.

FICCI, through its Water Mission, advocates for water sustainability, engaging with member companies. The FICCI Water Awards, part of this mission, promote awareness and recognize outstanding contributions to sustainable water management.

This compendium showcases best practices and innovative approaches from FICCI Water Award winners, offering replicable models to address water scarcity challenges. Congratulations to the winners, and gratitude to the Jury, Screening Panel, participating organizations, and the FICCI Water Mission secretariat.

Let's draw inspiration from these endeavours and collectively work for a water-secure future.

S K Pathak

Secretary General
FICCI



FICCI WATER AWARDS CATEGORIES

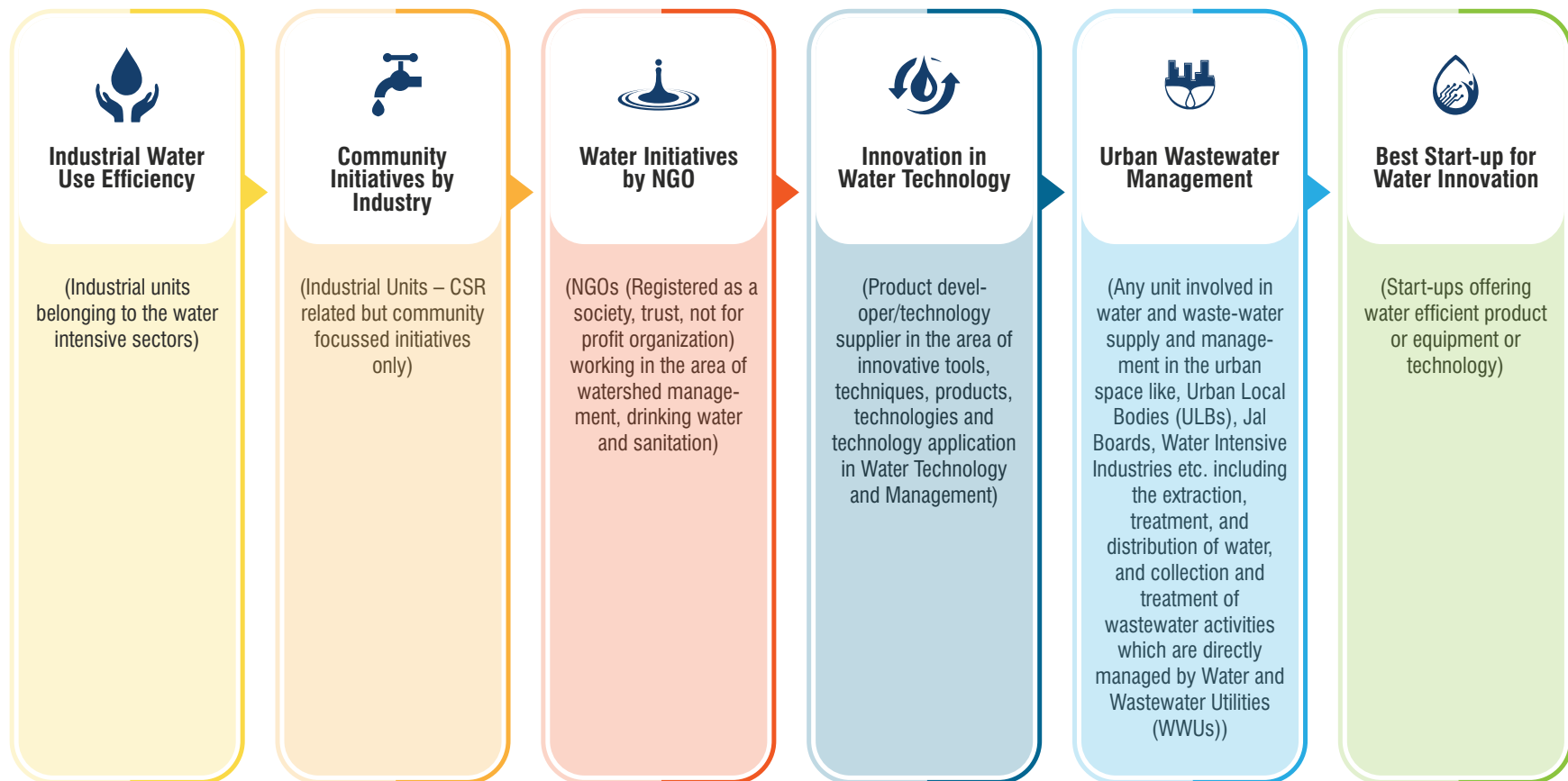


FICCI WATER AWARDS

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



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



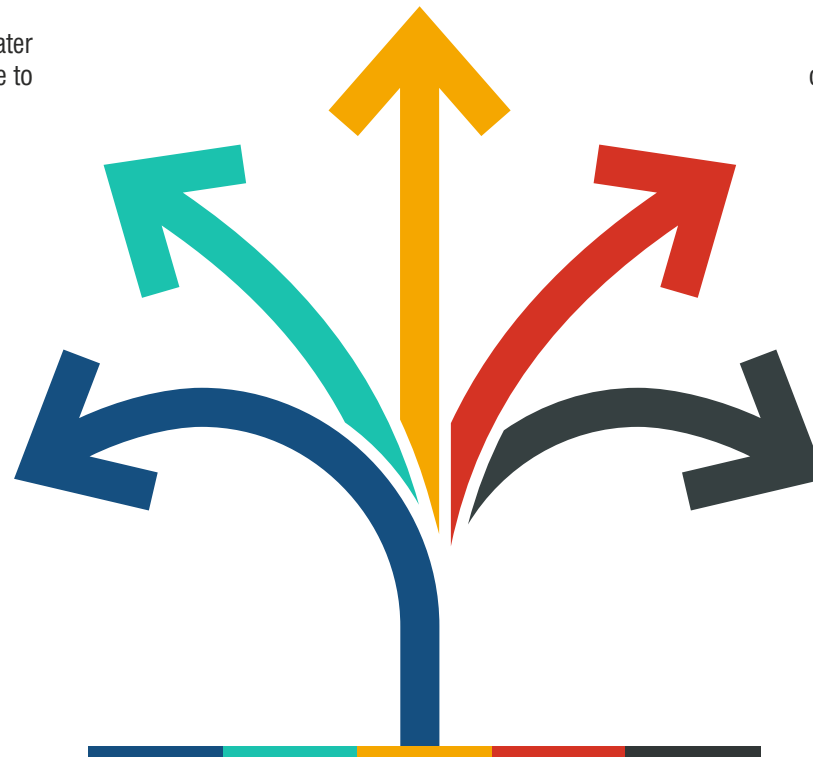
The call for awards is put up through print and online advertisements, and nominations for the different categories are received. A standard template for sending information is developed for every category. Through its network and database, FICCI Water Secretariat reached out to organizations working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



SELECTION PROCESS



WATER AWARDS THROUGH THE YEARS



2022

- 1 Hindustan Unilever Ltd., (Khamgaon Factory) (1st Prize) in the Community Initiatives by Industry Category
- 2 Coastal Gujarat Power Ltd. (2nd Prize) in the Community Initiative by Industry Category
- 3 Talwandi Sabo Power Ltd. (Special Jury's Award) in the Community Initiatives by Industry Category
- 4 Honda Motorcycle & Scooter India Private Ltd., (Narsapura) (1st Prize) in the Industrial Water Use Efficiency Category
- 5 Hindalco Industries Ltd.- (Belagavi Works) (2nd Prize) in the Industrial Water Use Efficiency Category
- 6 The Energy and Resources Institute (TERI) (1st Prize) in the Innovations in Water Technology Category
- 7 Taylormade Renewables Ltd. (2nd Prize) in the Innovation in Water Technology Category
- 8 Centre for Environment Concerns (Special Jury's Award) in the Innovation in Water Technology Category
- 9 The City Administration of Aurangabad (AMC & ASCDCL) (Special Jury's Award) in the Urban Water and Wastewater Management Category





7



8



9

Winners of the Water Awards being felicitated by Mr G Asok Kumar, Director General, NMCG, 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 2022, Distinguished Professor, Shiv Nadar University; Ms Naina Lal Kidwai, Chairperson, FICCI Water Mission, and Past President, FICCI; and Ms Jyoti Viji, Additional Director General, FICCI.

2021

1. Tata Steel Ltd. (1st Prize) in the Industrial Water Use Efficiency Category
2. Vardhman Fabrics (2nd Prize) in the Industrial Water Use Efficiency Category
3. Asian Paints Khandala (Joint 3rd Prize) in the Industrial Water Use Efficiency Category
4. Delhi International Airport Limited (Joint 3rd Prize) in the Industrial Water Use Efficiency Category
5. Green Lantern Engineering Pvt. Ltd. (1st Prize) in the Innovation in Water Technology Category
6. Himmotthan- Tata Trusts, Dehradun (1st Prize) in the Water Initiatives by NGOs Category
7. Bio-me Solutions (2nd Joint Prize) in the Water Initiatives by NGOs Category
8. People's Service Society Palakkad (2nd Joint Prize) in the Water Initiatives by NGOs Category
9. Watershed Organisation Trust (WOTR) (2nd Joint Prize) in the Water Initiatives by NGOs Category
10. Primove Infrastructure Development Consultants Pvt. Ltd. (1st Prize) in the Urban Wastewater Management Category
11. CWAS-CEPT University (2nd Prize) in the Urban Wastewater Management Category
12. Digital Ecolnnovision (1st Prize) in the Best Start-up in Water Innovation Category
13. NMCG , Special Jury's Award



1



2



3



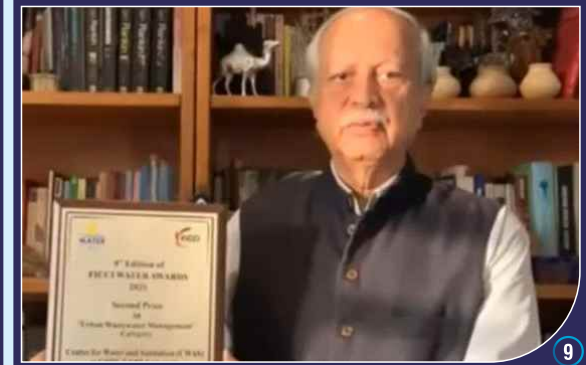
4



5



6



Winners of the Water Awards being felicitated virtually by Mr Gajendra Singh Shekhawat, Hon'ble Minister of Jal Shakti, Government of India; Mr Pankaj Kumar, Secretary, Department of Water Resources, River Development and Ganga Rejuvenation, Ministry of Jal Shakti, Government of India; Mr Sanjiv Mehta, President, FICCI and CEO & MD, Hindustan Unilever Limited; Dr Mihir Shah, Chair of Jury - FICCI Water Awards 2021, Distinguished Professor, Shiv Nadar University; Ms Naina Lal Kidwai, Chairperson, FICCI Water Mission, and Past President, FICCI; Ms Reshma Anand, Co-Chair, FICCI Water Mission and CEO, Hindustan Unilever Foundation; and Ms Rita Roy Choudhury, Assistant Secretary General, FICCI.

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.



2019



1



2



3



4



5

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, Sanitation and Hygiene (WASH) Institute (Joint 1st Prize) in Water Initiatives by NGO Category
4. Pratik Enviro Foundation (Joint 1st Prize) Water Initiatives by NGO Category

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.



2017



1



2



3



4



5



6

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 Ecosoft 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.



1



2



3



4



5



6

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.



2012



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

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.



FICCI WATER AWARDS 2023



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



Expert Screening Panel

Dr Manoranjan Hota
Expert Screening Panel



Dr Sujit Kumar Sinha
Expert Screening Panel



CHAIR OF JURY, FICCI WATER AWARDS 2023



Dr Mihir Shah

Chair of Jury – FICCI Water Awards 2023
Distinguished Professor, Shiv Nadar University
Chair, National Coalition for Natural Farming
Former Member, Planning Commission

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 first-of-its-kind Masters Program on Rural Management. 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, the Asian Institute of Technology, Bangkok 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. 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.




Dr. Sujit Kumar Sinha

Former Director, Atal Bhujal Yojna, Central Ground Water Board Ministry of Jal Shakti, Government of India

Shri S.K. Sinha is an alumnus of University of Roorkee (now IIT, Roorkee), did M. Tech in Applied Geology in 1984. Further, in the year 1996, he perused Master of Hydrology at IIT Roorkee as a sponsored officer from Govt. of India. He started his career in Central Ground Water Board, Ministry of water Resources, Govt. of India in 1986, worked for more than 34 years in Government as Ground water professional in various capacities in different parts of India. He superannuated from Government service in Sept 2020 and presently associated with “Atal Bhujal Yojana” as Team Leader and Advisor appointed by WAPCOS, The Atal Bhujal Yojana is one of the flagship schemes of Ministry of Jal Shakti, Govt. of India. He has vast experience in dealing with various aspects of ground water in different terrains of India. He is an accomplished professional and researcher in the Water Resources Sector in general and ground water domain in particular.

He is visiting faculty at IIT, Delhi and IIT Roorkee, RGI, Raipur. He has been invited by UN, IAEA, Vienna and other International Agencies as an expert on ground water during various international programs. Shri Sinha is widely travelled with versatile experience of working in various facets of ground water management which includes Ground water exploration in alluvium & Hard rock areas, estimation of ground water resources, sustainable development and management of ground water, Artificial recharge to ground water.

AWARDEES 2023

 CATEGORY
01

Industrial Water Use Efficiency


1st Prize

Grasim Cellulosic Division
 (Unit of Grasim Industries Ltd.)
 Vilayat, Bharuch, Gujarat

Joint 2nd Prize

NTPC Ltd.
 Muzaffarpur Thermal
 Power Station, Kanti

Century Enka Ltd.
 (Pune)

 CATEGORY
02

Innovation in Water Technology

1st Prize


ECOSTP
 Technologies Pvt. Ltd.

2nd Prize

NTPC Ltd.
 Simhadri Super Thermal
 Power Station

Special Jury's Award


Naturesani Pvt. Ltd.

 CATEGORY
03

Community Initiatives by Industry

1st Prize

Nayara Energy Ltd.

 CATEGORY
04

Best Startup for Water Innovation

1st Prize

Seventy One Percent
 Analytics Pvt. Ltd.

Joint 2nd Prize

Waterlab Solutions Pvt. Ltd.

Tellus Habitat Pvt. Ltd.

 CATEGORY
05

Water Initiatives by NGO

1st Prize

Srijan India

FICCI WATER AWARDS 2023 Category



**Industrial Water Use Efficiency
Innovation in Water Technology
Community Initiatives by Industry
Best Startup for Water Innovation
Water Initiatives by NGO**



INDUSTRIAL WATER USE EFFICIENCY



Grasim Industries Ltd.

(Unit -Cellulosic Division Vilayat)



Mr. H K Agarwal
 Managing Director



“Think about tomorrow, today!”

Protecting and conserving water resources through excellent water management practices and governance systems is a priority and is integral to our commitment towards water stewardship.”



Brief message from CEO and long-term goals:

Water is the most fundamental need to human existence and is required by all forms of life on earth. According to UN, at present, one in four people (two billion people worldwide) – lack safe drinking water. Around 1.4 million people die annually and 74 million will have their lives shortened by diseases related to poor water, sanitation and hygiene.

Water scarcity and climate change are major risks to our business as lack of adequate water availability can negatively impact operations. Water as a natural resource is susceptible to adverse impact from climate change. Hence, it is critical for our businesses to focus on water use and conservation to remain sustainable.

Our business has been consistently taking steps to attain global benchmarks in manufacturing man-made cellulosic fibres (MMCF), by consistently improving the sourcing and manufacturing practices. Responsible manufacturing is the mainstay of our entire business, and this is achieved by adapting the best available technologies, benchmark best practices and strengthening the closed-loop manufacturing processes.

We have applied the 4R Principles (reduce, reuse, recycle and regenerate) in operations for closing the loop on water, resulting in several technological breakthroughs and helping reduce water consumption significantly. Business is committed to reduce water intensity by 50% by 2025 from baseline of FY16. Based on our sustained efforts, our Business is amongst the lowest water consumer in viscose fibre manufacturing process. The focus is on improving water availability and consuming natural resources responsibly, aligned to our vision to be the leader of sustainable business practices in MMCF industry.

Name of the Organisation : Grasim Cellulosic Division (Unit of Grasim Industries Limited)

Location : Vilayat, Bharuch, Gujarat

Name of the Initiative : Water Intensity Reduction through Sustainable and Innovative Practices in Viscose Staple Fibre Industry

Brief about the Initiative : Birla Cellulose is committed to reduce its water intensity by 50% by 2025 from baseline of FY16. The focus is on improving water availability and consuming natural resources responsibly.

Philosophy of 4R (Reduce, Reuse, Recycle and Regenerate)

Man Made Cellulosic Fibres (MMCF) such as viscose, modal, and lyocell are nature-based fibre derived from sustainably sourced wood. Conventional viscose fibre manufacturing process requires a large quantity of water, and access to water both in terms of quality and quantity is of paramount importance.

Birla Cellulose has applied the 4R Principles (reduce, reuse, recycle and regenerate) in its operations for closing the loop on water, resulting in several technological breakthroughs which have reduced water consumption significantly. In order to implement the water reduction journey, qualitative and quantitative mapping of water & effluent was initiated. This was to develop better understanding of baseline data, what quality of water is required where, in what quantity and where is it landing after use. This helped us identify the possible losses as well as build data for target setting and internal benchmarking.

Post this mapping, 4R Journey can be summarized as follows –

R1 – Reduction

Reduce Water consumption with better technologies that require less water. Low water technologies are developed and deployed in core viscose processes such as fibre washing, chemicals recovery, cooling tower etc. Key initiatives involved:

- ◆ Digitization for real time monitoring & benchmarking of water consumption among various processes.
- ◆ Pinch study of product washing cycles to identify reduction opportunities
- ◆ Adoption of self-cleaning filter/ cake generating filters instead of liquid effluent generating filters
- ◆ Use of either process liquid or other used streams for filter washing.
- ◆ Air cooled condensers in captive power plant to avoid evaporation loss



Flowmeters for consumption monitoring



Pinch analysis - product washing

R2 – Reuse

Reuse water in the process or other applications multiple times. Circular technologies have enabled water to be used several times in finishing and recovery processes. Key initiatives involved:

- ◆ Use of low TDS streams for existing filter washing
- ◆ Reuse of RO reject for single use applications like quenching of tail gases, earlier done with fresh water.
- ◆ Lean chemical for washing i.e. Effluent stream reuse in process e.g.
- ◆ Desulfurization with Na₂S and Lean steam filtration & usage
- ◆ Fresh Water Elimination in Filter Backwash (candle, tow & filter press)
- ◆ Elimination of Once Through fibre washing in process –

R3 – Recycle

Recycle water with innovation in wastewater recycling and advanced membrane-based technologies. The water quality achieved after recovery is better than the soft water quality.

Key initiatives involved:

- ◆ Installation of RO on low TDS stream
- ◆ Installation of RO on treated effluent stream and recycle back to process
 Both these steps involved following –
 - Loss of water during soft water generation &
 - Reuse of water which would have added to effluent
- ◆ Stage wise recycling of vacuum pump & mechanical seal water to avoid any single use.

This step was the game changer for their water reduction journey and helped us reduce water footprint significantly.



Lean chemical for washing



Filter backwash water elimination



RO installed on treated effluent and other process streams

R4 – Regenerate

Regenerate water through harvesting (by building dams and reservoirs) to store water in the rainy season that can be used later in the year.

Key initiatives involved:

- ◆ Rainwater harvesting to collect water during rainy season from
 - Administrative & other non-plant buildings
 - Storage buildings like engineering material stores & warehouses.
- ◆ Recycling after settling storm collection of Coal Storage Area
- ◆ In order to further improve their credentials on this front, they are exploring technologies which can
 - Recover Water from mist of Cooling towers
 - Additional natural pond for water collection

Impact: In nut shell, the impact created can be summarized as follows –

- a. A whopping 75% reduction in fresh water consumption for VSF manufacturing at site. This equals to water saving of ~42 million litres every day which is nearly a day's consumption for a tier #3 city.
- b. This helped us achieve following:
 - ◆ Free up fresh water for potable & agricultural uses
 - ◆ Reduced ecological load on effluent discharge and
 - ◆ Most importantly reduce dependence on fresh water sources

They further strive to become the 1st VSF complex globally, which doesn't use fresh water at all & the water journey continues.



Rain water harvesting and reuse in process

NTPC Ltd. Muzaffarpur Thermal Power Station, Kanti

JOINT 2ND PRIZE



Mr. K.M.K. Prusty
Head of Project, MTPS Kanti
NTPC Ltd.



“At MTPS Kanti, we are focussed towards preserving environment and natural resources. Since, water is one of the precious natural resources, we are committed to conserve water by following 3 R's principle i.e, Reduce, Reuse & Recycle using structured approaches & adopting Best Practices across the industry, while carrying out its core business activity of Power Generation”



Brief message:

Water is one of the most precious natural resources on our planet. Seeing the recent water consumption trends across the world, it is evident that there would be a huge scarcity of freshwater in future. In context to our country, for a population of 16%, India holds only 4% of the world's freshwater resources, hence situation seems to be grim and needs urgent attention to conserve water & to hold adverse climate changes.

To address the issue of climate change, In 2015 United Nations member states have defined 17 Sustainable development goals (SDGs) under which water sustainability is one of the key components. Taking cognizance to this our country has taken multiple steps by way of policy intervention, issuance of directives & guidelines focusing on climate change & water sustainability. To align with UN SDGs & India's NDCs, our company NTPC, being a responsible corporate and largest energy conglomerate has laid down its own 'The Brighter Plan - 2032' which aims to accelerate NTPC in leading the energy transition and is committed towards becoming one of the most water efficient power company globally by generating more power per drop.

At MTPS Kanti, being one the unit of NTPC Ltd., we have aligned ourselves with the company's policies for protection and preservation of environment and natural resources. Additionally, at MTPS we have taken several initiatives over the years emerging after adopting systematic & structured approaches such as formation of POGs (Performance Optimization group), Capacity Building through learning, Training & awareness programmes, issuance of guidelines towards water sustainability, Digital initiatives & Transparency measures such as display of water flows in various processes, Real time Water monitoring Dashboard, Daily reporting of water consumption, conducting Third party water audits, mandatory & voluntary disclosures to appropriate authorities.

MTPS has been proactive in implementing the recommendations came through structured study, analysis & audits to conserve water. Through In-house developed Engineering schemes and further implementation such as Ash Water Recovery System (AWRS) & Dry ash extraction system (DAES) leads to huge water savings. Under water sustainability measures, Scheme of Zero Liquid Discharge (ZLD) has been implemented successfully through engineered and in-house schemes.

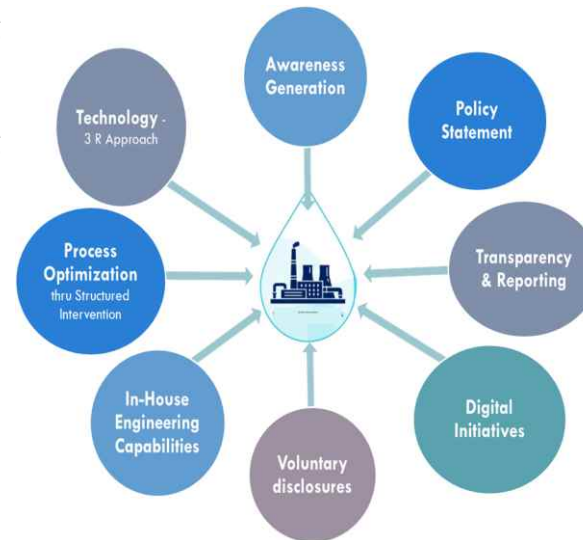
MTPS: A Growth Story & Project Synopsis

Muzaffarpur Thermal Power Station (MTPS) previously owned by erstwhile Bihar State Electricity Board (BSEB) started its operation in 1985 with 02 units of 110 MW capacity each. In 2003, Units went under shutdown for various technical & operational reasons. A JV company was formed in Year 2006 with NTPC and later on rechristened as 'Kanti Bijlee Utpadan Nigam Limited' (KBUNL) for revival of old sick units & Project expansion with 02 new units of 195 MW capacity each. Post renovation, Commercial Production from 02 old units was started in 2013 and further New Units started its commercial operation from 2017. Recently in year 2022, KBUNL has been successfully amalgamated with its parent company NTPC Ltd.

In the recent years, Station has shown consistent growth in its Plant Load factor (PLF) & availability while meeting its MOU generation targets set by Govt. of India on annual basis. Reduction of specific water consumption was one of the key components under MOU target along with Generation & plant availability.

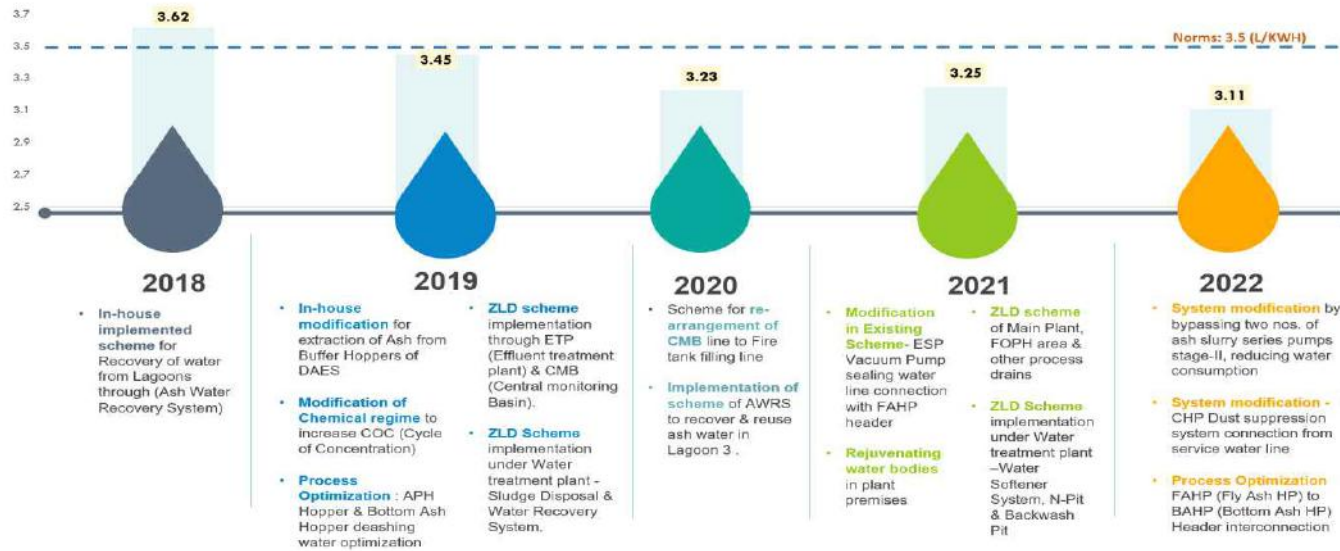
Key Synopsis:

- ◆ Present Installed Capacity: 390 MW
- ◆ Land: 1200 acres approx..
- ◆ Water linkage: 45 cusecs from Burhi Gandak river
- ◆ Beneficiaries: Bihar, West Bengal, Odisha, Sikkim, Jharkhand & DVC
- ◆ Project Location: Kanti tehsil in Muzaffarpur district,
- ◆ Nearest Railhead: Muzaffarpur (20Km)
- ◆ Nearest Airport: Patna (90 Km) & Darbhanga (65 Km)



A Multidimensional approach towards water sustainability

MTPS has adopted systematic & structured approach such as formation of Performance Optimization group for periodic survey of water consumed in various processes and optimization thereof. Capacity Building through learning, Training, awareness programmes, technical documentation etc., Developing In-House Engineering Capabilities for undertaking initiatives towards water sustainability, digital initiatives & transparency measures have been undertaken such as display of water flows in various processes, real-time water monitoring dashboard, reporting of water consumption, conducting Third party water audits, reporting of water related data to appropriate & statutory authorities and voluntary/ mandatory disclosures such as CEO Water Mandate & IR/SAR reporting.



A Journey of Sustainable Water Conservation

MTPS has taken several initiatives in adoption of upgraded technologies for energy conservation and water conservation. Post commercialization of expansion units, specific water consumption has shown a reducing pattern and since FY 2019-20, it has been continuously maintaining below normative value of 3.5 L/KWH

MTPS team has adopted systematic & structured approaches for enhanced water use efficiency and has been proactive in taking up the planned interventions as & when recommendations of process modifications/ new initiatives have been suggested in system.



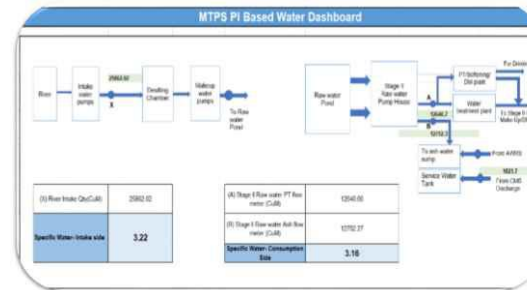
2022.03.22 06:40

Digital Initiatives

Initiative: Access & Display of real-time data for analysis

Intervention: To enable real-time monitoring of water consumption, Ultrasonic flowmeters have been installed at designated process locations & their readings are displayed in Main plant Control room. Further, flowmeters are hooked up in PI server & a simplified water dashboard has been created using PI software which enables monitoring of specific water consumption.

Impact: These digital initiatives are a great tool for Real-time monitoring, creation of alerts & analytics & carrying out self-audits to reduce overall water consumption in processes.

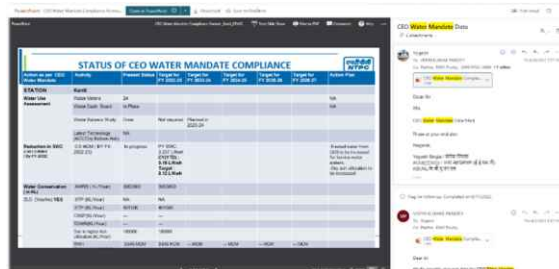


Voluntary disclosures & Policy Statement

Initiative: Capacity Building towards sustainability goals.

Intervention: Voluntary disclosures such as CEO water mandate & mandatory sustainability disclosures under SEBI BSR. Issuance of Company policies for protection and preservation of environment and natural resources

Impact: These measures have led to sensitization of all employees and stakeholders towards water conservation & company policies have served as directives for establishing water management strategies.



Environment Policy-2022

I. Purpose:
NTPC being the country's largest power generator, with its presence across the energy value chain, recognizes that protection of environment is essential for sustainable business.

II. Policy Statement:
"To provide cleaner energy by committing to the highest possible levels of performance in environmental compliance, practices and stewardship."

III. Applicability:
This policy shall apply to all establishments of NTPC and each employee shall be made a partner in implementing the policy.

IV. Principles:
This policy is based on the following principles:
1. Consideration of Environmental factors right from the stage of planning, design and operation of project/station to ensure that mandatory principles of compliance and sustainability are adhered to.

This document contains:
I. Purpose
II. Policy Statement
III. Applicability
IV. Principles
V. Institutional Framework
VI. Policy
VII. Review

Water Policy-2022

I. Policy Statement:
"Committed to become one of the most water efficient power company globally by generating more power per drop"

II. Purpose:
Water is the basic amenity for domestic, agricultural and industrial use. As a responsible corporate citizen, NTPC commits to becoming a flag-bearer by optimizing its processes & practices to increase freshwater availability for other uses.

III. Philosophy:
NTPC shall follow the 3 R's principle for water conservation and management by adopting the best Practices, while carrying out its core business activity of Power Generation.

This document contains:
I. Policy Statement
II. Purpose
III. Philosophy
IV. Applicability
V. Objective
VI. Policy
VII. Stakeholder Management
VIII. Water Stewardship
IX. Compliance & Assurance
X. Human Resource Development
XI. Structure & Responsibilities

Process Optimization thru Structured Intervention

Initiative: APH Hopper deashing & Bottom Ash Hopper Deashing Cycle optimization

Intervention: After carrying out study & analysis of design data of ash collection and Hopper capacity of APH Hopper & Bottom ash hooper, it was recommended

- APH hopper deashing to be done once in a day instead of continuous deashing.
- Reduce cycle of bottom hopper deashing from 3 times to 2 times per day

Impact: Resulted in saving of water and having monetary benefits which further leads to reduction of ash water ratio



In-House Engineering Capabilities

Initiative: In house modification for extraction of Ash from Buffer Hoppers of DAES (Dry Ash Evacuation System)

Intervention: After study of partially implemented Engineered scheme of Dry Ash Evacuation System (DAES) in one of the units (Unit #4), a modified scheme was proposed for extraction of ash in partially implemented scheme.

Impact: Maximizing extraction of dry ash has reduced wet ash evacuation load and thereby reduced water consumption.



Initiative: CHP (Coal Handling Plant) Dust suppression system from service water line

Intervention: To minimize use of Raw water, alternate source was explored for feeding Conflow dust suppression system of CHP & approx. 400-meter pipeline from St-II service water line was erected.

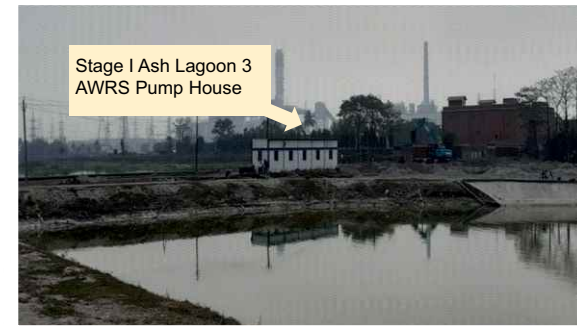
Impact: Minimizing the use of fresh water & better reuse of wastewater



Initiative: In house implemented scheme of AWRS (Ash Water Recovery System)

Intervention: To recover & reuse water from Stage- I Ash Ponds AWRS scheme was studied & developed in-house. Scheme was later replicated in Lagoon #3 also.

Impact: Enabled recovery of water from ash dykes and in turn reduced fresh water intake.



Technology - 3 R Approach



Under sustainability measures, Scheme of Zero Liquid Discharge (ZLD) has been implemented successfully through engineered and in-house schemes. Rainwater harvesting scheme at various locations have been implemented for conserving the ground water. Additionally various water bodies in power plant & township premises have been rejuvenated for storage of rainwater and water is being used from the sources in case of exigencies

Zero Liquid Discharge (ZLD) Schemes:

- ◆ ZLD Phase 1 (ETP & CMB) implementation (Mar'2019)
- ◆ ZLD scheme implementation of Main Plant, FOPH & other process drains (Feb'2021)
- ◆ ZLD- Water Treatment Plant (Sludge Disposal) (Mar'2019)
- ◆ ZLD- Water Treatment Plant (N-Pit) (Apr'2021)
- ◆ ZLD- Water Treatment Plant (Water Softener System) (Apr'2021)
- ◆ ZLD- Water Treatment Plant (Backwash pit) (Apr'2021)



Impact: Re-use of Wastewater from processes & reduction of freshwater intake

Initiative: Water Conservation through Rainwater Harvesting & Rejuvenating water bodies

Intervention:

- ✓ 18 No. Recharge Pits in in various locations of plant and Township
- ✓ 02 no. water storage ponds (Jheels) constructed to store rainwater and use in development of plantation
- ✓ 01 no. water body (Pond) rejuvenated inside township area.

Impact:

- ✓ Reduction in freshwater Intake
- ✓ Water Conservation through Groundwater Recharge.
- ✓ Water Sustainability



Their Way Forward...

Over the past 5 years, substantial water savings have been achieved through several measures & adoption of upgraded technologies. Though they have reached below their normative Specific water consumption of 3.5 L/KWH, they aim at aligning ourselves with NTPCs brighter plan 2032 and attain sp. Water consumption below 3.0 L/Kwh.

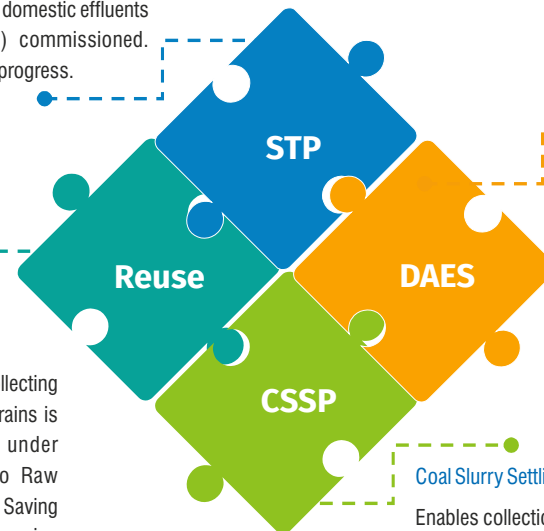
In line with this, MTPS has formulated its own Four-Fold strategy to reduce specific water including Commissioning of Sewage treatment plant, complete installation of Dry Ash Extraction System, Commissioning of Coal Slurry settling pond & reuse of storm water.

Sewage Treatment Plant

550 KL per day STP for treating domestic effluents (in plant & residential area) commissioned. Presently Trial operation under progress.

Reuse of Storm Water

Storm water drain Sump collecting water from plant rain/storm drains is ready. Re-use scheme is under evaluation for connecting to Raw water intake system. Potential Saving of 3000 KL per day during rainy season.



Dry Ash Extraction System

Enable additional utilization of Ash in Dry mode thereby reduces wet ash evacuation load by 400 KL per day initially. Presently System is under commissioning.

Coal Slurry Settling Pond

Enables collection of coal laden water coming from coal yard (Dust suppression water). Potential savings of 350 KL per day. Pond construction & Reuse network under progress.

Century Enka Ltd., Pune (Maharashtra)

JOINT 2ND PRIZE



Mr. Suresh Sodani
Managing Director



“Water conservation is a paramount business priority at Century Enka. It's not just about compliance; it's about ensuring sustainability and responsibility. We are committed to efficient water use, advanced technologies, and community engagement. Together, we can protect this precious resource and drive our business toward a more sustainable future.

“It is said that water will be the new oil and future wars will be fought not for land but for life-essential resources such as water!! The Aditya Birla Group has taken an audacious target to reduce the specific freshwater consumption per million US\$ by 40% by 2025 and all business to become water positive. Further all plants in water stressed area will have zero liquid discharge.”



Brief message:

Water conservation in industrial facilities is a pressing concern in today's world, driven by both environmental responsibility and economic efficiency. Century Enka is embracing the principles of reuse, reduce, and recycle water and has been able to significantly reduce the water consumption and has been simultaneously reduce the operational costs.

Century Enka plant started operations in 1969 in Pune (Maharashtra) and is producing Nylon Filament yarn and Nylon Tyre cord fabric with production capacity 24000 tons/ annum. Nylon production requires huge amount of water and in line with Aditya Birla group sustainability policies, it is very important to reduce this precious resource consumption. Hence, in 2020, the task was taken to reduce water consumption by 25% and I am very glad to share the team worked diligently and achieved 40% water reduction in three years by using principles of reuse, reduce and recycle. Furthermore, we have taken up challenge to further reduce water consumption by 10% in next two years.

During implementation of various water saving projects, various challenges were identified, and innovative techniques were used to address these challenges. Through in-house brain storming sessions were taken and ideas generated were executed using PDCA techniques. Small modifications could give significant reduction in water consumption. The monitoring systems were strengthened, and team was able to sustain the results of improvements achieved.

Century Enka Water journey embarks on three basic principles

- ◆ Reusing water within a factory is a fundamental strategy for water conservation. A closed-loop system is a prime example of water reuse. Water is used for cooling of panels. Water from one panel was reused for cooling of another machine panel.
- ◆ Water treatment plant for Soft water production- Water Quality (PH, conductivity, Hardness and Silica) based blow down method is opted instead of time based so as to avoid unnecessary blow downs. Earlier blow was given in every shift irrespective of water quality. However, it was found that blow down water volume quantity can be reduced as well water requirement of membrane cleaning is also reduced.

- ◆ The most important parameters in cooling tower is pH and Conductivity (Microbiological fouling, corrosion, Scaling etc.). Blowdown & top up of cooling tower is now controlled by periodically checking TDS and pH of cooling tower water, addition of chemicals as well as blow downs are well controlled. Automation done for raw water top up also helped in reducing water consumption.



- ◆ Water from monomer exhaust system of Spin draw machines was reused for another set of spinning machine.
- ◆ Water used for Jacket cooling of dowther pumps, vaccum pumps etc is reused for cooling tower make up.

Reduce-

Reducing water consumption in industrial processes is essential for water conservation. One way to achieve this is through the implementation of water-efficient technologies and practices. For instance, replacing older machinery with high-efficiency equipment can substantially decrease water usage. This may include installing low-flow faucets, using water-saving nozzles in production processes, and upgrading to water-efficient pumps.

Furthermore, optimizing processes to minimize water wastage is crucial. Proper process design and engineering can help in reducing water needs while maintaining equipment safety and efficiency.

Implementing a comprehensive water management plan that includes leak detection and repair programs is another significant aspect of water reduction. Even small leaks can result in substantial water losses over time, and prompt detection and repairs can prevent this wastage.

Some of improvements done are as follows:



Water consumption reduced by replacing water cooled Chips conveying blowers with oil cooled blowers.



Process cooling - Water consumption reduced by replacing air washers with air handling units eliminating use of raw water.



Extruder jacket cooling water flow reduced; Monitoring method changed from flow to temperature of Jacket.



Gardening water reduced by providing sprinklers.



Foam type taps provided in mass consumption areas (Canteen, Residential colony, Washrooms.)



Underground water pipelines (GI) replaced with PPL lines above the ground.

Recycle-

Recycling wastewater offers multiple benefits. First, it reduces the demand for freshwater intake, thereby conserving natural water resources. Second, it lowers the cost associated with treating and discharging wastewater. Lastly, it minimizes the environmental impact of industrial effluents.



Lactum recovery fresh Raw water replaced with recycled cooling water for vacuum pumps.



In conclusion, water conservation in Century Enka, through the principles of reuse, reduce, and recycle is not only environmentally responsible but also economically advantageous. By reducing freshwater intake, minimizing waste, and recycling wastewater, they have significantly contributed to sustainable water management while simultaneously enhancing their operational efficiency and reducing costs. It is imperative that industries prioritize these strategies to ensure a water-secure future for all.



INNOVATION IN WATER TECHNOLOGY



ECOSTP Technologies Pvt. Ltd.

ECOSTP[®]
 sewage to gold™



Mr. Tharun Kumar
 Founder & CEO

“

“We have reclaimed over 2 Billion litres of sewage without using power or chemicals. Our moonshot mission is to ‘reclaim every drop of wastewater, naturally.’ and we are getting there!”

”

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

“Our dedication to long-term water sustainability is not just a corporate initiative; it's a shared vision that unites us all. Together, we can make a lasting impact on the health of our planet and ensure that clean water remains accessible to future generations. Our moonshot mission is to ‘reclaim every drop of wastewater, naturally.”

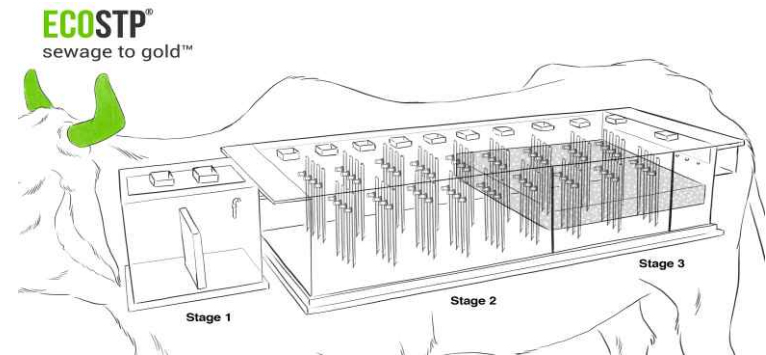
Name of the Organisation : ECOSTP Technologies Pvt Ltd

Name of the Initiative : Net Zero Sewage Treatment

Location : Bangalore

The Innovation:

Their unique patented "Zero Power Zero Chemical " Sewage Treatment Technology has no moving parts compared to conventional STPs which use energy, hogging motors, exhaust fans, pumps, and blowers. The product is a replica of a cow's stomach based on biomimicry concepts.



The Problem:

93% of Indian sewage is untreated!!! As per UN About 80 per cent of the world's wastewater is discharged into the environment without any treatment. In India - cities generate 35,000 MLD of sewage. Out of this only 11000, MLD is treated.

The Solution:

The solution is to implement Sewage Treatment Plants, but Conventional STPs need power and India does not have power! India has energy shortage and is difficult to get ‘power’ to ‘treat’ India’s sewage. Their power is fossil fuel - Coal based.

ECOSTP research team have created a unique 'Zero Power Zero Chemical' sewage treatment product to disrupt the current model of using power hogging motors to treat the sewage. The product is a replica of a cows stomach based on bioengineering concept.

Remember the Water and Energy Connection - Water and energy are intricately connected. Producing energy uses and pollutes large amounts of water. Likewise, providing and using water requires large amounts of energy. Their ECOSTP Product is 'Zero Power' - The more they sell the more they impact environment.

One of the biggest headache of Real Estate is STP .. as over 70% are failures (Imagine 70% of AC or Fans not working !!) and ECOSTP is received well. They are disrupting the current paradigm though 99.9% still opt for the power hogging noisy STPs.

Their best benchmark is our 200+ paying clients . The proof of the pudding is in the eating ! They have 20 Client CEO testimonials - <https://www.ecostp.com/customer-stories/> and they use them as a key sales aid

"Your costs are 70% less"

"ECOSTP is a Tesla " etc

The key factor is RoI - It costs just 2 rs per KL to maintain ECOSTP vs 15 Rs for conventional SBR/ MBBR systems.

Hear from a affordable housing leader - <https://www.youtube.com/watch?v=1DTppXkZj9Q>

Sandeep Bedi, CEO of Janaadhar speaks about their vision "to realise the home-ownership dreams of the Indian population by building high-quality, affordable homes." and how ECOSTP fits into the vision. He beautifully articulates 'affordability'—the highest quality with the lowest lifecycle cost and affordable to begin with. It also means simplicity, the use of fewer resources, and low maintenance.

He lucidly explains that, as quality and affordability are the focus, the Janaadhar team's process of scouting innovations and selection of ECOSTP. He also offers advice on making sustainable sanitation a reality.

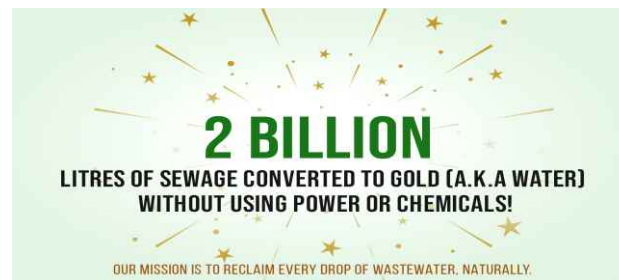
Also worthwhile reading this article from Affordable Housing funder Reall UK

<https://reall.net/blog/world-water-week-2022-seeing-the-unseen-the-value-of-water/>

Brigade Group, Adarsh Reality, DS Max, Aparna, Adani Reality etc. switched to ECOSTP They have a R&D engagement with IIT Jammu to conduct deep research in Green Chemistry / Synthetic Biology. They have already isolated a 'Phenol Eating Bacteria' (code named PEB) on their lab and field testing is planned. The engagement is a unique one - it is joint IP and joint commercialisation. The next global sewage treatment innovations will come from India.

Impact:

They treated over 2 Billion litres of sewage without using power or chemicals.



ECOSTP below playground

NTPC Simhadri, NTPC Ltd.

1st PRIZE



Mr. Sanjay Kumar Sinha
Group General Manager

“

SDG Goal 6 is to ensure availability and sustainable management of water.

Water Water Everywhere & not a single drop to drink. 97 percent of our water resources is sea water which is not usable for drinking purpose. NTPC Simhadri has developed a desalination plant using innovative & low carbon intensive technology. The desalination plant is first of its kind in the country.

”

Brief message :

“As we stand on the brink of a global freshwater crisis, our prime concern remains to ensure sustainable management of water resources for generations to come. Water is the elixir of life, from quenching thirst to growing the food, supporting vast ecosystems, and driving our industries. But the current trajectory makes it hard to take this resource for granted. We are in a situation where over-exploitation, wastage, and contamination of water bodies persist, and climate change intensifies water scarcity.

To march towards a sustainable water future, we must understand that each one of us can make a substantial difference. We must bear in mind that every drop counts. We need to integrate technology into areas of water management. Innovations in rainwater harvesting, drought-resistant crops, desalination, and AI-driven water management systems can help us monitor, predict, and make efficient use of water.

NTPC Simhadri, a 2000 MW coastal based power station of NTPC Ltd has undertaken a few initiatives towards achieving a sustainable water future.

One such measure is setting up a 120 Tons per day capacity desalination plant for the production of desalinated water from sea water utilising the heat of exhaust flue gas of power plant. Given that most of the Earth's water is saline and undrinkable, desalination technology holds immense potential to provide potable water.

Further, the need of the hour is to shift the focus from a linear to a circular water economy. It means we need to reduce, recycle, and reuse - lessening our freshwater footprint. NTPC Simhadri has made a conscious decision in this regard to manage water in a responsible manner by taking initiatives like rainwater harvesting & reusing the effluent.

Simhadri station is also recognised as a Zero Liquid Discharge (ZLD) station.

In conclusion, NTPC Simhadri's implementation of seawater desalination could serve as a model example for other industries to follow, thereby contributing to a sustainable water future.

Name of the Organisation : NTPC Ltd.- Simhadri Super Thermal Power Plant, Visakhapatnam

Location : Simhadri Super thermal Power Station, NTPC Limited, Paravada (Md), Anakapalli (Dt) Andhra Pradesh

THE ORGANISATION

Simhadri Super thermal Power Station is a coastal thermal power plant of NTPC Ltd located in the “City of Destiny “Visakhapatnam, Andhra Pradesh. Generation capacity of this power plant is 4X500MW (Thermal) and 25MW Solar.

THE INNOVATION

The patented, Flue gas-based sea water desalination Technology is an innovative, low carbon intensive desalination system. It is a joint initiative of NTPC Simhadri and NETRA (R&D) of NTPC. The desalination plant installed at NTPC Simhadri is first of its kind in India and in this facility, the waste heat from exiting flue gas in a fossil fired power plant is utilized for distillation of sea water instead of steam or electricity as used in conventional desalination system.

LOCATION OF THE PROJECT

Simhadri Super thermal Power Station, NTPC Limited, Paravada (Md), Anakapalli (Dt) Andhra Pradesh

DETAILS OF THE INNOVATION



The capacity of the Flue gas-based sea water desalination plant is 120 TPD (Tone per day). Flue gas is tapped from downstream of ID fan and sent to a heat exchanger where hot water is generated. This hot water is flashed in flash chamber to produce LP steam. Flue gas exiting heat exchanger is sent back to main flue gas duct going to chimney thru a separate flue gas fan. LP steam is taken to MED (Multi Effect Desalination) where desalinated water is produced from sea water. ID fan is having VFD which modulates the speed to maintain a constant hot water temp at all operating conditions.

SALIENT FEATURES

- ◆ Capacity of Plant: 120 TPD
- ◆ Thermal Rating of Plant: 800 kW-Th
- ◆ Technology:
 - (i) Desalination: Multi Effect Distillation
 - (ii) LP Steam: Flash Steam Generator in conjunction with Flue Gas Heat Exchanger
- ◆ Plant Input: (i) Waste Flue Gas from ID Fan outlet (ii) Sea water (iii) Auxiliary power for drives
- ◆ Plant Output: (i) DM water (ii) Potable water
- ◆ Gain Output Ratio (GOR) more than 6
- ◆ Foot Print: 300 sq.mtr
- ◆ Output Quality: TDS < 5 ppm

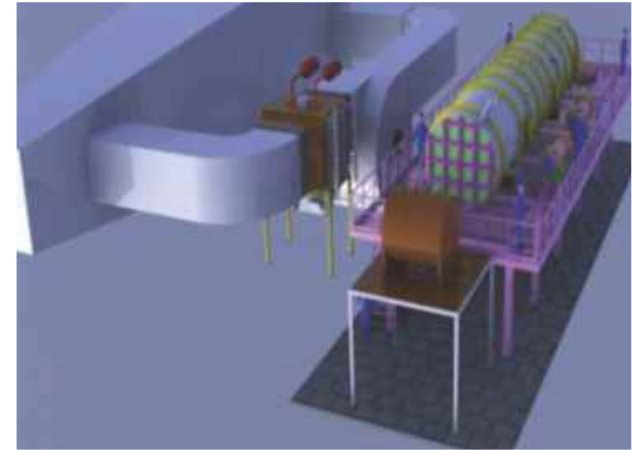
SYSTEM DESCRIPTION

The plant is divided in to two blocks.

Low Pressure (LP) Steam Generation Block and Desalination Block.

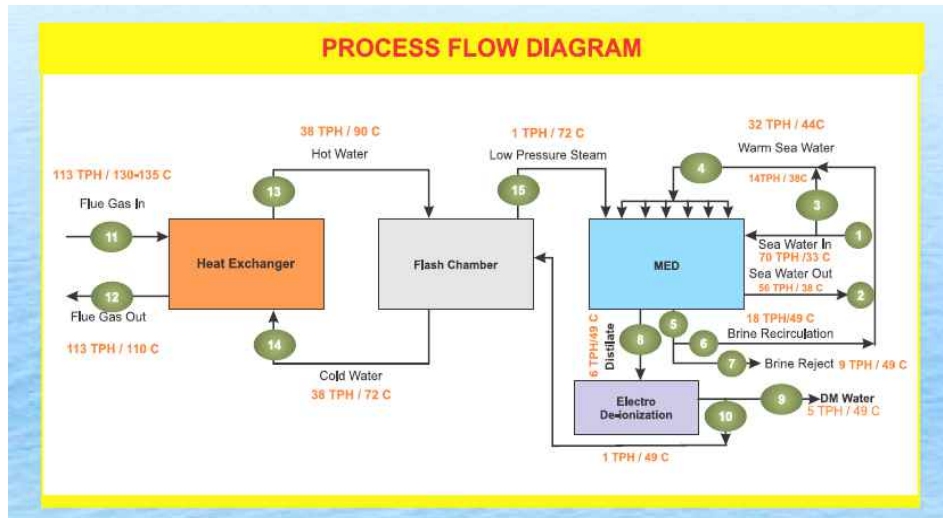
LP Steam Generator Block: In LP Steam Generator Block, the thermal energy from exhaust flue gas exiting ID Fan is utilized to generate hot water at desired temperature thru a heat exchanger. This hot water is flashed in a flash chamber which is maintained under vacuum to generate low pressure steam

Desalination Block: The flash steam so generated is fed to the Desalination block i.e. the 1st effect of Multi Effect Distillation (MED) unit. In this chamber, sea water is sprayed over LP steam piping. Due to the combined effect of high skin temperature of the LP steam piping and vacuum in the distillation chamber, part of the sprayed sea water is evaporated. This phenomenon is akin to a 'falling film reactor'. This evaporated vapour



is fed to the next distillation chamber of MED where it acts as working steam and the above-mentioned process is repeated. Last stage of MED is condenser where vapour generated from preceding stage is condensed. The desalinated vapours produced in various effects are condensed and send to the electrode-deionization system where it is converted to DM water.

BRIEF DESCRIPTION OF THE PROCESS:



The number of effects will primarily depend on three factors: (i) Input steam parameter, (ii) Cooling Water Inlet temperature to MED condenser, (iii) Calcium Content in Sea Water.

MAJOR SYSTEMS

- ◆ SEA WATER SYSTEM
- ◆ BRINE SYSTEM
- ◆ DISTILLATE SYSTEM
- ◆ VACUUM SYSTEM
- ◆ FLUE GAS HEAT EXCHANGER AND FLASH CHAMBER SYSTEM
- ◆ FLASH CHAMBER SYSTEM (0.34 BAR & 72°C)
- ◆ DOSING SYSTEM
- ◆ ELECTRO DEIONIZATION SYSTEM (EDI)

IMPACT

- ◆ Demonstration of State of Art Technology.
- ◆ Proof of concept facility
- ◆ Utilization of waste heat
- ◆ Cost effective desalination Technology
- ◆ Sustainable & Environmental friendly Technology
- ◆ Modular & Scalable design
- ◆ Production of distilled/DM water using waste heat from flue gas and Sea water (otherwise not usable).
- ◆ NTPC and IRCTC had entered a MoU (Non Disclosure Agreement) on 05/01/2018 to establish a packaged drinking water manufacturing facility at NTPC Simhadri. NTPC will supply on an average 100 MT/day Distilled water as feed to bottling plant of IRCTC.

Naturesani Pvt. Ltd.

SPECIAL JURY'S AWARD



Mr. P. L. Bhupathi
Director

“

"Embrace the eco-revolution with NatureSani no-odo waterless urinals, where water efficiency meets odor-free innovation. Together, we conserve resources today to enrich our tomorrow, one flushless moment at a time." – P.L. Bhupathi, Director, Naturesani Pvt. Ltd.

”

Brief message:

Our flagship product, the NatureSani Waterless No-odo Urinals, has been a game-changer in redefining water efficiency in restroom solutions. These urinals not only eliminate the need for excessive water usage but also tackle odors effectively.

In line with our mission, we are taking several key initiatives:

Research and Innovation: We continue to invest in research and innovation to improve our product's performance, making it even more efficient and eco-friendly.

Education and Outreach: We are dedicated to educating businesses and individuals about the benefits of waterless urinals. This includes sharing water conservation best practices and encouraging the adoption of NatureSani urinals.

Sustainable Partnerships: We actively seek partnerships with organizations that share our commitment to water sustainability. Collaborations with like-minded entities help us amplify our impact.

Long-term Vision: Our goal is not just short-term gains but long-term water sustainability. We envision a future where our products play a significant role in reducing water wastage globally.

Environmental Responsibility: We are committed to reducing our own environmental footprint as a company. This includes sustainable manufacturing practices and minimizing waste.

Our journey towards enriching tomorrow through water efficiency is an ongoing one. NatureSani is more than a company; it's a movement towards a greener, more sustainable future. We invite you to join us in this endeavor and be a part of the positive change we aim to bring to the world.

Name of the Organisation: Naturesani Pvt. Ltd.

Location: Southern Railways (Warangal, Guntakal, Hyderabad, Chennai and many more places); Hyderabad Metro Rail (34 Metro Train Stations in Hyderabad City); Archaeology Survey of India (ASI), (Ajanta and Pandav Leni Caves, Aurangabad, Maharashtra)

Name of the Initiative:

Replacement of Traditional Urinals to Naturesani No-Odo Waterless Urinals at Southern Railways.

The Impact:

After installation of Naturesani No-odo Waterless Urinals, it was observed that the restrooms did not have any mal odour in the restrooms, due to which Passengers who were using the restrooms felt comfortable and the customers perception towards hygiene factor of the restroom has increased.

For the railways, the water savings were huge, as Naturesani No-odo Waterless Urinals do not require water to flush the urinals, Lakhs of Liters of Water has been saved. Apart from water savings, Railways has noticed that the costs towards cleaning and maintenance has reduced.

The Hygiene factor of the restroom has increased and at the same time Indoor Air Quality has bettered than what it was before.

Happy Passengers, Happy Railways and Happy Environment!!!

Installation of Waterless Urinals in front of Metro Railway Stations in Hyderabad City.

Naturesani was given a daunting task of installing Waterless Urinals in Outdoor Environment. As these locations were on the road, some of the areas doesn't have a drain connection to let out Urine. Such was the challenge in this project.

Naturesani successfully not only designed a very low space occupying Urinal Station which accommodates 3 Urinals in a 6 feet diameter, it also successfully treated the Urine and the treated urine was used for plantations nearby. Outdoor Waterless Urinal Stations are the first of its kind in the Country.

The Impact:

Naturesani 3 in 1 Outdoor Urinal Stands were installed in front of 34 Metro Stations in Hyderabad. Each Urinal Stand had 3 Urinals fitted. In Total 72 Urinals were provided.

After installation of Naturesani No-odo Waterless Urinals, the Urinal Stations were easily accessible to passengers approaching Metro Station, as well as pedestrians passing by the station.

- ◆ Huge water savings
- ◆ Easily accessible to pedestrians.

- ◆ Less crowd in restrooms inside the stations.
- ◆ Lakhs of Liters of Water saved for Metro Stations.
- ◆ Lesser maintenance costs,
- ◆ High Hygienic conditions.

Installation of Unisex Toilets at Ajanta and Pandav Leni Caves. Less Water consumption WC for Females and Waterless Urinals for gents.

Naturesani was given a challenge of designing and installing Urinals for both Male and Female.

Naturesani successfully designed a very low space occupying Unisex Urinal Stations. These stations occupy lesser than 10 x 10 space and provides 2 WC Cubicles, 2 Baby Changing Stations and 4 Waterless Urinals for male.

Some of the locations were hill top and did not have any Drainage Connections.

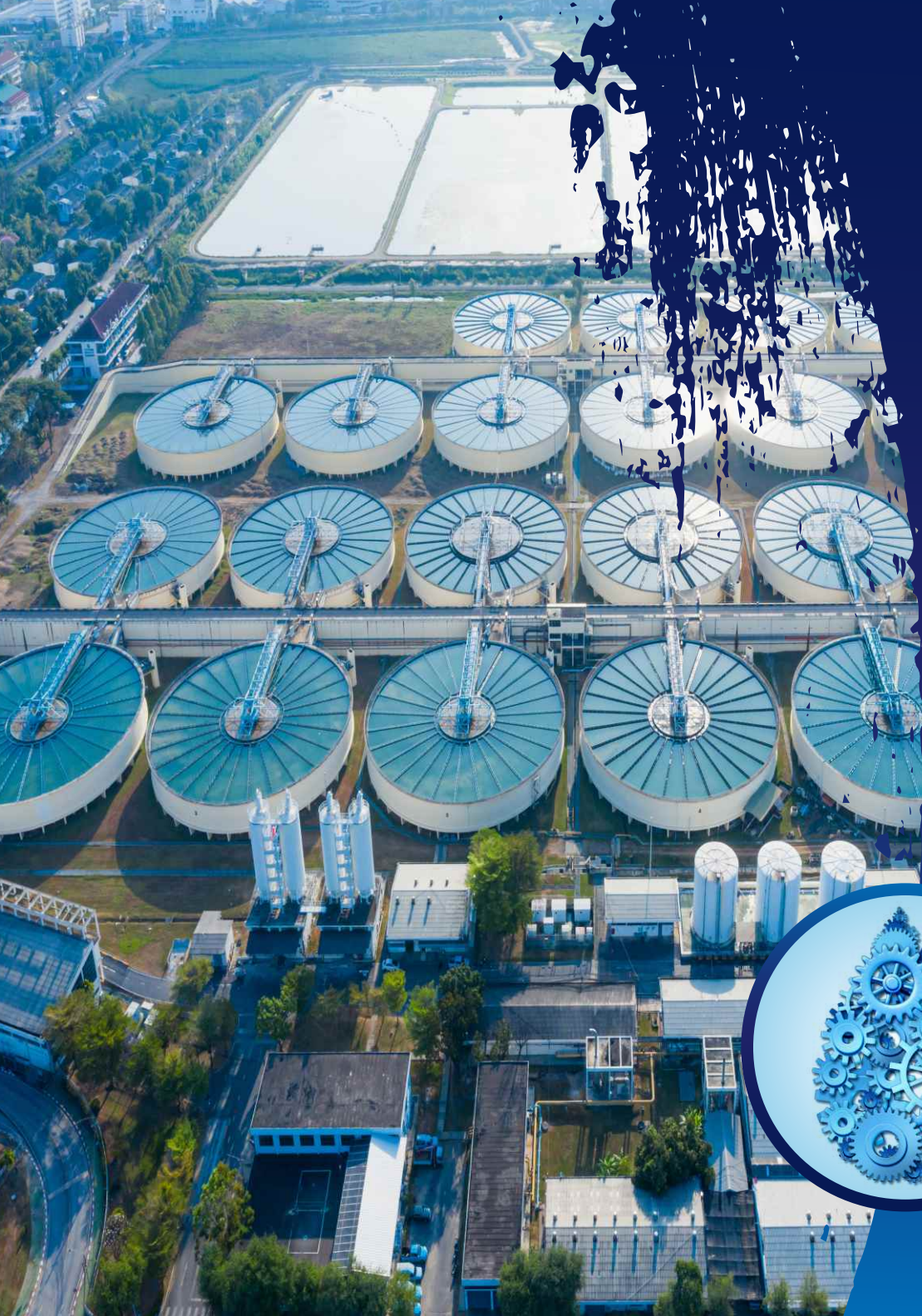
These Unisex Stations were installed for tourists visitng Ajanta And Pandav Leni Caves.

The Impact:

After installation of Naturesani No-odo Waterless Urinals, the Urinal Stations were easily accessible to huge number of tourists visiting Ajanta and Pandav Leni Caves.

- ◆ Zero Solid Waste Discharge.
- ◆ Huge water savings
- ◆ Easily accessible to pedestrians.
- ◆ Less crowd in restrooms inside the stations.
- ◆ Lakhs of Liters of Water saved for Metro Stations.
- ◆ Lesser maintenance costs,
- ◆ High Hygienic conditions.

COMMUNITY INITIATIVES BY INDUSTRY



Nayara Energy Ltd.

1st PRIZE



Dr. Alois Virag
Chief Executive Officer

“

“Nayara Energy’s endeavour through Project Gramsamruddhi, is to provide sustainable livelihoods to communities by transforming soil previously affected by high salinity to productive and cultivable. This flagship project is impacting lives and livelihoods of over 10,000 beneficiaries in the stakeholder villages of Jamnagar and Devbhumi Dwarka districts”.

”

Brief message from CEO:

Nayara Energy, an integrated downstream company of international scale with strong presence across the hydrocarbon value chain from refining to retail, is committed to driving sustainable growth and development in the communities surrounding its Vadinar refinery in Gujarat. Our Water Resource Management and Sustainable Livelihoods Project Gram Samruddhi has successfully addressed the issue of water scarcity in coastal villages in Jamnagar that fall in semi-arid zones and are plagued by low rainfall and high soil salinity. The project has played a key role in driving agricultural development and economic growth in the region through a range of initiatives, including aquifer recharge, farm bunding, pond desilting, and deepening. The outcomes are more than encouraging, and it is reported that the water table has increased significantly, with the overall water storage capacity of the villages enhanced by as much as 17.92 million cubic meters. This expansion has led to an increase in the irrigated area to 4,470 hectares, providing much-needed livelihood support to local farmers.

We are committed to creating sustainable and long-term value for the communities in which we operate, and our Water Resource Development Initiatives are a testament to our dedication to this mission. We continually invest in initiatives that promote sustainable livelihoods and integrated rural development. Through its strategic CSR initiatives, Nayara Energy has worked persistently with communities across multiple states, leading to long-lasting impact for all to thrive collectively.

Name of the Organisation : Nayara Energy Limited

Location : Following 15 villages of Jamnagar and Devbhumi Dwarka districts –

- ♦ Jamnagar – Jakhar, Singach, Mithoi, Modpar, Rasangpar
- ♦ Devbhumi Dwarka – Vadinar, Bharana, Timdi, Kathi Devariya, Sodha Taraghadi, Kajurda, Vadaliya Sihan, Nana Mandha, Mota Mandha, Parodiya

Brief about the Initiative : Gramsamruddhi

1. Innovation –

Their bucket of innovations include -

- ◆ Aquifer Mapping and Monitoring of Aquifer with around 165 observation wells
- ◆ Use of IoT (Internet of things) and soil moisture probe to monitor the irrigation requirement.
- ◆ Use of flow meter to measure water use efficiency and sensitize community regarding water use in different crops.
- ◆ Low-cost Arch Dam
- ◆ Soil Aquifer Recharge to recharge upper layer of sub soil, to minimize the quantum of water required for irrigation.
- ◆ Artificial ground water recharge through injection bore well in stream/water bodies as the area have basalt rocks that prevent the water to seep in aquifer.
- ◆ Bore Charger to recharge ground water through base flow.
- ◆ In situ- mobile soil testing kit to test the soil at farm
- ◆ Yield Guarantee insurance with collaboration with WRMS.

2. Impact

Social Impact - They included more than 1100 women and other disadvantaged group of community in project activities. Their awareness regarding agriculture, animal husbandry, financial inclusion and government schemes increased. This also led to an improvement in their social status. They have also linked more than 3000 vulnerable individuals through various social security and direct benefit transfer schemes.

Economic Impact - To understand the impact of the project, a detailed SROI (Social Return on Investment) study was conducted by Vikas Anvesh Foundation. The SROI estimates show that each rupee spent on the project will return a minimum value of about Rs.3.98 over a period of five years indicating a impactful implementation of the project. The return on investment over the livestock is much higher compared to that of other components. Gramsamruddhi project has been a holistic development initiative cutting across natural resources, livelihood, and quality of life.

An investment of about 20 crores has created over 80 crores worth of social value to the community and individual households in the project area. It is to be noted that the social value for most of the outcomes are conservatively estimated with a strict adherence to the principles of SROI throughout the entire process of SROI estimation exercise. A social value of about 80 crores cutting across all the thematic areas covering about 7000 households would imply a benefit of more than 1.14 lakhs per household through the Gramsamruddhi project.

In 2021, They have successfully demonstrated the spice cultivation like cumin, carom, mustard and coriander in their area with 40 farmers in 45-acre land. The initial result was very encouraging. For example, Wheat is the main crop of Rabi and they have introduced cumin, coriander, gram and mustard in their area as all these crops required less water than other crop. At the same time these crops provide more profit to farmers. Their experience with these demonstrations shows that cumin, coriander, gram, and mustard provided 73%, 16%, 33% and 48 % more income from wheat cultivation. **Cumin provides highest return than other crops. Now farmers are expanding the area of spice crops, which requires less water and give decent profit to farmers.**

In the last Kharif season, their project beneficiaries got (618 kg per Acre) 17.50 % more yield than control farmers (524.8 kg per acre). Project farmers realized 6 % more price than control farmers because of good crop quality.

Environmental Impact - In the last nine years' timeframe they increased 17.89 MCM additional water availability/recharge capacity through series of water conservation, harvesting and recharge structures. Impact of their intervention is seen in increase in irrigated area from 1244 ha (Base Year 2014) to 5714 ha in 2022-23. The micro irrigation area also increased from 4 ha to more than 796 ha. The area's soil health around 3000 ha was improved through silt application from desilting of water harvesting structures. Apart from these benefits, recharge and water harvesting work impacted in terms of increase in water level in well and reduce the TDS of ground water. Due to groundwater recharging and optimum use of water through micro irrigation, groundwater quality is improved. Area under high TDS is reduced and low TDS is increase. They also demonstrated 36 indigenous varieties of wheat, chemical free natural farming in 50 acre and encouraged farmers to go for mix farming to maintain biodiversity at farm level.



BEST STARTUP FOR WATER INNOVATION



Seventy One Percent Analytics Pvt. Ltd. (BluCred)



Mr. Shrvanth Donthi
Managing Director and CEO

“

“Through technology and innovation, we can turn the tide in the battle against water scarcity. BluCRED’s journey is proof that when we combine purpose, passion, and perseverance, we can create lasting solutions that benefit not only the present but also future generations. Let’s continue to harness the power of technology to democratize access to water, protect our environment, and build a better world for all.”

”

Brief message from CEO and long-term goals:

Treated wastewater emerges as a pivotal solution to our water scarcity predicament. Across major cities, both centralized and decentralized sewage treatment facilities produce vast quantities of treated wastewater on a daily basis. Regrettably, without a clear purpose, this valuable resource finds its way into lakes and rivers, leading to nutrient contamination, urban flooding, and failing to address the underlying issue of water scarcity.

Within urban landscapes, the construction sector stands out as a prominent consumer of freshwater, often accounting for a substantial portion, around 25-30%, of a city's water demand. Remarkably, in many instances, the quality of treated wastewater aligns with the standards set forth in IS 456:2000, rendering it suitable for construction purposes. This treated wastewater holds immense potential for replacing the use of freshwater in construction, thus significantly mitigating water shortages within urban areas. Cities such as Bangalore and Chennai exemplify this potential, with BluCRED poised to reduce daily water deficits from 41% to a mere 8% by substituting freshwater with treated wastewater in the construction sector.

The overarching vision driving BluCRED is nothing short of revolutionary – to transform the utilization of treated wastewater and entirely supplant freshwater applications within the construction industry. By delivering high-quality treated wastewater, BluCRED aims to ultimately eliminate the freshwater deficit in all urban centers, fundamentally reshaping how we manage this vital resource.

Name of the Organisation : **Seventy One Percent Analytics Pvt. Ltd. (BluCred)**

Location : **The pilot of BluCRED was launched in Bangalore and now is live across India**

Brief about the Initiative : **BluCRED is an online platform to trade excess sewage treated water between sewage treatment plants and construction sites**

Impact: BluCRED has successfully enlisted the participation of more than 500 sewage treatment plants scattered across India, facilitating the supply of top-tier treated water to various construction sites. Through a seamless integration with Tankerwala's PinkTANKER service, BluCRED has gained access to an extensive network of water tankers, capable of delivering an astonishing daily total of over 100 million liters of treated water.

BluCRED embarked on its operational journey by collaborating with prominent construction and infrastructure firms situated in key cities such as Bangalore, Chennai, and Mumbai. In Bangalore, for instance, L&T procured approximately 36 million liters of sewage treated water to support the construction of Metro-rail stations in Shivajinagar and Cantonment. Similarly, AFCONS harnessed sewage treated water for concrete preparation, utilizing the resulting concrete for the construction of Metro-rail elevated lines. Meanwhile, in Mumbai, JP Infra adopted treated wastewater for their real estate project construction, and in Chennai, L&T harnessed treated wastewater for the construction of underground lines and tunnel boring activities. This transformative approach is already making a significant impact on sustainable water use within the construction sector. BluCRED has successfully replaced over 50 million litres of freshwater with treated wastewater in the construction industry.

Waterlab Solutions Pvt. Ltd.



Mr. Vijay Gawade
Founder Director

“

“Ground Water remains the major source of life for future and the solution for improved and efficient management of the precious resource lies with the users. Developing demand side tools for users remains the critical action in this direction.”

”

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

Climate change, population increase and unplanned urbanisation have combined to put immense stress on water resources. In India, groundwater accounts for nearly 62% of all irrigation water and over 80% of rural and urban water supplies, making India the largest user of ground water in the world.

If the exponential growth in the use of groundwater seen over the last few decades continues, 60% of districts in the country are likely to reach critical levels of ground water depletion putting at least 25% of agricultural production at risk, exacerbating poverty and causing displacement of people, particularly those dependent on small holder agriculture. The country will face extreme water stress by 2050 according to the research published by science.org.

In India's context, there have been situations of overuse and exploitation of ground water to meet water requirements leading to depleting ground water levels in several parts of the country. In absence of knowledge of ground water, water is being abstracted relentlessly with continuous pumping and until the wells go dry. Lack of ground water knowledge has resulted in inefficient management of ground water wells and inefficient use of available water. With borewells which are hidden source of ground water, the problem of understanding water availability is relatively more compared to open wells. In the current situation, there are no demand side tools available for users to understand ground water and improve management of their wells.

Waterlab Solutions recognises growing challenges in ground water management and the need for data driven ground water management. We believe that the ground water management should be taken to the lowest level by empowering well users and communities to plan and manage their own water

resources in a sustainable manner. Based on the principle "what needs to be managed, needs to be measured", we are committed to empower every individual user to measure the ground water resource and manage it efficiently. Some of the specific plans that Waterlab intends to pursue soon are –

- ◆ Promote decentralised management of ground water sources by empowering the users with a powerful demand side tool. We intend to reach to 1 million users in the next 5 years.
- ◆ Promote Data Driven Ground Water Management by assisting generating ground water data and developing analytics and advisories for informed decision making, for urban and rural areas.
- ◆ Providing low cost and low maintenance ground water monitoring IoT technology for enhancing the reach of current monitoring networks available in the country

Waterlab : A technology and implementation Partner to Government of India

- ◆ Amrut 2.0 programme was launched by Ministry of Housing and Urban Affairs, Government of India in October 2022 with an objective to ensure water secured cities and included a special component on Urban Aquifer Management focusing on ground water management in cities. In 2022, the Ministry launched India-Pitch-Pilot-Scale Start-up Challenge Programme to identify innovations from Startups and selected Waterlab Solutions as one of the 76 successful start-ups in the challenge and a technology and implementation partner to the Ministry under Amrut 2.0 Programme. The Ministry further supported the selected Startups by assigning grant support and projects to test their innovations in various cities. Waterlab was assigned Pune City to test the innovation “Bhujal Borewell Monitoring App” developed by Waterlab. A tripartite MoU was signed with Administrative Staff College of India (AMRUT Partner with the Ministry), Pune Municipal Corporation and Waterlab Solutions (AMRUT Innovator) in September 2022 to commence the pilot in Pune Municipal Corporation.

Bhujal App Innovation

Bhujal App is the first of its kind acoustic and non-contact type tool for ground water monitoring in India. It is a user friendly and android based multilingual App. Bhujal works on sonar technology and does not require any sensors or opening of the borewells assembly making it the most convenient and non-invasive tool to monitor water levels in a borewell.

Bhujal App is available in App and in IoT variant. The App, where manual measurements are required, is suitable for simple, quick measurements and at a scale through crowd sourcing. The IoT is useful for remote monitoring and where frequent measurements are required. IoT results are more consistent compared to the App owing to absence of any human intervention. Bhujal App is a patented technology.

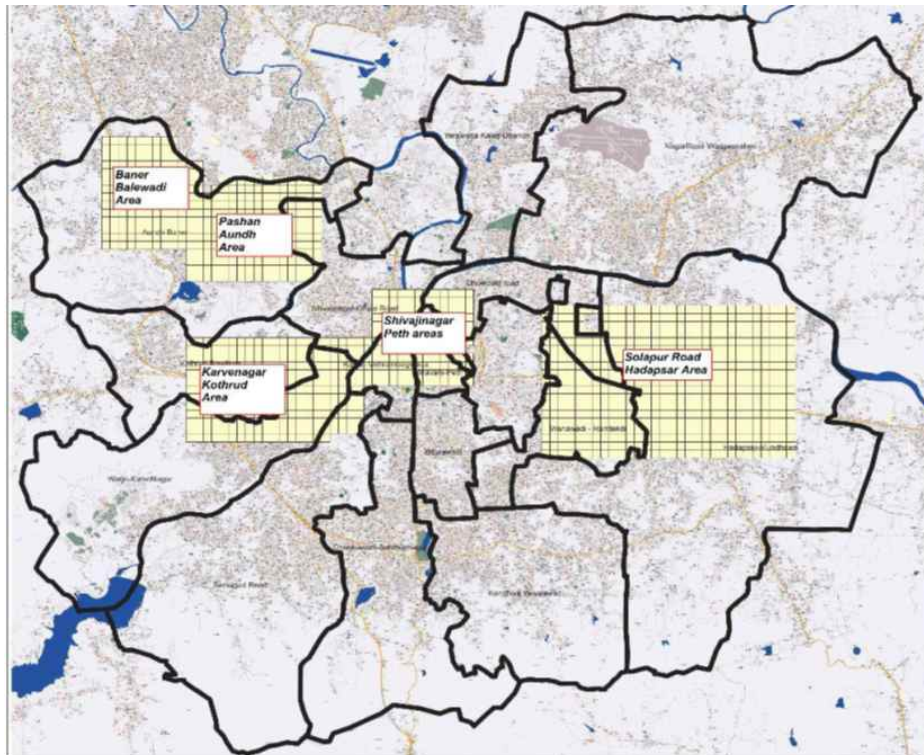
The Bhujal App is jointly tested with CGWB, IIT (Mumbai), ACWADAM and certified for accuracy by Centre for Water Resource Development and Management (CWRDM), Government of Kerala.

Name of the Organisation : Waterlab Solutions Pvt. Ltd.
Name of the Initiative : Pilot project for groundwater assessment in Pune
Location : Pune

Case Study : Pilot Aquifer Management Plan at Pune Municipal Corporation

A pilot initiated in collaboration with Pune Municipal Corporation in select areas of the city covering 300 borewells locations. The pilot project is fully grant funded by the Ministry of Housing and Urban Affairs, Government of India. Using the innovation Bhujal App, the pilot intended to generate ground water level data and analyse it to assess ground water situations in the selected areas, which will help to guide preparing the Urban Aquifer Management Plan envisaged under Amrut 2 Mission for the city.

The Pilot has commenced in January 2023 with identification of borewells suitable for measurements, baseline surveys and water level measurements using the Bhujal App. The slusters selected fr the pilot were Cluster 1 (Pune West – Baner and Pashan), Cluster 2 (Pune West - Aundh, Baner and Pashan), Cluster 3 (Pune South - Karvenagar and Kothrud), Cluster 4 (Pune Central - core city area covering Peth areas and part of Shivajinagar), Cluster 5 (Pune East - Hadapsar)



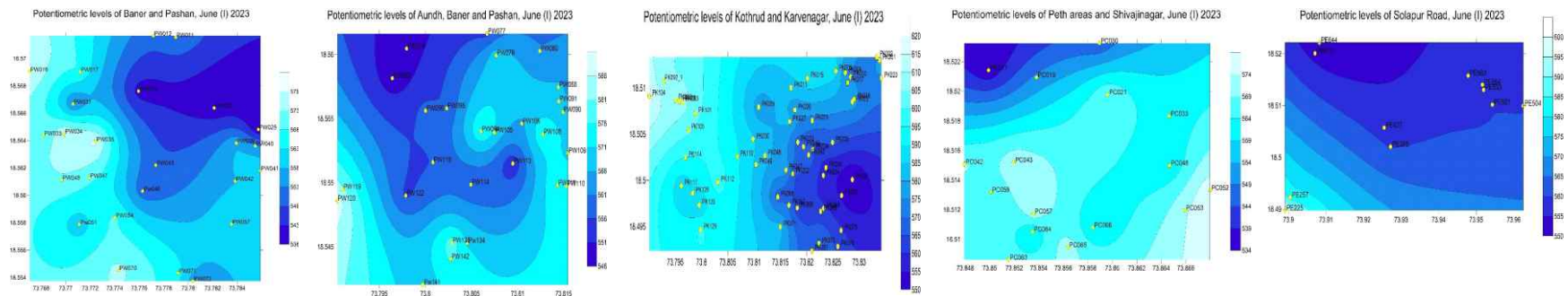
and these are shown below in the map.

Existing borewells that were feasible for water level measurements were identified in these areas at a scale of one borewell in a grid of 300m x 300m for hydrogeological study purpose. The baseline survey and measurements of water levels using the Bhujal App was carried out from January 2023 to mid-June 2023 with two measurements in a month on each of the borewells. Each water level measurement took approximately 5-10 mins and 5-6 days for all 300 borewells spread over pilot areas in the city. The measurements were also witnessed by Shri Rajesh Bhutkar, Dy Engineer, Water Supply Department, Pune Municipal Corporation (Add a photo).

Hydrogeological Study

Waterlab had partnered with ACWADAM, Pune – a renowned organisation working in Pune on hydrogeology and ground water issues to provide technical support on mapping and measurements of borewells water levels, analysis of the data collected using the Bhujal App for 300 borewells, develop inferential aspects of confined aquifer in pilot areas, develop a framework for Managed Aquifer Recharge for Pune’s confined aquifers and a framework for long term ground water management and governance.

Potentiometric level data from each borewell collected using the Bhujal App was used for preparing the potentiometric level contours. Potentiometric level contours represent areas of equal pressure head. Potentiometric level contours and flow lines indicate recharge and discharge areas. Potentiometric Maps were prepared for all 5 clusters and are shown below for reference.



Dark blue coloured shades in the above maps showing areas with low pressure zone or groundwater recharge areas, whereas light blue coloured shades illustrate area with high pressure zones or groundwater discharge areas. The recharge areas are essential to plan and undertake recharge measures in the pilot areas. The Study is still being continued and it is in its final stage of developing recommendations.

Conclusion

Pune Pilot is a successful attempt of collecting the grided data using the Bhujal App and developing ground water management strategy for deeper confined aquifers for Pune City. One of the challenges of mapping and understanding of the deeper confined aquifers anywhere in India is the lack of access to a systematic technology to measure and record the ground water levels in borewells. The project has also proved that the Bhujal App is a promising app of measuring ground water levels at boreholes with a back-end data acquisition and collation system.

Waterlab is thankful to the Ministry of Housing and Urban Affairs for providing the opportunity of demonstrating the use of the Bhujal App through a pilot project Pune and funding support, Pune Municipal Corporation for their wholehearted support to the project, ACWADAM for their comprehensive technical guidance and support and ASCI for their guidance on fund utilisation.

Tellus Habitat Pvt. Ltd.

JOINT 2ND PRIZE



Dr. Seema Sukhani
Director

“

“It takes a lot of Blue to Stay Green”

”

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

At Tellus Habitat Pvt. Ltd., we've always been committed to responsible practices, and water sustainability is a cornerstone of our mission. Here are some of the key initiatives and actions we're taking:

1. **Cutting-Edge Technology:** We are investing in state-of-the-art technologies to enhance the efficiency of our sewage treatment processes. This not only ensures cleaner water discharges but also maximizes the reuse of treated water.
2. **Resource Optimization:** Our teams are continually working to reduce lag time for our systems by optimizing our operations. We're implementing water-efficient equipment and fostering a culture of responsible water use throughout the organization as well.
3. **Recycling & Reuse:** Recycling and reusing water is at the heart of our strategy. We are pioneering new methods to recycle water in our processes and explore opportunities to repurpose treated water for various applications such as exploring water reselling.
4. **Research & Development:** We're proud to support ongoing research and development projects focused on improving water treatment and sustainability. Our partnerships with research institutions and experts drive innovation in water management.
5. **Employee Training:** We believe that our team's awareness and commitment are vital to achieving our sustainability goals. Comprehensive training programs ensure that every Smart STP employee understands the importance of water sustainability and their role in achieving it.
6. **Community Involvement:** Beyond our operations, we actively engage with local communities to improve water access and quality. We support initiatives that promote responsible water use and collaborate with communities to address their specific water-related needs.
7. **Monitoring and Reporting:** Transparency is crucial. We have established robust systems to monitor our water sustainability efforts and will regularly report our progress. This transparency ensures accountability and encourages continuous improvement.

We understand that the journey towards water sustainability is a shared responsibility, and it's one that Tellus Habitat takes seriously. Together, we can have a lasting impact on our environment and ensure a better, more sustainable future for all.

Name of the Organisation : Tellus Habitat Pvt. Ltd.
Location : Prestige Tech Vista, Inside Prestige Tech Park, Kadubeesanahalli, Bengaluru, Karnataka 560103
Brief about the Initiative : “R3H2O- Fully Automatic Smart STP”

The Initiative/Innovation:

Providing for an equitable supply of freshwater in urban and peri-urban regions of developing nations such as India is a political and strategic development issue under the United nation's sustainable development goals. Yet, there is inadequate primary or freshwater resource to tap from or to remain unconcerned in the global environmental threat-bearing future. Hence, holistic management of the household's water sources such as drinking water supply by civic authorities, rainwater, and wastewater (WW) reuse is increasingly essential to meet the shortfalls in water availability in the emerging future. As water shortages and supply irregularities grow, wastewater recycling at household (HH) level can meet over half the daily needs while overcoming socio-cultural obstacles and reducing pressure on scarce sources of freshwater where it is a premium.

Conventional wastewater treatment systems (ASP/SBR) are not suitable at this small scale as households will find it difficult to dispose of the smelling sludge nor will these technologies treat increasingly used hand-wash (anti-microbial), detergents and personal care and pharma products (PCPPs) effectively to efficiently reuse water within the HH. Widespread use of these chemicals kill the very micro-organisms that biodegrade them, and thus biological treatment is rendered nearly impossible. The few micro-organisms that still survive are rendered sluggish and biodegradation of matter is slowed down ten-fold while most degrading bacteria are washed out before the treatment can be completed. In addition, it is very difficult to operate the conventional system at the household scale. Relying on an operator or waiting on the technical staff is neither comfortable nor realistic. There was a need for technological innovation which can be automated especially for on-site water recycling. This was a plaguing problem that their product seeks to address.

Solution: Modular wastewater treatment plant “R3H2O” provides water security in individual households and communities. Treatment of wastewater improves the sanitation conditions through the simultaneous reduction in the ground /drinking water contamination with pathogens and pollutants, and the spread of communicable diseases respectively, altogether improving the health of the community dwellers. It performs the purification of wastewater with a combination of biological, physical, and ozonation processes. The novel part is the biological reactor. Unlike the traditional systems, where aeration-based technologies are the secondary treatment, in their case, there is an anaerobic and aerobic biofilm combination. This unique capability to adopt these two technologies simultaneously allows their system to provide consistent effluent quality at lower energy, operation, and maintenance costs. The system is also fully automatic and does not require any human intervention at all. The system also requires minimal civil preparation and can be transported, installed and commissioned in less than 3 days with being ready for operation. This quick turnaround has allowed us to be recognized by some of the best-known names in the residential and industrial partners such as Prestige group, Saint Gobain, Anthillia Resort group, Royal Palm Builders, BIT Institute, etc. who are not only using their products but have become a spokesperson for their organization.

Apart from the obvious environmental and societal impact, the intent to produce health-safe water on-site has allowed for recycling and much safer discharge downstream has met with much appreciation. Early adoption data shows, that 50-70% of the treated water has been used for non-potable applications within the vicinity of the product site. Their team will continue to push boundaries and strive towards their goal of water sustainability.



WATER INITIATIVES BY NGO



Self-Reliant Initiatives through Joint Action (Srijan India)



Mr. Prasanna Khemariya
Chief Executive Officer

“

"Irrigating fields, nurturing communities: Women in rural India, the architects of water use efficiency, where community-managed water governance brings prosperity"

”

Brief message from CEO:

The vision of SRIJAN is to promote self-reliance and reduce poverty, particularly among poor and marginalised communities, through building their collectives, enhancing livelihoods with a focus on improving natural resources, introducing environment-friendly initiatives to enhance the farm-based livelihood, establishing value chains, market linkages for better price realisation, and empowering communities through the institution building. SRIJAN is working in most backwards regions in four states. We aim to drive towards water security in the water-stress areas through our initiatives with focus key aspects.

Empowering Women:

One of the cornerstones of our initiative is empowering women in these rural communities. Women are pivotal in water management, agriculture, and household well-being. We have launched a series of programs to provide them with the knowledge, tools, and resources needed to become champions of water sustainability. Through training sessions and community workshops, we are fostering a new generation of female leaders who will drive change from within.

Enhancing Rural Livelihoods:

We recognise that sustainable water practices are integral to rural livelihoods. Our efforts aim to implement water-efficient farming techniques and facilitate access to innovative technologies. By helping farmers optimise their water usage and crop yields, we are improving their incomes and ensuring a secure future for their families.

Community Engagement:

We firmly believe in the power of communities coming together to address shared challenges. Our engagement initiatives encourage collaboration among community, farmers, and stakeholders. We have established community-led water management committees that make decisions collectively and work towards the sustainable utilization of water resources. We are nurturing a culture of responsible water usage by fostering a sense of ownership.

Investing in Sustainability:

Our commitment to long-term water sustainability goes beyond words. We invest in water-saving technologies, infrastructure, and research to develop drought-resistant crops suitable for rainfed areas. We aim to make these regions resilient to climate change and ensure a continuous clean water supply.

Measuring Impact:

We understand that our efforts must be measurable to drive meaningful change. We are working with local organizations and experts to monitor our initiatives' impact rigorously. This data-driven approach enables us to adapt and refine our strategies continually.

In conclusion, our long-term water sustainability plan for rainfed areas of India is not just a project—it's a commitment to our planet, our communities, and our shared future. I invite each one of you to engage in this endeavour actively. Your ideas, passion, and dedication are instrumental in bringing this vision to life.

Together, we can create a brighter, more sustainable future for all, where water is a source of life and prosperity, not scarcity and strife.

Name of the Organisation : Srijan India

BIWAL: Comprehensive development of the Bundelkhand region through restoring historical tanks, and augmenting agrarian livelihoods. (From Drought to Prosperity)- SRIJAN

In ancient and medieval India, water management was undertaken by the local community themselves, the kingdoms were responsible for providing monetary support. The site selection, planning, construction, distribution and maintenance of the rainwater harvesting structures were all community-led and managed. India had a wealth of different water harvesting structures and techniques suited to the local geographical and geological contexts. The ancients had known the importance of harvesting rainwater that was received on the 120 odd rainy days so that it could be used year long to meet the consumptive and livelihood requirements. Grand water harvesting structures were built across the country and funded by different kingdoms. The culture of building tanks was widespread in the Bundelkhand region, which was ruled by Chandela and Bundela Kings. 8000 Chandela and Bundela Tanks were built between 800 to 1200 AD.

This wisdom was lost as the control over water resources shifted to the state beginning with colonial times. The era of the rule by Britishers was marked by the gradual erosion of local control over resources. The policies of Independent India too favoured state control over water resources with the government's fascination to build huge reservoirs across rivers. The local wisdom of water harvesting was not paid heed to. This led to the disrepair of most water harvesting structures and the decay of local community management systems. The shift of water control from the community to the government also had many other unwelcome repercussions such as the low-cost recovery of canal systems,

high cost of water supply, lack of source sustainability, lack of financial sustainability of water schemes, abysmal repair and maintenance and reduced supply resulting from poor management. Tank management systems also fell into disuse due to the erosion of traditional community ownership structures. Since the community no longer has control over the resource, they do not feel liable to manage tanks. Some of the reasons for the decline in tank irrigation are siltation of the tank bed, siltation of the feed channels, encroachments in the tank bed and catchment area, and development of well irrigation in the command area of tanks (Gomathinayagam et al., 2005).

Bundelkhand

The Bundelkhand region straddles 14 contiguous districts; 7 of them are located in Southern Uttar Pradesh and the other 6 in Northern Madhya Pradesh. The region has a recorded history of droughts and water scarcity. This is due to the absence of any river systems and adverse geological conditions leading to suboptimal recharge, and also recently the over-extraction of groundwater resources. This has led to high inter-generational incidences of poverty.

Bundelkhand is an agro-climatically and socio-culturally distinct region. It has languished behind other regions, even within these states, which by themselves rank low amongst states of India in economic development. Geographically it straddles the Vindhyan plateau (overwhelmingly in Madhya Pradesh) and the Gangetic plains (mostly in Uttar Pradesh but also in Madhya Pradesh). Beset with light soils with poor moisture retention capacity, agriculture here over the ages has suffered from the vagaries of monsoons. Rainfed single annual cropping systems sustain a majority of the population, barring a few tracks which have received the benefits of canal irrigation. With erratic rainfall, the agricultural lands located in the vicinity of the small streams are left with a limited source of water for irrigation. These shallow streams often run dry 2-3 months post monsoon without any scope of recharge, and this takes its toll on the rabi crop.

Access to drinking water is a major issue in the region, and communities especially women bear the brunt of this. During the summer season, they travel around 1.5km or more to fetch water for domestic needs. In many villages barely a few kilometres away, people haven't had the time and "luxury" to worry about the Covid-19 pandemic. These villages have a much bigger crisis to deal with – water scarcity, which has peaked along with the summer, like every year. For nearly two dozen villages in this Bundelkhand region, water scarcity is common at most times

Bundelkhand Region Map



of the year and reaches its peak in the summer months of April to June. Most hand pumps in the region have stopped running water, and wells have dried up.

Bundelkhand Initiative for Water, Agriculture and Livelihood (BIWAL) was launched in 2018 to revive the ancient tanks and their surrounding ecosystem to their past glory. It is a joint undertaking by five civil action organizations lead by SRIJAN and the communities to collectively revive the water harvesting culture of the region. This consortium is led by SRIJAN and intends to work on the holistic and comprehensive social and economic development of rural Bundelkhand.

The hypothesis for the BIWAL programme to uplift the rural economy through work on tank restoration is as below:

- ◆ Drought proofing and assured water for agriculture and allied activities can impart an impetus for economic growth and social empowerment
- ◆ A historical legacy in water harvesting would have been restored for use well into the future
- ◆ It would have contributed to climate-proofing of landscapes in a region where lack or shortfalls in the availability of water has adversely impacted the economic well-being of the people
- ◆ Building pool of local cadres on soil & water conservation and climate-smart agriculture.

The repair and rejuvenation of the tank economy was seen as an opportunity to pave the way toward community-led management of the natural capital endowed upon them. Additional impetus was given to promote sustainable agriculture practices to expand avenues of on and off-farm employment. The implementation plan of the region-wide venture of BIWAL thus rested on two major focus areas; help expand and deepen livelihood opportunities with backward integration and forward linkages to strengthen the local agroecology.

The BIWAL initiative was a daunting undertaking due to the large number of tanks spread across several districts and many attempts had been made in the past to revive tanks on a large scale across the country but most tank systems often fell into the revival-lack of maintenance - disuse-revival. The main reason for this was the focus on the repair of physical structures rather than on institutional mechanisms to maintain the tank infrastructure. It is extremely important to map the socio-economic dynamics around tank infrastructure before initiating any physical works.

In this context, BIWAL, a consortium of CSOs lead by SRIJAN with vast experience in work at the grassroots focussed heavily on fostering relationships with local institutions to ensure the long-term sustainability of the rehabilitation work. Tank Management Committees (TMCs)



were formed at every site to mobilize the local community and ensure the village's active participation in the revival and desiltation operations of the tank. These TMCs also worked in close coordination with the Gram Sabha and Panchayati Raj Institutions which have been vested with the constitutional status as the supreme authority at the village level. This led to participatory decision-making and the long-term sustainability of the tank systems.

Strengthening the Tank Management Committees (TMC) is an important strategy to empower the user communities with decision-making responsibilities. This was done by providing access to ready-to-use information on water available and its sparing use, providing appropriate skills on water budgeting, creating an enabling environment and devolving financial management responsibilities.

The BIWAL worked on larger and comprehensive socio-economic development of the region. Starting with the desilting of ponds and their repair, the initiative worked on building-related water harvesting structures and Climate-smart livelihood practices to optimise production and reduce costs to restore the agroecology of the region. The major activities undertaken were tank

restoration, silt application on farms, institutionalization and capacity building of Tank Management Committees (TMCs), excavation of other water recharge/harvesting structures such as Dohas and gabions, promotion of climate-smart agricultural practices through training and support, the establishment of Prakritik Krishi Kendra (resource centre for natural farming), facilitation of women producer groups, promotion of high-density agricultural production systems such as multi-layer farms, nano orchards, kitchen gardens and creation of micro forests known as Tapovans inspired by the Miyawaki technique.

In the last three years, a lot of ground has been covered for both restoration of the tank ecosystem and the strengthening of local livelihoods by promoting innovative climate resilient practices. A brief description of the various activities undertaken under the BIWAL initiative is below:

Tank Restoration

The first step of the restoration of the tank is its selection. Some of the criteria of the revival are; a) it is a demand-driven process in that the community around the tank has to be interested in the repair of the structure and willing to take up the tank management and maintenance responsibilities post-rehabilitation. Also, priority is given to multi-purpose tanks and structures that are relatively free of encroachments and there are fewer conflicts within the community regarding tank repair and usage. The selection of the tank is formalized in the form of a Memorandum of Agreement with the Gram Panchayat.



At a general meeting with the village community, a Tank Management Committee (TMC) is constituted for ensuring active community participation from the beginning of the work. Efforts are made to ensure the representation of all habitations/communities in the village. The various terms kept in mind while forming the TMC are; 50% of members must be women. The TMC Charter states that "either the Treasurer or Secretary should preferably be a literate woman who can read and write". Regular meetings and discussions are held with the TMC to identify problems and issues in the Tank infrastructure. Detailed problem analysis is conducted and based on its findings, an action plan is prepared that includes a comprehensive list of interventions to be carried out to rehabilitate the tank.

Desilting is often one of the most crucial operations. The program arranges for the excavators for desilting while the responsibility of transferring the silt from the tank site to agricultural fields is the responsibility of the community. Tank Management Committees (TMCs) play an important role in the management of silt removal. The TMC leads the activities such as hiring tractors for silt transportation, deciding upon timings and shifts of silt removal, collecting names of farmers interested in silt application on their farms, developing norms to ensure equity in silt distribution, and conflict resolution, among others.

TMCs are the anchors of the project in the villages, responsible for the overall management of revival efforts, including water use planning and governance and the redressal of disputes among local stakeholders. Capacity building of TMC is therefore crucial for the success of the rehabilitation operations. Trainings are provided to community members and TMCs on tank maintenance, water-use planning, water management, well water monitoring, improved farming practices, and horticulture as well as maintaining records and conducting meetings. A hands-on approach is used for training and capacity building wherein the implementation of tasks was assigned to TMC members and handholding support is provided by CSOs.

Since the initiation of the project, 224 historical tanks have been desilted by the excavation of over 12.23 lakhs cubic meters of silt that has been used by 6468 farmers. In Tank restoration work the project contribution range from 28-32% and community contribution range from 68-72%.



While addressing the issue of water, based on their field experiences and interaction with farmers, it was observed that climate change is affecting land and crop productivity in the region. There are instances of crop failure because of erratic rainfall, poor crop management practices, knowledge gap among farmers, poor soil health and poor quality seed availability. Thus, to address the adversity of climate change and build capacity of local community towards climate resilience agriculture. They started with climate-smart agricultural practices, promoting high income generation interventions such as Multi-layer farming, Nano-orchards. They have been working on promoting Tapovan (on Miyawaki technique) to increase tree outside forest by planting native trees of Bundelkhand.

Impact

Key Learnings of the Program

During the implementation of the BIWAL program with a network of capable partners in Bundelkhand. Following are key learnings from the program.

- ◆ Water Security interventions such as the restoration of tanks, and construction of Doha structures have been highlights of the BIWAL program benefitting farmers in securing crops, increasing groundwater recharge, tackling the issue of lack of availability of drinking water in many instances, and setting up the platform for agriculture and livelihood interventions.
- ◆ Scaling up and larger outreach among communities are possible through a network of partners working together with common objectives and goals.
- ◆ Replications of established models can be achieved through building a trained pool of community cadres with a strong understanding of the processes engaged.
- ◆ Building and strengthening local infrastructures such as Prakritik Krishi Kendre and the pool of lead farmers resulted in creating an enabling environment for improved agricultural practices and driving the agenda of sustainable agriculture at the local level.
- ◆ Constant engagement with local administrations helps in leveraging resources from govt schemes through field visits of officials, workshops

This has been reflected in mid-term assessment conducted by Deloitte in detailed. Key highlights are.

Pre-intervention scenario

- ◆ Severe water stress in the region affecting farm productivity and household incomes
- ◆ Poor quality of land resource, resulting in low productivity and household incomes

- ◆ Dependence on chemical fertilizers and pesticides for crops' nutrition and pest management
- ◆ Lack of community ownership of the water resources resulting in overutilization and dry outs
- ◆ High Level of migration due to low agricultural income

Key Findings

- ◆ Tank and Doha structures were constructed leading roughly 6.8 feet increase in the water level in wells.
- ◆ 35% increase in land under irrigation from water conservation work.
- ◆ Formation of water user groups (Tank Management Committees) has led to an increase in community ownership and collective decision-making regarding governance of water resources in the village, along with other livelihood interventions.
- ◆ Women farmers are an integral part of the program.
- ◆ Average annual net income: There has been an increase by 65%.
- ◆ Average crop yield: that of wheat by 35%.
- ◆ Multi-layer farming: By adopting multi-layer farming, income of farmers grew by four times – average annual income of INR 25,000 from a plot of 600 sq. ft as compared to an average of INR 6,000 from the same patch of land.
- ◆ 75% of the farmers were either marginal or small farmers.



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.



FICCI Water Mission Secretariat



Hemant Seth
Senior Director and Team Lead
MSME & Water, FICCI



Kirtika Arora
Senior Assistant Director
Water

Email: hemant.seth@ficci.com
kirtika.arora@ficci.com
watermission@ficci.com
T: +91-11-2373 8760-70



Federation of Indian Chambers of Commerce and Industry

Industry's Voice for Policy Change

Federation House, Tansen Marg, New Delhi 110001

T: +91-11-23738760 - 70 | F: +91-11-23721504, 23320714

E-mail - watermission@ficci.com | Website - www.ficci.in

www.indiaindustrywaterconclave.com