FICCI

8th Edition of FICCI
WATER
AWARDS
2020

Recognizing
Excellence in
Water Management
& Conservation

Compendium *of* Best Practices

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

This report is a compilation of best practices received as part of the 8th Edition of FICCI Water Awards. The case studies of the awardees are published in the report.

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Acknowledgements

FICCI acknowledges the eminent members of the Jury for their exceptional guidance in the final selection of the awardees. FICCI also acknowledges the valuable contributions of the Expert Screening Panel in assessing and evaluating each nomination. We also extend our gratitude to the organizations who participated under the various categories of the 8th Edition of FICCI Water Awards.

Team's Contribution to the FICCI Water Awards and Compendium

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

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CONTENTS

MESSAGE BY MINISTER

MESSAGE BY MINISTER

गजेन्द्र सिंह शेखावत
Gajendra Singh Shekhawat

सत्यमेव जयते

जल शक्ति मंत्री
भारत सरकार
Minister for Jal Shakti
Government of India

15 FEB 2021

Message

Recognizing Excellence in Water Management & Conservation: Compendium of Best Practices of 8th Edition of FICCI Water Awards 2020

India has continued to suffer from drought, crippling water scarcity in villages and towns, delayed and erratic monsoon, with floods in some parts of the country while drought and water scarcity continue in other parts. With increasing industrialisation and urbanisation, the water crisis continues to grow at a much higher rate. The government has spoken repeatedly on the need for water conservation, rejuvenating traditional water harvesting, technological interventions and reducing water use in irrigation which accounts for around 80% of all water use in India.

The Ministry of Water Resources, River Development and Ganga Rejuvenation and Ministry of Drinking Water and Sanitation, have been brought under a unified Jal Shakti Ministry to combat water crisis employing an integrated approach.This led to increased realisation to act responsibly and adapt sustainable measures and solutions across the board.

The government appreciates the intensive efforts being made by industry and other stakeholders to conserve water by using different innovations and technologies, but there is still a lot that needs to be done to conserve this precious resource.

I congratulate FICCI for launching this compendiumandrecognizing the distinguished award-winning case studies for popularizing and disseminating the best practices and efforts in sustainable water management space by a diverse range of organizations that includes the corporates, NGOs, and state governments and urban local bodies.

I am sure that this initiative by FICCI will act as one of the positive steps in inspiring others towards conserving this precious resource and these best practices will be propagated and replicated for wider adoption.

(Gajendra Singh Shekhawat)

जल शक्ति अभियान

MESSAGE

Water being at the core of sustainable development is not only critical for socio-economic development, but also for maintaining healthy ecosystem and a better quality of life. Sustainable water management will not only contribute to SDG 6 (clean water and sanitation) but have significant impact on several other sustainable development goals such as SDG 3 (good health and wellbeing), SDG 12 (responsible consumption and production), SDG 13 (climate action), SDG 14 (Life below Water) and SDG 15 (Life on Land).

Community, industry, and government must work together to manage water efficiently and effectively to overcome the mismatch between water supply and demand. Over the past years, the government has worked on multiple initiatives with varied stakeholders to combat the water crisis through schemes like 'Atal Bhujal Yojna', 'Swajal' scheme, 'reuse of wastewater' and other legislative changes to promote better water management. Industry efforts to conserve water in its ecosystem by using different innovations and technologies is gaining ground over the years, to mitigate the risk of future availability of this precious resource, thereby safeguarding business continuity and sustainability. Companies are following the 3Rs approach which is Reduce, Reuse and Recycle for sustainable water management. Corporates are also realising the importance of going beyond the fence to provide solutions that assure availability of water for the communities through a watershed approach. However, larger awareness needs to be created on the positive steps being taken to encourage wider engagement of stakeholders towards ensuring water sustainability in India.

My experience in the media industry has shown that effective communication and outreach can be both powerful and empowering, for the target audience and those in action, respectively. Disseminating positive stories of effective management of any public good is a powerful tool to create a momentum and a movement among its stakeholders. Water is a public good that has a social, economic, and environmental dimension. Before we make a larger difference to addressing the water issue, we must understand what is happening on the ground, the challenges industry faces, the opportunities it is harnessing to make its water use sustainable, and how it is engaging with other stakeholders and the communities to create a positive difference around water. I am glad that FICCI Water Mission has taken on this seemingly basic task, but one that is fundamental, by recognizing efforts and leadership, and helping to develop a knowledge base on sustainable water management practices adopted by different stakeholders and disseminating these best practices to encourage many other organisations to replicate or generate new ideas.

The intense process and rigour by the FICCI Water Awards Jury has taken these Awards to a different level of distinction and elevated the understanding of excellence in sustainable water management. I thank the esteemed Jury for their tremendous contribution. I thank the Expert Screening Panel for their immense effort in the scrutiny and assessment of each nomination. My heartiest congratulations to the winners of the 8th edition of the FICCI Water Awards for their exemplary work. Last but not the least, I commend the FICCI Water Mission secretariat for their hard work behind the scenes.

Uday Shankar

President, FICCI

FOREWORD

The lack of availability of clean and sufficient water is often associated with a range of issues from polluted water resources to an increasing demand for water due to a growing population, poor agricultural practices, and erratic rainfall patterns. It is estimated that water scarcity is likely to experience further aggravation as the population increases, over the next few decades. Thus, it becomes imperative that water issues are not considered in isolation, and a more holistic approach to water management is attempted.

Water reuse is one such option that can help significantly increase water supplies. Recycling and reuse of wastewater are central to a circular economy approach and offer a strategic direction to address both the supply and demand side of water management. A transition to circularity of water use could create significant synergies for the wide adoption of water reuse as an alternate water supply for different end-user segments.

Concerns about water in the private sector are rising rapidly. Industry and corporates are proactively managing scarce water resources in a sustainable manner. They are becoming more aware and understand the complexities of their role, and the interconnections of their impact on water and groundwater and are working towards creating shared value for themselves and society.

FICCI has been working steadily to promote water conservation and sustainable water management within its member companies through the FICCI Water Mission which was constituted in 2011 to promote awareness, thought leadership, policy advocacy and best practice sharing in sustainable water management with a special focus on water use efficiency, urban wastewater management and corporate water stewardship. The annual Water Awards instituted by the Mission recognizes exemplary contribution in the areas of industrial water use efficiency, urban wastewater management, community initiatives by industry, NGO initiatives in water, and innovations in water technology.

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 on the scale and urgency of the water challenges facing business and industry in India and enables the engagement of new players in the discourse on the future management of water.

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

Naina Lal Kidwai

Past President, FICCI
Chair, FICCI Water Mission

MESSAGE

For the first time since the National Water Policy was first drafted in 1987, the Government of India has set up a Committee chaired by and comprising experts from outside government. This shows the keenness of the Government of India to seek professional advice from those outside government and to learn from the best practices on the ground.

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

There are many unsung heroes who are making brilliant contributions in this direction. This compendium will give you a glimpse into some of this work, which is showcased here after a very rigorous process of scrutiny and appraisal. The aim

of the Water Awards Jury has been to reward those efforts that embody truly cutting-edge innovation, while also providing the best chances of replication on a large scale.

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

Dr Mihir Shah
Chair of Jury – FICCI Water Awards 2020
Chair, Committee to draft National Water Policy

FICCI WATER AWARDS CATEGORIES

FICCI WATER AWARDS

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

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

AWARDS CATEGORIES

Industrial Water Use Efficiency

(Industrial units belonging to the water intensive sectors)

Community Initiatives by Industry

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

Water Initiatives by NGOs

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

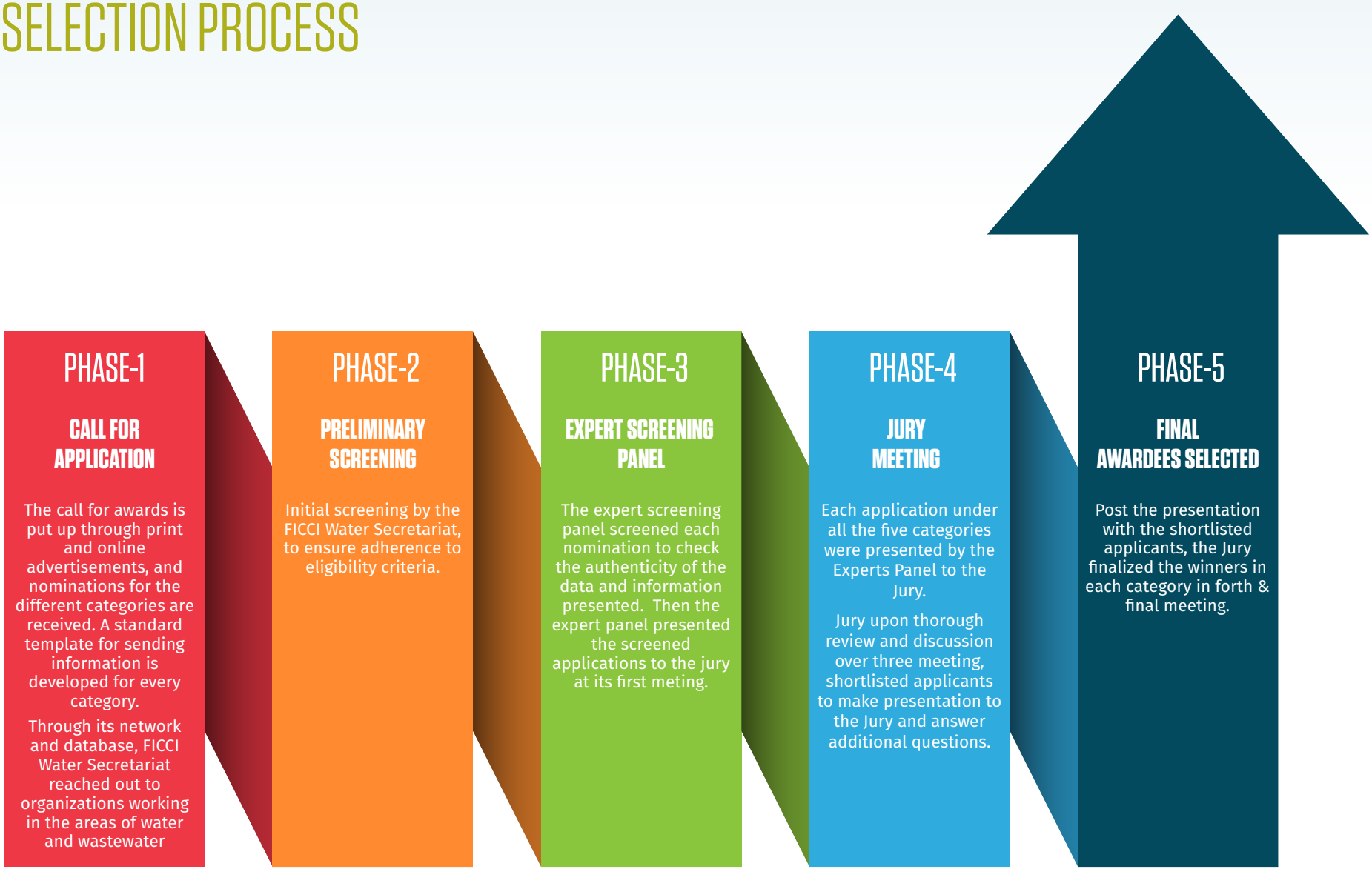
Innovation in Water Technology

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

Urban Wastewater Management

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

SELECTION PROCESS



8th Edition of FICCI WATER AWARDS 2020

WATER AWARDS THROUGH THE YEARS

2019

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

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

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

1

2

3

4

5


6

2016

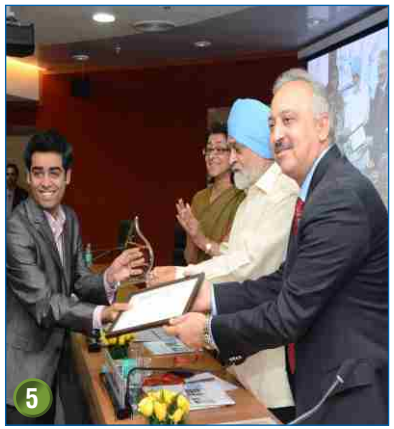
1. ITC Ltd. Saharanpur, Winners, Industrial Water Efficiency Category
2. TATA Motors Ltd., 1st Runner - Up, Industrial Water Efficiency Category
3. ITC Ltd. Jalahobli, 2nd Runner - Up, Industrial Water Efficiency Category
4. ITC Ltd., Winners, Community Initiatives by Industry Category
5. Self Employed 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.

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

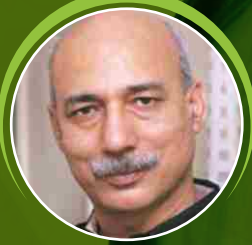
1. Essar Steel India Limited, Hazira, Winner, Industrial Water Use Efficiency Category
2. ITC Limited, 1st Runner Up, Industrial Water Use Efficiency Category
3. Tata Chemicals Limited, Winners, Community Initiatives Category
4. Hindustan Unilever Limited, 1st Runner Up, Community Initiatives Category
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 2020

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 Dipankar Saha

Dr Manoranjan Hota

CHAIR OF JURY, FICCI WATER AWARDS 2020

Dr Mihir Shah
Chair of Jury, FICCI Water Awards 2020
Distinguished Professor, Shiv Nadar University
Former Member, Planning Commission
Government of India
Co-Founder, Samaj Pragati Sahayog

After co-founding Samaj Pragati Sahayog in 1990, 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.

In 2019, the Government of India invited him to chair a Committee to draft the new National Water Policy (NWP). This is the first time since the NWP was first drafted in 1987 that a person from outside the government has been asked to chair this Committee. In 2015, the Government of India invited him to chair a Committee on Restructuring the Central Water Commission and Central Ground Water Board and also to chair a Committee to draft the National Water Framework Law and the Model Groundwater (Sustainable Management) Bill.

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.

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.

He is the Founder President of the Bharat Rural Livelihoods Foundation, set up by the Government of India to support innovative civil society action in close partnership with state governments. Dr Mihir Shah's 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 Asian Development Bank in Manila, the Arctic Circle in Iceland, Chatham House and University College, London; UNESCO-IHE at Delft, International Institute for Applied Systems Analysis in Austria, the EAT Forum, Stockholm; the Himalayan University Consortium in Chengdu, China; International Water Management Institute in Colombo and the Singapore Water Week.

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

Executive Director and Secretary 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 – PhD from Pune University in 1987 - and has been working on aquifers and groundwater across India's diverse groundwater typology for more than 35 years. He has been a CSIR research scholar, UNESCO scholar and a Fulbright Fellow at different times of his career.

ACWADAM has partnered with a variety of organisations on piloting and mainstreaming the ideas of participatory groundwater management and springshed management 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 has supervised 2 PhDs and many post-graduate dissertations. He continues to advise Government of India and has held many advisory positions on various committees of the Government. He is currently also a member of the committee that is drafting India's new National Water Policy. Dr. Kulkarni has anchored several international action research collaborations in the subject of groundwater, particularly in his lead role at ACWADAM.

Mr VK Madhavan

Chief Executive
WaterAid India

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

EXPERT SCREENING PANEL

Dr Dipankar Saha

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

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

He has authored more than 50 papers in International Peer Reviewed Journals and delivered more than 300 lectures and keynote addresses in national and International Seminars. Professionally trained from Asian Institute of Technology, Bangkok and from JICA, Tokyo, he represented the country and presented papers in World Bank session at Kathmandu, International Atomic Energy Agency at Ho-Chi Minh City, and Vienna, World Water Week - Stockholm, India-UK Water Security Exchange- Wallingford, Oxfordshire, IAH Congress in Dajeon, Korea, Lincoln University UK and led the Govt of India Delegation to Myanmar. Co-Edited two Books on Water, published by Springer and special volume of Journal of Hydrology-Regional Studies.

He is the recipient of National Geoscience Award - 2010 conferred by Ministry of Mines and Excellence in Ground Water conferred by International Association of Hydrogeologist-Indian Chapter in 2014. He is presently Secretary of International Association of Hydrogeologist-Indian Chapter, Adjunct Professor IIt Kharagpur in School of Water Resources, and Chairman of the Committee of accreditation of ground water consultant organisation under Quality council of India.

Dr Manoranjan Hota

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

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

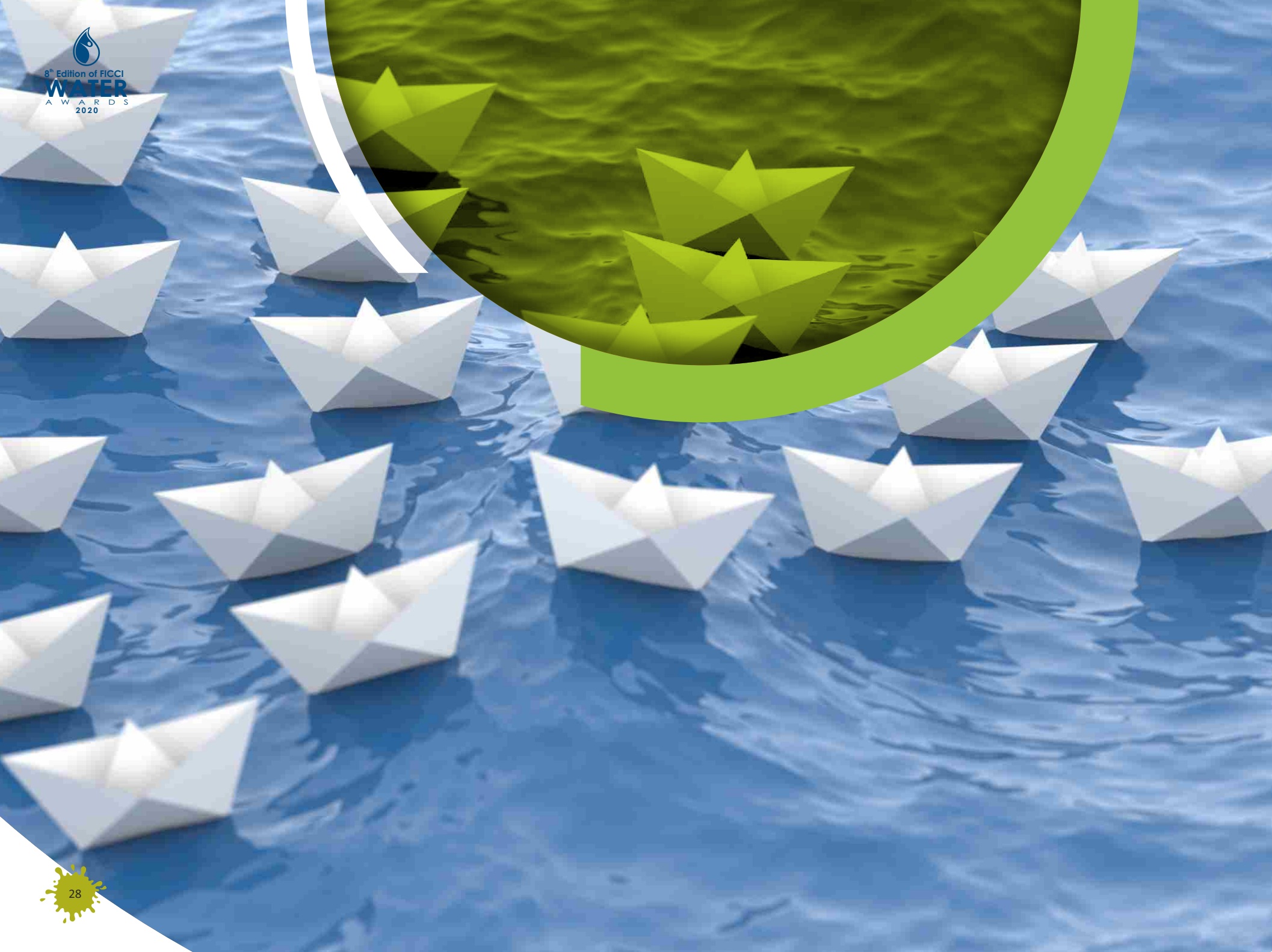
He is an Expert Member in Expert appraisal Committee of MoEFCC, EIA Accreditation Committee of QCI-NABET, and OECD Expert Group on Best Available Technology (BAT).

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

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

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

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



Awardees 2020

CITATION FOR THE AWARDEES

CATEGORY

Industrial Water Use Efficiency

Joint 1st Prize

Tagros Chemicals India Private Limited

Tagros Chemicals Private Limited is jointly being awarded first prize in this category for demonstrating its commitment to reducing its water consumption by 28% from past two years and recycling 40% of its water by adopting Water Banking System and various water efficiency measures as well as technology upgradation.

CATEGORY

Industrial Water Use Efficiency

Joint 1st Prize

Trident Limited

Trident Limited is jointly being awarded first prize in this category for demonstrating its commitment to minimize the environmental impact at their manufacturing facilities and conserve water through various initiatives. They have reclaimed 100% of wastewater and reduced their freshwater consumption through ZLD system and various water efficiency measures as well as technology upgradation.

CATEGORY

Community Initiatives by Industry

1st Prize

ITC Limited

ITC Limited is being awarded the first prize in this category for their holistic and community driven Water Stewardship Programme (WSP) with objectives of drought-proofing agriculture & creating water security for all catchment stakeholders.

CATEGORY

Innovation in Water Technology

1st Prize

Daiki Axis India Pvt. Ltd.

Daiki Axis India Private Limited is being awarded the first prize in this category for introducing Johkasou technology for treating wastewater and sewage water. The technology is robust, modular, easy to operate and cost effective. The treated wastewater generated from the plants meet the CPCB norms and can be used for horticulture and other non-potable purposes.

CITATION FOR THE AWARDEES

CATEGORY

Innovation in Water Technology

2nd Prize

Konark Fixtures Limited

Konark Fixtures Limited is being awarded second prize in this category for introducing KoSEM (Konark's Scientifically Engineered Microorganism) technology which involves specially acclimatised microorganisms which actively participate in degradation of chemicals present in industrial wastewater and the technology does not require any primary chemical treatment.

CATEGORY

Innovation in Water Technology

3rd Prize

JS Water Energy Life Co. Private Limited

JS Water Energy Life Co. Private Limited is being awarded the third prize in this category for introducing Aquaritin which is a 4th generation Nano-Nutrient technology that promotes sustained growth, both of photosynthetic algae (mainly diatom and other useful algae) and aerobic bacteria, through nutrient supply into the water and treats polluted water bodies and rejuvenate aquatic ecosystem.

CATEGORY

Innovation in Water Technology

Special Jury's Award

Water Resources Department (WRD) Rajasthan

Water Resources Department (WRD) Rajasthan is being awarded the Special Jury's Award for developing of Grid of automated stations by Real Time Data Acquisition System (RTDAS) for acquiring rainfall, water level in rivers, reservoir and ground water and its online dissemination in public domain. They also introduced SCADA technology in the state to handle flood situations and Acoustic Doppler Current profiler (ADCP) for precise flow measurement in rivers and canals.

CATEGORY

Water Initiatives by NGO

1st Prize

Aga Khan Rural Support Programme

Aga Khan Rural Support Programme is being awarded the first prize in this category for their initiative for improving the productivity and reducing water use in cotton farming by facilitating adoption of drip irrigation technology by institutionalizing a community managed financing mechanism in Saurashtra region of Gujarat.

CITATION FOR THE AWARDEES

CATEGORY

Water Initiatives by NGO

2nd Prize

Jan Jagran Kendra

Jan Jagran Kendra is being awarded second prize in this category for their exemplary initiatives around watershed development and natural resource management. They have completed more than 500 watershed development projects, covering nearly 30,000 hectares of land and impacting over 1,00,000 people and covering 1028 villages in Jharkhand.

CATEGORY

Urban Wastewater Management

1st Prize

Vishvaraj Environment Private Limited

Vishvaraj Environment Private Limited is being awarded the first prize in this category for implementation of India's largest Sewage Treatment Plant of 200 MLD on PPP model and reusing the treated wastewater from the STP for power plants in Nagpur in collaboration in Nagpur Municipal Corporation.

CATEGORY

Urban Wastewater Management

Special Jury's Award

Vadodara Municipal Corporation

Vadodara Municipal Corporation is being awarded the Special Jury's Award for implementation of one of the largest Smart Water Management project in Vadodara city in Gujarat to provide adequate, reliable, and quality water supply with the state of art automation technology including instrumentation and Supervisory Control and Data Acquisition system (SCADA) for monitoring of water supply flow and pressure in main distribution lines.

WATER AWARDS 2020

Industrial Water Use Efficiency

1st PRIZE

TAGROS CHEMICALS INDIA PRIVATE LIMITED

Mr. Abhimanyu Jhaver
Managing Director

"A drop of water is worth more than a sack of gold to a thirsty man."

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

With a vision "To make the world a better place to live by partnering path-breaking innovations in agriculture", Tagros marches with a water stewardship which is socially equitable, environmentally sustainable and economically beneficial.

Reduction of water consumption has been reduced to 28% for the past two years and 40% of water has been recycled. Tagros is operating Effluent Treatment Plant with 'Zero Liquid Discharge' system for trade effluent and Tagros explore the potential to recover Product from effluent converted as a sealable product.

Tagros is the leading manufacturer of Synthetic Pyrethroids, Herbicides, Fungicides, Pesticide Intermediates and Special Formulations, producing 2,500 metric tons of active ingredients and exporting them to over 90 countries.

Business philosophy of Tagros revolves around supply of quality products and services in a timely manner so that its customers always meet their business obligations and benefit from the association.

Tagros also strives for the continual improvement of systems by adopting sound design and operational practices to ensure safe work environment.

Right from the inception we had a continuous improvement in the areas of environmental protection, health and safety. Water Management have also had had great strides and accomplishment in terms of conservation, wastewater management. We have built critical sharing networks across companies and functions of operations, and even across related industries. We had always remained open and understanding of the needs and drivers of our industry, people and society at large.

Tagros endorses a socially equitable, environmentally sustainable and economically beneficial water management system. Our efforts to make water conservation effective, begins with framing a strong strategies and Goals and practised by each one in the organisation.

Water Banking System: A well-defined Water policy has been famed for water governance. An exclusive water committee for water management has been formed. A key person from each department renders their part for the effective execution of water governance and contribute new ideas. Water banking mechanism is in practice with Tagros in which every department has been allotted with the water budget, in case if had to exceed the budget, then it can obtained from other department as a loan making it sure that it does not affect the overall budget.

Water Conservation Measures:

- The technical team specifically assigned for water conservations acts accordingly. Process modification wherever possible for water reduction has been carried out.
- Suggestions related to water efficiency are always encouraged and impact water conservation posters are placed at different spots to create awareness.
- Water flow meters are installed at various locations. Treated sewage water is being used in place of fresh water for gardening.
- Converting all toilets to dual plumping toilets.

Rainwater Harvesting system

We have initiated massive awareness and motivational campaign to induce every stakeholder of our organization to adopt rainwater harvesting system in their houses.

- 1100 residences of direct employment
- 3000 residences of Stakeholders
- 4400 residences of villages around
- Tree Plantation of 4000 nos in 4 acres of barren SIPCOT Land
- Desilting of 4 Lakes in nearby villages

New Technology:

Sewage Treatment Plant- Bio Zone Technology:

- "Zero bio sludge generation”
- Compact and space requirement (footprint) is very less compared to conventional treatment plant
- "Silent operation" since air blowers are not required
- The treated Sewage is "colourless and odourless"

FORWARD OSMOSIS:

- No additional high-pressure feed or heat input - giving energy reduction up to 50% from MEE
- High water recovery
- Simple operation and less maintenance
- Less fouling
- Less CIP and less cleaning chemicals
- Capable of treating upto 50000ppm TDS and replacement of MEE

Salt Generation has been Reduced from 450 MT/month to 410 MT/month by Bifurcating the effluents streams

- 40 MT of salt converted to Sodium Chloride Saleable product
- 20 MT of salt converted to Sodium Sulphate Saleable product

PROPOSED WATER CONSERVATION PROJECTS.

We have proposed few water conservation projects like AQUA LIFE (Advanced Membrane Technology), Paddle drier technology, Salt recovery system etc...

AQUA LIFE (Advanced Membrane Technology):

- Not require multistage RO (1,2,3 & etc stage)
- Permeate recovery will be improved from 85% - 95%
- Compact design
- Low power consumption
- TDS-handle Up to 45000-90,000 ppm
- High pressure pipelines not required - Inlet & out Pressure -3 bar only
- Low noise in operation

PADDLE DRIER TECHNOLOGY:

- To reduce moisture 45%-50% from ATFD salt. (Reduction of disposal cost)

Advance Combo Technology (ECO-Oxidizer, Aqua life) for Salt Separation from Effluent

- 60-70 % reduction in Solid waste disposal Quantity and more recycling of water
- Sodium Sulfate and Sodium chloride separate from mixture of salt and made as saleable product

1st PRIZE

Trident Limited

Padma Shri Rajinder Gupta
Founder and Chairman, Trident Group

"We, at Trident, have a substantial budget dedicated to water recovery & treatment. With state-of-the-art technology and dedicated R&D and Sustainability teams at the helm, we restore natural resources at every step"

Brief message on the long-term water sustainability plan.

Nature comes first — and for nature to keep thriving, we, at Trident, are committed with our extensive eco-friendly initiatives. We follow environment-conscious manufacturing practices – recycling water, zero liquid discharge and usage of non-toxic chemicals and dyes. With continuous improvement, our textile business is operating with much lesser water consumption than the benchmark set by Indian & Global counterparts.

We made this possible with the implementation of smart processes like 100% recycling of water used in the manufacturing process, optimization of water consumption at various machine wise activities, modernization and automation of machinery & processes. We also follow multiple wastewater treatment strategies that include Zero Liquid Discharge technology & reduction of landfill waste generation.

Trident Group is a collaboration of many hearts reaching out to protect and preserve our environment. Embracing sustainability as a core business vertical, we have adopted different technologies to reduce the consumption as well as the pollution load through our pivotal technologies.

Case Study :

Inspired by challenges, we at Trident will add value to life, and together, prosper globally. We have completed different projects to minimize the environmental impact at our manufacturing facilities & believe that conservation of water is the way to sustainable development.

For this, we have undertaken ;

- 100% reclamation of waste water & reduction of fresh water consumption from natural resources. It is being done by setting up the zero liquid discharge system
- Flow Metes have been installed on individual machine to avoid wastage of water during process
- Additional Reverse Osmosis system installation to augment the recovery & reduction of carbon footprint
- Liquor ratio of machine up-gradation for all wet process of textile
- Recovery & Utilization of steam condensate from all machines & reuse in process
- Usage of washing range waters in pre chambers in all machineries
- 100% automation & Industry 4.0 Artificial Intelligence implementation in all equipments to optimize the consumption of water

Reducton in Water Consumption

Installation of Low MLR processing Machineries -

The latest processing machineries with MLR ratio 1:4 is installed at Budhni which consumes less water, power, steam and chemicals .

Water Saving - 11250 KL per Year

Use of Post wash drain water in pre-washer of PTR machine-

The consumption of Water is reduced signficantly by re-using the form the post water wash chambers in the initial washing stages.

Water Saving - 49960 KL per Year

Sanforizer Machine -

Waste water drained from sanforizer machine is collected in pit and pumped for reuse in same machine after filtration and cooling.

Water Saving - 7440 Kl per Year

Installation of 4th Stage Reverse osmosis to enhance the Water recovery following the TPM methodology.

The recovery of waste water from the Reverse Osmosis system has increased from 92% to 95%.

36.5 million litres of Water Has been recovered after installation of 4th Stage.

Installation of Condensate Recovery Units

Steam condensate is recovered in Pre Treatment Range & washers machines and used for the processing of the cloth.

Water Saving - 18000 KL

Installation of Continuous Dyeing Machines:

We have implemented the continuous dyeing machineries in place of exhaust dyeing machineries to reduce the specific water consumption across machines.

Installation of Rotary Filter -

Rotary Filter installed to filter the used water during peach washing and then reused through pad steam drying machine

Water Saving - 5254 KL per year.

Rain Water harvesting System - Trident has established impervious reservoir to store surplus rain water during rainy season and use the same during summers. Total rainwater harvesting potential (including paved/unpaved/rooftop) is 1,29,658 m3. The complete water run off generated is diverted to rain water harvesting ponds which is spread across 1,02,080 meter square of area. Rain water harvested is reused in industrial processes.

Impacts-

- Due to the enhanced water recovery through innovative technologies total fresh water consumption reduced by 231497 KL in FY 2019-20.
- By installation of Zero Liquid Discharge Facility there is remarkable reduction in the usage of fresh water consumption. Almost 9034.5 Million Liters of water is recycled for wet processing instead of which saved equal quantity of fresh water since the incepton of Zero Liquid Discharge System.
- 350000 KL of Water is conserved after establishment of Reservoir.
- 125647 KL Water has been conserved from Various TPM Methodologies in FY 2019-20.
- 389626 KL of domestic water is treated and reused in the development of green belt within the premises.

Community Initiatives by Industry

1st PRIZE

ITC Limited

Sanjiv Puri
Chairman & Managing Director

"ITC's Water Stewardship Programme - Water for all, today and tomorrow"

ITC limited

ITC limited is an Indian business conglomerate with multiple businesses and business operations spread across the country. ITC's vision of sustainable and inclusive growth is actualised through the Triple Bottom Line approach that simultaneously builds economic, social and environmental capital. ITC has constantly strived to reduce the impact of its businesses, processes, products, and services and create a positive social and environmental footprint. ITC endeavours to reduce specific water consumption and augment rainwater harvesting both on site and off site in watershed catchment areas. It has adopted a low-carbon growth strategy by creating carbon sinks through its large-scale forestry projects. ITC also minimises waste generation and maximises reuse & recycling on an ongoing basis. As a result of these efforts, ITC has been carbon-positive, water-positive and solid waste recycling positive for over a decade now.

ITC believes that enterprises that embed sustainability in their business can deliver substantial stakeholder value through innovative development models that simultaneously create livelihood opportunities and a positive environmental footprint. This is realised through ITC's Mission Sunehra Kal", which engages with multiple stakeholders - communities, institutions, government bodies, programme implementation partners, technical institutes/universities - to develop and implement sustainable, replicable and scalable models for conservation of natural resources, while ensuring societal welfare and inclusive development

I. Name of the Initiative

'ITC's Water Stewardship Programme'

II. Location

ITC's Water Stewardship Programme has covered 43 districts in 16 states, majority of which are moisture stressed, and the programme continues to expand to newer regions.

III. The Initiative

ITC has long been engaged with two sets of stakeholder communities to address their vulnerabilities, livelihood and sustainable development related challenges: agrarian communities associated with its agricultural value chains and communities residing around its production units. ITC considers the sustainability challenges of the community as its own given the intrinsic relationship of the stakeholder communities with ITC in the areas of procurement, co-existence and sharing of natural resources.

Agriculture is the predominant livelihood for the majority of the stakeholders, who are mostly small landholders and are dependent on rainfed agriculture. These farmers are especially vulnerable to the vagaries of monsoons, with extreme weather events caused by climate change aggravating their situation. Increasing dependence on borewells is leading to severe groundwater depletion with groundwater tables falling and bore wells rapidly drying up, further increasing costs and reducing yields.

ITC's Water Stewardship (WSP) programme was launched in 2001 to ensure 'Water for all - today and tomorrow' in its catchments. WSP, is in line with ITC's commitment to the Triple Bottom Line Performance, and SDGs 6, 13 and 15 - Clean Water and Sanitation, Climate Action and Life on Land, respectively.

The WSP programme addresses all issues related with water in a comprehensive manner anchored in an eco-systems approach. It aims to; a) find solutions for the issues; b) mobilise financial and technical resources; c) ensure effective on-ground implementation; and d) promote community ownership in the whole process.

A. Robust Technical approach for effective solutions

Water balance studies are conducted to identify the supply and demand gaps, followed by interventions to improve supply and to reduce demand for water:

i. **Supply side augmentation:** The objective is to conserve most of the rainwater during the rainy season within the watershed through surface storage, sub-

Check Dam - Pune dt., Maharashtra

Check dam Pratapgarh dt. Rajasthan

surface flows and groundwater recharge. Benefits realised are control of topsoil erosion, increased access to water sources, improvement in groundwater levels and improvement in post monsoon flows in streams and rivers.

The work includes catchment treatment, water harvesting, groundwater recharge and improvement of biomass and biodiversity conservation. While the first two interventions are conventional solutions, ITC has additionally embarked on groundwater recharge and biomass improvement based on the learnings from its vast experience. Geohydrology studies identify potential recharge zones to enable Managed Aquifer Recharge (MAR) by constructing groundwater recharge structures exclusively in those zones. MAR maximises groundwater recharge rate within the available monsoon window. Biomass and biodiversity conservation in the catchment areas is achieved through restoration of village commons, fringe area development to reduce pressure on forests, and tree plantations. Biomass acts as a sponge to hold water during the monsoon and gradually releases it into streams in the post monsoon season.

ii. **Demand Management:** ITC's experience clearly states that most of India's watersheds and river basins have higher demand than supply and the situation is only worsening with a growing population and related needs of community. Hence there is an urgent need to work on reduction in demand for water. Agriculture continues to be the major water user in most of the river basins, consuming up to 80% of water. There is, therefore, a huge opportunity to promote 'more crop per drop' while simultaneously improving yields and reducing costs of cultivation.

As part of demand management, ITC identifies the most effective agronomical and micro irrigation practices with technical experts that promote water-use efficiency. The practices are demonstrated to farmers through Farmer Field Schools and ITC helps farmers to adopt those practices in their fields by facilitating technical and financial assistance through various Government schemes. The major crops and practices being promoted are: a) Direct Seeding of Rice; b) Zero tillage cultivation in wheat; c) Seedling plantation along with drip in sugarcane; d) Raised bed plantation along with drip in onion; e) Drip in

Checkdam backwaters Pratapgarh dt., Rajasthan

Coconut drip and Mulching to save water - Coimbatore dt., Tamilnadu

banana; f) Mulching and drip in coconut; and g) drip and mulching in vegetable crops. All these practices have reduced water demand significantly and, at the same time, improved yields and reduced costs of cultivation.

iii. **River Basin level work:** ITC has expanded its work to the river basin level in a phased manner in its major catchments. Achieving positive water balance at the river basin level will have a long-lasting and large-scale impact as compared to work at the micro/mini watershed level. ITC is currently actively engaged in four basins: Ghod (tributary of Bhima - Krishna, Maharashtra), Mureru (tributary of Kinnerasani - Godavari river, Telangana), Upper Bhawani (tributary of Kaveri river, Tamilnadu) and Kolans (Upper Bhopal lake source, Madhya Pradesh).

B. Partnerships for scale and coverage

ITC could succeed in achieving significant scale and coverage primarily due to the thrust and efforts put in forging partnerships at multiple levels to mobilise knowledge and resources and to ensure effective implementation and community ownership:

- Community partnerships are at the core as it entails people's ownership and, therefore, ensures programme sustainability. Various community institutions are formed to deliver different objectives of WSP. Water User Groups (WUG) are formed for implementing watershed development and water harvesting structure construction, Farmer Field Schools are promoted for farmer capacity building and Agri Business Centres are formed for providing equipment and services to small & marginal farmers.
- Civil society partnership brings to the table their vast field knowledge, insights and grassroots delivery efficiency. Programme implementation is done in partnership with thematic expert and grass-roots Non-Governmental Organisations.
- Public Private Partnerships (PPPs) are done to leverage additional resources and to scale up through the government machinery. ITC has partnered for watershed development with government programmes like Mahatma Gandhi National Rural Employment Generation Scheme (MGNREGS), Integrated Watershed Management Programme (IWMP), Mukhyamantri Jal Swavlamban Abhiyan (MJAS) - Rajasthan and

Direct Seeding of Rice to save water, Kapurthala dt., Punjab

Irrigation tank, East Godavari dt., AP

with NABARD. Partnerships with forest departments and the Pastureland Development Boards improve green cover and biodiversity, while those with state Irrigation departments address demand/supply gaps in water use.

- Knowledge partnerships with technical institutions and thematic expert organizations undertake scientific research and pilot identified solutions. Few of the important partnerships include those with Tamil Nadu Agricultural University (TNAU) and Vasantdada Sugar Institute, Pune for crop water use efficiency; International Water Management Institute (IWMI) for developing drought proofing & water security templates; CGIAR for developing climate change resilience in agriculture, IUCN for improving biodiversity and WWF India for Water security studies, etc.

IV. Coverage and Impact

- As part of supply side management, over 17,456 water-harvesting structures, such as farm ponds, check dams, irrigations tanks, etc., have been constructed/revived and 1,529 groundwater recharge units have been constructed, resulting in a total water storage capacity of 39.31 million KL. ITC's WSP has till date covered 11.33 lakh acres and 3.31 lakh households and created 59.84 lakh person days of employment.
- Demand management practices are adopted in 2 lakh acres of seven major crops which has saved up to 129 million cubic metres of water in one year as compared to conventional practices.
- Till date, ITC has signed 44 PPPs with Governments.

Various positive impacts have been observed by several third-party impact assessment studies, few of which are as follows:

Impacts on Supply Side Augmentation

- Increase in crop yields in the range of 20-25% and reduction in cost of cultivation by 25-30%.
- Improvement of groundwater table by around 40%.

Water User Group meeting near Stop Dam - Sehore dt., Madhya Pradesh

Zero tillage practice in wheat to save water - Gorakhpur dt., UP

Impacts of Demand Management

- 37 to 50% less water consumption as compared to conventional practices followed.
- 10 to 31% higher yield as compared to conventional practices.

V. In conclusion

Water resources in India are under continuous stress with 36% of the country's area being categorised as Semi-Critical to Over-Exploited zones by the Central Groundwater Board. The demand on water is increasing due to population growth and at the same time nature's system of capturing rainwater during monsoon is getting disturbed due to human activities and climate change induced monsoon patterns. In this backdrop there is an acute and urgent need to address the issue, by incorporating advanced solutions, adopting ambitious targets and forging large-scale partnerships for accelerated scale-out and coverage.

Irrigation tank, East Godavari dt., AP

Innovation in Water Technology

8th Edition of FICCI WATER AWARDS 2020

1st PRIZE

Daiki Axis India Private Limited

Hiroshi Ogame
President & CEO

"We promote the conservation of water environment to the world."

Having spent 60 years, focusing on water and people's lives, our goal is to continue working towards becoming an "eco-creation and development company" that provides greater support to humans and the natural environment.

Brief Message from Director/CEO/COO, the Indian representative of the company on Long Term water sustainability plan

Food, energy and water security are the key challenges faced by India for sustainable development. Food and energy both are highly dependent on water, which has been under tremendous stress due to overexploitation and pollution of natural water resources. Treatment of domestic wastewater at the site provides great opportunities, as using treated wastewater can reduce the burden on freshwater resources, pollution load on rivers & water environment. This also creates a healthy environment and the circular economy for local communities. We at Daiki Axis are committed to working with all the stakeholders in India to walking through this journey.

Innovation

Packaged Sewage Treatment Plant (Johkasou): Plug and Play type completely factory-made package sewage treatment system

Johkasou technology is extensively used in Japan for decentralised sewage treatment since 1960, but our AI and AIJ STPS are specially designed for India after detailed study of Indian conditions, requirements and cost expectations. The product works on the principal of gravity, it utilizes the natural anaerobic and aerobic (MBBR) biological processes in combination with chlorination for disinfection. There is no chemical (other than chlorine tablets) or bacterial cultures added from outside. This is housed in an FRP Tank which makes it durable and corrosion free. A small diaphragm type blower is the only component which uses electricity; hence the product is highly

energy efficient compared to conventional STP products. The product is designed for both underground and over the ground installations. The product works on automatic mode and doesn't require any full-time operator and its specially designed processes and closed body design makes it low noise (lower than refrigerator sound, <45 DB), no smell and low sludge generating system.

This Johkasou technology is described as the advance technology for grey and black water treatment in the CPHEEO (Central Public Health Environmental Engineering Organization) manual, a government of India document, in 9th chapter in the Engineering section. Daiki Axis Johkasou is impanelled by Ministry of Jal Shakti of Government of India for the Jal Jeevan and Swachh Bharat Mission.

Applications and Range

Apartment complex Building complex (60KLD)

Individual House (1KLD)

Factory (30KLD)

Commercial Building (40KLD)

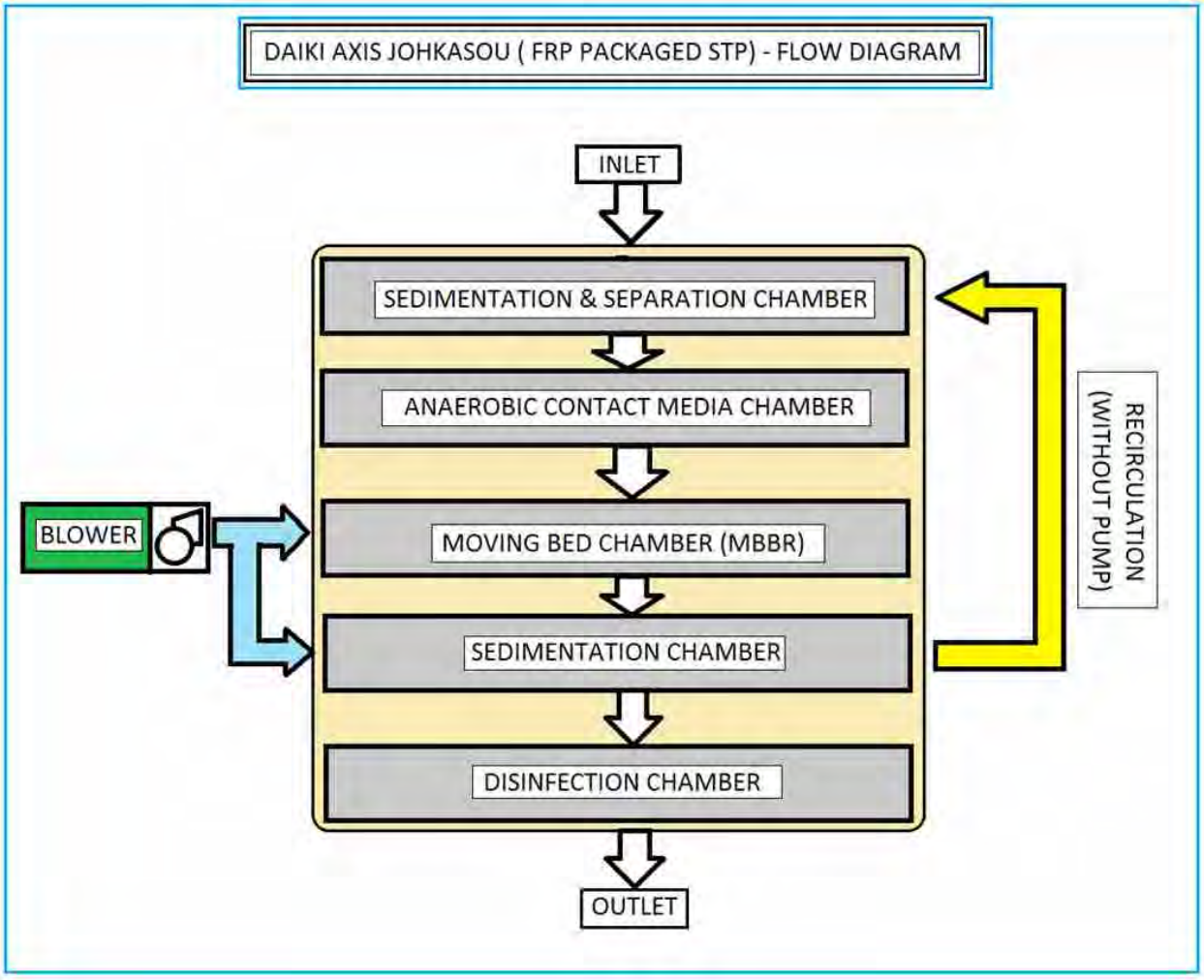
Underground Installation

Under Car Parking

Underground Green Area

Multiunit installation for higher capacity requirement

Treatment Process Flow Diagram:



Five Stage Treatment Process:

The treatment process is split into 5 treatment chambers inside the treatment tank.

1) Separation & Sedimentation chamber
2) Anaerobic Contact media chamber
3) Aerobic chamber
4) 2nd Sedimentation chamber
5) Disinfection chamber

Water flows from first chamber to fifh chmaber sequentially by gravity. There is continuous circulation of water from the forth chamber to first chamber, which ensures continuous denitrification and nitrification along with water movement inside the tank. Sludge gets accumulated in the first chamber,which needs to be removed after every 6 months.

The Impact

- **Large Coverage in a short period:** 1000 Acres of green area got covered through these plants in just about 1 year and water bodies were revived by using treated wastewater.
- **Fresh Water Savings:** 900 Million Litres of ground water withdrawal will be avoided every year by shifting the requirement to treated wastewater.
- **Pollution Abatement:** River Yamuna will be saved from the load of 900 million litters of wastewater entering into it every year.
- **Compliance:** Local authority could comply with the requirement of NGT order in a time bound manner.

The outcomes can easily be multiplied in a short period of time if the project is implemented across city by all the authorities.

Conclusion

Decentralised treatment of domestic wastewater can resolve many issues, like pollution abatement, reducing load on fresh water resources, resolving sanitation issues and enabling circular economy, it can contribute significantly to the Swachh Bharat, Jal Jeevan Mission and accomplishing SDG goals.

8th Edition of FICCI WATER AWARDS 2020

2nd PRIZE

Konark Fixtures Ltd.

Shri. Rakesh Sajjan Gupta,
Chairman & Managing Director (CMD)

"Konark Fixtures Ltd. was founded by a visionary, Shri Sajjan Kumar Gupta in 1970. The mission of the company is to develop New Products and Processes indigenously through rigorous Research and Development. Konark Fixtures Ltd (KFL) is actively involved in Wastewater Treatment. With years of R & D, Konark has developed Environment friendly wastewater treatment technology – KoSEM Technology."

BRIEF MESSAGE FROM THE CMD: -

ARE YOU AWARE THAT WATER IS BEING TRADED ON STOCK EXCHANGE ?

Yes! Water has been traded on New York Stock Exchange since it is going to be scarce commodity

As India has resolved to become a five trillion economies, we need to use our natural resources like Water judiciously. Konark is committed to efficiently treat Wastewater generated in industries. We believe in Zero Liquid Discharge (ZLD) norms and contribute to Recycle, Recover and Reuse of wastewater.

Safe reuse of water resources is a radical contribution to the old paradigm of water resource management, which had seldom considered the value of recycling of wastewater and its uses in various industrial processes.

KONARK is committed to treat wastewater employing environmentally sustainable methods in such a way that the wastewater can be reused as much as possible at the same time hazardous chemical sludge is not generated. This will ensure not only ZLD (Zero Liquid Discharge) but also ZSD (Zero Solid Discharge) which is environmentally friendly.

CASE STUDY

Name of the Organization: Raymond UCO Denim Private Limited

Textile industry is one of the most water intensive industries. Therefore, it is important to recycle wastewater. With the new environmental laws regarding discharge of wastewater in the water bodies it is essential for the industry to use technologies which are economical and environmentally sustainable.

Name of The Initiative: Zero Liquid Discharge: New Paradigm shift in Wastewater Treatment

Location: Raymond UCO Denim Private Limited, MIDC Lohara, Yavatmal, Maharashtra, India

Initiative / Innovation: Wastewater Treatment by KoSEM Technology.

After more than 10 Years of Research & Development we completed successful trial at Raymond UCO Denim Private Limited at Yavatmal and applied the same at their ETP of 3800 LKD capacity This Technology is based on the principles of Bioremediation.

We collected a number of effluent samples from site and developed the KoSEM Cultures. Hence it is Effluent Specific consortium of microorganisms. KoSEM Culture seed is developed in our Laboratory and scaled up and used in the Aeration tank at the site. The technology works on Low F/M ratio and more aeration time leads to generation of less sludge.

Impact: -

It is important to note that Capital investment in installation of KoSEM Technology is just a fraction of the total capital cost of complete plant. ETP Treated Water quality is more suitable for UF & RO Feed. This increases UF & RO recovery and membrane life, which ultimately reduces consumption of MIDC water.

Due to high UF & RO Recovery there is less RO reject quantity and hence MEE runs for lesser time which saves Chemical & Electricity cost (MEE OPEX), It also allows recycling and reuse of treated water. Since TSS in Secondary outlet is less, it reduces the backwash frequency in the tertiary filtration (PSF & ACF).

In short the KoSEM Technology has helped the Textile Industries in many ways:-

As it is completely biological, the chemical cost is reduced.

It has generated no hazardous chemical sludge as in the Conventional Treatment. Also the amount of sludge generated is 20-25% less than conventional activated sludge process and hence saves the cost on disposal of sludge to the designated site.

The Technology is environmentally sustainable as naturally occurring microorganisms are used to degrade BOD COD and Color, therefor there is less Operation & Maintenance cost as well as Less energy requirement.

The Technology has the very high efficiency reducing BOD, COD, color and TSS above 95 to 99%.

Because of the very high efficiency in treating wastewater and being economical, the ETP has contributed to receiving prestigious awards like **Vasundhara Award**, Golden Peacock Award and Greentech Environment Award.

Vasundhara Award-2019
(Suryalakshmi Cotton Mill. Ltd, Nagpur)

Vasundhara Award-2016
(Raymond Luxury Cottons Ltd., Kolhapur)

Golden Peacock Award-2019
(Raymond UCO Denim Pvt.Ltd, Yavatmal)

Greentech Environment Award-2015
(Raymond UCO Denim Pvt.Ltd, Yavatmal)

Greentech Safety Award-2016
(Raymond UCO Denim Pvt.Ltd, Yavatmal)

The KoSEM Technology has allowed industries to augment their production without fearing of increased effluent volume. There is a substantial reduction in cost of wastewater treatment. The technology allows efficient treatment of shock load of BOD, COD and color in the raw effluent. The technology is indigenous and hence affordable and economical. The industries which have old ETPs, can be upgraded and made efficient.

KoSEM SUCCESS STORY-

Sr. No.	Technologies	Physico-Chemical System	Activated Sludge Process	Aeration process – KoSEM Technology
	Parameters			
1	Capital Cost	Low	Relatively High	Relatively High
2	O&M Cost	High	Relatively Low	Low
3	Chemical Cost	High	Relatively Low	Low
4	Chemical Sludge Generation	High	Relatively Low	Low
5	Total Sludge Generation	High	Relatively Low	Low
6	Sludge Disposal Cost	High	Relatively Low	Low
7	BOD removal	30%	90-92%	96-98%
8	COD removal	40%	90-92%	96-98%
9	TSS Removal	80%	90-95%	95-97%
10	Color Removal	80%	92-94%	98-99%

3rd PRIZE

JS Water Energy Life Co. Pvt. Ltd

Mr Sunil Nanda
Managing Director
JS Water Energy Life Co. Pvt. Ltd

"Water is the most important nutrient for plant and animal Life."

Brief message

Maintenance of raw water quality in our rivers is critical for aquatic habitat. Anthropogenic pollutants impair raw water quality, and it is important therefore to restore the raw water quality through nutrient remediation in the drains, tributaries and main stems of the rivers.

Long Term Sustainability Plan

In a sustainable society, the goal is to limit the rate of pollution to what ecosystems can assimilate and break down without long term negative effects on ecosystem functions or human health. Meanwhile that goal is attained, we will have to give the ecosystems a hand to boost their intrinsic biodegradation capacity.

Nano-bioremediation involves the use of nanomaterials initially to reduce the contaminants to levels that are conducive to biodegradation and then promote biodegradation of the contaminants to reach the risk-based levels.

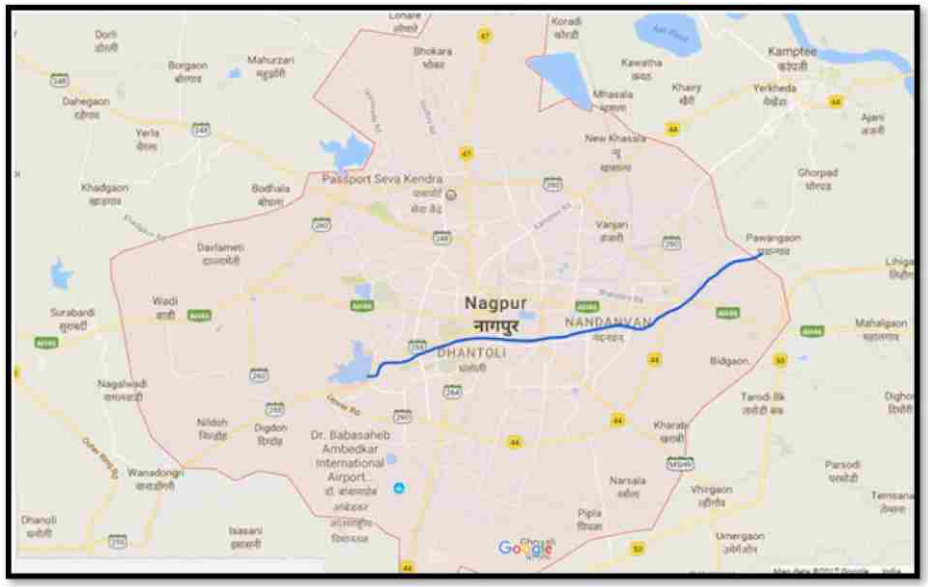
JS Water Energy Life Co. Pvt. Ltd.

Innovation

Aquaritin: Accelerated - Bio-Remediation of Nag River, Nagpur, India

Aquaritin

Location : Nag River, Nagpur, India



Pre-Treatment Analysis.

Under a MoU with the Nagpur Municipal Corporation (NMC), the Company undertook a pilot trial on a 1 km segment of the river.

The river serves as drainage for Nagpur and as a result its ecosystem is heavily polluted by urban waste from the city. The length of river is 17 km up to the city limit. The width of the river ranges from 12-40m and its depth is 2-4.5m. Nearly 190 MLD of sewage water is discharged in Nag River. Major sources of waste water in Nag River are domestic as well as industrial. A initial survey of Nag River was conducted along 1 km stretch. The flow in the river was estimated at 288 MLD.

Initial Test Results (sample were collected by the lab nominated by NMC)

- Dissolved Oxygen - **1.2 mg/l**
- Biological Oxygen demand - **110 mg/l**
- Chemical Oxygen demand - **267 mg/l**
- Faecal Coliform - **320,000 MPN/100 ml** (indicates that the sewage flowing into the water is accumulating as the River algae and bacteria are unable to digest it).




Pre-Treatment Condition of Nag River Nagpur.

Sources of pollution

- Industrial effluents.
- Solid waste dumping.
- Sewage.
- Wastewater from Commercial establishment.

Methodology

Dosing of Aquaritin and Microbes

- To apply the formulation of Aquaritin and Bacterial Culture on recommended interval basis for 90 days.
- Continue dosing until desired quality is achieved.
- Utilization of Bio-fences will be fixing for optimum result.

Monitoring

- Daily Monitoring of Physical Colour of Sungai-Gong and Sg Gong Holding Pond.
- Daily Monitoring of Odour.
- Weekly Monitoring of Water Analysis at designated points.
- Monthly Lab Report.
- Weekly Site visit.

Treatment phase

Solid Waste Removing

Dosing of Aquaritin Solution and Microbes

Revival of Aquatic Life

Bio- dredging in progress

Results

Water Turbidity after Treatment

Improvement of water clarity after treatment

Fish Survive Test

Result

Fish Survives for more than 72 hours in Treated Water.

Water Quality Comparison before and after Treatment

S no	Parameter	Unit	Pre-Treatment Value on	Post-Treatment Value	Percentage Change
1.	Faecal Coliform	MPN/100ml	320,000	250 MPN	**-99%**
2.	Dissolved `Oxygen	mg/lit	1.2	5.8	**+383%**
4.	BOD	mg/lit	110	3.41	**-96.9%**
5.	COD	mg/lit	267	11.8	**-95.5%**
6.	Total Dissolved Solids	mg/lit	460	340	**-26%**

Conclusion

- Technology can degrade pollutants and contaminants rapidly, usually within 3 months.
- Biotransformation of heavy metals and other harmful chemicals into simpler compounds which are easy to degrade naturally.
- Phyco-Remediation can revive aquatic food chain and ecosystem.
- Technology can degrade incoming sludge.

"Let's all do our share to conserve water with care."

Special Jury's Award — Water Resources Department, Government of Rajasthan

Naveen Mahajan,
Secretary Water Resources Department
Government of Rajasthan

"Utilizing technology for efficient and transparent management of most precious asset of universe"

Brief Message

State water profile & challenges before water management.

1. Water, a finite resource, is a key driver of economic and social development and a basic necessity for maintaining the integrity of the natural environment. Rajasthan, the largest state contributing 10.41% geographical area of Indian union, is having meager water resources to the tune of 1.16% surface water & 1.72% groundwater resources of the country.
2. Rajasthan water sector experiences multi sectoral challenges. It broadly includes both supply side challenges as well as demand side issues. Diversity and uncertainty in water availability across state, poor efficiencies of irrigation system, limited potential for water harvesting etc. are the major issues with regards to supply.
3. Similarly, diversity in irrigation water demands and irrigation water allocations, poor irrigation water efficiencies, lack of technological interventions for management of water, conventional farming practices, limited spread of micro irrigation system etc. are some of the critical issues regarding demand side irrigation water management.
4. Looking towards diversity in both availability & demand of irrigation water, no type cast or readymade solutions are available for managing water.

Key initiatives by department

1. **Thrust on enhancing water use efficiency:**

   Cost-benefit analysis shows rehabilitation of existing projects is much more beneficial. Lesser funds, shorter time, quick impact are key outcomes of rehabilitation of existing project. Thus, besides investing in creation of new water resources infrastructure, efficiency enhancement of existing infrastructure is a top priority

Major works for enhancement of irrigation water use efficiencies includes NDB funded Rajasthan Water Sector Restructuring Project in Desert Area (RWSRPD) for rehabilitation & restructuring of existing IGNP stage I system costing Rs 3291.63 crore, JICA funded Rajasthan Water Sector Livelihood Improvement Project (RWSLIP) for rehabilitation and renovation of 137 Irrigation Project in 27 districts to treat 4.70 Lakh Ha CCA costing Rs 2348.87 crore, Relining of Sirhind Feeder and Indira Gandhi Feeder (Punjab portion) costing Rs 1976 Cr, World bank aided Dam Rehabilitation & Improvement Project (DRIP) for restoration & rehabilitation of large dams of state costing Rs 965.56 crore.

2. Mandatory use of micro irrigation system in surface water irrigation projects:

- All the future surface water irrigation projects are being taken on micro irrigation based water application.
- Rajasthan has successfully implemented first major surface water irrigation of Nation project on micro irrigation techniques. Narmdada Canal project of Rajasthan is serving CCA of around 2.5 Lac Ha in the desert districts of Jalore & Barmer based upon use of 100% micro irrigation techniques.
- Apart from creating micro irrigation based CCA in 2.74 Lac HA area, out of total 3.48 Lac Ha CCA under IGNP Stage II Lift area, Micro irrigation works in about 1.94 Lac Ha area are being executed. Ongoing surface water irrigation projects covering 2.75 Lac Ha are being constructed on micro irrigation techniques.
- For promoting use of micro irrigation in irrigation command areas, concept of additional subsidy for use of micro irrigation in command area is introduced in state. Top up subsidies to the tune of 5-25% are being given in the command area under Rajasthan Water Sector Livelihood Improvement Project (RWSLIP) covering 4.70 Lac Ha in 27 districts of State.

3. Bringing Technological Interventions

- Transformation of Hydro meteorological observations from Manual mechanism to scientific methods.
- Development of Grid of automated stations by Real Time Data Acquisition System (RTDAS) for acquiring rainfall, water level in rivers, reservoir and ground water and its online dissemination in public domain. In this regards state installed 250 odd stations throughout the state.
- Development of decision support system through development of Integrated Water and Crop Information and Management system (IWCIMS) with National Water Informatic center, New Delhi.
- Rajasthan is the first state sharing hydro metrological data acquired manually and real time to the WIMS portal developed by Ministry of Jal Shakti, Govt of India.
- Integration of Hydro meteorological observations being taken by CWC and State.
- Lowering the operational cost of pressurized piped irrigation system through utilization of solar power, which are being coupled with pressurized micro irrigation projects.

4. Brining Transparency in water management for generation of confidence among beneficiaries.

- Timely information, transparent distribution of water & assurance of water availability among stakeholders is a key towards irrigation water management. To introduce these aspects in irrigation water management, technological interventions through SCADA and latest hydro

meteorological instruments are being tried. Real- time information will be available on web portal which will enable stakeholders for timely decisions & will bring assurance.

- SCADA is installed on Bisalpur Dam and is being installed on other major dams like Mahi, Jawai, Gudha dam.
- Availability of online real time data will bring sense of assurance among stakeholders and will enable them in making timely decisions for their agriculture management.
- IGNP main canal covering 16.17 Lac Ha command area is already equipped with SCADA and is being further upgraded in the light of information with respect to allocated share.
- For timely information of canal flows to cultivator, SCADA system is being installed on major canal system comprising canal system of Gang Bhakra and Narmada Canal project for automated, transparent, online and precise water distribution.

5. Non-structural/regulatory reforms:

- Handholding of farmers' organizations are being tried for effective involvement of farmers in irrigation water management by forming Water Users Association (WUA)& development of sense of ownership among stakeholders. Structured & timely meetings between department & farmers organization right from grass root level to top level upto Chief Engineer level are being organized. In February 2020, more than 1700 meetings between WUAs and department were organized.

6. Acknowledgement at National Level

Since last two years States Water Resources sector is being awarded at National level by various organizations, the details of which are as under:

SN	Organization	Award	Category	Details	Date
1	National Water Mission under Ministry Of Jal Shakti	1st NWM award 2019	Water conservation, augmentation & preservation	1st Position to Narmada Canal Project Sanchore	25.9.2019
2			Increasing water use efficiency by 20%	2nd Position to Tejpura Minor under IGNP Stage II	
3	Central Board of Irrigation & Power	CBIP award 2020	Integrated water resources Management	IGNP system	19.2.2020
4			Participatory Irrigation Management	Entire Rajasthan	
5	Water Innovation Awards	Water Innovation Summit 2020	Best State Water Board	Indira Gandhi Nahar Board	28.8.2020
6			Adopting New age Technology	NHP Rajasthan	

Case study

Name of Organizations : **Water Resources Department, Rajasthan**

Name of Initiatives : **Technological interventions in water management.**

Location : **SCADA at Indira Gandhi Nahar project, Bisalpur Dam & Entire state**

Districts covered : **Bikaner, Jaisalmer, Hanumangarh, Sriganganagar & Tonk**

Innovation in Water Resources Management

Previous Conventional system of Water Management

- Traditional Manual system of measurement of rainfall, gauge at rivers and reservoir. Manual Control of gates at reservoir and canal system.
- Lack of transparency in canal management
- Flood forecasting based on the old manual calculations mostly based on experience.
- Absence of scientific Decision support system and appreciable time loss in decision making.
- Traditional system often leads to excessive spill over from reservoirs leading to excessive flood situation or shortfall in harvested water, poor decision support system.

Adaptation of Innovative Technologies by WR Rajasthan

a) Real Time Data Acquisition System (RTDAS) for acquiring rainfall, water level in rivers, reservoir and ground water and its online dissemination in public domain.

b) Supervisory Control and Data Acquisition (SCADA) system for canal system for automated, transparent, online and precise water distribution.

c) SCADA system on reservoir for automated control.

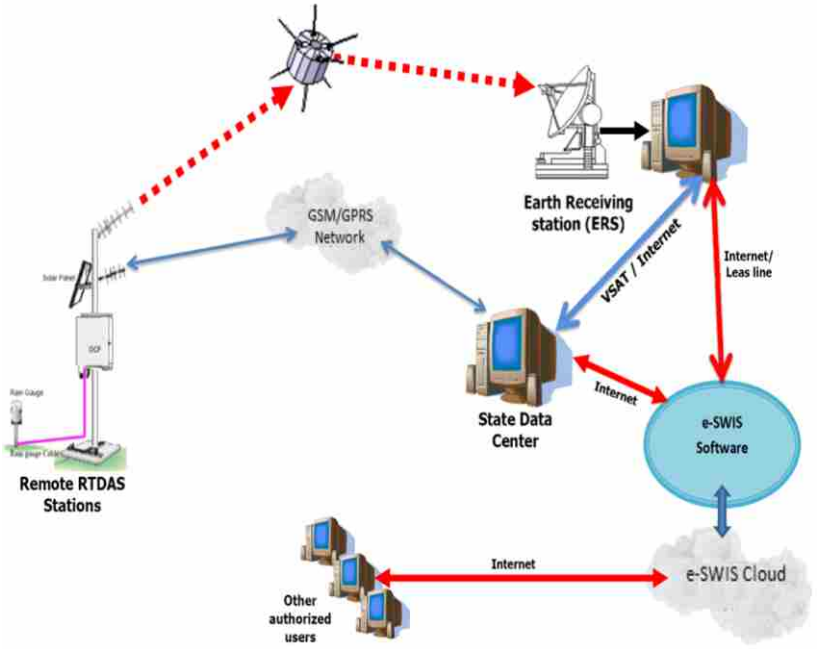
d) Acoustic Doppler Current Profile for measurement of precise flow of water in rivers and canals.

e) Decision Support System for effective water resources management.

Integrated Water and Crop Information and Management system (IWCIMS) - part of Water Resources Information System (WRIS)

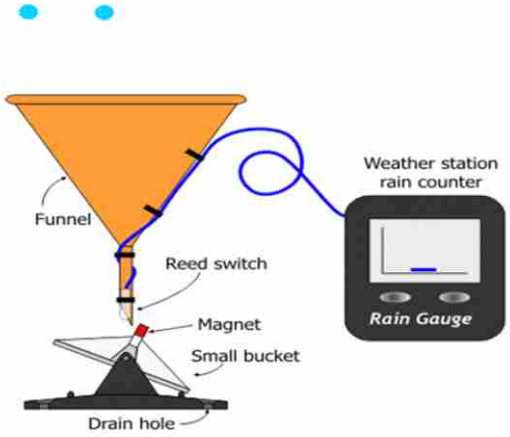
Real Time Data Acquisition System in Rajasthan

Automated Rain Gauge (ARG)	135
Automated Water Level Recorder	71
(AWLR) radar type at Dam site	
AWLR radar type at river site	33
ARG+AWLR at Dam site	15
Automated Weather Station	1
Digital Water Level Recorder for ground water level	150



Telemetric System Architecture consists INSAT & GSM transmission of data dissemination to the public at real time

Automated Water Level Recorder



Automated Raingauge

Supervisory Control and Data Acquisition (SCADA)

SCADA system on Indira Gandhi Canal System

Profile of IGNP

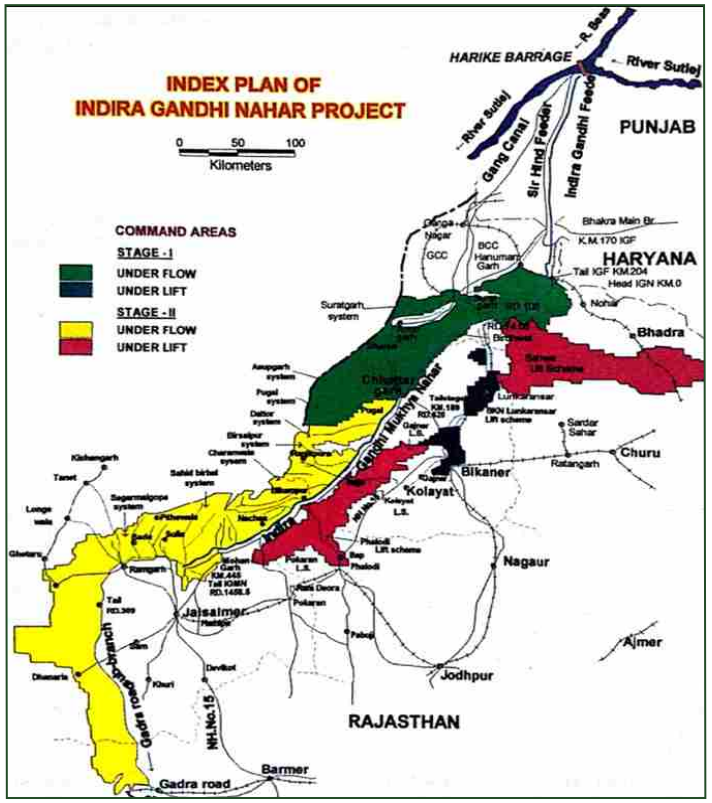
- IGNP is a grand endeavour to bring the Himalayan water to the desert terrain of Western Rajasthan
- Lifeline of western Rajasthan
- Offtakes from Harike Barrage from Punjab & total allocation of water is 7.59 MAF
- Main Canal & Feeder : 649 Km, Distribution system : 8758 Km
- CCA 16.17 lac Ha, it caters 17.5 million population of 10 districts of Western Rajasthan
- Land holding converted into Murabba (square) in command area of IGNP and equitable water is distributed by Barawandi
- Most of the area is under conventional flood irrigation practices
- Water allowance in IGNP Stage I ranges from 5.23 cusecs/1000 Acre to 3 cusecs /1000 Acre whereas in Stage II-Lift, it is only 2 cusecs/1000 Acre which is insufficient to irrigate area using flow techniques

Highlights of SCADA:

- Flow measurements in 53 locations of main, branch, sub-branch and lift scheme. 6 cross regulator are automated
- V-Sat communication system used
- Control & monitoring with the help of 2 Master station, 3 regional station and 11 field stations
- Flow & gauge measurement through doppler and ultrasonic

Imacts:

- Timely information, transparent distribution of water & assurance of water availability among stakeholders
- To disseminate instant information of flow data upto each stakeholder,



SCADA system on Bisalpur Dam

Salient Features:

Reservoir operation of Bisalpur dam is automated under National Hydrology Project. Its highlights are:

- 18 dam gates, 4 canal gates & gallery operation automated using 7 Programmable Logical Control (PLC) unit
- Master PLC at control room
- Use of Virtual Frequency Drive (VFD) at each gate
- Flow measurement through radar at four upstream & downstream points in the rivers.
- Surveillance through 24/7 camera system
- New SCADA control room constructed

SCADA system on Other Dams and Canal System in Rajasthan

SCADA on Canal System

Narmada Canal Project (NCP)

- Automation of 11 heads, cross regulator of main canal using Programmable Logical Control
- Master Control room at Sanchore
- Side looking Doppler for flow measurement
- Ultrasonic radar for gauge measurement at main canal and offtake branch

Automation of Gang & Bhakra Canal system

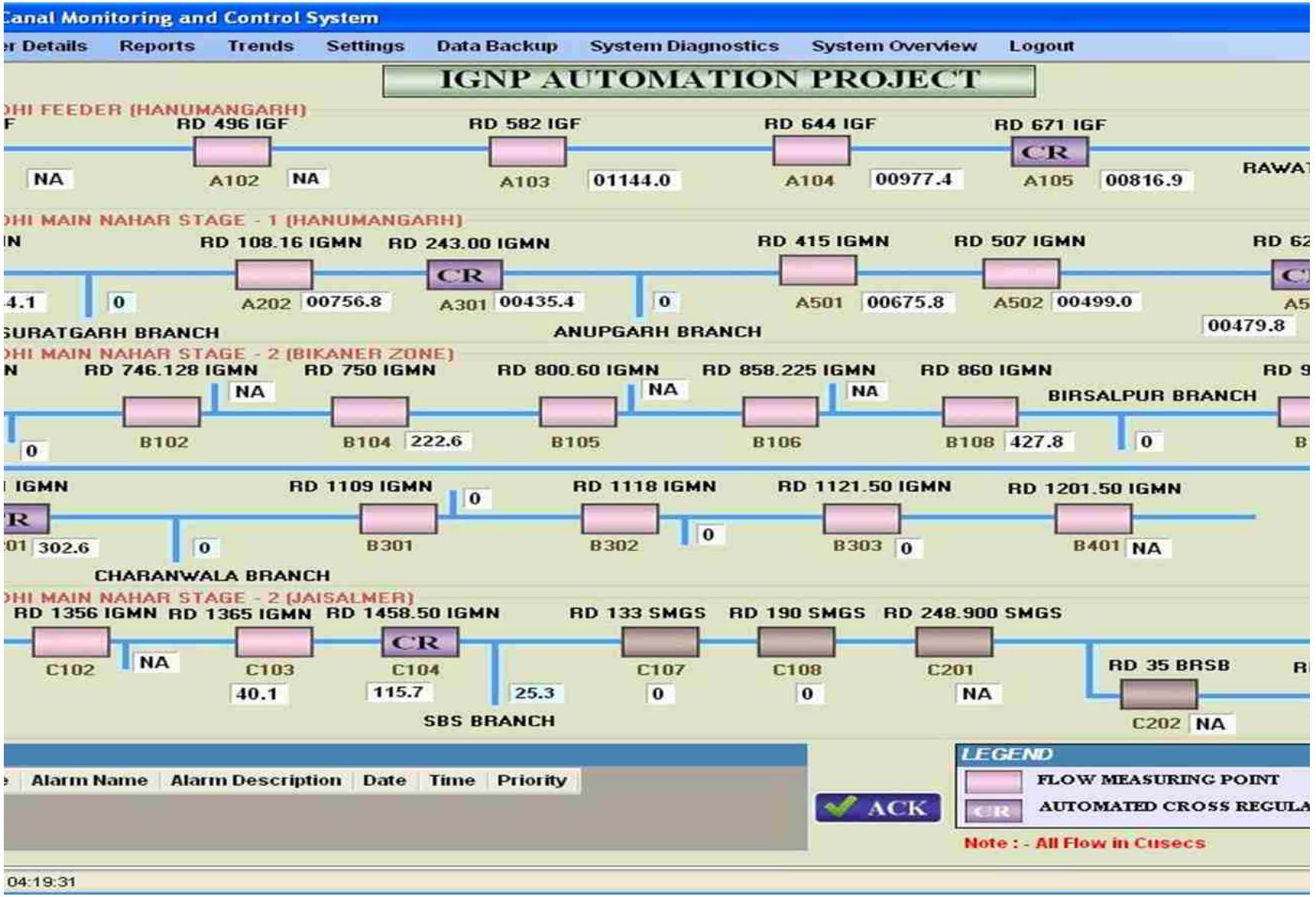
- Automation of 8 head regulator of Gang and 13 head regulator of Bhakra systems using PLC
- Side looking doppler and ultrasonic radar for flow & gauge measurement at main canal and off-taking

Master control room at Hanumangarh

SCADA on Dams

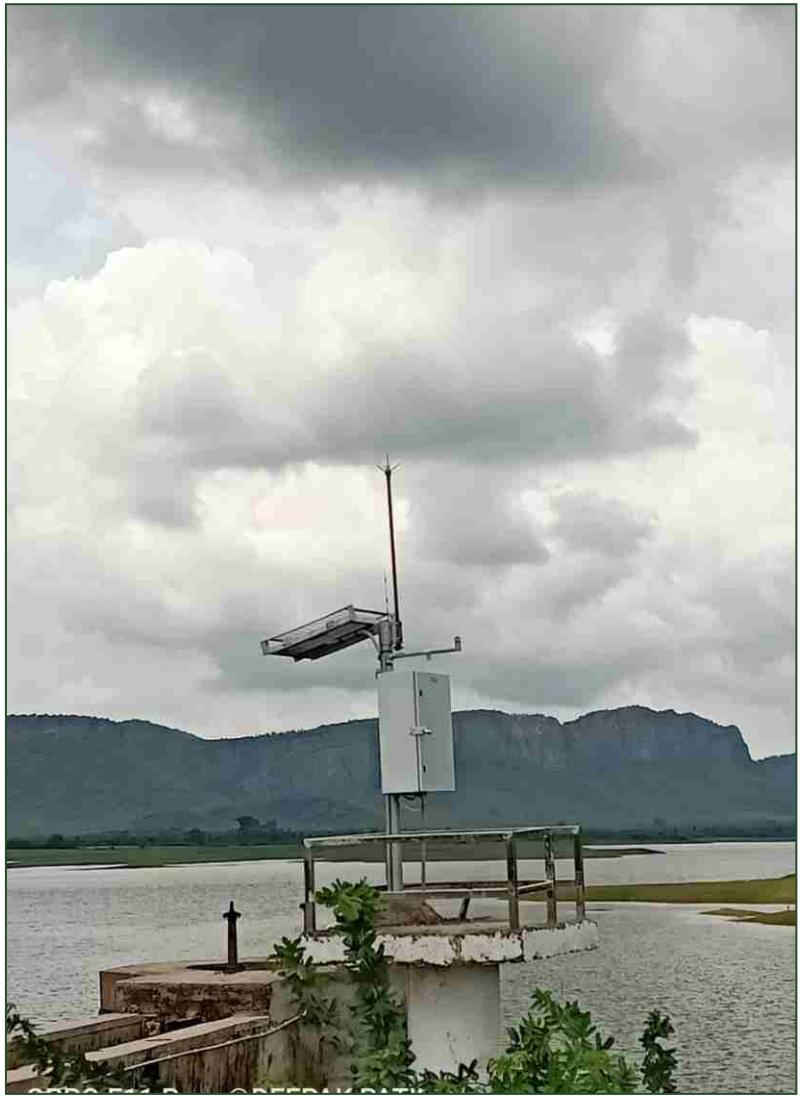
Mahi Dam, at Banswara
Jawai Dam at Pali &
Gudha Dam at Bundi district

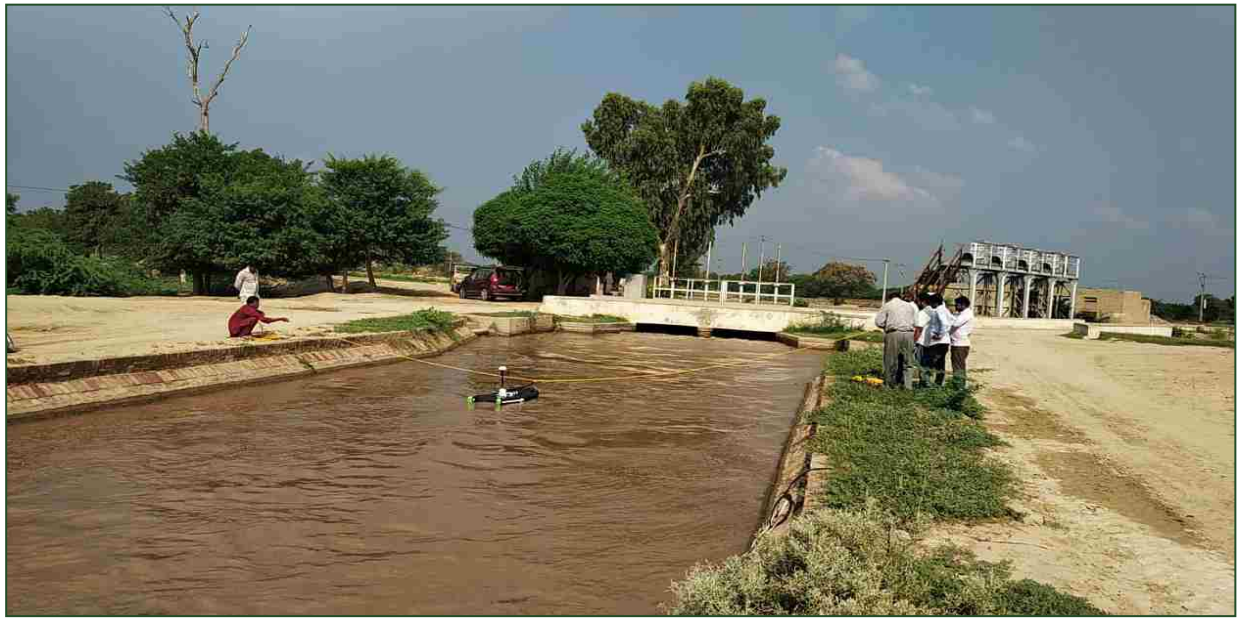
Diagram Showing Canal Monitoring and Control System for IGNP using SCADA



Impacts of Technology Intervention

- After installation of SCDA system over the IGNP canal, now the farmers are getting the level of water in the canal instantly. While previously they have to visit the canal system or have to trust on the information received from the department over the phone. This is a big saving in time and efforts.
- This helping them in crop planning and irrigation planning according to the available water in the system.
- The impact of real time data acquisition system will come after functioning of real time flood forecasting system. After development of flood forecasting system, area prone to flood will be identified and saved before any flood catastrophe.
- Farmers know the availability of water in their canal through web portal, now they are taking decision accordingly in the IGNP command area.
- Now the system is transparent, everything is visible to everyone. That increases the trust between the government and the users.
- Saving the time and efforts of the user to get the information about the water availability in the system.
- Integrated water resources management is only possible if decision maker has the data in real time and now that is reality in the state. We can't manage if we can't measure. This is a big impact on the part of decision maker and researchers.
- Better flood and draught management with the help of Real time data collection.
- Effective crop management.
- Development of a pro-active Decision Support System.





Water Initiatives by NGOs

1st PRIZE

Aga Khan Rural Support Programme (India)

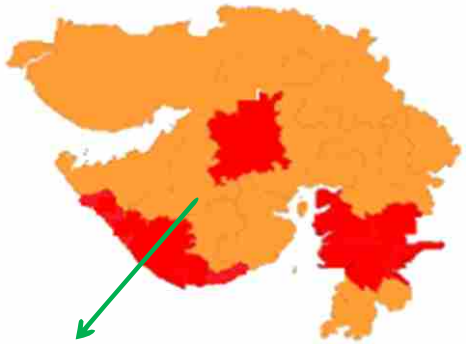
AGA KHAN RURAL SUPPORT PROGRAMME (INDIA)
A PROGRAMME OF THE AGA KHAN DEVELOPMENT NETWORK

Mr. Apoorva Oza
Chief Executive Officer
Aga Khan Rural Support Programme (India)

"There is a finite availability of water on earth, while humankind, with its growing population, has a growing need for water and food. Agriculture is the largest user of water in India. Instead of over-using our groundwater to meet the water needs, enhancing water efficiency is the only way ahead to balance the environment with the growing water needs."

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

- **Initiative:** Improving productivity and reducing water use in cotton farming by facilitating adoption of drip irrigation technology
- **Location:** 4 Districts of Gujarat i.e. Rajkot, Surendranagar, Botad and Morbi; Covering 13 Blocks and more than 319 villages - Chotila, Chuda, Tankara, Wankaner, Muli, Vinchiya, Vadhwan, Jasdan, Rajkot, Than, Sayla, Botad and Ranpur



Project Intervention:

- Improving water use efficiency by promoting the adoption of drip irrigation technology in cotton farms
- Institutionalizing a community managed financing mechanism to support drip irrigation systems and facilitating large scale adoption of drip irrigation systems among cotton farmers
- Establishing farmers' institutions and collectives to manage and operationalize a community managed financing mechanism and lead interventions towards the promotion of sustainable farming practices and market linkage of small farmers
- To promote sustainable agriculture to reduce the cost of production and improve productivity

Impact:

- 8284 Farmers installed Micro Drip Irrigation System covering 20819 acres of land of small and marginal farmers
- Eight Farmers' Producer Companies established for managing and operationalizing community revolving fund to provide loans to other farmers to leverage government subsidy for installing Micro Drip Irrigation System
- INR 17 Crores fund has been created in eight farmer Producer companies
- Overall income increase of drip farmers is more by 82% compared to non-drip control farmers. The analysis is based on FFB (Farmer Field Book) data of 5434 drip farmers in cotton and 134 non-drip control farmers
- Since April 2015 the 'Drip Irrigation Project' has supported installation of drip systems on 20,819 (GGRC Acre) acres of land which has resulted into water savings of 18.36 billion litres

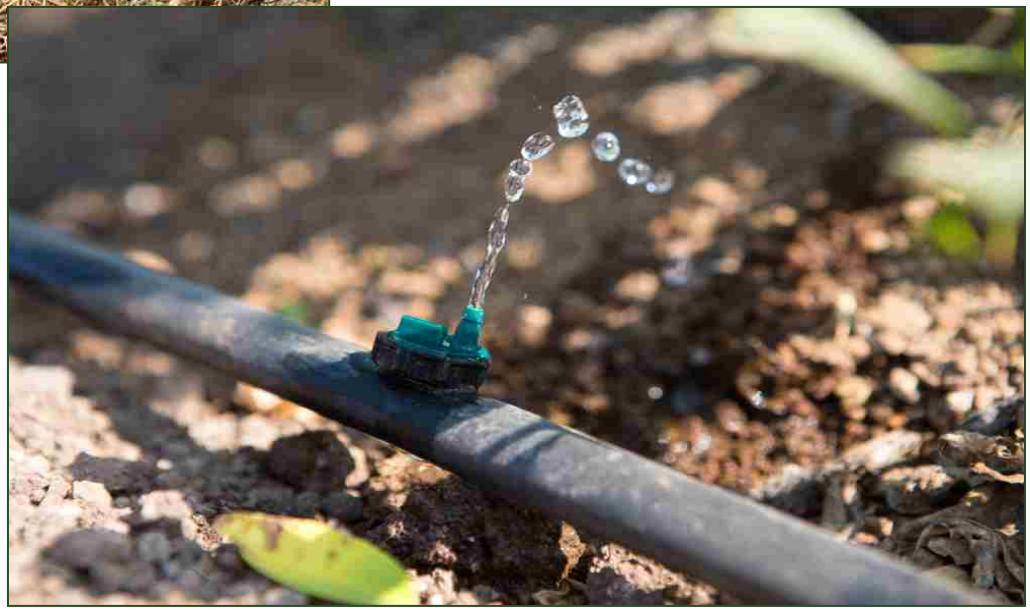
Results achieved:

- 18.36 billion Litres of water saved through Drip irrigation
- 172 million Litres water storage potential created through the construction of 19 Tanks
- Recharge water: Total 1029 Open/Tube well
- Income Enhancement: INR 11,202 per acre (15,000 acres of Drip System)

- Incorporation of eight Farmer Producer Companies that promotes water management
- Drip Pool Fund (revolving fund) - This fund is generated through the equity capital at the Farmer Producer company level. The fund is to be used for financing drip to other cotton growing farmers in the four districts, this leads to the sustainability of the programme
- Promotion of 8 FPCs: Creation of Revolving Fund - INR 17 Crore
- 24% increase in cotton production yield (PWC Study Report)
- Reduction in drudgery for women i.e. weeding, watering and cotton picking
- Emergence of 8 FPCs with 8000 plus member farmers (including non-drip), with INR 17 Crore revolving fund for the sustainability of the programme

Drip Installation

Drip irrigation in Cotton Farming



Drip Irrigation

2nd PRIZE

Jan Jagran Kendra

Sanjay Kumar Singh
Secretary, Jan Jagran Kendra (JJK)

"Pani hain to hum hain, pani nahi to hum nahi"

Message from Secretary:

Water is the unique and precious resource that determines every aspect of our lives and other natural resources. We, in the tune of JJK mission are dedicated to save the natural resources through our water initiatives for balancing the ecosystem and social development. To make the initiative sustainable, the concern and accountability is utmost important to respond to the issues through incorporating it into plan and policies that must be reflected in terms of 'water budget'. Apart from that the water initiative and concern must be enforced in a way that every single drop of rainwater should be treated as the precious dewdrop for lives. We look forward to spread out the initiative through NGO's fraternity, Government, PRI, global forum, research institutes and academic institutes.

Initiative: JOURNEY OF WATER CONSERVATION

Jan Jagran Kendra is a non-profit Organization (NGO) founded in 1978 and registered in the year 1981-82 in Jharkhand. Jan Jagran Kendra is recognized widely in the field of watershed development, natural resource management, advocacy and awareness generation, and livelihood enhancement. The organization worked on different watershed projects such as Drought Prone Areas Program (DPAP), Integrated Wasteland Development Project (IWDP), Integrated Watershed Management Program (IWMP), Jharkhand Tribal Development Society (JTDS) with support of Jharkhand State Watershed Mission, IFAD and NABARD covering 1028 villages in Jharkhand. It has completed more than 500 watershed development projects, covering nearly 30,000 hectares and impacting over 1,00,000 people. JJK initiated the process and built up its institutional structure and trained its leadership for water conservation activities. The

objective importance and rationale of watershed management project is to in-situ soil and moisture conservation in which we have made a provision of **"**खेती की मिटटी खेत में, खेत का पानी खेत में, गाँव की मिटटी गाँव में, गाँव का पानी गाँव में**"**

Watershed management activities and natural resource management programs were initiated in order to conserve the runoff water in different parts of Jharkhand. The communities were sensitized and encouraged in execution of the initiative in such a way that they become the key stakeholder for sustaining the initiative. Traditional knowledge of water conservation and technical team's knowledge were combined to achieve the mission objectives.

Impact:

- Soil and water conservation activities were undertaken i.e. 38,624 Trench Cum Bund (TCB) and 9963 Water Absorption Trench (WAT) through which 811.74 Ha wasteland / fallow land converted into agricultural land and harvested 811 crore litre of rain water
- New water harvesting structures were developed which included 125 farm ponds, 34 dobhas, 4 percolation tanks etc. through which irrigation potential has been created for 603.91 Ha of land. Apart from that fish cultivation is under progress in all the water harvesting structures
- Increased awareness at the community level for water conservation and management

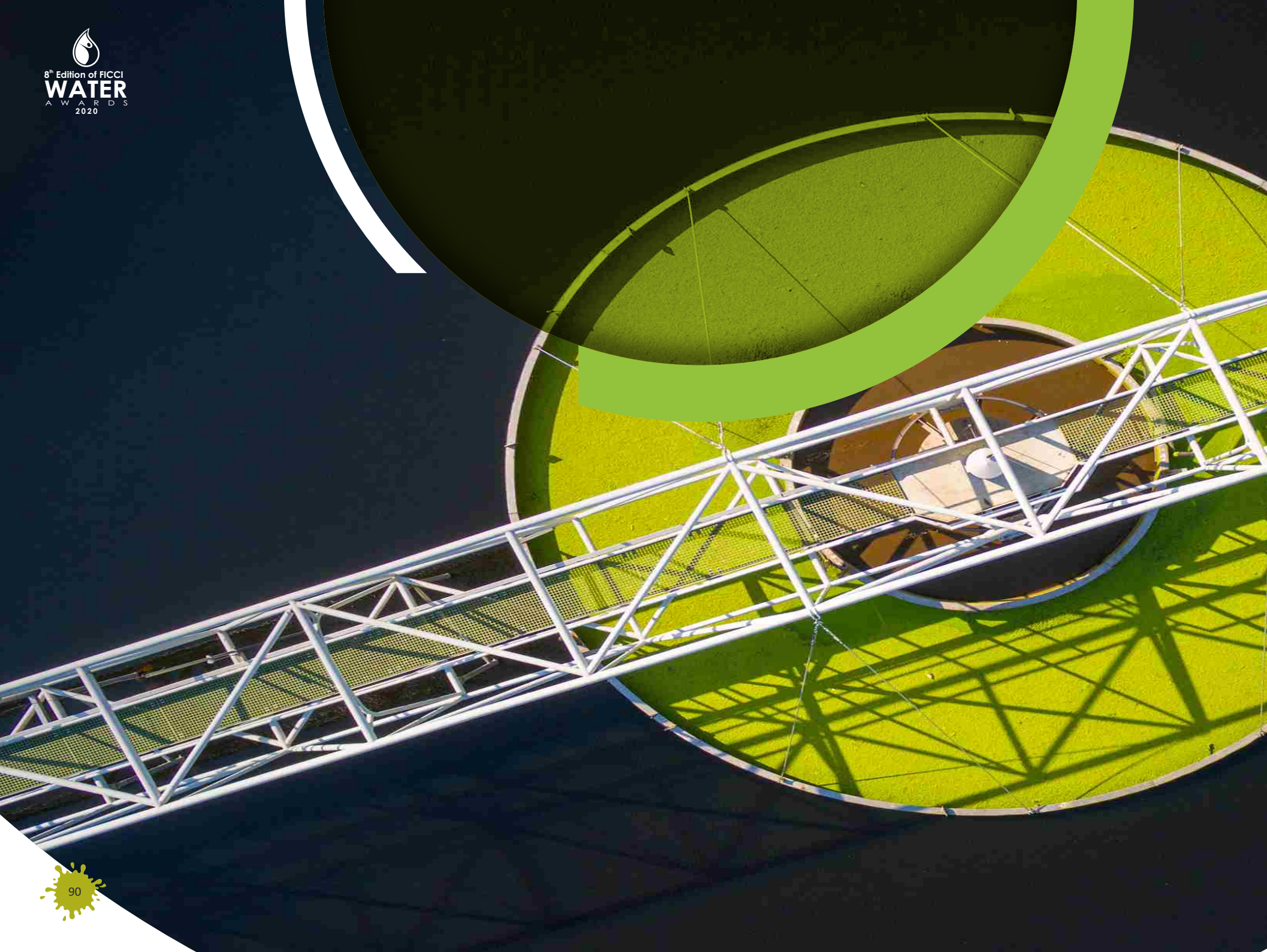
Water Absorption Trench (WAT) Constructed in Village – Parasi of Ichak Block at Hazaribagh District of Jharkhand State

Trench cum Bund (TCB) Constructed in Village – Barmuri of Keliasole Block at Dhanbad District of Jharkhand State.

- Increased cropping intensity
- Increased groundwater levels in the watershed area
- Enhanced agriculture productivity led to increased livelihood opportunities
- Uncultivated lands were brought under agriculture practices by adoption of new technologies
- Organization is playing a resource institution for providing technical inputs to the Jharkhand State Watershed Mission







Urban Wastewater Management

1st PRIZE

Vishvaraj Environment Pvt. Ltd.

Arun Lakhani
Chairman & Managing Director

"We should have Water Efficiency Index of a town with a target [net water intake from various sources (–) Net water discharged with Reusable parameters for non-potable use = 25%]"

Brief message from the CMD on the long-term water sustainability plan

Water Sustainability / Security are words which should remind us all how inadequately we are coping with these subjects - slowly becoming critical for the humanity.

The very essential thing to make these parameters measurable in direct terms is to adapt the "Water efficiency Index of a town" a simple measurable parameter. All towns know approximately how much water they are taking from the surface source or from ground water through bore wells (or desal). They need to measure how much sewage they are treating to a level of re-usability and is being re-used by industry / construction or simply agricultural.

Till the time we do not have this last leg of the water cycle - sewage treatment and reuse - The one way use of water - "Pump in - use and through as it is - to further contaminate fresh water source affecting health of millions" this method which we are following since decades will never allow life-critical concepts like sustainability and water security to come anywhere on the horizon.

There is a large drinking water program being introduced by Govt of India. It's an extremely laudable and necessary program which will improve health, quality of life of millions of citizens. Now we have toilets all across rural villages and towns. With piped water we are adding one more critical part for safe drinking water. But on the tail of drinking water program we will need sanitation and sewage treatment programs to make the towns healthy and safe in long run. And will bring out real value of the piped water being pumped from long distances by reusing it without evaporation wastage or contamination to the village wells and streams.

I think we need to roll out larger picture. The priority will always be beginning with drinking water, but till we reach the last- maximum reuse leg of the water cycle, long term sustainability and water security will remain a distant target.

Waste Water Reuse - The Nagpur Way

Traditionally India has been a 'Sujalam, Sufalam' nation. However, the ever increasing urban population and the rapidly growing industrialization have been taking a huge toll on the water resources. Coping up with the increasing water demand requires a fresher outlook towards the overall management of the Urban Water Cycle. An integrated approach is what can be a solution. Water Supply and Sewage Treatment with Reuse comprise this integrated approach.

The thumb-rule says that 80% of the potable water supplied to a city comes back as sewage. In India, towns are generating more than 61,000 MLD of sewage of which we have only 30% sewage treatment capacity in the large cities and a mere 3% in smaller towns. This untreated sewage is posing hazard to the socio-environmental health of our country. In most of the cases, the cities take water from one source and the generated sewage from the same city pollutes the very same source. We do not have sufficient STPs in place and for the ones we have, we do not have sufficient budgets to maintain. This reluctance is proving hazardous to our major rivers and lakes. We release 15000 Million Liters of Municipal and Industrial Waste in Ganga every day.

A solution to this issue is the last link of the integrated water management approach i.e. Reuse. While considering sewage treatment more seriously and systematically what we really need to add to it is the reuse of the treated sewage.

The Nagpur Way:

In Nagpur, this concept is getting implemented on a large scale. Nagpur is a city with 27 lac population and consumes 700 MLD of fresh water each day. Roughly 80% of this translating to ~550 MLD is getting converted in sewage. Like any other cities in India, there was a sewage treatment deficit in Nagpur as well. The sewage in the city flows through three rivers cum drains viz. Pivali, Pohra and Nag. This sewage pollutes the famous Gosikhurd Dam which is a source of fresh water and the irrigation as well.

Local NGOs alarmed the civic authorities of rise in contamination of water and the hazards for the nearby villages of the Gosikhurd dam. Hon'ble high court ordered action to bridge the gap of sewage generation and treatment with immediate effect. For Nagpur Municipal Corporation, it was financially impossible to establish a system to meet up the requirement of increased and efficient Sewage Treatment. The municipal authority from Nagpur took a PPP route with a focus on reuse of the treated sewage water.

The project involved collection of 200 MLD of sewage from three rivers and augmenting existing 100 MLD STP to 200 MLD. The scope also includes O&M of the entire facility for 30 years post commissioning. The project was structured on PPP model wherein entire capital investment was to be made by the operator. Vishvaraj Environment Pvt. Ltd. was selected as the operator through a competitive bidding process.

A new STP of 200 MLD was constructed by picking up sewage from these three drains. Entire project was built though 100% private investment making it the largest and the first STP on PPP model.

Innovation:

The real innovation was the reuse of this sewage treated water by the industry. The project was conceptualized keeping reuse as a center theme. Nagpur has two power plants by MAHAGENCO, the state power generation utility. They were approached with a proposal to use this treated water. Power plant management responded positively and this initiative resulted in path breaking policy by Ministry of power making it mandatory for the power plants across India to use treated sewage water if it is available within 50 Km radius of the power plant. The additional cost of this treated water is allowed as a pass through tariff by power plants making the whole value chain financially sustainable.

The 200 MLD STP and the reuse phase was already commissioned in Jun 2018. 190 MLD out of 200 MLD was planned to be used by MahaGenCo for Khaparkheda and Koradi power plants. The reuse infrastructure project too was a challenging one that involved laying a 1500 mm dia pipeline largely through dense urban areas and crossing railway at six locations. The project was completed 9 months ahead of its designated construction period of two years that too in the peak pandemic situation.

The project was completed in two phases:

Phase I - Major Project Components

- New 200 MLD STP on SBR technology
- 3 Pumping Stations
- Nag River - 50 MLD
- Pohra River - 75 MLD
- Pivali River - 75 MLD
- Sewage carrying pipeline laying - 17 Kms

Phase II - Major Project Components

- Tertiary Treatment Plant : Fibre Disc Filtration, 190 MLD
- Treated water Pumps : VT pumps, 190 MLD
- Transmission pipeline : MS pipeline, 190 MLD, 1500 mm Dia, 21 Km
- Railway Push through : 6 nos.
- NH push through : 2 nos.
- Major River crossings : 3 nos.

Impact:

The project has created a win-win cycle for all the stake holders.

- The municipality gets 200 MLD treatment facility with no financial burden since revenue from sale of tertiary treated water takes care of entire investment and operational cost.
- City will also get additional 190 MLD fresh water that the power plants were using and this additional source will be sufficient to take care of 10 years of future needs of the city.
- The power plants get secured source of water and the additional cost of this treated water is anyway a pass through cost so there is no financial burden on them.
- And lastly citizens are benefited since sewage is getting treated making a healthy environment and additional source of water is generated for the city.

This can be looked up to as a showcase project that has national and international level replicability. Indian cities are growing rapidly and water supply to the cities are already scarce. Our cities will have to look for newer avenues for water and Nagpur reuse model can act as a torch bearer for the cities.

8th Edition of FICCI WATER AWARDS 2020

Special Jury's Award

Vadodara Municipal Corporation

Shri Swaroop P
Municipal Commissioner
Vadodara Municipal Corporation

"Water technologies have become new solutions to water scarcity and could play an increasingly crucial role in the future."

Brief message from the Municipal Commissioner on initiative/actions on the long-term water sustainability plan

As we all are aware that the world is facing the major problem related to water scarcity. It is very important to provide the sufficient and qualitative water to citizens. We all have a limited fresh water sources available on earth and day by day the water deficit increases. In such situation we also have to handle the High-water Demand in future as per the present population growth and the urbanization scenario. Vadodara Municipal Corporation is on a mission to provide adequate and qualitative water supply to its citizens by considering the future demand. It is very necessary to modernize previous installations with the latest technologies and automation so that the growth can be handled effectively. We have started the phase wise implementation of SCADA system based Smart water management for Water Audit as well as Energy Audit. So, as a part of this vision we have already implemented and Go live the project named "Information and Communication technology management system for Vadodara City Smarter Water Management (SCADA Phase#1) from Water sources to Water distribution stations" in 2019 and presently it is giving good outcome. As a future vision we have started the Water audit and Energy audit work of different 16 area in Vadodara city from Water distribution station to various society. This all initiative is our steps to meet future water demand of our citizens.

Case Study

Name of the Organization : Vadodara Municipal Corporation

Name of the Initiative

SCADA Phase#1:"Information and Communication technology management system for Vadodara - Smart City Water Management."

SCADA Phase#2:"Supply, Installation, Testing and Commissioning of Flow meters, Valves and Instrumentation for SCADA Phase#2 Water Audit and Energy Audit project."

Location : Vadodara

The Initiative/Innovation

Vadodara Municipal Corporation (VMC) has implemented one of the largest Smart Water Management project in India. The objective of the project is to provide adequate, reliable, and quality water supply with the state of art automation technology including instrumentation and SCADA (Supervisory Control and Data Acquisition) system for monitoring of water supply flow and pressure in main distribution lines. This project in Vadodara city has shown that a water supply system can be managed efficiently using Supervisory Control and Data Acquisition System (SCADA). A vision of the corporation to provide equal distribution of water to different areas in Vadodara city is achieved by this project and from its success story VMC has initiated its Phase#2 which is one of the largest project in India and it will cover the Secondary & tertiary water distribution network.

This project has covered Total 75 Locations which includes various water sources/Water Treatment Plants/Ground Storage Reservoir/Elevated Storage Reservoir/Booster Pump/Junctions like Radial Collector Well at Fajalpur/Raika/Dodka and Poicha, Intake Well at Dodka and Sherkhi, Water Treatment Plants at Dodka/Khanpur and Nimeta, Ground Storage Reservoir/ Elevated Storage Reservoir and Booster Pumps in various areas and major water Junctions Of the city.

This project consists of the Redundant SCADA system at Integrated city command and control center, Geographical information system with all live data and Instruments like Flow Transmitters, Pressure Transmitters, Butterfly Valves with Electrical Actuator, Level Transmitters for GSRs and ESRs Level Measurement, PH Analyzer, Chlorine Analyzer, Turbidity Analyzer on feeder lines from water sources to Water Distribution Station (GSR/ESR/Pump houses/Booster Pumps). We have implemented Web application particularly for water audit and demand analysis which comprises the features like Overall consumption of water on an hourly and daily basis, Dispatch and demand comparison to give the total water loss during transportation of water from the source to water distribution station, Water Capacity monitoring, Water Tank Maintenance Scheduling & Tracking, PDF and Excel Reports, Water quality report (PH/ Chlorine).

A system is being monitored by many ways using Local indicator available at local field places, Complete system can be monitored and controlled from Integrated city command and control center (ICCC), Water distribution Engineers can access real-time data of the complete system using a mobile application.

Smart Water Management System(SWMS) Web Application Photos

Fig 1: Water Accounting

Fig 2: Daily/Monthly/Yearly Water Consumption

Geographical Information System(GIS) Photos

Fig. 3: GIS Mapping

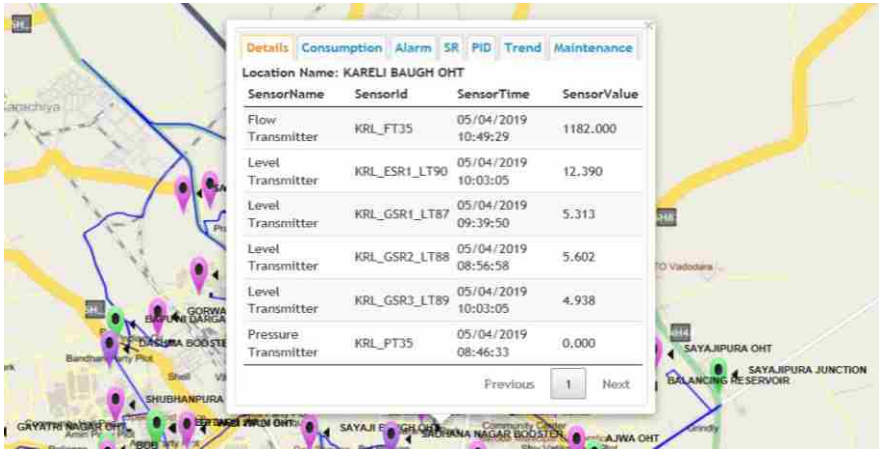


Fig. 4: Data on GIS

SCADA/HMI System

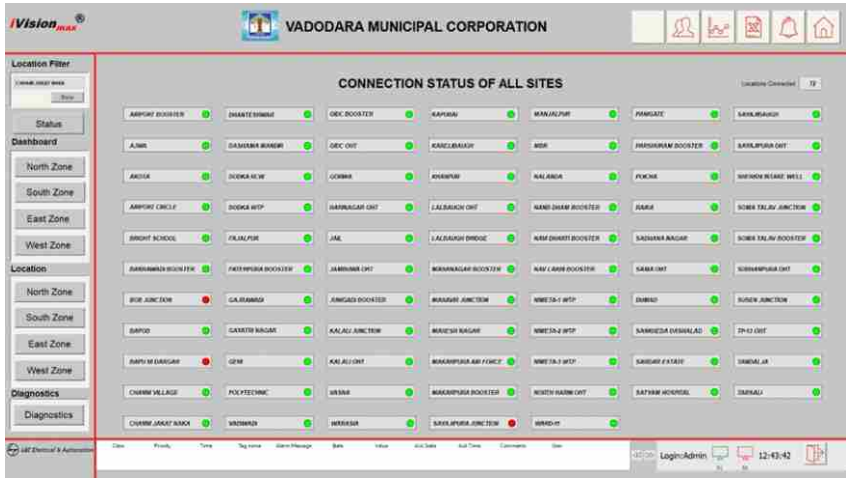


Fig. 5: Site (Node) connection with Central Server

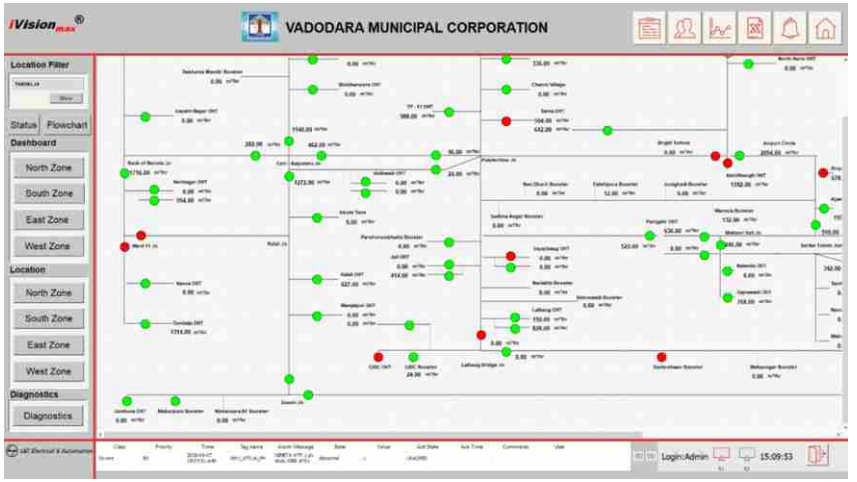


Fig. 6: Single Line Diagram (SLD) of complete Primary Water N/W

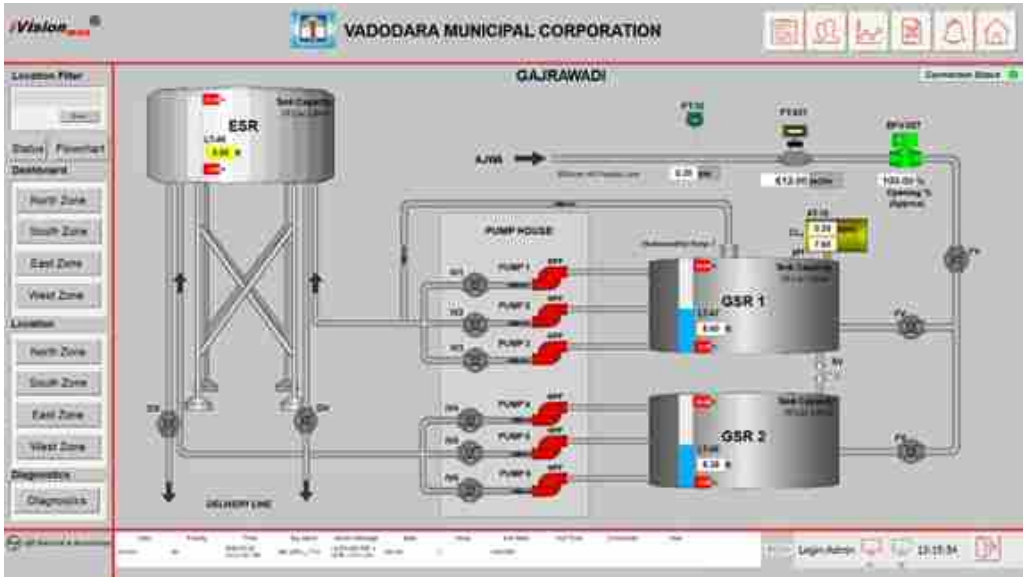


Fig. 7: OHT Wise SCADA Graphics

Field Instruments photos

Fig. 8: BFV & Actuator for Controlling Application

Fig. 9: PH & CL Analyzer Display

Fig. 10: PH/CL/Turbidity Analyzer Panel

Fig. 11: Flow meter & Pressure Monitoring Device installation

Impact

Average Water Consumption Reduced around 54 MLD, Non-revenue water has reduced to 26%(as per 2019-20) from 30%(as per 2016-17) and Target for year 2020-21 is 24%, Water transmission losses has reduced from 7.5% to 2.5%, Online and Offline complain regarding various point related to water supply has reduced greatly, Real time monitoring is possible of the entire network which helps in providing reliable water supply with optimum Water Management, Reduced the overall drawl of water by measuring water supply quantity, Water leakages are identify very quickly by monitoring Water Flow at different points, Network and system downtime has reduced, Comparison patterns analysis provides a better overview of the situation and helps management to make operational decisions, Water quality parameter's monitoring and action to maintain them within desired range which helps in promoting health of citizens, Continuous monitoring helps in supply of sufficient water to all areas and prevents unequal water distribution which may cause scarcity of water in some areas and abundance of water in other areas, various critical parameters like Line Pressure in Entire Main Feeder Line network at critical nodes in city prevents the failure in Primary distribution network and hence water distribution can be done on daily basis without any disruption.

FICCI Water Mission

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