



BOMBAY CHAMBER

Bombay Chamber  
of Commerce & Industry

# SQ

raising the Sustainability Quotient



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Jain Irrigation Systems Ltd.

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### Sustaining CSR Investment in Water

India is currently facing severe water scarcity. Around 54% of India faces high to extremely high water stress<sup>1</sup>. Groundwater levels are falling as farmers, city residents and industries are drawing water from wells and aquifers exceeding the rates of replenishment. The national supply is predicted to fall 50% below demand by 2030<sup>2</sup>. There is also an element of uncertainty introduced in the water security due to climate change.

Availability of water is affecting the business. Predictions by economists were – 20 to 50% cut on water to industries may pull down Index of Industrial Production (IIP) growth by around 40-50 basis points<sup>3</sup>, while the manufacturing sector alone could take a hit of about 50-75 basis points. Unfortunately, the National and State Water policies do not address economic value of water from industrial perspective.

Clearly, business in the interest of ensuring adequate water security and to combat its own resource risks, needs to innovate, undertake measures on conservation and recycling of water, and make efforts to

recharge ground water aquifers to meet both industrial demand and the community needs.

With the 2% CSR investments made mandatory, CSR interventions on 'water' have taken a leap over the last couple of years. The present issue of SQ focuses on the theme of CSR driven interventions in water.

We are covering under this theme articles on innovation by Jain Irrigation followed by case studies from Larsen & Toubro (L&T), Infrastructure Leasing and Financial services (IL&FS) and Mahindra & Mahindra (M&M). L&T's projects on Corporate Social Responsibility (CSR) focus on water conservation at the factories as well as in the communities. Case study from IL&FS takes a watershed approach in the drought prone region of Aurangabad. Similar experiences are shared by Mahindra's programme captioned H<sub>2</sub>O to H<sub>2</sub> Infinity.

We hope that the articles and cases studies in this issue of SQ provide a source of inspiration to our readers.

- Prasad Modak

<sup>1</sup>[www.indiawatertool.in](http://www.indiawatertool.in)

<sup>2</sup>Mickensy report for 2030 Water Resource Group, "Charting our Water Future"

<sup>3</sup>100 basis points = 1 percentage point



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Published & Printed by :

**Bombay Chamber of Commerce and Industry**  
'The Ruby', 4th Floor, NW  
29, Senapati Bapat Marg,  
Dadar (W), Mumbai 400 028  
Tel.: 61200200 Fax : 61200213  
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# Knowledge

## Innovation is the key to solve the problem of water

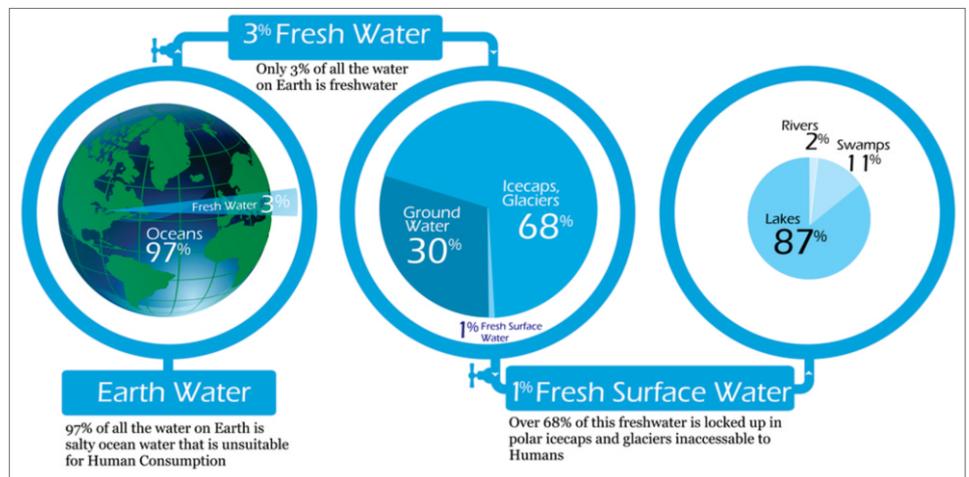
**Atin Kumar Tyagi**

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Water is the elixir of life. It can, and it has, made or marred nations. Why only nations, water has nurtured or wiped out entire civilizations. More than 97% of the earth's water is in the ocean. Out of the 3% usable water, 2% is in the form of Arctic and Antarctic ice. Only around 1% is fresh, liquid water in lakes, rivers and underground aquifers. Even out of this, 0.6% is more than 3,000 feet under the ground level. Effectively, we only have only 0.4% of total water on earth at our disposal, which we have to share between agricultural, industrial and human needs including developmental needs.

In the recent decades India has shifted its status from a 'water adequate' to 'water stressed' country given that per capita

availability of water has reduced from 1816 cubic meters to 1545 cubic meters from the period of 2001 to 2011<sup>1</sup>. As per a study done by Mekonnen and Hoekstra (2015) of the University of Twente, Netherlands, about 80% of Indians face a severe scarcity of water for at least a month every year. As per the United Nations World Water Development Report about 22 out of 32 Indian cities face daily water shortages. Precious groundwater resources are alarmingly under severe stress today. Of the total 5842 blocks assessed by the Central Ground Water Board (CGWB), about 802 are over-exploited, about 523 are semi-critical and about 169 are critical.



<sup>1</sup>WWF, 2013. *Water stewardship for industries the need for a paradigm shift in India.*

Besides increased population pressure, constant competing demand for water from household, agriculture, industry and energy sectors reportedly contribute to declining water availability.

Like the other fast growing economies agriculture accounts for a majority of freshwater withdrawals in India too (WWDR, 2012). India also tops the list of ground water abstracting countries having 30 million abstraction wells withdrawing 251 km<sup>3</sup> ground water per year<sup>2</sup>. In India the area irrigated with groundwater has increased 500% since 1960. As of 2009, the annual ground water withdrawal for irrigation has been estimated to be 221 billion cubic meters (BCM). The estimates also show that out of total sown area, 60% is irrigated with ground water which in turn contributes to 40% of the total food production<sup>3</sup>. Due to withdrawals exceeding the rate of recharge and replenishment, groundwater levels are declining rapidly across the country.

In order to secure the future of India's water resources, it is very important that certain steps be taken immediately especially in agricultural sector. If even 10% of water is saved in the agriculture sector, farm productivity will go up by 65% for irrigated land and by 35% for rain-fed land.

### Do We Have Solution? Yes, We Do, Innovation is the key.

We at Jain Irrigation Systems Ltd. (JISL) work in the area of sustainable agriculture, renewable energy and water conservation with a motto "Leave this world better than we found it". We pioneered a revolution in the country way back in 1980s with modern irrigation systems and innovative technologies. Our technologies are based on cutting edge research and development in order to save precious water and to get significant increase in crop yields using global agronomical knowledge for millions of small as well as large farmers.

### More yield with less water in agriculture:

The micro-irrigation (MI) technologies involving drip and sprinkler irrigation are the key interventions in water saving and improving crop productivity. Better crop growth, improved soil health, less pumping hours and thus easier irrigation are the additional benefits of micro-irrigation technology. Jain Irrigation pioneered the concept of drip irrigation and integrated irrigation system in India in 1986 and 1990 respectively.

Drip technology improves farm productivity by a factor of 50% to 230%. It also acts as a catalyst to improve productivity of other farm inputs. Till date more than **4.5 million acres** have been covered under drip irrigation, bringing smile to more than **4 million small holding farmers families**. In addition **more than 5,00,000 smallholder farmers are trained** on drip irrigation technology annually as a part of extension work.

### Water and Energy Conservation through Research and Development:

The latest success of R&D trials which brings even the major water guzzlers (e.g. rice and wheat) cultivation under drip irrigation is first-of-its kind in India. With the new Jains technology farmers will get **22% more rice using 66% less water** (water use in drip irrigation is 3.2 million litre per acre compared to flood irrigation which is 9.5 million litres per acre);

moreover, usage of pumping power will be reduced by 52% (Refer Table 1 & 2). The trials have been completed successfully and the technology is now ready to be percolated at farm level.

### Sustainable water supply systems make Integrated Irrigation Solutions Possible:

Our PE and PVC Piping solutions have changed the way how the water supply and large irrigation systems used to be designed. For instance the PE pipes have more than double life of traditionally used RCC, DI and GI pipes, which have conveyance efficiency up to about 40%, whereas PE pipe based solutions can provide a conveyance efficiency up to 80%. We ushered a new concept of Integrated Irrigation Solutions (IIS) based on PE and PVC water supply systems. The IIS concept has been a tremendous success as it is now accepted for execution of the world's largest irrigation supply. The project engages more than 7,000 farmers from a 30,381-acre command area comprising 35 villages of Bagalkot District (Karnataka), the project is valued at INR 3,857 million. Krishna Bhagya Jal Nigam Limited (KBJNL), a division of Water Resources Department of Karnataka, selected JISL through a pan-India bidding process. A typical canal project would give maximum water use efficiency up to 40%, whereas, this project has water use efficiency up to 80%. Due to the project the farmers can do cultivation throughout the year on the rain fed land.



Jain Technology: Rice with Sprinkler Irrigation



Jain Technology: Rice with Micro Irrigation

<sup>2</sup>UNESCO, 2012. *Groundwater and Global Change: Trends, Opportunities and Challenges*. Published in 2012 by the United Nations Educational, Scientific and Cultural Organization 7, Place de Fontenoy, 75352 Paris 07 SP, France. ISBN 978-92-3-001049-2.

<sup>3</sup>WWF, 2013. *Water stewardship for industries: the need for a paradigm shift in India*.

Table 1 - Water saving due to Jain Irrigation's technical intervention

Activity	Savings per annum	Total Savings
Water Supply Systems	15% to 20%	1043.02 billion litres
Micro Irrigation Systems	50% to 100%	44296.46 billion litres
<b>Total</b>		45339.5 billion litres

Table 2 - Energy saving due to Jain Irrigation's technical intervention

Activity	Direct Beneficiaries	Total Savings
PVC Piping / Foot Valves	15%	450.00 million kWh
Micro Irrigation Systems	30%	185.00 million kWh
Solar Water Heating	1200 kWh/household	22.60 million kWh
<b>Total</b>		657.60 million kWh

## Creating water through watershed management:

We entered into a pioneering public private partnership (first within the space of Maharashtra) to create infrastructure for regional benefit without engaging in unending land acquisition and government clearances. The project was named as “Kantai Bandhara” and got commissioned in 2013 at half the usual cost and a fourth of the prevailing time using captive competencies.

The dam is built across river Girna (a tributary of River Tapi) and has 179.2 crore litres storage capacity. The total expenses in building the dam i.e. 7.96 crores were incurred by Jain Irrigation, however, as a part of social obligation it has committed to use only 50% water from the dam. The project has improved irrigation/drinking water situation in 7 Panchayats comprised of 15000 families in its watershed area. The dam also serves as a public transport bridge connecting two major villages with the district head quarter (Jalgaon), reducing their travel by seven kilometres.

Apart from this we created a one-of-its-kind watershed area covering about 600 acres of barren land at Jain Hills and Jain Valley in Jalgaon. The area was devoid of ground water resources and unsuitable for cultivation. The work was started way back in 1988 and continues till date. Since last year an additional 500 acres of barren land was acquired and watershed activities were started by construction of farm ponds.

The creation of watershed has converted barren lands of more than 600 acres into bird roosting areas. The Jain Hills watershed has subsequently become the

home to more than 150 native flora and more than 180 fauna species (Refer Table 3). The two projects and surrounded villages are being brought under alliance for water stewardship (AWS).

## Green energy for access of drinking and irrigation water

We have also promoted solar based water pumps for irrigation particularly, in remote, small and marginal farms. Attaching solar energy with micro-irrigation systems is one-of-its kind innovation. It ensures access to drinking and domestic water, producing “**more from less**” in water and electricity starved areas. It is notable that with installation of more than 10,000 solar pumps we have installed the highest number of agri-solar pumps across India.



Aerial view of Kantai Bandhara built on seasonal Girna River



Jain Hills micro watershed and Jain Sagar

Table 3 - Biodiversity in Numbers at Jain Hills & Valley

a) Flora & Fauna		
Flora and Fauna		Types
Flora	Trees	75
	Herbs & Shrubs	51
	Climbers & Grasses	24
<b>Total</b>		<b>150</b>
Fauna	Birds	102
	Butterflies	32
	Insects & Reptiles	30
	Mammals	20
<b>Total</b>		<b>184</b>

b) Total Number of Trees	
Tree Type [no. of plant at Jain Hills]	Total No.
Fruit crops	54,074
Ornamental	10,223
Ago-forestry	45,416
Medicinal	564
Flower plants	4,253
Natural forest species	1,691
<b>Total</b>	<b>1,16,221</b>



Jain solar hand pump installed at Udumalpeth, Tamil Nadu has reduced the drudgery of these women who were subjected to much hardship earlier while fetching drinking water



Solar Powered Small Scale Irrigation Project Site- Jain Solar Irrigation Pumps are Installed Near the Storage area (Earthen sump/Plastic tank) of Harvested Rain Water

## Conclusion

Efficient irrigation technologies are the need of the hour. Despite all the benefits, the adoption level of micro irrigation is too low in the country. Out of total irrigable area, 42.23 million ha is suitable for micro irrigation, however, the present area under micro irrigation accounts for 3.87 million ha (1.42 million ha under drip and 2.44 million ha under sprinkler)

which is only 9.16% of the potential area. The main reason behind this is not the initial capital cost but lack of right awareness amongst farmers. Our extension team is working in this direction. We have trained more than five lakh farmers in our Food and Agriculture Organization of the United Nations (FAO) accredited centre. Every product or service at Jain Irrigation is based on the foundation, which our

honourable founder chairman Dr. Bhavarlal H. Jain set 40 years ago "Leave this world better than you found it". Our products and services bring alternative solutions for energy, water and food scarcity. Following our mission we will keep working in order to bring more prosperity to society and, the son of the soil, the farmer, as our slogan states "Farmer's Smile is the best bottom-line".

## Larsen & Toubro: Water Management for Sustainable Future

**P. S. Mallik & Kaustubh Phadke**

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'Water' is central to sustainable development, it is a finite and irreplaceable resource that is fundamental to human well-being. Water scarcity is affecting every continent. According to United Nations around 1.2 billion people, or almost one-fifth of the world's population, live in areas of physical scarcity, and 500 million people are approaching this situation. Water can pose a serious challenge to sustainable development but managed efficiently and equitably, water can be an enabler in strengthening the resilience of countries towards climate change.

At Larsen & Toubro (L&T) we believe water is critical and it poses important risks for our businesses. It also presents us with an opportunity to contribute towards sustainable water management solutions. In order to effectively manage its water footprint, the Company has undertaken numerous steps across its Landscape of activities covering campuses and project sites; and also

extending to the community through our Corporate Social Responsibility activities in water management (Refer Fig 1).

### Zero waste-water discharge campuses

State-of-the-art water treatment systems are available at all 28 major facilities of L&T. The treated water is re-used within the campuses for non-potable use, making the campuses zero waste-water discharge. This also helps us reduce our fresh water consumption.

### Water Positive Campuses

The water storage structures in the form of check dams built by the company for the communities through Larsen & Toubro Public Charitable Trust (LTPCT) along-with Rain water harvesting structures within premises and water conservation initiatives within our campuses helped us achieve water

positive status for eight campuses – Powai (West), Talegaon, Hazira, LTSSHF Hazira, MFF Hazira, Ranoli, E&A Mahape and Ahmednagar. Water debit was calculated as the fresh water consumption of the campuses and water credit included rain water harvested, water storage in check dams, water recycled & reused. (Refer Table 1).

Table 1 - Water Balance Index

Total water debit of eight campuses	1629.32 million litres
Total water credit	1726.61 million litres
Water Balance Index = Water Credit/Water Debit	+1.05

### Rain Water Harvesting

At all our major campuses we have implemented rain water harvesting systems. The harvesting of rainwater is done through the recharge of underground aquifers, collection & storage of water for later use and through collection and utilization of rain water immediately. The rain water harvesting has increased significantly in last year.

### Awareness campaigns

At the company level a constant endeavor is to emphasize on the optimum utilization of water resources. This is done through awareness campaigns for our employees, contractors and external vendors on World Water Day, Earth Day and World Environment Day.

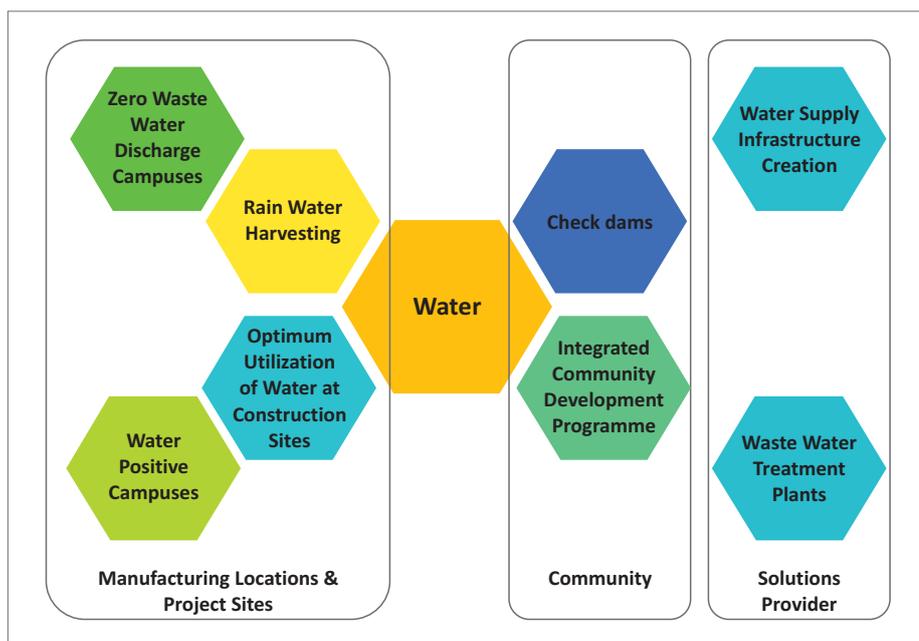


Fig 1 : Water & Sustainability across L&T Landscape

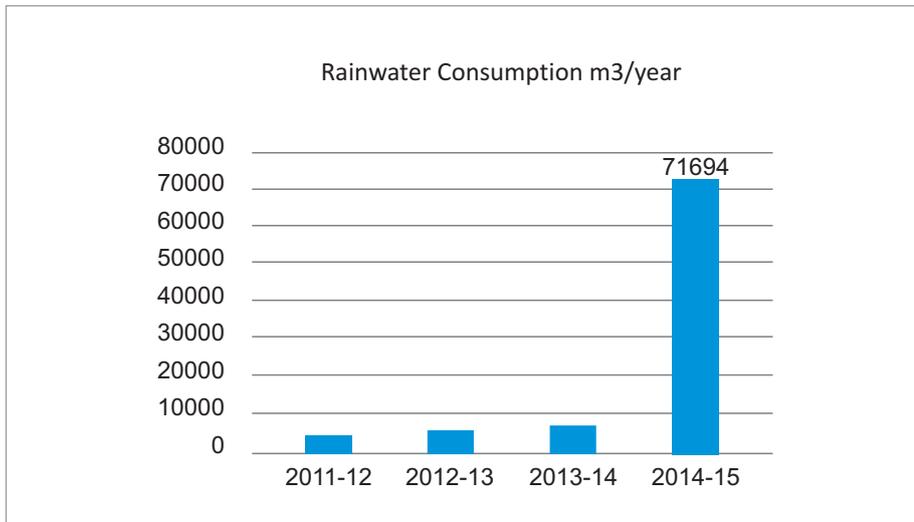


Fig 2 : Rainwater Consumption m3/year

## Benefits

- **Groundwater Storage and Recharge:** 1200 Million liters/year of additional groundwater storage and recharge.
- **Bore well Recharge:** Recharging of more than 250 open wells/bore wells.
- **Increase in Drinking Water Availability:** Availability of water for drinking and farm (3610 Hectares) around the year. Water is available for two more crops/year and vegetable farming.
- **Increase in Ground water levels:** There has been an increase in ground water level by 0.25m to 0.30 m.
- This shift in scenario has led to livelihood development, reduction in migration to cities and overall development.

## Water Solutions Provider

L&T provides complete water supply, treatment and recycling solutions. We have 'concept to commissioning' capability covering design, detailed engineering, procurement, project management and execution. Our portfolio includes:

- Urban & rural water supply
- Industrial water supply and treatment plants for recycling
- Water treatment plants
- Waste water treatment and network
- Refurbishment of treatment plants
- Lift irrigation projects
- Rehabilitation of canals
- Desalination
- SCADA Software
- Identification of Unaccounted for Water (UFW)



A water treatment plant built by L & T

*L&T is recognized as the leader in developing and providing water infrastructure in the country. Thus providing water management solutions for its customers*

## Investing in Communities

### Check dams

In collaboration with Rotary International, L&T Public Charitable Trust has constructed 200 check dams in tribal area of Thane District since 2008. Tribal areas in Thane district were chosen as it has substantial rainfall but is water starved in non-monsoon season. The objective was to tap the precious rain water and make it available throughout the year. Water from check dams is used primarily for irrigation (more than one crop in year with additional cash crops) by communities, ground water recharge and improving biodiversity. A key benefit to the village women & children has been easy access to water avoiding the need to walk to distant areas to fetch water.

*Touching lives of more than 75,000 people with the construction of 200 check dams in Thane District*



Check dam in Talasari

## Integrated Community Development (ICD) Programme

As part of its Corporate Social Responsibility (CSR), L&T has decided to undertake Integrated Community Development (ICD) programme in selected areas of the country. Project area selection was done on the basis of Water stress in the area (including availability of water, quality of available water, climate change impact) and the Human Development Index (life

expectancy, maternal and child mortality, education index and standard of living and availability of sanitation facilities). The project aims at integrated development involving conservation and supplementation of natural resources (Water, Land, Forest, Livestock and Community) also impacting the health, education and livelihood status of the community.

The ICD program is laid out for a period of 4-5 years and includes watershed development projects, building community awareness on water, building of sanitation facilities and water conservation measures. It also includes providing education support to schools, and health development support to the community. The project plans to ensure availability of water for the community for drinking, sanitation and agricultural purposes, alleviation of poverty, community awareness on civic issues, improve skills of the local community, capacity building activities and women participation in decision-making process, thus leading to overall empowerment of the community.

The programs were customized and monitored at every stage by a cross functional team formed within L&T. The fruits of these efforts are being already seen:

**Maharashtra:**

- Rise in water levels in wells located in vicinity of treated areas in Pathardi (Maharashtra) from 1.5 to 1.8 mts (18%) in Rabi season. Now wells are refilling faster than before
- Despite three consecutive years of drought at Pathardi, soil moisture content has increased in 177 ha cultivable area. Subsequently, farmers could grow jowar, chick pea and onion.

**Tamil Nadu**

- Ground water levels have increased by 6.85 ft in Chettipalayam and 5.7 ft in Pappampatti in the peak rainfall season.
- 28.8 ha of fallow land have been converted into cultivable land in Coimbatore district.

- Even after low and erratic rainfall, there has been an increase of 27% in productivity of maize, urd and moong crops in Bhim.
- Control measures for foot and mouth disease have reduced mortality of livestock at Bhim and Kumbhalgarh.



*Women forced to climb down into the well as the water levels (Before)*



*Water stand posts in Vanader - an L&T intervention village in Kumbhalgarhm, Rajasthan (After)*

*Table 2 - Project areas we are working on from 2015 are:*

State	District	Tehsil	No. of villages	No. of households
Rajasthan	Rajsamand	Bhim	6	2681
		Kumbhalgarh	10	2096
Tamil Nadu	Coimbatore	Chettipalayam	4	2514
		Pappampatti	4	2212
Maharashtra	Ahmednagar	Pathardi	8	1503
<b>Total</b>			<b>32</b>	<b>11006</b>

More than 70 self-help groups have been formed and we have conducted awareness campaigns on soil and water harvesting techniques, training sessions on farming techniques and crop demonstrations and importance of community participation; a sense of community ownership of the programme is on the rise as evident in regular interactions.

**Rajasthan**

- 41 families are getting chlorinated clean drinking water from two water supply systems built at Kumbhalgarh, Rajasthan.
- More than 50% farmers who have undergone training on crop demonstration have planted less water requiring varieties of wheat and vegetable seeds in Kumbhalgarh.

95% of watershed work has been carried out by beneficiary communities, generating alternate employment opportunities at all locations with a high level of participation of women (30–50%) across all locations in programme implementation is noteworthy

The Company realizes the importance of water and it is our constant endeavor to effectively manage our water footprint. We will continue to undertake steps across our landscape of activities covering campuses, project sites and community; and strive to conserve this precious resource.

# The Mahindra Way: H<sub>2</sub>O to H<sub>2</sub>infinity

**Anirban Ghosh & Priya Zutshi**

Group Sustainability, Mahindra & Mahindra

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Programs and initiatives on water conservation, harvesting, and reducing water intensity across the Mahindra group have always been part of our Sustainability Approach. Recurring droughts and drought-like situations across the country made it imperative for us to accelerate our efforts to turn and transform a fast depleting reserve into tomorrow's infinite resource.

Our Group spans multiple sectors and has demonstrated the capacity to conceive and execute integrated solutions. In 2013-14 the Group as a whole attained the water positive status with total water consumption of 6.1 million m<sup>3</sup>, and total verified water savings of 8.4 million m<sup>3</sup> through the offset mechanism. In addition, there are four large water harnessing projects in rural India which together harvest up to 12 times the water consumed by the Group.

## The Approach

H<sub>2</sub>O to H<sub>2</sub>infinity was our clarion call to turn back the clock on water and return to a situation where it is again available in abundance. Conservation, consumption and cultural norms all needed to undergo a paradigm shift. We realised that the task was huge and arduous. To combat this hydra headed problem we put in motion multiple interventions addressing key issues across our businesses.

## Saving Every Drop

At the business level we undertook detailed risk mapping and rigorous water-audits. Focussed programs comprising rain water harvesting, ground water recharging and reusing treated waste water have been put in place by many of our existing facilities with an aim for each plant to become water secure.

On the basis of a water foot-printing exercise we identified opportunities to reduce, reuse and recycle water and planned strategies to address the same across sectors. Implementation of the various water conservation projects have resulted in the better utilisation of this resource in many sectors this year. New innovative technologies like using enzymes or natural plants to treat and reuse wastewater have been explored and put to use.



We are committed to maintain the natural water cycle at Mahindra. Hence, efficient discharge systems comprising of ETPs (Effluent Treatment Plants) and STPs (Sewage Treatment Plants) have been set-up investing significant resources. The treated water is used within the campus in the most suitable ways possible and thus many of the locations have achieved zero discharge status. Regular monitoring of our waste water is done by internal as well as external agencies, in terms of parameters specified by statutory authorities like C.O.D, B.O.D, pH etc. The values have always been found to be within the guidelines and limits as defined by the State Pollution Control Boards and local regulatory authorities.

A new capacity building program 'Water Management: The Mahindra Way' was introduced at the Mahindra Institute of Quality (MIQ) in March 2013. The purpose of this annual program is to help

the participants understand the various water streams which exist in a manufacturing facility and the issues related to it. Major topics covered include:

- Business risk arising from water scarcity
- Effective water utilisation
- Process optimization and statutory requirements
- State of water resources in India
- Water audits, accounting and disclosure
- Water demand management and conservation (water neutral and positive)
- Water policies & statutory requirements
- Rainwater harvesting
- Watershed management
- Water treatment technologies and sharing of best practices

## Societal Outreach

We have undertaken holistic interventions in water harnessing such as the integrated watershed development programs as a part of our work in Corporate Social Responsibility.

Examples of this can be seen at Damoh in Madhya Pradesh, wherein we have been instrumental in providing the local community year-long access to water, plus the knowledge to maximise productivity from every drop. Our Integrated Watershed Management Project (IWMP) works on a two-pronged approach. While on one hand, it seeks to enhance the water conservation capabilities of some of the most remote geographies of India, it also seeks to spark a social transformation through carefully planned interventions.

The project aims to transform the lives of the villagers of the area by addressing the following key issues:

- Mobilising the community through formation of community-based organisations and engaging them in the implementation of the project.
- Improving water availability by constructing watershed structures.
- Increasing area under cultivation and crop production intensity.
- Enhancing avenues of agricultural earning by increasing area under vegetable cultivation and also encouraging higher milk production.
- Creating livelihood opportunities and self-sustenance by setting up self-help groups and training them to run micro-enterprises effectively.
- Ensuring holistic development through interventions in health, sanitation and education.
- Ensuring ecological balance by conserving & developing soil, water and natural vegetation.
- Enabling doubling of the per capita income through the various measures taken.

## Our Products

Mahindra Lifespace Developers Ltd. has built more than 165,000 sq. ft. of green residential space. It is also building two integrated cities, one of which is designed as a carbon neutral city. There are extensive plantations in both cities to

strengthen biodiversity and facilitate reduction in temperature. The greening work done in the barren areas of Jaipur is particularly noteworthy. There are systems to institutionalize effective and efficient waste, water and energy management.

At Mahindra & Mahindra's Farm Division they have taken up a Clean Development Mechanism (CDM) project on Micro Irrigation Systems in association with the UNFCCC (United Nations Framework Convention on Climate Change). Under the project, farmers were encouraged to use water efficient drip and sprinkler irrigation systems and save more than 40% water in irrigation apart from getting productivity benefits.

The Automotive Division has reduced its fresh water intake for painting vehicles by using recycled and treated water. It has also piloted a way of cleaning vehicles without using water in its plants. This is an initiative which will get rolled out at dealerships and can be amplified amongst all vehicle owners saving millions of liters of municipal water every morning.

Mahindra Sanyo Special Steels has used water harvesting techniques to reduce offtake of fresh water from the adjacent river by more than 70%. Such harvesting systems have been replicated at other locations of the Group as well.

Mahindra Holidays operates a number of resorts in remote locations where municipal water does not reach. The

business does not hamper the flow of water through natural streams and paths and practices effective water harnessing and recycling methods to be water secure. It is an organization that strives to ensure that its members get a responsible holiday experience.

At Mahindra we believe in leveraging the power of alternative thinking to rise to the challenges of the future. A large number of interventions in energy, water and other areas of sustainability have helped Mahindra play a leading role amongst corporations in addressing the issue of climate change. This has also helped Mahindra to be a role model for members of its value chain who have started energetically adopting sustainability practices.

Recognizing the crucial interplay of energy and water, Mahindra has been the first global signatory of EP100 – a program in which corporations pledge to double energy productivity by 2030 on a base of 2005 or later. Mahindra is also the first Indian member of the World Bank's Carbon Pricing Leadership Coalition and has played a prominent part in multiple conversations at COP21, the climate change conference held at Paris in December 2015.

Acknowledgement for the role that Mahindra has played in Sustainability sphere has come in many ways, the most significant of which has been the opportunity to represent all the corporations of the world at the signing of the climate change agreement on 22<sup>nd</sup> April, 2016 (Earth Day) at the United Nations.



# Tushar Samruddhi: Water Harvesting Initiative in two drought affected villages in Aurangabad District, Maharashtra

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## Background

Tushar Samruddhi is an initiative by IL&FS towards watershed rejuvenation in the two drought-prone villages of Aurangabad, Maharashtra. This initiative is in the catchment area of 12 MW plant of Shendra Green Power Limited that generates electricity from biomass. Aurangabad district is one of the drought prone districts of Marathwada. The unavailability of water for domestic and agriculture use was too prominent to ignore and it also reflected in the baseline study conducted in the region. The primary means of income here is rain-fed farming and farmers have small landholdings.

The region receives scanty rainfall, less than 400-600 mm annually. The villages Chartha and Shelud, where the project was implemented are tanker dependent every year almost for 3-4 months.

The Maharashtra Government, on its part, built 34 Kolhapur type weirs (commonly known as KT weirs) along Dudhana River in 90s. However, eventually, these weirs became defunct. Sadly, they were not scientifically constructed and not regularly maintained by departments. Also, the villagers were not involved in the building or maintenance of these water-critical harvesting structures and thus, could not manage them and use their water effectively.

IL&FS collaborated with Savitribai Phule Mahila Ekatma Samaj Mandal (SPMES), a

local NGO that has a deep community connect in the same area for decades. SPMESM came on board as the implementation partner for the project and this association particularly played an important role in the project. SPMESM along with the farmers in Chartha and Shelud region planned to explore the KT weir refurbishment in the villages to improve the water harvesting capacity of the structures with support of IL&FS

## Refurbishing the KT Weirs

The first step was to work on KT weir 3 and 4 due to their close proximity to the villages of Chartha and Shelud. As per the plan, the silt was removed and the hard layer was broken to have a water column of 20-feet depth in order to increase the ground water recharge. The excavator, driller and in some places minor blasting techniques were used. The weir gates were then concretised and rebuilt. The basin was excavated in such a way that the natural wall of hard rock and basalt strengthened the KT weir structures from the high-velocity monsoon flow.

Cut out trenches were dug all the way down to the rock before the weirs and black cotton soil was compacted into it. Thus, the leakage below the weir structures was plugged using inexpensive innovations. The soil and stones removed from the basin area were used as landfill to improve roads into the villages. In addition to this, local plants were planted on both sides of the river to improve the greenery in the area.

The budget required for the refurbishment was huge. IL&FS collaborated with the Forbes Foundation and CII Western Region to raise the needed funds. It was through this synergy that it became possible to meet the budget requirements for the refurbishments.

## Progress of the Project

The refurbished weirs have enhanced the storage and ground water recharge currently available in the villages. An initial impact of the project was felt when, instead of 600 – 650 mm, the villages recorded only 297 mm of rainfall from June – Dec. 2014, less than half of the annual rainfall. However, thanks to the project the villages were not as hard hit, as they had their own stock of drinking water. Due to the work being carried out, the ground water recharge is now strengthened by 42 mn litres of water. It was found that there is an average increase of the water table by 0.5 – 1.5 meters more in comparison with the control wells. i.e. 9% to 25%. Also, more recharge and less time was taken in dug-well recharge (14-20 hrs), in comparison to control wells (19-25hrs).

Usually in summer, the villages required 200 water tankers to cover their water needs. However, in the summer of 2015, only 120 tankers came to the villages despite the low rainfall. This was only possible due to the availability of the water in the dug well and four hand pumps.

Cotton and Maize are the main crops in the Aurangabad region. And despite a flat 70% decrease in Cotton and Maize production due to the rainfall this year, the villages of Shelud and Chartha were relatively less affected. The cotton yield was near normal and the maize yield only decreased by 30% because the farmers were able to sustain the longer dry spells through protective irrigation. This was possible due to the increased ground water made available by the KT weirs. Today, a total of 300 acres, spanning across the two villages, have protected irrigation mechanisms in place.

Additionally, due to this intervention the farmers of the two villages were able to save 71 acres out of the total 174 acres of pomegranate orchards in FY 15. The farmers were able to achieve this by transferring overflow water from KT weirs and through wells on the banks of the KT weirs, to 37 farm ponds, all within a 2 km radius, to feed the orchards. Over 66,700 m<sup>3</sup> of water were stored in 37 farm pond for critical irrigation.

In April 2016, all partners of the project met with the villagers to review the progress of the project and to plan the next phase. The villagers showed willingness to participate in the work and to take the project further by refurbishing 3 more defunct weirs. This task has also since been completed. Total 30,000 cubic meter of harvesting capacity created and

all the 5 KT weirs were refurbished with concrete works and COT (Cut off Trench).

Water user's committees are formed in both villages as a next step to this project which will focus on water literacy and sustainable irrigation practices. Efforts are being done to connect farmers to the financial Institutions to install drip irrigation and other facilities in their farms.

### Impacts in FY 16

During the last few years, the pattern of rainfall in Maharashtra has changed. The longer dry spells and sudden heavy rainfall is posing major threat to agrarian livelihoods. In FY 16, Chartha and Shelud unexpectedly encountered flash floods. Farmers in both villages along with neighbouring villages like Hatmali suffered major loses. Fortunately, the structures withstood the challenge and were not damaged. Thus, the impact on livelihoods in FY 16 was hampered by the natural calamities. In FY 16 the de-siltation work was undertaken on 5 structures to sustain the impact of the work.

Even in a low and erratic rainfall, the works were able to achieve a significant impact,

- In 2016 both the villages became tanker free for drinking water.

- 143 million litres of rain water was harvested which enhanced the ground water recharge, impacting 450 households positively .
- 59 farm ponds were constructed which stored 104 million litres of water for critical irrigation.
- On time sowing was done in 2 villages and the crops sustained on 350 acres even during dry spell
- 4 hand pumps in the villages are now functional through out the year, which prior to the intervention were functional only for a period of 8 months.

### Way Forward

The village community along with SPMESM, IL&FS and other partners is now focusing the next phase on water utilisation and agriculture productivity enhancement through sustainable agriculture practices. In the remaining area ,treatment work for the catchment will be linked up with government's watershed scheme. The scale up potential was identified in 20 villages of upper Dudhana region and is being shared with different national and international grant-making organizations.



## Government Schemes on Water Conservation

### Pradhan Mantri Krishi Sinchayee Yojana (PMKYSY):



Pradhan Mantri Krishi Sinchayee Yojana (PMKYSY) has been formulated with the vision of extending the coverage of irrigation 'Har Khet ko pani' and improving water use efficiency 'More crop per drop' in a focused manner with end to end solution on source creation, distribution, management, field application and extension activities. MKSY has been formulated amalgamating ongoing schemes viz. Accelerated Irrigation Benefit Programme (AIBP) of the Ministry of Water Resources, River Development & Ganga Rejuvenation (MoWR, RD &GR), **Integrated Watershed Management Programme (IWMP) of Department of Land Resources (DoLR)** and the On Farm Water Management (OFWM) of Department of Agriculture and Cooperation (DAC). (For more details please visit - <http://pmksy.gov.in/AboutPMKSY.aspx>)

### Vasundhara, IWMP:

Integrated Watershed Management Programme (IWMP) is a modified programme of erstwhile Drought Prone Areas Programme (DPAP), Desert Development Programme (DDP) and Integrated Wastelands Development Programme (IWDP) of the Department of Land Resources. This consolidation is for optimum use of resources, sustainable outcomes and integrated



planning. The scheme was launched during 2009-10. The main objectives of the IWMP are to restore the ecological balance by harnessing, conserving and developing degraded natural resources such as soil, vegetative cover and water. (For more details please visit - <http://mahaiwmp.gov.in/>)



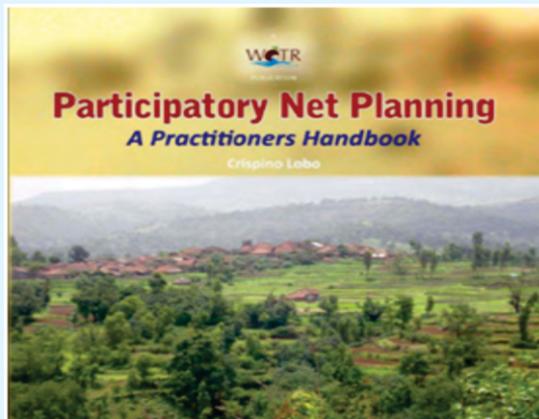
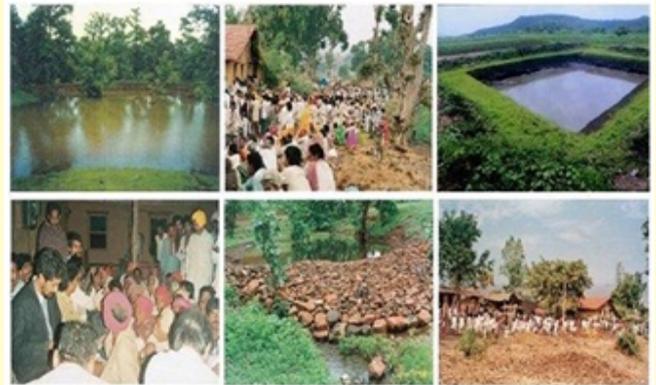
### Neeranchal National Watershed Project:

The development objective of the Neeranchal National Watershed Project for India is to support integrated watershed management program (IWMP) through technical assistance to improve incremental conservation outcomes and agricultural yields for communities in selected sites, and adoption of more effective processes and technologies into the broader IWMP in participating states. (For more details please visit - <http://neeranchal.gov.in/>)

## Useful Resources for Watershed Planning & Management

### Watershed Works Manual for the National Rural Employment Guarantee Act (NREGA):

The manual was prepared by Samaj Pragati Sahayog (SPS) at the request of the Union Ministry of Rural Development. It is meant for those individuals and organisations who will be involved in planning, implementing and/ or monitoring NREGA. SPS plans to carry out a series of training programmes in the use of this manual. (For more details please visit - [http://nrega.nic.in/manual\\_eng.pdf](http://nrega.nic.in/manual_eng.pdf))



### Participatory Net Planning Manual (PNP):

PNP was born of the need to develop a practical, participation-promoting and inclusive methodology that is at the same time pedagogically and technically sound. The PNP methodology grew out of the IndoGerman Watershed Development Program (IGWDP) in Maharashtra, India, and was adopted by all NGOs and watershed communities involved in it. Since then it has been widely disseminated across the country (and even, internationally) through thousands of training and capacity building events organized by (Watershed Organization Trust) WOTR. (For more details please visit - <http://www.wotr.org/books/participatory-net-planning-practitioners-handbook>)

- Participatory Net Planning Manual (PNP):

### India Water Portal ([www.indiawatertool.in](http://www.indiawatertool.in)):

The India Water Tool Version 2 (IWT 2.1) launched on 31 March 2015, is an easy-to-use, online tool for companies and other users to understand their water-related risks and prioritize actions toward sustainable water management. IWT 2.1 combines data from Indian government agencies and water stress indicators from the World Resources Institute and Columbia Water Centre. It allows users to access to an easy to use platform for comprehensive water data of water availability, quality, and water stress. Upon entering user site location details and water data including source water, water use, and water risk, the tool generates a water inventory containing water risk and indicators.

# Sustainability Committee Activities

## RELIEF FOR FREIGHT CHARGES FOR WATER SUPPLY TO LATUR

**Bombay Chamber with support of 46 members contributed ~INR 1.9 Crores to the Central Railway represents over 25% of the cost of transporting drinking water to Latur until June 15, 2016.**

Bombay Chamber of Commerce and Industry presented a Cheque of INR 94.43 lakhs to Shri S. K. Sood, General Manager, Central Railway at its 180<sup>th</sup> Annual General Meeting on May 13, 2016. Subsequently we presented cheques for INR 45.91 & 47.46 lakhs towards Central Railway's initiative for drinking water transportation to Latur via the "JALDOOT" train. The total, amounting to ~1.9 crores, represents over 25% of the cost of transporting drinking water to Latur until June 15, 2016.

Bombay Chamber members responded generously to a request to support this novel initiative of the Union Railway Minister, Shri Suresh Prabhu and the Chief Minister of Maharashtra, Shri Devendra Fadnavis for meeting the immediate need of the citizens in this drought hit area.

Bombay Chamber's Managing Committee Members, Mr. R. Mukundan, Immediate Past President, Mr. P. R. Ramesh, President, Mr. F. N. Subedar, Vice President along with other members decided to support this initiative; and accordingly an appeal was made to its Members to contribute to support the initiative of Indian Railway for supplying drinking water by train. The Chamber received excellent response from Members with about 46 organisations (some including employee contributions) participating. It was able to accumulate ~INR 1.9 crore.

62 Jaldoot trains went between 11th April to 15th June 2016 of which 16 Jaldoot trains of 50 wagons each (totalling 800 wagons) drinking water to be distributed to the people of Latur (population ~ five Lakhs).



Mr. Vijay Srirangan, Director General, Bombay Chamber presenting a Cheque to Shri S.K. Sood, General Manager, Central Railway and Mr. R. Mukundan, Immediate Past President, Bombay Chamber (Center)

## SYMPOSIUM ON E-WASTE TO NO-WASTE: CONTRIBUTING TO END-OF- LIFE SOLUTIONS

Bombay Chamber of Commerce & Industry and USAID LEAD is organized a Symposium of E-Waste to No Waste: Contributing to End-of-Life Solutions" on June 17, 2016 at The Orchid, Mumbai. The event was supported by Maharashtra Pollution Control Board (MPCB) and Adelphi was Knowledge Partner. The Chief Guest for the event was Dr. Sandip Chatterjee, OSD to Secretary, GoI, Department of Electronics & Information Technology (DeiTY) The senior officers from Mr. Vinay Gangal, Senior Scientist, CPCB and Mr. Nandkumar Gurav, MPCB presented the GoI and GoM initiatives and policy. The experts from Adelphi – Dr. Ashish Chaturvedi, Senior Fellow, adelphi and Mr. Satish Sinha, Associate Director, Toxics Links presented the overview, issues and management and handling solutions of E-Waste at individual and corporate level. They also gave tips to industry on management of E-waste beyond compliance. The background paper E-Waste Management in India: Key Issues and recommendations was released at the Symposium. Mr. B.K. Soni, Chairman & MD, Ecoreco shared the views on recycling of E-Waste perspective and shared his initiatives of training the informal sector. The feedback of participant was encouraging as content discussed will be useful to delegates in their day to day operations in their organisation. *To know more about the program, please check the link: <http://goo.gl/g433Sx>*

## FORTHCOMING ACTIVITIES

- CSR Committee of Bombay Chamber of Commerce & Industry is organizing Workshop on **CSR: Policy to Practice** on **11th August, 2016** at **Ballard Estate, Mumbai**. The workshop is for CSR professionals, CSR team members from medium and large corporate with the objective to discuss and unlock the queries during policy and implementation of CSR Projects.
- Sustainability Committee under the aegis of Bombay Chamber is organizing a **Site Visit to an Afforestation Project: A Replicable Model, Plant Visit, Modern Sustainable, Healthy, and Safe Workplaces** on **31st August, Mumbai** from 8.30am to 4.30pm. The objective of the Site visit is to provide an opportunity of learning from the best practices of organizations work in reducing carbon footprint.

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