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COMPENDIUM OF
Best Practices

Recognizing excellence in water management and conservation

5th Edition of FICCI WATER AWARDS 2017

www.indiaindustrywaterconclave.com

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Tansen Marg
New Delhi - 110001
Website - www.ficci.com

This report is a compilation of best practices received as part of the 5th 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 and contribution in assessing and evaluating each case study submitted, and in the final selection of the awardees. We also extend our gratitude to the organizations who participated under the various categories of the 5th 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; and Swapna Patil, Senior Assistant Director, FICCI; Biba Jasmine, Assistant Director, FICCI; Aakanksha Pathania, Former Research Associate, FICCI; Anju Choudhary, Research Associate, FICCI; Amrita Kumari, Former Project Assistant, FICCI.

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FOREWORD

India has been identified as one of the most water-stressed countries with the growing imperative to manage water resources efficiently. In order to do that, the country needs to augment water conservation technologies, best practices in water management, as well as wastewater treatment and reuse, and invest in innovative technologies and business models through robust policy directives.

Concerns about water in the private sector are rising rapidly. Companies are recognising that water is an essential aspect of their business operations and the lack of access to sufficient water quantity or quality is posing a material risk to a growing number of companies. Therefore, it becomes important to understand their own water use and shared risks in terms of water governance, water balance, water quality, and water-related technology; and then engage in meaningful individual and collective actions that benefit society at large.

FICCI has been working steadily to promote water conservation strategies within its member companies through the FICCI Water Mission; and also creating corporate awareness in the area of water use efficiency, through research, policy advocacy and sharing of best practices since 2011. The Mission, instituted the Annual Water Awards in 2012 to recognize efforts by Indian industry in areas of water use efficiency, management, and conservation through innovative technology; applications, process improvements, and stakeholder awareness and engagement.

The 5th Edition of the FICCI Water Awards assessed a wide range of entries across four different categories - Industrial Water Use Efficiency; Community Initiatives by Industry; Innovation in Water Technology; and Initiatives by NGOs. The awards acknowledge businesses and NGOs for their exemplary initiatives and endorsing their efforts in balancing their own water use with the needs of communities and the environment.

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

Targeting water use efficiency is a collaborative and multi-stakeholder effort that aims to achieve social, environmental and economic benefits. Therefore, it becomes crucial to provide Indian industry and its members a platform where they can come together and engage in identifying comprehensive approaches for water management, mitigate water related risks at their site and within supply chains more effectively, and build better community relations through shared water governance. I wish to thank the stellar FICCI Water Awards Jury and all the award nominees for being part of this important journey.

Naina Lal Kidwai

Past President FICCI
Chairman, FICCI Water Mission


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FOREWORD

Among many constraints to growth in the Indian economy, perhaps the most important and least understood is water. India is the most groundwater dependent country in the world but water tables and water quality have both been falling with arsenic, fluoride, mercury and even uranium contaminating the water we drink. Growing incidence of cancer is only one of the health hazards this is creating.

We also see increasing conflicts over water: across states, uses and users, with India's growing urban and industrial sectors often in ugly competition with farmers for water. Agriculture still consumes more than 80% of India's water, even though it contributes only around 15% of the GDP. India's water use efficiency is among the lowest in the world. Without a complete paradigm shift in the way we manage water in rural India, we will never be able to release enough water for cities and industry, thereby jeopardizing India's overall growth process.

Indian industry has among the highest water footprints in the world. It is in its enlightened self-interest to invest in wastewater treatment and reuse the recycled water, since the payback period for these investments is very short. We must also recognise deep synergies in the water sector: recycled wastewater can meet industrial and agricultural needs and be a powerful source of revenue for urban local bodies at the same time the same time.

In order to draw national attention to these critical issues and to incentivise innovations that offer solutions to these challenges, the FICCI Water Mission has been recognising the best players in the field through its annual FICCI Water Awards. The aim of the 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 to moving India towards a 21st century paradigm of water management.

Dr Mihir Shah, Chairman of Jury, FICCI Water Awards 2017

President, Bharat Rural Livelihood Foundation
Former Member, Planning Commission

MESSAGE

Water being at the core of sustainable development is not only critical for socio-economic development, but also for maintaining healthy ecosystem. It is fundamental for adaptation to climate change, serving as the crucial link between the climate system, human society, and the environment. UN Sustainable Development Goal 6 on 'Clean Water And Sanitation', brings into perspective India's commitment and efforts towards capacity building on water and related activities and programmes. To fulfill the Goal, India is actively working towards substantially increasing water-use efficiency across all sectors in order to ensure sustainable withdrawals and adequate supply of freshwater to address water scarcity. This is being brought about by exercising prudence in use and minimising the amount of wastewater generated.

FICCI constituted the Water Mission in 2011 to work on improved water efficiency in industries across the various sectors. The Mission undertakes documentation of best practices of water conservation across various industry sectors to be shared for adoption and creation of a knowledge base. The FICCI Water Awards under the aegis of FICCI Water Mission strives to recognise excellence in water conservation and management.

Although the concept of sustainable development may be straightforward, different stakeholders tend to see the challenges and potential solutions from their particular – and often varying – perspectives. Translating this vision into reality requires efforts by all, through concrete and interrelated actions that go from establishing the policy, institutional, and technological framework to ensure sustainable water management and increasing investments and financial support for water conservation.

FICCI under its Water Mission has endeavoured to present corporate sector developments and initiatives pertaining to water conservation and its management. As we move towards a new paradigm of sustainable development, with a new set of global goals, providing a platform to stakeholders in the water space, proactive discussions pertaining to water will help identify and adopt appropriate responses.

FICCI has the pleasure to organise annually the India Industry Water Conclave and FICCI Water Awards, and to present herewith the Compendium of Best Practices, which will serve as a tool for scaling up innovation and technology, policy, and research on water management and conservation across sectors which, if replicated widely, can yield very impressive results.

Dr Sanjaya Baru
Secretary General
FICCI

5th Edition of FICCI WATER AWARDS 2017

FICCI Water Awards

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

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

Selection Process

The call for awards is put up through print and online advertisements, and nominations for the different categories are received. A standard template for sending information is developed for every category. An initial screening is done to see if the applications received fulfil the eligibility criteria. This is done on the basis of the narrative submission by the applicants.

After the first level of screening, gaps and the missing information was identified, and a set of questions were sent to the individual participants and more clarification was sought. The additional information received was used to assess the overall application form by the Jury in the second screening round and shortlisting was done. The shortlisted candidates were then called to present their work to the Jury followed by a question and answer round. The final list of winners was unanimously selected by the eminent Jury.

- **Announcement of call for awards**
- **Submission of entries**
- **First round of screening and short listing**
- **Second round of shortlisting**
- **Presentation by the finalists to the Jury**
- **Selection of winners**

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Water Awards Through The Years

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, Deputy Chairman of the Planning Commission, Government of India, Smt. Shiela Dixit, Former Chief Minister of Delhi, Ms. Naina Lal Kidwai, Chairman, FICCI Water Mission, Former President, FICCI and Dr. Arbind Prasad, Former Director General, 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 Initiatives Category.
5. ITC Limited, 1st Runner Up, Community Initiatives Category.
6. Vikram Cement Works, 2nd Runner Up, Community Initiatives Category.
7. IRRAD (An Initiative of S. M. Sehgal Foundation), Winners, Initiatives by NGOs.
8. Watershed Organisation Trust, 1st Runner Up, Initiatives by NGOs.
9. KGDS RE Pvt. Ltd., DST & NIOT, Winners, Innovation Category.
10. Ortho Clinical Diagnostic, J&J Company, 1st Runner Up, Innovation Category.

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

2015

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

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

2016

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

Winners of the Water Awards being felicitated by Shri Shashi Shekhar, 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.

FICCI Water Award 2017

The 5th Edition of FICCI Water Awards was proposed for the following four categories so as to recognize efforts and build up a database of sustainable models across various sectors:

Sl. No	Categories	Awardees
1	Industrial Water Use Efficiency	Industrial Units
2	Community Initiatives by Industry	Industrial Units (CSR related but community focused initiatives only)
3	Innovation in Water Technology	Product developer/ technology supplier in the area of innovative tools, techniques, products, technologies and technology application
4	Initiatives by NGOs	NGOs registered as a society, trust, not for profit organization

JURY MEMBERS

Chairman of Jury, FICCI Water Awards 2017

Dr Mihir Shah

President, Bharat Rural Livelihood Foundation
Former Member, Planning Commission

From 2009 to 2014, Dr Mihir Shah 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 MGNREGA, the largest employment programme in human history, with a renewed emphasis on rural livelihoods based on construction of productive assets. 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. These are currently under the active consideration of the Government of India.

Dr Shah is a Founding Signatory of the Geneva Actions on Human Water Security, 2017. He is Distinguished Visiting Professor, Shiv Nadar University. He is a Member of the International Steering Committee of the CGIAR Research Program on Water, Land and Ecosystems (WLE). He is the first 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 Shah has addressed audiences on his life's work all over the world from Stanford University to the World Bank in Washington, the OECD in Paris, the Arctic Circle in Iceland, Chatham House and University College, London, UNESCO-IHE at Delft, International Institute for Applied Systems Analysis in Austria, Himalayan University Consortium in Chengdu, China, the International Water Management Institute in Colombo and the Singapore Water Week.

Members of the Jury

Dr A K Gosain
Professor
Department of Civil Engineering
Indian Institute of Technology-Delhi

Dr A. K. Gosain, is a Professor of Water Resources Engineering in the Civil Engineering Department, IIT Delhi. Some of the recent works of Prof. Gosain include a significant contribution to the NATCOM – the National Communication made by the Ministry of Environment and Forests to the United Nations Framework Convention on Climate Change (UNFCCC).

He has also been reviewer for AR4 and AR5 of IPCC. Prof. Gosain has served on many prestigious World Bank, ADB and European Union projects besides a large number of national projects. Prof. Gosain has to his credit above hundred fifty papers published in refereed national and international journals and conferences. One of the recent assignments of Prof. Gosain include 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 also part of the expert committees appointed by the Honourable National Green Tribunal to suggest solutions to deal with the ever increasing pollution levels in Yamuna. He also part of the Supervisory Committee to look into the implementation of the NGT order on Gang. Prof. Gosain has served as Head of the Civil Engineering Department and the Computer Services Centre of IIT Delhi.

Er M Gopalakrishnan
Secretary General (Retd.)
International Commission on Irrigation and Drainage

Er. Gopalakrishnan FNAE has retired as Secretary General of the International Commission on Irrigation and Drainage (ICID), a global organisation promoting the best agricultural water management practices, the assignment he held until 2011. He is involved in the national and global community dialogues on water and was a member of the Technical Advisory Committee for crafting World Water Development Reports, annually released by UN Water and WWAP, UNESCO.

Er. Gopalakrishnan had held several leadership positions in water sector in the Country's premier water set up, Central Water Commission attached with Union Ministry of Water Resources in 2003. He was associated with the Interlinking of Rivers programme since 2003 and now associated with the Special Committee on the subject under the Chairmanship of Union Water Resources Minister constituted by the Government of India in 2014. He is a member of various committees of Union Ministry of Water Resources and is the Chairman of Panel of Experts of Utilities like Tehri Hydro Development Corporation etc.

He is currently President of New Delhi Associate Centre of World Water Council.

Members of the Jury

Mr Raghava Neti
Senior Infrastructure Specialist
World Bank Group, India

Mr VK Madhavan
CEO
WaterAid - India

Raghava Neti has about 25 years of experience in Urban Development, Rural and Urban Water and Sanitation, Natural Disaster Risk Mitigation sectors, working in diverse set of development projects and Technical Assistance activities, supporting the central and state governments in India. He is currently working with the World Bank Group as Senior Infrastructure Specialist, with Water Global Practice based at New Delhi, leading many of its projects. He has led many of the innovative projects in the World Bank Group, some of them are conceived for the first time in India. He is the Team Leader for the country's first Program-for-Results (PforR) investment support program that was designed to disburse funds only upon achievement of results in the Rural Water Supply and Sanitation (RWSS) Sector in Maharashtra. In the Urban Water Sector, he has successfully led to completion, the country's first 24x7 water supply project in India that has for the first time demonstrated improved and sustainable 24x7 water services in India, which is now being scaled up.

Following a Master's in International Politics from Jawaharlal Nehru University in 1991, Madhavan commenced working with the Urmul Rural Health Research and Development Trust in Bikaner district of Rajasthan where he worked in various capacities till 1998. Subsequently, Madhavan worked with Action Aid and The Hunger Project for four years. For eight years commencing in 2004, Madhavan was the Executive Director of Central Himalayan Rural Action Group (Chirag) in Nainital District of Uttarakhand. In over two decades as a development professional, he has worked on an integrated approach to rural development - community health, primary education, natural resource management, on and off-farm livelihoods and investing in young people. Prior to assuming his role as Chief Executive of WaterAid India, he is the former Managing Director of Skills Education Private Limited, a company that provides youth with access to information, skills and opportunities leading to employment.

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Awardees 2017

Category: Industrial Water Use Efficiency

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Industrial Water Use Efficiency

Winner

Sterlite Copper Vedanta Limited

Location: Tuticorin

Production sector and capacity: Manufacturing - Metallurgy and Mining

- COPPER ANODE: 4 Lakh MT/Annum
- COPPER CATHODE: 4 Lakh MT/Annum
- SULPHURIC ACID: 4200 MT/DAY

Max Water Demand:10050 m^3

Main sources of water: Municipal fresh water supply, Private water tankers, RWH, Desalination water

Table 1: Water consumption pattern

Year	Water use in Industrial process only (in m3)	Water use in Utilities and other services* (in m3) Landscaping	Water use for Drinkig purposes (in m3) (Including Colony consumption)	Actual production of the plant MT of cathode	Specific water consumption (m3 per unit of production)		Reduction in water usage w.r.t. preceding year*	
					For fresh water only (Industrial use alone)	For total water (Industrial + Domestic excluding colony)	(in m3)	(in %)
2013-14	2245037	139169	66668	294434	7.62	7.79	330070	13%
2014-15	2488716	134165	80852	362373	6.87	6.97	6.97(255288)	(11%)
2015-16	2688498	123983	86320	384382	6.99(↑ additional Plant load & Annual shutdown)	7.12	(203835)	(8%)
2016-17	2633275	103672	107009	403445	6.53	6.63	60749	2%

6.5% reduction since 2015-16 was observed in specific water consumption. Total average 14% reduction since 2013-14 was observed in specific water consumption.
**other services like fire water, dust control etc.*

Table 2: Water conservation projects implemented from 2013 - 2017

S. No.	Title of Water Saving project implemented	Year of implementation	Annual water savings		Invest. Made	Payback Period (months)	Planned date of Completition	Actual date of Completition	Replicability
			m3	Rs. Lakhs	Rs. Lakhs				
1	Recycling of Process condensate from evaporator	2013	61600	20	5	3	Jan' 13	Jan' 13	Yes
2	Recycle cooler seal water reuse	2013	16800	5.8	-	-	Mar' 13	Mar' 13	Yes
3	DF-6,7 Seal water reuse	2013	2800	9.8	-	-	May' 13	May' 13	Yes
4	Recycling of Steam from Evaporator in ETP	2013	25200	8.8	2	2.7	Oct' 13	Oct' 13	Yes
5	Reuse of wastewater for lawn in Colony by introducing the Filtration In the STP	2014	69540	32	5	1.5	Dec' 14	Dec' 14	Yes
6	Drip irrigation system for Green Belt	2013	36500	12.77	0	0	Jan' 13	Mar' 13	Yes
7	Using Cooling Tower blowdown for vaccum pump seal water tank	2014	15000	5.25	1	3	Mar' 14	Mar' 14	Yes
8	SAP B/D water lining to Evaporator vaccum pump	2014	15000	5.25	1	3	Mar' 14	Mar' 14	Yes
9	Cooling Tower make up to FC common seal tank	2015	5000	1.75	0.5	12	June' 15	June' 15	Yes
10	Using of Desai water for DM plant	2015	3240	1.13	0	0	May' 15	May' 15	Yes
11	Reduction of water Loss in the plant due to leakages	2016	54750	19	2	2	Dec' 15	Mar' 16	Yes
12	Reduction of fresh water consumption in plant by using RO treated water	2016	175000	343	150	5	Apr' 16	Jan' 17	Yes
13	Optimization of cooling towers evaporation	2016	52500	102.9	10	1	Sep' 16	Dec' 16	Yes
14	Reduction of evaporation loss in open reservoirs by using the waste plastic drums to cover the reservoirs	2017	60000	117.6	0	0	Apr' 16	Mar' 18	Yes

S. No.	Title of Water Saving project implemented	Year of implementation	Annual water savings		Invest. Made	Payback Period (months)	Planned date of Completion	Actual date of Completion	Replicability
			m3	Rs. Lakhs	Rs. Lakhs				
15	Water Recovery from the Compressor air traps	2016	17500	34.3	10	4	Aug' 16	Oct' 16	Yes
16	Optimization of Selenium back wash filter operation	2017	1200	2.352	0	0	Jan' 17	Mar' 17	Yes
17	Condensate recovery from CPP fuel heating system	2017	7200	14.112	20	16	**Plan to implement FY 2017-18**		Yes
18	Recovering of steam loss in traps	2017	1925	3.773	10	18			Yes
19	Condensate recovery from Oxygen plant heating system	2017	18305	35.8778	50	15			Yes
20	Direct use of treated water in PAP plant	2017	175000	343	75	2			Yes
21	Optimization of ETP-2 Operation ther by stoppage ETP-3 Operation	2013	Cost of ETP operation & Power conservation 1200 units per day						Yes
22	Blending of Raw water with soft water for cooling towers	2017	52500	102.9	0	0			Yes
23	Usage of Desalination water for cooling towers	2017	35000	68.6	0	0			Yes

Table 3: Effluent generated and treatment from 2013 - 2017

Year	Effluent generated in m^3	Effluent treated in m^3	Effluent recycled back into the industrial process in m^3	Effluent discharged in m^3	Effluent discharged/ unit of production
2013-14	408873	408873	408873	0	0
2014-15	499988	499988	499988	0	0
2015-16	555752	555752	555752	0	0
2016-17	609692	609692	609692	0	0

100% of the generated effluent is treated in the ETP and 100% of the treated effluent is reused in the process for manufacturing Copper. The plant maintains its Zero Liquid Discharge status.

Table 4: Water treatment measures undertaken and investment made from 1997 - 2016

Sl. No	Wastewater treatment measures implemented	Year of implementation	Amount of water treated (m^3) For FY 2016-17	Investment made (₹ Lakhs)	Replicability of the measures implemented	Reuse of treated wastewater		
						Amount reused (m^3)	Reused for	Amount discharged (m^3)
1	ETP-1	1997	609692	4500	100% shall be implementable for the similar industries where ZLD is main moto of operation.	298421	Process	0
2	ETP-2,3,4,5,6	2007				302047	Process	0
3	RO-1 Plant	2004	8164	600		6729	Process	0
4	RO-2 Plant	2012	466845	1400		418630	Process	0
5	RO-3 Plant	2016	97809	3400		83147	Process	0

Table 5: Wastewater generation, treatment and use in the residential areas from 2013 - 2017

Year	Wastewater generated in m^3	Wastewater treated in m^3	Wastewater used for processes in m^3	Wastewater discharged in m^3	% Wastewater discharged	Mention the areas where treated wastewater is put to use use
2013-14	31927	31927	0	0	0	Used for Gardening & Toilet flushing purpose % Effluent discharged
2014-15	37401	37401	0	0	0	
2015-16	40802	40802	0	0	0	
2016-17	41206	41206	0	0	0	

Table 6: Wastewater treatment measures implemented from 2008 - 2011

S. No	Wastewater treatment measures implemented	Year of implementation	Amount of water treated in m3 (Water Treated for FY 2016-17)	Investment made (` Lakhs)	Replicability of the measures implemented	Reuse of treated wastewater		
						Amount reused (m3)	Reused for	Amount discharged (m3)
1	STP	2008	22556	100	100% replicable	20301	For Gardening & Toilet flushing Purpose	0
2	STP-1(in Colony)	1999	7005	65		6305		0
3	STP-1(in Colony)	2011	14600	75		13140		0

Rainwater harvesting and its use:

Total rainwater harvesting potential (including paved/unpaved/rooftop): 129658 m^3. The complete storm water runoff generated is diverted to rainwater harvesting ponds through a dedicated storm water network. All the rainwater harvesting ponds are HDPE lined at the bottom and side walls with brick and concrete slabs. We have three rainwater harvesting ponds: Pond D-50000 m^3, Pond E - 27000 m^3, and Pond - F - 50000 m^3. Rainwater harvested is reused for industrial process purposes and not for groundwater recharge and storage. Harvested rainwater reduced freshwater intake by 20000 m^3 in 2016. 71493.6 m^3 of water was harvested in 2016.

Awareness generation and capacity building:

Awareness among the employees, business partners, vendors, nearby village people created through trainings, competitions etc. The company conducts various competitions like slogan writing, drawing, ideas on energy & water conservation, puzzle words etc. for employees, school children, vendors on National Energy Day &World Water Day. Every year, Sterlite Copper is taking continuous improvement projects with respect to Energy & Water which involves both vendors and employees. For local communities as a part of sustainable improvement, Sterlite Copper provided rainwater harvesting in nearby villages, drinking water supply, improving the water resource pond conditions, etc.

Sterlite Copper has tracking of its employee and business partners skill levels every year through

skill mapping process, this process will check the existing gap and provide the required trainings to the team in order to enhance the knowledge. With respect to energy & water awareness and capacity building among the team, Sterlite Copper conducted around 44 trainings on energy & water which covers almost 600 direct employees & more than 800 indirect employees last three years.

Sterlite Copper also considers evaluation of supply chain for their energy and water conservation measures as part of their Green Supply Chain Management (GSCM). Sterlite Copper has a sustainability framework, as a part of it vendors and business partners shall be audited for their adherence and compliance. Almost 113 nearby vendors have been audited in order to track the performance improvements.

Transparency measures/ Water audits/ Voluntary disclosures

- Water audit carried out every 3 year as per BEE policy with 80% focus on energy conservation and 20% focus on water conservation.
- The Water audit specifically focused on water conservation is being carried out by NALCO Water Service Team and the Preliminary Report has been provided.
- Online monitoring system for all the freshwater and wastewater handling across the plant. All the sourcing and consumption points are metered and tracked online.
- Disclosure to stakeholders through Sustainability Development Report.
- Vedanta is partner with India Water tool to understand the water resource availability and scarcity across Vedanta site locations in India.

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Category: Innovation in Water Technology

Innovation in Water Technology

Third Prize

SM Sehgal Foundation Gurugram, Haryana

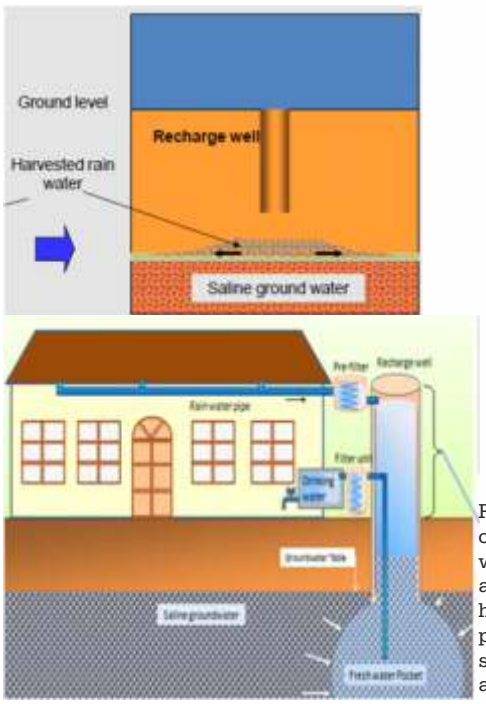
Project Location: - Mewat, Haryana

The average annual rainfall in the area is 594 mm spread over 31 days. The depth of water level in Mewat is between 2 to 29 metres below ground level (m bgl). Net groundwater available in the district is 22,902 ham (CGWB, 2007). Mewat, Haryana, primarily groundwater-dependent district has highly saline groundwater in 78% of its area.

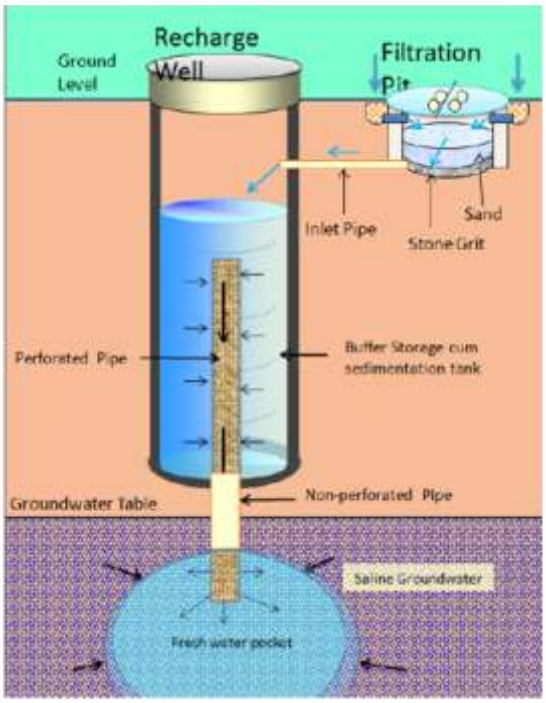
Product/ Technology: Creating freshwater pockets in saline aquifers

This innovation in rainwater harvesting technology enables creation of freshwater pockets in saline aquifers. The recharge well extends above and below the groundwater table. The rainwater harvested from the school rooftops creates hydrostatic pressure enough to slowly push aside existing saline groundwater to take its place. This freshwater is extracted from underground with a hand pump, and a biosand filter is deployed to address the risk of biological contaminants, making water fit for drinking.

Figure 1: Rainwater Harvesting Technology



Raised height of recharge well creates additional hydro-static pressure for shallow saline aquifer



Technology Impacts:

In a conventional recharge well rainwater floats over the saline groundwater. In order to maintain hydraulic equilibrium this freshwater layer gradually spreads over a large area and ultimately forms a thin layer. This thin layer is difficult to extract as any attempt at pumping it out causes an influx of saline groundwater. The innovative model of recharge well is designed in a way to form a sizeable pocket of freshwater within the saline aquifer which can be exploited without getting it mixed with surrounding saline water.

Innovation in comparison to similar products available:

- Best suited for saline areas
- Open source technology
- Low capital, no recurring costs
- No need of cost intensive rainwater storage tanks
- No limitation of storage capacity
- Scalable from household to community level
- Adaptable to inland and sea water intrusion affected coastal areas.

Positive outcomes of the technology:

- In saline groundwater areas, the model provides a source of freshwater without constructing any storage tank
- The harvested water when passed through a biosand filter makes the water fit for drinking
- Over 60 demonstrations of creating freshwater pockets successfully serving households, institutions, and agricultural farms since 2015
- Fifteen rainwater harvesting structures specifically designed based on the technological innovation of creating freshwater pockets in saline aquifers in government schools, ensuring safe drinking water for school children and teachers.

Viability and replicability of technology:

Storage cum recharging tank of 8' diameter and 30' depth/ height will cost - INR 3,41,429.

- The model can be adapted for both inland and sea water intrusion salinity areas
- No energy footprint and operates under gravity
- Its construction, operation and maintenance is not very high skill intensive, therefore, it can be scaled up from households to community level.

Case Studies

a) **Untka School** - 297 students with annual water demand 150,000 liters, for 200 working days per year; in an area having highly saline groundwater with 5980 mg/L TDS 638 sq. m of rooftop rainwater harvesting; average annual rainfall of 594 mm, estimated annual harvest of 322,126 litres of water (run-off factor as 0.85).

Table 7: Total Dissolved Solids of created pool of freshwater

Year 2013						Year 2014					
Month	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun
TDS (mg/l)	91	91	88	92	95	82	99	96	102	108	98

b) **Four government schools of Nagina block of Mewat district** - Drinking water to 942 children and teachers as well as 519 people from aanganwadi (day-care) centers

- Water savings: 14,69,310 liters based on the volume of water harvested per year
- Energy savings: 3240 kWh per year if RO is used as an alternative
- Cost savings in terms of energy: INR 26,000 (calculated at Rs 7 per unit) per year
- Cost savings in terms of purchased water: INR 60,000

Hence, the total amount saved is INR 86,000 across five sites.

Community rainwater harvesting systems in Mewat

Description	Proposed	Accomplished
Creating fresh water pocket within saline aquifer	4	7
Roof water harvesting systems Cluster lelvel storage tanks (100 KI cap) Community level storage tanks (300 KI cap))	 8 4	 8 4
Surface runoff based system Pond development Horizontal roughening filter	 4 4	 4 4
Capacity Building Awareness sessions (school children, Community) O&M Trainings Community Radio Programs	 48 4 NS	 (81,53) 7 Twice a week

Outcomes based on indicators	
Number of Direct Beneficiaries	29143
Annual Harvest (in KL)	14867
Per beneficiary (LPCD) School PHC* Households	3.85 1.88 3.15
Cost per KL Harvest (20 years working life, ignoring multiple usage in pond)	42.56

Second Prize

Technorbital Advanced Materials Pvt Limited

Location: 100 units already installed at different locations (300 installations under progress)

Product/ Technology: Technorbital based on their own invented specialty polymer has developed Ultrafiltration hollow fiber membranes in collaboration with CSIR - NCL Pune (Central Govt's research lab).

"Tech Jal" which works without electricity, with no wastage of water, no technical person to operate, zero maintenance and lowest operating cost (3 - 4 paisa/litre). Tech Jal comes with multiple capacities (500/1000/2000 LPH) and more than 100 units (300 units are under installation) are running in different parts (mostly remote) of India. The technology is in use since 2014.

Three stage water purification system - sediment pre - filter (5 micron), activated carbon filter (10 micron) and innovative hollow fibre ultrafiltration membranes.

The hollow fibre is made of specialty PAN polymer with average porosity size of 20 nano - meters and is capable of removing smallest impurities from water like virus along with bacteria and cyst. The specialty polymer is chemically modified to work under very low pressure like gravity.

The most important features of the membrane are:

- It works without electricity
- Removes viruses / bacteria / turbidity
- Minimal rejection of water
- Very easy to operate
- Compact and can produce upto 2000 litres of drinking water per hour
- The cost of pure water comes around 4 paisa per litre
- As per an independent analysis carried out, membranes spun at our facility exhibit 4 log reduction of virus,
- These membranes are highly anti-fouling
- Maintains necessary minerals in the water
- No need of heavy chemicals for membrane washing
- The activated carbon filter removes bad smell/odor, VOCs, pesticides from the raw water.

Technology Impacts:

The unit is perfectly suitable for rural areas because it is effortless to operate, runs without electricity, no technical person needed to operate/clean, it and it takes care of all water borne diseases.

The R&D was started on this product (membranes) in year 2013 and first few Tech Jal units were installed in the year 2014.

Table 8: Innovation in comparison to similar products available

S. No.	Parameter	Sky Hydrant	Tech Jal
1	Price INR	more than 2,00,000	1,25,000 including transport and installation
2	Capacity	1200 LPH	1000 LPH
3	Technology	UF membrane with 40 nanometer porosity	UF Membrane with 20 nano meter porosity
4	Pre-filters	Not available	Includes pp-prefilter and activated carbon
5	Virus claims	3 log	4 log (as per WHO norms)
6	Bacteria claims	6 log (as per WHO norms)	6 log (as per WHO norms)
7	Odor/smell/ pesticides/VOCs	cannot remove)	can remove
8	Membrane washing	needs chemicals for membrane washing norms)	Only water washing (even if chemical washing is done, the frequency is very less). Technorbital's UF membrane is specially invented higly hydrophilic and high anti-fouling membrane
9	Guarantee	NA	The initial price includes the replacement of pre-filters for two years
10	Unit structure	Open	Enclosed in a saftey cabinet with the lock
11	Indigenous technology	No	Technology developed by IITians in collaboration with CSIR - NCL (central govt. India) Pune. It is a completely made in India product including raw material to membranes
12	Reputation	NA	Technorbital has done around 100 installations of Tech Jal in India last year. The same membranes are being used by a reputed Indian company TATA for their domestic water purifier TATA SwachDezire+

Positive Outcomes of the Technology:

- Access to safe and clean drinking water,
- Employment of local people for installation and maintenance of unit,
- There is no water wastage at all in this purification system. Tech Jal also preserves the essential minerals in the drinking water.

Viability and Replicability of Technology:

The cost of pure water comes around 4 paisa per litre.

S. No.	Unit Capacity (Lt/Hr at 1 bar pressure)	Total Price/Unit (INR)	Suitable for no of persons	Membrane and pre-filters replacement price (INR)
1	50 (portable)	19000	50-100	10000
2	500	130000	200-500	45000
3	1000	150000	500-800	65000
4	2000	200000	800-1200	90000

First Prize

Hindustan Ecosoftt Pvt Limited

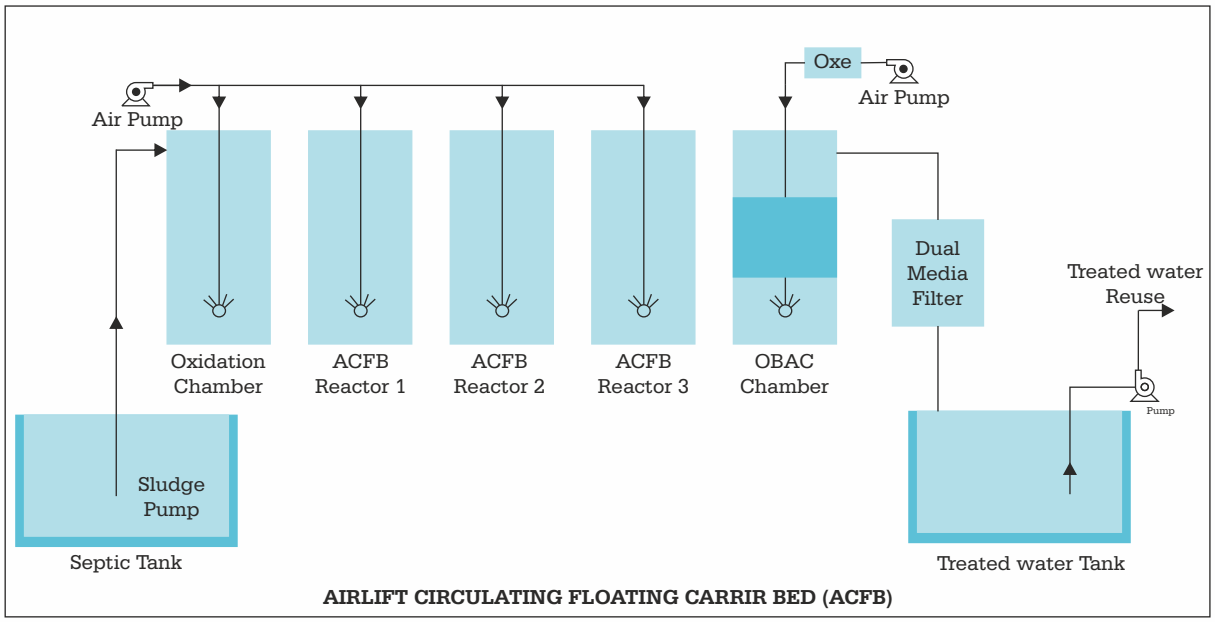
Location: - Xavier Institute of Development & Action Studies, Jabalpur

Product/ Technology: Poseidon is ECOSOFTT's extremely compact, packaged, robust, energy - efficient, plug - and - play natural biological wastewater treatment and recovery system - 2012.

Based on Airlift Carrier Floating Bed Technology - The packaged solution uses aerobic, anaerobic and anoxic process together to achieve high treatment efficiency, high levels of carbon, nitrogen and phosphorous removal in a single treatment unit. This reduces the overall hydraulic retention time in the system, thereby resulting in a highly compact and portable wastewater system.

System also includes in-built disinfection and activated carbon, making the treated effluent fit for

PROCESS FLOW - THE POSEIDON



AIRLIFT CIRCULATING FLOATING CARRIR BED (ACFB)

reuse directly in car washing, gardening, landscaping, general cleaning and toilet flushing.

It is highly recommended for urban areas where the use of land and space has to be optimised such as decentralised treatment within households, hotels, hospitals, educational institutions, offices, residential & commercial buildings and communities including ships and floating vessels.

Technology Impacts:

The core system generates no sludge, produces no odour and noise, requires no consumables, and is fully automated with minimal manual intervention required.

Innovation in comparison to similar products available:

- Prefabricated in stainless steel with minimum civil structures/works involved - fabrication decreases the maintenance exponentially. It can be installed on roof tops/basements;
- Does not require regular checks to confirm that the media is moving about the entire volume of the tank instead of merely clumping at the top layers, which is a major drawback in the conventional systems.

The conventional systems process flowchart below requires extra equipments and processes; but Posedion by - passes most of the high energy consuming equipments and works on principle of natural attached growth process, combining three organic removal processes in one - single unit itself.

Conventional systems process flow chart

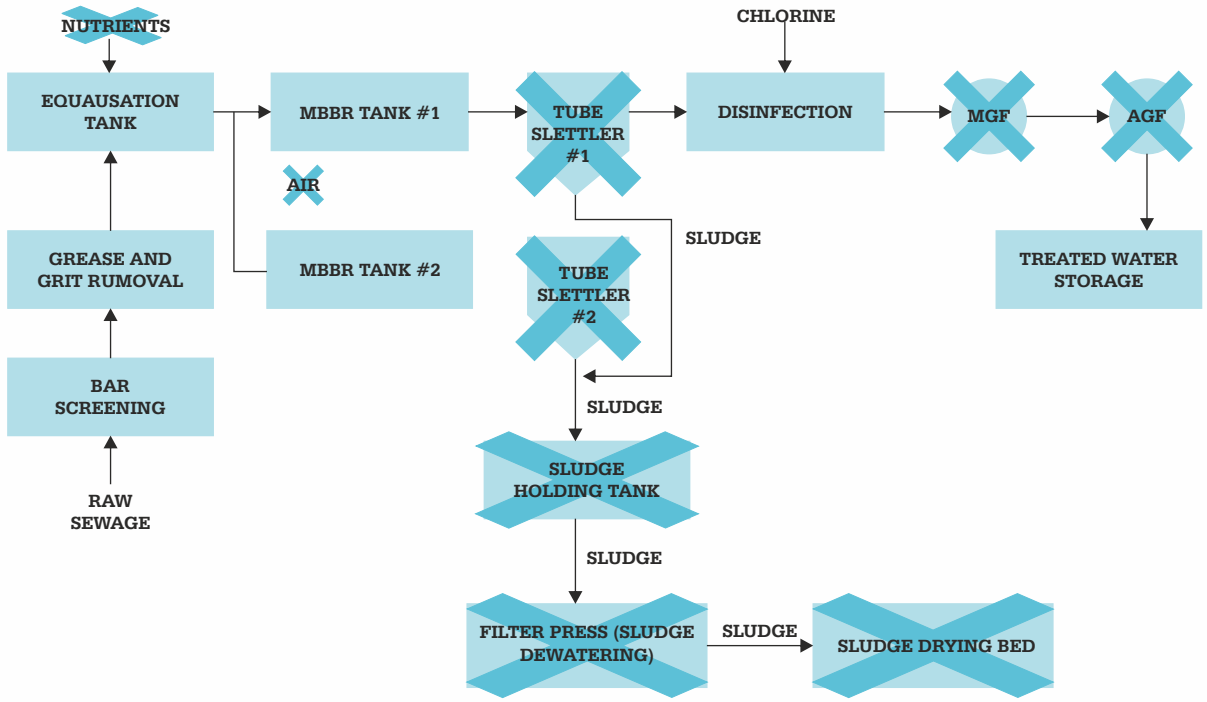


Table 9: Poseidon Treatment Technology

Parameters	Ecosoft Solution	Others
Treated Water Quality	Very High	Low to Medium
Footprint/ Land Requirement	Small	Large
Operating Cost	Low	High
Power Consumption	Approx.30-50 units/day	Approx.80-150 units/day
Removal Efficiency	97-99%	90-95%
Odour Generation	Low	Medium to High
Consumables Required	Low	High
Sludge Generation	Minimal (back flushing included)	Moderate (seprate unit for disposing sludge)
Blowers	Not required	Mandatory
Chemical based additives	No	Yes & High
Post Treatment	Not required	Required
Disinfection	Ozone	Chlorine
Filter Press Required	No	Yes
Hydraulic Retention Time	4-6 hours	6-10 hours
Meeting Latest CPCB Norms for Treated Water	Yes	May or may not
Services & After Sales Support	Onsite with fully warranty	Not clear

Positive Outcomes of the Technology:

- Achieves recovery of more than 90% wastewater
- Owing to its compact size, no odour & no sludge generation from the core treatment process, the POSEIDON solution is setting new standards for green and blue buildings
- The project case studies depict the project-specific positive impact to the overall net-zero discharge mission of the institutions & campuses.

Viability and Replicability of Technology:

- The modularity and scalability of the system from 5,000 LPD and 15,000 LPD (further multiples)

with short - on site installation time is in line with the vision of green and blue building requirements. The system is based on Mother Nature, uses naturally available local material, hence reducing the overhead costs dramatically.

Table 10: Successful Case Studies of Hindustan Ecosoft

Client	Xavier Institute of Development & Action Studies, MP	Little Sisters of the Poor, MP
Project duration	Three years	Two years
Capacity	5000 LPD	20000 LPD
Wastewater recovery	**90%**	90%
Water available for gardening, landscaping & general cleaning	4500 L	18,000 L
Power consumption with normal 8-10 hours of working	3-4 units per day	10-12 units per day


5th Edition of FICCI
WATER
AWARDS
2017

Category: WATER INITIATIVES BY NGOs

Water Initiatives by NGOs

Second Prize

Akhil Bhartiya Samaj Sewa Sansthan (ABSSS)

Programme: Watershed Management

Duration: April 2008 to March 2012

Location: Mangawan, Itwan and Patin in Manikpur block of Chitrakoot district, UP Bundelkhand

The Mangawan, Itwan and Patin site is in the `Patha' plateau, which falls in the Agro Ecological Zone (AEZ) 11 of India. The Patha region frequently receives extremely poor rainfall, below the 400 mm mark, which is generally used to declare an area as drought-prone. Most lands are characterised by poor quality soil with low organic content, zinc and sulphur, average nitrogen and medium to high potash.

An intensive survey conducted under the project at the sites in May-June 2008, with a sample of 77 households (around 10% of total households), showed that even in the best of years agriculture constituted only around a sixth of total income. The main source of income was wage labour (45% of total income) followed by sale of fuelwood (27%).

Project Intervention:

The primary objective of ABSSS intervention was developing micro watersheds with people's participation and sustainable approach, preventing soil erosion and increasing water availability. As per approved project plan, a total of 27,345 ha were to be covered under land & water development and in-situ rainwater harvesting and 50 ha was to be covered under land use diversification, including forestation.

Designed interventions included: land bunding, levelling, gully plugs, farm ponds, checkdams, percolation tanks, earthen bunds, gabion structures, well construction, agriculture development techniques, vegetable cultivation, afforestation, awareness generation etc.

Target Groups:

- 66% of households were Koltribals, classified as SC in UP
- Women and children
- Landless households.

Table 11: Water conservation activities and the outcomes

S. No.	Activity	Outcomes
1	Water Conservation Structures	• 330.511 ha-m (33,05,110 cum) water conservation structures were constructed and repaired in Mangawan Watershed, Dist. Chitrakoot.
2	Afforestation	• 28,611 trees planted in sites, on structures and lands of 166 farmers. • Appropriate local species planted with a survival rate was 62.5%.
3	Cultivation	• In Mangawan, wheat production increased 10 times and in Patin wheat production increased 3 times as 54 Quint./bigha to 188 Quint./bigha. Paddy yield increased over 10 times from 24kg/bigha to 330kg/bigha and 68 Quint./bigha to 246 Quint./bigha. • In Mangwan, the total area under cultivation increased from 472 bighas in 2007-2008 to 1481 bighas in 2011-2012 and the total production in main crops increased from 26765 kg in 2007-2008 to 294283 kg in 2011-2012. • In Patin-Itwan, the total area under cultivation increased from 1342 bighas in 2007-2008 to 2100 bighas in 2011-2012 and the total production in main crops increased from 188926 kg in 2007-2008 to 804995 kg in 2011-2012. • Technical support to was provided 23 HHs to grow variety of vegetables and alternate crops which enhanced nutritional status of family, and also gain additional income. • Many HHs in sites started cultivating alternative crops like til, arhar, linseed and barley- increased from 49 to 406. • Kitchen gardens increased from 32 to 150 in 2011-12. • Number of HHs cultivating in kharif increased by over 10 times and in rabi the number doubled. • Gross area under cultivation increased in sites by 3 times and area under mustard and gram increased by 2 to 2.5 times. • At the end of the project, over 95% of the HHs were cultivating even in a below-normal rainfall year.
4	Awareness	• On-field training with input support was provided to motivate 45 farmers to adopt System of Rice Intensification (SRI) and 25 farmers to adopt System of Wheat Intensification (SWI). • 119 farmers participated in training programmes conducted each year on topics – Organic Fertilizers, Improved Agricultural Practices, Agriculture Yield Trends, Kharif Crop Planning. • Farmer learner groups: 10 farmer groups were active with around 120 members, of whom 10% were women. They used to discuss, and share knowledge on a number of topics like crop planning, seed varieties, use of insecticides, benefit of dhaincha cultivation, etc. • 500 farmers were covered in an intensive awareness campaign on good agriculture practices, conducted at both sites before the rabi season. • Women's self-help groups were formed to initiate the practice of household savings, to build capital for emergencies and farm investment.
5	Community Involvement	• Developing micro watersheds. • Preventing soil erosion & increasing water availability. • Formation of Committees for project implementation and O&M of watershed structures.

Table 12: Activity-wise area/units and beneficiary households covered under the programme

Component	Activity	Area/units	No. of beneficiary HHs
Land development & in-situ water harvesting	Land bunding	2440 ha	1142
	Land leveling	104 ha	151
	Earthen gully plugs*	23 ha	20
	Land leveling	32 units	51
Ex-situ rainwater harvesting	Checkdam construction*	32 units	142
	Checkdam renovation*	2 units	30
	Pond renovation*	2 units	8
	Percolation tank	1 unit	7
	Renovation of earthen bund*	1 unit	2
	Water Harvesting Bund	8 units	8
	Stone gully plug	310 units	24
	Nala excavation*	555 m	9
	Diversion drain*	2152 m	NA
	Gabion structures*	3 units	NA
	Masonary outlets	98 units	
	Stone outlets	5 units	
Water resource development	Well construction	5 units	16
	Well renovation*	2 units	22

Exposure visits conducted for farmers

Number of Farmers	Place visited
29	Model farms in Sidhpur, Barwaraand lift irrigation project in Sitapur, Chitrakoot district
8	Model farms in Jatara, Tikamgarh district (MP)
14	Model vegetable farms in Naraini, Banda (UP)
40	Kissan Mahakumbh organised by Agriculture Department, Banda

Implementation Strategy:

- The first strand of strategy used in this project was to arrest the rainwater as far as possible close to the plants that needed it, while following a watershed plan. Levelling lands, making field bunds and impounding rainwater in each field were the main techniques used. Complementing the in - situ approach outlined, some larger water impounding structures were planned in the lower reaches, to help capture water seeping through the ground.
- The second strand of the strategy was to harness the riverine resources in the region. Both the strategies were accompanied by crop diversification and productivity enhancement efforts.
- More intensive land development was carried out, with both in-situ or on-farm water harvesting (through Pradan's 5% farm pond model and levelling- bunding) and ex-situ water harvesting (earthen checkdams). The main activities were land development through levelling, bunding and tree plantation. Agriculture development was carried out along with capacity building in specific areas.

Table 13: Community contribution made during implementation, operation and maintenance of project

Funding Sources	Support Cost from funding agencies (INR)	Community Contribution (INR)	Support from other sources (Govt./Non Govt.)
SDTT	1,34,90,000	9,63,571	58,90,494
NABARD	88,98,509	6,40,000	0.00
Total	2,23,88,509	16,03,571	58,90,494

Project Sustainability:

- In Patin & Itwan watersheds, two Watershed Development Committees (WDC) were formed with total of 21 members (6 women and 10 SC) for project implementation.
- In Mangawan watershed, 5 `SAJLA (Samekit Jalagam) samitis' were formed with a total of 51 members (15 women and 33 SC) for O&M of watershed structures and met weekly.
- Around 25% of programme investments were from convergence with government schemes and leveraging MGNREGA. Sanctions for convergence work amounting to over INR 1.20 crores were obtained, and INR 68 lakhs were spent under different activities such as land bunding, land levelling, ex-situ rainwater harvesting, afforestation and improved agriculture techniques.

In-situ models








Ex-situ water harvesting

First Prize

Aga Khan Rural Support Programme

Programme: Water harvesting

Duration: 2002 to 2011

Location: Meghal River Basin Management, Junagadh district, Gujarat- 55 villages (19,450 households)

The Meghal river basin is located in Junagadh District in the coastal Saurashtra region of Gujarat. Being a semi - arid region with mainly basaltic rocks, the region is prone to droughts. The rocks being unable to retain much storage of water for longer periods have also been unable to sustain water requirements during such drought periods.

Erratic rainfall coupled with overexploitation of groundwater led to gradual drying up of river Meghal. This led to scarcity of drinking water and drying up of irrigation wells.

Project Intervention:

The objective of the intervention is to create ownership of the village community on the revival of sustained management of Meghal River.

AKRSP (i) has been working in the villages in the Meghal basin since 1987-88; AKRSP (ii) motivated the villagers to participate in the water conservation programmes of the government and other similar efforts.

Table 14: Different activities and there outcomes across 55 villages (19,450 households).

S. No.	Activity	Outcomes
1	Water Harvesting Structures	• 306 structures were built having a storage capacity of 115.61 MCFT including small and medium checkdams and reservoirs. Boribunds were also constructed.
2	Water Flow in River Basins	• 8 observation places were decided by AKRSP-I and community to check the river flow. Data observation from those river basins clearly shows the substantial increase in the water flow
3	Cultivation	• Cropping intensity in Meghal has grown from 1.50 to 1.96. • The gross value of output produced in all three seasons has grown from ~150 crores in 2000-01 to ~ 400 crores in 2010-11; an annual growth of roughly 10%. The summer cultivated area has become more than 5 times since 2000-01.
4	Awareness	• Promoted improved agricultural practices, adoption of drip & sprinkler irrigation. Core group was taken to Alwar in Rajasthan to see the much acclaimed water conservation work done by the Tarun Bharat Sangh.
5	Community Involvement	• Local traders and farmer groups fund for the construction of the boribunds in the area. Promoting participatory and democratic village-level institutions in the form of Jal Bachao Juthsand Gram, Jal Bachao Sangathans and Mahila Manch.

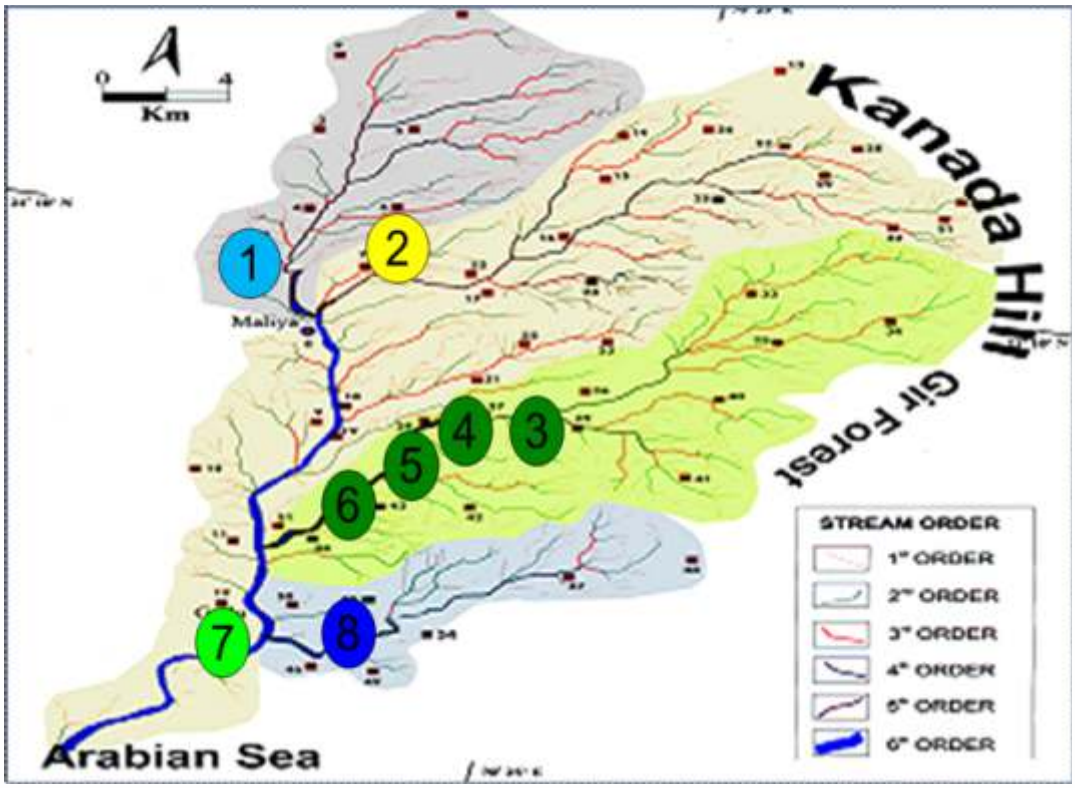
Table 15: Water flow measurement details

Water Flow Measurement							
Sr. No.1	Village	Name of Point	River	0.41	Water Flow in Cubic Meter (In 24 Hours)	Rainfall 2007	Water Flow in Cubic Meter (In 24 Hours)
				825mm		1216mm	
				6/3/2007		6/3/2008	
				Q = AV m^3/sec		Q = AV m^3/sec	
1	Itali	Meghapat	Vrajmi	0.41	35424	0.64	55296
2	Vadiya	Jangivad	Vrajmi	0.54	46656	0.55	47520
3	Kadaya	Khodiyarghuno	Vrajmi	0.79	68256	0.86	74304
4	N. Dhanej	near village causeway	Vrajmi	0.42	76032	0.9	77760
5	N. Dhanej	near village causeway	Vrajmi	0.42	76032	0.9	77760
6	N. Dhanej	near village causeway	Vrajmi	0.42	76032	0.9	77760
7	N. Dhanej	near village causeway	Vrajmi	0.42	76032	0.9	77760
8	N. Dhanej	near village causeway	Vrajmi	0.42	76032	0.9	77760

Table 16: Discharge Flow Data

Discharge Flow Data Rainfall: 1087 mm (Maliya Hatina- Govt. Gujarat)				
Sr	**Location**	**20/10/2008**	**28/11/2008**	**0.10m3/sec**
1	Maliya Lathodra CD	20/10/2008	28/11/2008	23/1/2009
2	Vadala Causeway CD	1.44m^3/sec	Flow stopped	Flow stopped
3	Itali Meghapat CD Gate	1.24m^3/sec	1.24m^3/sec	0.78m^3/sec
4	Vadia Jangivat CD	2.37m^3/sec	1.72m^3/sec	1.50m^3/sec
5	Kadaya Khodiyar	2.47m^3/sec	1.44m^3/sec	0.81m^3/sec
6	Nani Dhanej CC wall	2.10m^3/sec	1.20m^3/sec	1.12m^3/sec
7	Gadu Meghal River	4.0m^3/sec	2.66m^3/sec	2.24m^3/sec
8	Khorasa Kalipati River	1.2m^3/sec	0.03m^3/sec	

Figure 2: Observation points decided by AKRSP and community members



Implementation Strategy:

AKRSP and people build the boribunds once the monsoon is in its receding phase unlike the 'scientific' way where structures are built prior to the monsoon. The former approach helps the community to locate structures where water is already flowing so there is no chance of speculation going wrong. Secondly, as these are built at the end of the monsoon, the flow velocity is reduced making it easy to build structures that last the season. Thirdly, people know exactly how much water is there and how much more they need to help them design the boribund accordingly. AKRSP besides providing the material support to building the boribunds, also helps the community with arriving at technical specifications of the structures in each location.

Intervention Cost:

Funding Source	Contribution (INR)
Community, government and non-government	1,34,21,000
Foreign fund	2,19,53,000
Total	3,53,74,000

Project Sustainability:

The Jal Bachao Juth (Water Conservation Group, JBJ) is a representative body located within a village formed of landed and landless farmers. They are entrusted with micro-planning of this area, program planning and implementation, and awareness building. They also act as a local pressure group for water conservation activities.

Women members of the JBJs have gone on to form a district level federation called the Mahila Manch. They help their members take up business activities, get their rights and entitlements and address drinking water problem in the villages through the roof rainwater harvesting scheme. They also contribute to the water conservation agenda by sometimes paying for construction of boribunds.

FICCI Water Mission

Access to safe water is one of the essential elements for sustainable development and poverty reduction. However, the past few decades has seen an increase in demand amongst various water using sectors putting enormous stress on the natural resource.

FICCI constituted a 'Water Mission' to promote and provide thought leadership in the area of water efficiency. It aims to facilitate the sharing and dissemination of best practices across industry sectors in order to encourage corporate and industry players to imbibe a culture of water conservation within their organizations.

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

The objectives of the Mission's work are:

- To formulate suggestions for changes in policy framework in India for better water resource allocation, conservation and management;
- To document and disseminate best practices across various sectors and create a forum to facilitate exchange of information and experiences in the country;
- To promote good practices in sustainable water management and innovative technologies of water saving and management through workshops, conferences and training programmes.

FICCI Secretariat Focal Point for Water Mission

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