

The CEO Water Mandate

HCC



“Endorsement of ‘The CEO Water Mandate’ has helped HCC take focused action towards embedding water consciousness throughout the Company. The core elements of the Water Mandate framework catalyzed the processes needed to be a water conscious company. All levels of staff, from senior managers to site workmen, now consider well-being of water as integral to the construction planning of all HCC’s sites”.

Yours sincerely,



Ajit Gulabchand

Chairman and Managing Director





Hindustan Construction Co Ltd

HCC is an integrated group spanning Construction, Real Estate and Infrastructure development. The HCC group of companies comprises HCC Ltd (Engg & Construction), HCC Infrastructure Ltd, HCC Real Estate Ltd (HREL) and Lavasa Corporation Ltd. The group specializes in technically complex, new age construction in infrastructure projects, E.P.C, B.O.T, Integrated projects as well as in urban development and management.

HCC has executed a majority of India's landmark infrastructure projects, having constructed more than 25% of India's hydro power and over 50% of India's nuclear power generation capacities, 2,300 kms of Roads & Expressways and over 170 kms of complex tunneling in addition to hundreds of Bridges, Dams and Barrages.

HCC has remained at the forefront of India's engineering construction industry with global management practices which include acquiring international ISO certifications for management systems in Quality, Occupational Health & Safety and Environment. Environment Management is a key focus area for the Company, implementing various initiatives through the government recognized Centre for Research and Development and Innovation (CRDI), such as use of fly ash in concrete that helps reduce carbon emissions and innovative techniques in pipeline joint testing.

Having established robust Corporate Governance norms, the Company has also set global benchmarks in the construction industry with the fastest implementation of SAP-ERP coupled with high levels of complexity across all its 50 diverse project locations. The complex implementation of ERP at HCC's hydro power projects under construction at altitudes of more than 11,000 feet in Leh, Jammu and Kashmir, remains the highest location of SAP-ERP operations in the world.

The Company strongly believes in corporate responsibility. HCC works closely with key communities in which the Company operates, undertaking initiatives that support and strengthen the communities in the areas of HIV/AIDS Awareness, Disaster Response, Education and Water Conservation. HCC is the only Indian signatory member of the United Nations Global Compact's CEO Water Mandate which involves water management projects at grass root levels.

HCC Real Estate Ltd (HREL), a fully owned subsidiary has developed 247 Park, a state-of-the-art business destination at the heart of the upcoming IT corridor at Vikhroli (West) in Mumbai. The 1.8 million square feet building, 247 Park is India's largest standalone Leed Gold certified commercial building and is designed to lower energy costs by 23% while offering a clean and green work environment. HREL has pioneered new standards for environmental conservation in construction in India, setting exemplary standards for efficiency in energy resources.

Also developed by HREL is Lavasa, free India's first Hill City, a 3-hour drive away from Mumbai near Pune. Lavasa is spread across a picturesque landscape of 25,000 acres, set amidst 7 hills and 60 kms of lakefront. Inspired by the principles of New Urbanism, the master plan of Lavasa has been developed by internationally-renowned design consultant HOK, USA. Developed to meet the lifestyle aspirations of residents, Lavasa is where one can Live, Work, Learn and Play in harmony with nature. Lavasa hosts a complement of global leaders in hospitality, tourism, education, healthcare, business research, industry and is set to be home for over 300,000 residents and over 2 million tourists annually.

The successful model of Lavasa is being replicated as a Waterfront City in the state of Gujarat's Dholera Special Investment Region, about 110 kms from Ahmedabad.

HCC Infrastructure Ltd, a wholly owned subsidiary of HCC Ltd, is engaged in developing infrastructure projects through the public-private partnership route, as well as build, operate and transfer routes. Founded in 2008 to develop an infrastructure portfolio in areas of HCC's core competence, its focus is on growth sectors such as transportation (roads, metro rails, railways, ports and airports) and energy (hydro power, nuclear and thermal power) as well as water resources and other special infrastructure projects. The Company's current portfolio includes INR 5,500 crores (CHF 1.3 billion) of assets under management.

HCC's most important asset is the talented manpower, which is committed to construction standards of the highest quality. The group has a knowledge asset of more than 3,000 officers, including approximately 2,000 engineers; and employs more than 38,000 workers at project sites across India.



Corporate Stewardship in HCC

With leadership comes responsibility. HCC has always worked towards improving the quality of life of the communities it serves. Be it within the organization, the industry or the society we live in, we have a strong sense of corporate stewardship, which is reflected in our values and actions. Our Company's Corporate Responsibility (CR) came into existence with the objective to identify and work closely with the key communities in which

it operates, and to undertake practices as responsible corporate citizens to support and strengthen such groups and fulfil all obligations towards society. HCC uses its economic strength for broader social goals and to demonstrate environmental responsibility, high standards of ethical behaviour and greater transparency and accountability. Acting on “Do Good to Do Well and Do Well to Do Good”, the CSR team undertakes initiatives that are broadly categorized as:

HIV/AIDS: The initiative was launched in the year 2004, and since, the programme has seen a momentous jump in the acceptance levels for the cause and thus in spreading the message. Hence, the Workplace Intervention (WPI) Programme started at all the project sites in partnership with NGO - FXB India Suraksha. Having covered 21,904 workers and employees since its launch, the Company is now focusing on pioneering a graduated acceptance of the disease and creating awareness to achieve complete eradication of new infections in the communities they operate in.

Disaster Resource Network (DRN): The Company is the founding member of DRN Global, an initiative of the World Economic Forum, to leverage the resources of Construction Engineering Businesses to implement quick relief during natural disasters. Through DRN India, HCC has provided relief during the Tsunami (2004), the Mumbai floods (2005), the Andhra Pradesh floods (2005), Hurricane Katrina (2005), the Jammu & Kashmir earthquake (2005), Sidr cyclone (2007) in Bangladesh, the Bihar floods (2008) and the Orissa floods (2008). HCC has trained most of its employees under ‘First Responder Training’ for emergency preparedness. In addition to this, detailed training was given to a group of engineers under the ‘Engineering in Emergencies’ training. These engineers are specially equipped with resources trained to respond in the departments of water, sanitation and shelter during emergencies.



Handpump installation in a disaster affected area.

Education: Walchand College of Engineering (WCE) was set up in 1947 at Sangli, Maharashtra, and offers various undergraduate, post-graduate and

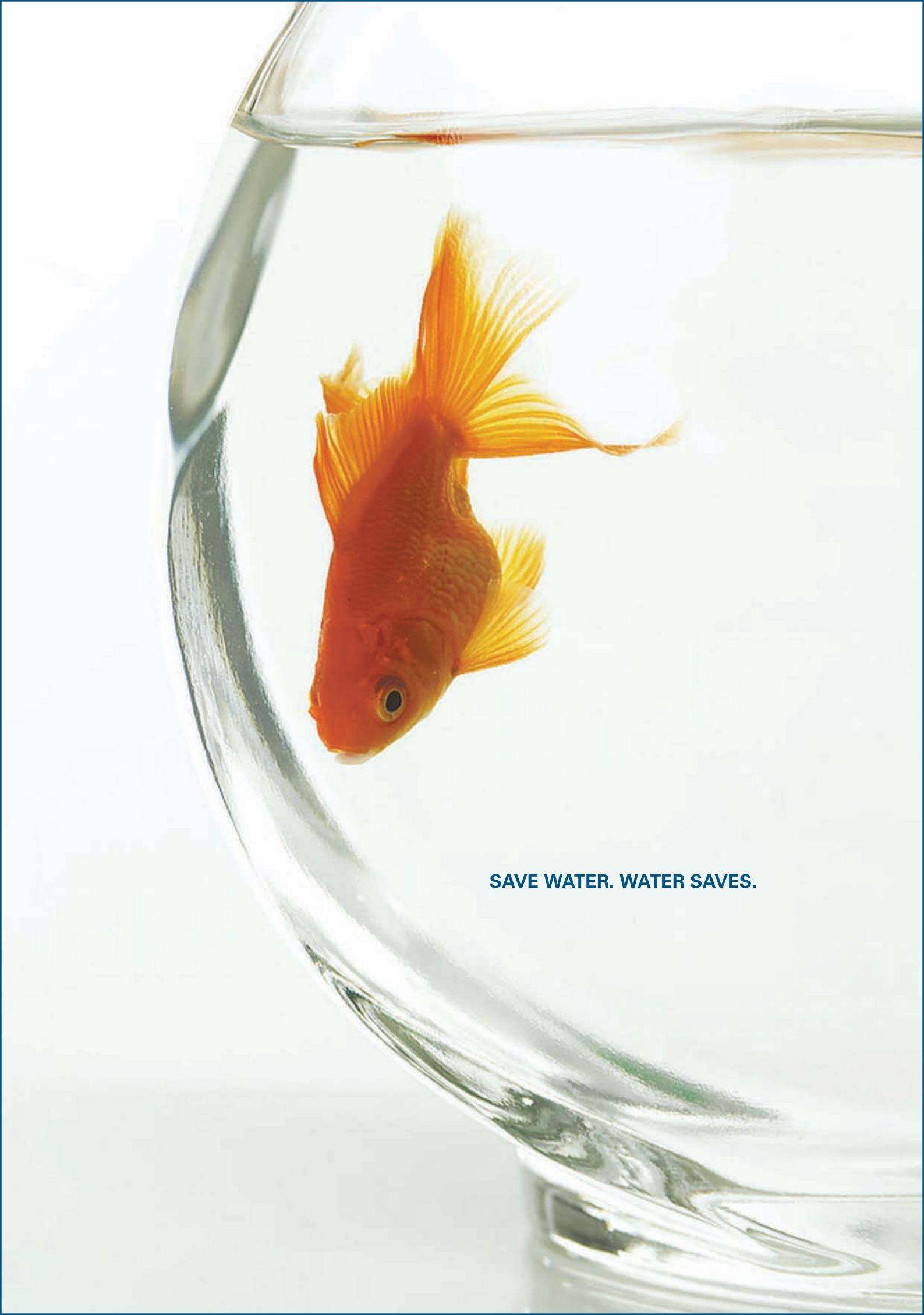
diploma programmes in various branches of engineering. The college management under the leadership of Mr. Ajit Gulabchand, is committed to the goal of achieving excellence. The college has achieved an autonomous status, effective from academic year 2006 - 2007. The National Institute of Construction Management And Research (NICMAR), founded in 1983, is a pioneering management institute catering to the needs of the construction industry and HCC took the lead in founding it. Its advanced construction management programme, structured in collaboration with MIT and Michigan (USA), ILO and IIM-A, is highly rated by academia and industry.



Ajit Gulabchand Central Library at Walchand College of Engineering.

Water: HCC has taken up projects with a focus on water management, sanitation and solid waste management to promote economical usage of water, improved sanitation and garbage disposal systems in rural areas. The Company has also become the only Indian signatory member of the UN Global Compact’s CEO Water Mandate, a special initiative of the UN Global Compact, which recognizes the twin problems of water availability and sanitation that tend to pose a range of challenges and risks.





SAVE WATER. WATER SAVES.

Water @ HCC

According to the United Nations, approximately 1 billion people lack access to safe drinking water, and 2.6 billion are denied access to adequate sanitation. Many areas of the world are expected to experience acute water stress in the coming years and decades, as a result of factors that include climate change, urbanization, population growth, increasing food production, and industrialization.



The CEO Water Mandate

This emerging water crisis was the impetus behind 'The CEO Water Mandate', launched by the UN Secretary-General Ban Ki-Moon in July 2007. As the UN Secretary-General stated, "When you consider the health and development challenges facing the poorest of the world's population, diseases such as malaria or tuberculosis, rising food prices, environmental degradation, the common denominator amongst all of them seems to be water". Thus, water isn't just an environmental issue. It also stems from poverty and development, and is, therefore, also an economic issue, a business issue.

This was the starting point for HCC to become a signatory of 'The CEO Water Mandate' in March 2008. As a signatory of 'The CEO Water Mandate' we recognize that the twin problems of water availability and sanitation pose a range of challenges and risks, and in some instances, opportunities for our business operations. Prior to endorsement, HCC had initiated a few activities towards better water management. **"HCC has made water sustainability and stewardship a corporate priority", said Mr. Ajit Gulabchand, Chairman and Managing Director, HCC,** about the Mandate. "As an endorser of 'The CEO Water Mandate', we pledged to provide our inputs and perspectives to public policy makers on the issue of water. This letter is an expression of this commitment, and I am pleased to join other business leaders in urging key governments to take action".

As a business leader in the initiative, we are committed to a number of areas, direct operations, supply chain and watershed management; collective action; public policy; community engagement and transparency. Actions are being undertaken to include setting targets related to water conservation and waste water management; encouraging suppliers to improve their water practices; partnering with non-governmental organizations, community groups and UN agencies to support water and sanitation delivery systems; and providing inputs and recommendations to public authorities with respect to the formulation of regulations and relevant policies.

HCC's Communication on Progress

This 'Communication On Progress' (COP) document is the first COP that reports HCC's water consciousness activities carried out within 'The CEO Water Mandate' framework, till August 31, 2009.

The document reports:

- Progress on orienting HCC's policies towards becoming more water conscious
- Key water related data such as water consumption and costs
- Investments in software and hardware for 'water consciousness' activities

Policy Pointers based on:

- How introspection into the consumption patterns inform HCC's internal priorities
- How the concurrent information on consumption patterns and recharge actions aid scoping of HCC's key actionables for 'Public Policy Element', through policy pointers
- Engagement and participation in global policy interactions
- Efforts to outreach target audiences as a preliminary step towards creating a critical mass of Government and Societal participants sensitized towards water consciousness
- Processes within HCC that facilitate and accelerate identification of opportunities for water consciousness through proposal making, harnessing the opportunities (execution and actions), and enhancing the opportunities through pilots
- Processes within HCC for implementing Water Mandate activities at project sites, the methodologies and tools, communication mechanisms and internal accountability mechanisms
- Lessons learnt in select 'beyond fence' interventions that reveal collective actions taken in water consciousness activities, dictated by several factors beyond value underpinning of the stakeholders involved in it. These are reported specifically to receive suggestions from the readers on improving acceptability and effectiveness of water consciousness actions beyond fence
- Water consciousness actions at project sites (within fence), around the sites (around the fence) and in locations unlinked to its business activity (beyond fence)

Policies

Budget allocation for water management and water consciousness works

The annual budget proposals for all projects (old & new) have a provision for establishing wastewater treatment plants. These are usually linked to water

reuse recycling proposals. The project sites are entitled to carry out such proposals on their own, if value of works is INR 2.0 million or less. Sites are permitted to invest more than INR 2.0 million in wastewater treatment plants / reuse proposals in consultation with the technical team at the HCC Head Office.

Cost Reporting

In order to monitor the consumption of water purchased from water utilities, local governments and vendors, the expenses for procuring water for site activities are reported in HCC's Internal Account Code: 1407040.

The annual expenditure on water will be reported in the Company's Annual Report in Schedule L of the P&L statement from FY 2009-10. This will include water as an independent reported item.

Water Consumption Reporting

Mandatory Forms & Formats

It is mandatory for all project sites to furnish the following forms related to water:

1. HCC F 01 18 05 Format for Dust Suppression.
2. HCC F 01 18 28 Format for Wastewater Monitoring.
3. HCC F 01 18 29 Format for Water Balance.

Water Mandate in HCC's Mission Statement

HCC's water consciousness is elucidated in HCC's Mission: "To contribute and actively participate in the UN CEO Water Mandate" (HCC's Management System Manual Chapter 2.1 of HCC Q 01 02 01).

To implement this mission, CSR-UN Water Mandate undertakes a range of 'Water Consciousness Activities' at project sites.

Summarily, for implementing HCC's endorsement of UN Water Mandate, all project sites:

- a) Will ensure that water is genuinely drawn from nature, without over-exploitation, and used in reasonable quantities to avoid waste.
- b) Will explore and implement, if possible, the water conservation measures, reuse of wastewater and dewatering water.
- c) Will maintain records of all water usage.

The HCC Mission

Ref: HCC's Management System Manual Chapter 2.1 of HCC Q 01 02 01.

- To be a leading construction company in the global market
- To become the customers' most preferred choice by attaining excellence in quality and timely completed value-added projects
- To continually innovate, develop and adopt state-of-the-art technology in methods and materials to

enhance productivity and cost-effectiveness

- To continually improve the competence of our people and make them proud to work at HCC
- To build a strict culture on safety, so as to ensure a continual reduction of the frequency severity rate, and to finally achieve zero accident status
- To identify and mitigate all the environmental impacts arising from our activities and comply with applicable environmental norms
- To develop and adopt eco-friendly concrete technology so as to ensure reduction of Green House Gas (GHG) emissions
- To contribute to the development of the local community and society at large, as a part of our corporate social responsibility
- To contribute and actively participate in 'The CEO Water Mandate'

Reported Data

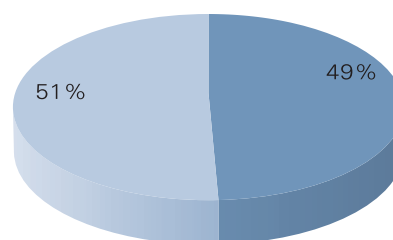
Cost

The annual expenditure on water in FY 2008-09 was INR 80.8 million and in FY 2007-08 was INR 32.2 million.

Investments

HCC invested INR 13.83 million in implementing 'The CEO Water Mandate'. The investments covered various soft activities and water related hardware, almost in equal proportion.

Investments in Water Mandate Implementation: INR 13.83 million



■ Hard Investments ■ Soft Investments

Soft Investments

These include conference & travel expenses, books and literature, salaries, costs of specialized training, participation in UN conferences and contributions to UNGC foundation & promotion activities. These investments are aimed at building the Company's internal capacity as well as raising societal awareness on the water issue.

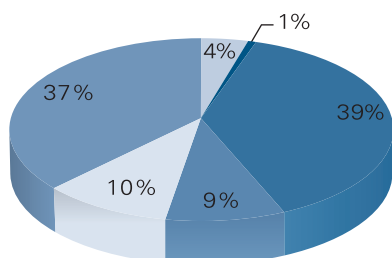
The specialized training aims to develop trainers for technical support to the HCC's project sites. One such trainer is currently undergoing online training

on 'Cleaner Production & the Water Cycle' at UNESCO-IHE Institute for Water Education eCampus virtual learning environment.

In the Kihim Integrated Water Environment Enhancement Project (Initiated, facilitated and supported by HCC & titled 'Ujjivana'), HCC invested INR 2.55 million in institutionalizing the solid waste management system and to reduce the beach pollution at Kihim, Dist. Alibag, Maharashtra.

About 37% of the total software investment was made for the community initiative namely, the Ujjivana Project.

Soft Investments: INR 6.81 million



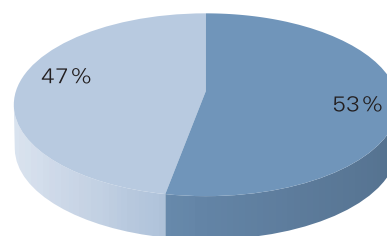
Note: Read clockwise

- Conferences, Travel, Books
- Specialised Training
- Salaries
- Participator in UN Conferences
- Advertisement & Sponsorship
- Kihim Town Water Environment Initiative (Soft Component)

Investments in water related hardware

Water recharge, reuse and harvesting proposals at various HCC project sites are currently being executed. Till August 2009 end, HCC accomplished water reuse plant and other harvesting infrastructure worth INR 3.7 million. The hardware has been created at mainly the following project sites: Vizag Cavern Project, Badarpur BOT Road Project (Artificial Pond & Integrated Stormwater Management - Groundwater Recharge Project), Middle Vaitarna Pipeline Project, Pranahita Chavella Lift Irrigation Scheme Package 10 & Chutak HEP. In the Kihim Integrated Water Environment Enhancement Project, Ujjivana (initiated, facilitated and supported by HCC), HCC invested INR 3.3 million in creating solid waste management facilities, and a solid waste recycling polyloom unit. About 47% of the total hardware investments were made for community component in the Ujjivana Project.

Hard Investments: INR 7.0 million



- Implementation of Proposals for Water Recharge / Reuse / Recycle at Project Sites
- Water Environment Improvement at Kihim, Maharashtra, India

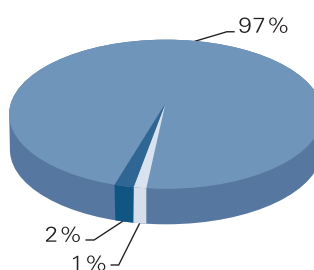
Water Quantity Consumption

1) HCC's water consumption in ML (Million Litres)

FY 2006-07	FY 2007-08	FY 2008-09
12897	50330	53123

- 2) The water consumption depends on varied degrees of construction activity (e.g. number of project sites), type of works (hydropower, transport projects), and quantities of work (e.g. m³ of earthwork, m³ of concreting accomplished).
- 3) The source-wise break-up of the water consumption confirms that HCC project sites largely depend on local groundwater resources.

FY 2008-09: Source-wise Consumption

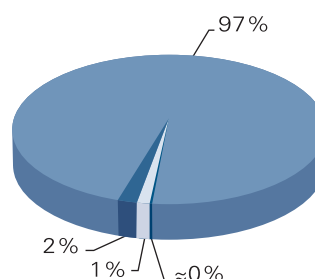


Note: Read clockwise

- Groundwater
- Municipality Water / Water Utility
- Surface Water

4) HCC's four business verticals consume different proportions of water. Transport vertical is the largest consumer of water.

FY 2008-09: Consumption¹ in HCC's Four Business Verticals



Note: Read clockwise

- Transportation
- Water
- Nuclear
- Hydro

Policy Pointers

Based on recent experiences gained by HCC while implementing 'The CEO Water Mandate' Direct Operations, all learnings will be applied in HCC Water Mandate thrust areas in future years. The water consumption monitoring and statistics at the HCC direct operations lead to two-key policy pointers. An Internal Action Pointer sets HCC's priority focus at its construction sites and an External Public Policy Pointer for 'water conscious road design paradigm', which will be pursued with the relevant public policy-makers.

HCC Internal Action Pointers

With HCC's water consumption pattern, HCC is giving high priority to groundwater recharge and rainwater utilization. HCC will also penetrate its supply chain of water vendors and promote groundwater recharge action.

HCC Public Policy Pointers

Transport projects consume a large share of water and are mostly catered by groundwater. HCC's first analysis of the Badarpur Elevated Highway Road Project for 'integrated stormwater management and groundwater recharge project' shows that the road projects bear a strong potential for groundwater recharge. Investments in 'data about local aquifers and hydrogeological settings' can be gainfully used to divert roadway run-off to recharge local aquifers. However, the 'integrated design practice' needs to form a part of the contract between the construction company and the client. Attention of road authorities needs to be drawn to harness the water recharge potential of the roadways projects. As a public policy initiative, HCC will take this issue up with relevant Road Authorities and promote the 'water conscious road Stormwater run-off policy.'



Mr. Ajit Gulabchand, CMD, HCC, seen here with Al Gore, Nobel Laureate and Environmentalist of global repute at the UN Summit on Climate Change held in New York.

Participation in Global Policy Arena

HCC actively contributes to the global policy arena. Mr. Ajit Gulabchand, Chairman and Managing Director participated in various events and forums of global significance.

Creating Policy Drivers

On November 15, 2008, at the India Economic Summit, Mr. Ajit Gulabchand stressed on creating policy drivers for:

- 1) Promoting the use of technology, both low cost technologies as well as cutting-edge technology,

in water management.

- 2) Promoting multi-stakeholder partnerships, in lines with PPCP projects with RCBAW.
- 3) Creating information on investment challenges in the water sector and the national level project bankability database.

WEF Document on Forecast of the Main Economic and Geo-political Water Issues

In November 2008, Mr. Ajit Gulabchand offered key inputs to the forecast document. These are about explicating elements of 'economic awareness' and identifying the need for quantifying economic challenges in the water sector beyond financial statistics, to a particular context of the Indian water sector.

On Climate Justice - Open Forum at Davos

On January 30, 2009, at the World Economic Forum event at Davos, Mr. Ajit Gulabchand emphasized on adopting climate justice as a tool for allocating better development outcomes to vulnerable populations. A knowledgeable response to the climate change, he also recommended proactive modelling of a post-climatic change hydrology.

Asia's Next Challenge, Securing the Region's Water Future: A Report by the Leadership Group on Water Security in Asia

In April 2009, as a member of The Leadership Group, Mr. Ajit Gulabchand put forth the concept of the private sector and governments partnering in developing the 'Water Infrastructure Preparedness Index'.

The Leadership Group arrived at recommendations² for the relevant policy-making processes to ensure adequate public and political support for water security in Asia.

The UN Private Sector Forum

On September 24, 2008, Mr. Ajit Gulabchand participated in a Round Table discussion on 'The Millennium Development Goals & Food Sustainability: Water Access & Management'. At the Round Table, he emphasized on factoring the investments attributable to ageing and rehabilitation of water resources infrastructure.

He also raised the need for innovative water governance through detection and reporting of crops by satellite data and main-streaming the practice of water foot-printing in food production industries.





Interaction with the Government of Gujarat.

Outreach to Target Audience

HCC believes that sensitizing and educating a range of government and societal participants is crucial to the well-being of the water sector. Therefore, HCC believes in sharing experiences while implementing 'The CEO Water Mandate', water projects within the community, and on stressing the importance of endorsing 'The CEO Water Mandate' to specific audiences. These include policy-makers, potential endorsers, and professionals who would raise the profile of the water issue amongst practitioners and young professionals.

Interaction with the Government of Gujarat

On March 19, 2009, HCC presented the 'United Nations CEO Water Mandate and its relevance / utility' to 59 senior officers and decision makers from the Government of Gujarat. The presentation was organized by Narmada Water Resources, Water Supply and Kalpasar Department, Government of Gujarat.

HCC appealed to the audience to urge more industries to endorse the Mandate and actively put six principles into practice. The brainstorming interactions with the audience highlighted the need for farm scale pilots such as low cost micro-irrigation, development of Water User Associations for Participatory Irrigation Management; and attention towards developing a River Basin Organization with reference to IWMI's effort on Benchmark River Basins. An initial understanding of virtual water trade between water stressed areas and water sufficient areas of the state, was also developed during the session.

Water Summit 2009

On catalyzing investments in the Water Sector organized by CII and IBAW, New Delhi, HCC presented its 'Experiences from India on Investments in the

Water Sector' - How Corporate engagement in the water sector may help in improving the investment 'climate'³, elucidating the importance of 'The CEO Water Mandate' and platforms like IBAW.

Habitat Business Forum 2009

In July 2009, HCC enunciated on 'Business opportunities with International Organizations' at the Habitat Business Forum: showcasing and debating urban challenges and solutions, New Delhi, India.⁴ HCC highlighted the need for transformation from the BAU (Business As Usual) approach to a water cognizant, multi-stakeholder partnership oriented approach.

Water Today's Workshop

On October 17, 2008, HCC elaborated on its approach to water and on the importance of endorsing 'The CEO Water Mandate' at WATER TODAY™'s Workshop on 'Water Audit for Reuse and Recycle', in Mumbai. The audience included the water and environmental managers of industry and consultants.

Eco-Talk Event

On February 11, 2009, HCC offered insights to the management students of Sydenham Institute of Management Studies, Research and Entrepreneurship Education, Mumbai (SIMSREE) through an eco-talk event by showcasing HCC's Ujjivana Project at Kihim, Alibag, Maharashtra. Through the talk, HCC highlighted the potential for innovative social entrepreneurship projects which can deliver and improve on women employment, waste reduction and containment, the local government's capacity-building and local economic development through tourism promotion while improving water environment. The young management professionals offered their perspectives on the practical issue of competition of

Ujjivana's eco-products with commercial markets. They consider it to be a fundamental factor, if such interventions are to succeed.

Promotion Activities for Raising Public Awareness

HCC promoted the issue of water and 'The CEO Water Mandate' initiative through several sponsorships, adverts and publicity materials. HCC supported GoodPlanet, an NGO founded by Yann Arthus-Bertrand, currently designated as the United Nations

Environment Programme (UNEP) Goodwill Ambassador, in its activity to raise public awareness on environmental issues by providing partial support to the world premiere of the film 'Home', hosted by the French Consulate at Mumbai on World Environment Day on June 05, 2009. Other adverts included publications such as 'Down to Earth', Local World Water Day publications and TERI publication. The public displayed materials such as public hoardings on water at major traffic junction in Mumbai. HCC partially sponsored the UN CEO Water Mandate 2nd Working Conference at Stockholm, in August 2008.

The Technology Dimension - Water Technology Pilots

Tunnelling wastewaters Reuse: Modularity is the key

During all tunnelling activities the sites encounter varied quantities of water seepage. The seepage water collected at drains is "not so difficult" wastewater as it is amenable for reuse through solid-liquid separation processes (e.g. Vizag Water Reuse Plant). HCC is currently looking at options so as to be able to select the most suitable technology towards enhancing the reuse/recycling potential of seepage water. The full scale Vizag Water Reuse Plant uses IPS (Inclined Plate Settlers) followed by filtration units. HCC recognizes the potential and need for recycling and for reusing tunnelling wastewaters. Currently, HCC, in collaboration with M/s. Membrane Systems Specialist India Pvt. Ltd. (MSS) is pilot testing modular/package treatment plants for real time/offline utilization of treated seepage wastewater. M/s. MSS is carrying out pilots to test the applicability of Hydrocyclones and self cleaning filters at HCC's tunnelling wastewaters. M/s. MSS is carrying out the pilot on a "not for profit" basis, with the collective technical effort of HCC and MSS.

Hydrocyclone & Self Cleaning Filter Pilot



Hydrocyclone Pilot

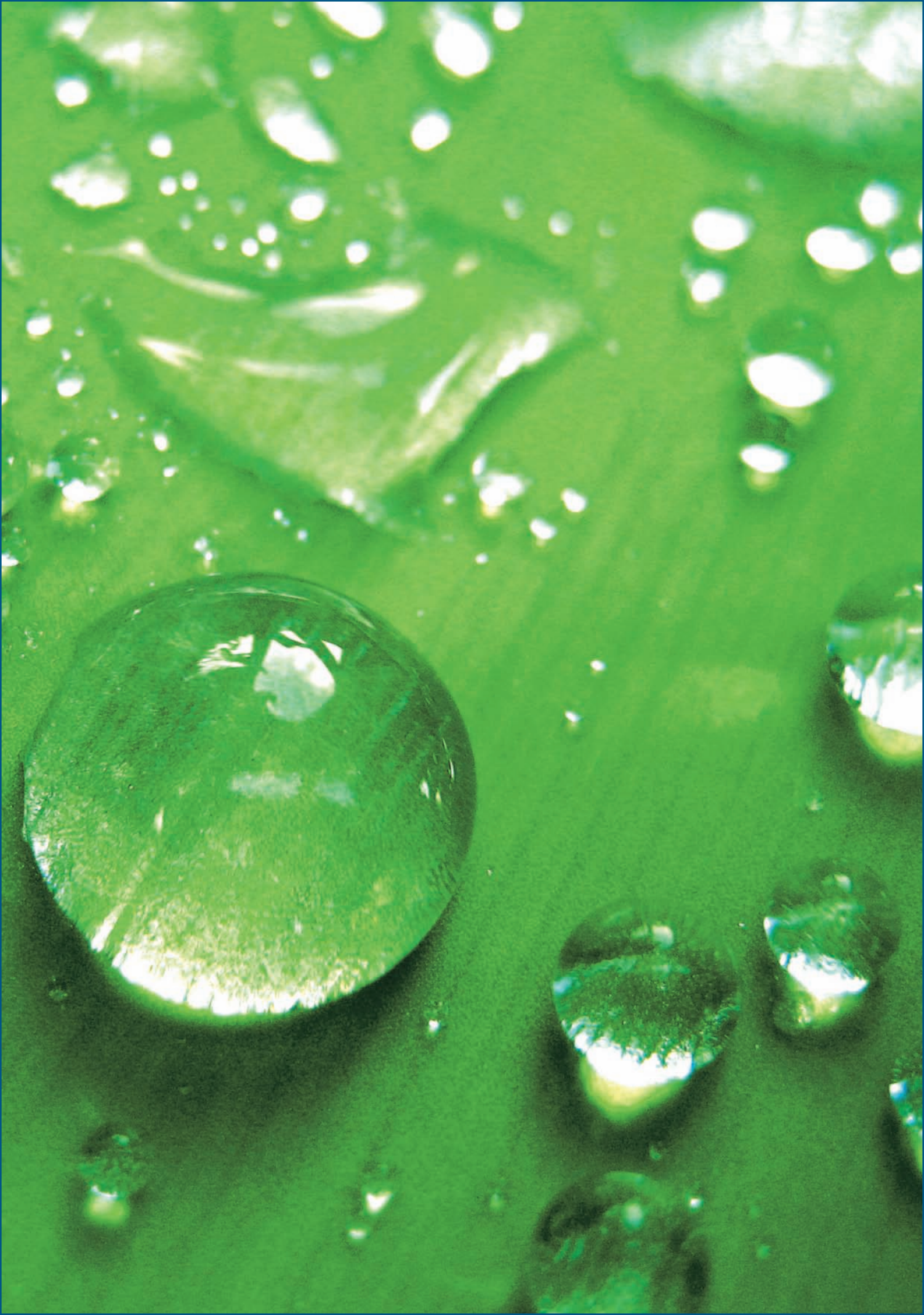
MSS tested the application of hydrocyclones as pre-cleaning devices for HCC's tunnelling wastewaters. Currently, the pilot results do not advise the universal adoption of this technology in wastewater treatment and reuse at HCC's tunnelling operations. MSS has initiated testing the applicability of self cleaning filters on similar lines. The pilots' preliminary results also inform HCC's choice of less compact offline technologies like Inclined Plate Settlers (IPS). The Vizag Cavern Water Reuse Plant, the IPS process and treatment performance show well-established results. On other tunnelling sites, wherever the space is available, similar technology schemes will be adopted.

Micro Level Water Saving

Water-free lavatories have been installed at the HCC Corporate Office to test their suitability and in turn to recommend the same at all new HCC sites. The lavatory relies on a cartridge based liquid biodegradable sealant. Till date, the results of the installation are ambivalent. Multiple factors attribute to overall performance of the water-free lavatory. According to HCC's experience, the key factors are cultural adaptation of users, a vigilant housekeeping staff and the performance of cartridge sealants.

For HCC to mainstream the use of water-free lavatories, attempts at measuring the performance were made. Vendors for flushing actuator company and the water-free lavatory suppliers were requested to develop 'lavatory usage digital counters', with academic support, arranged by HCC. Such product and technology development was not material to both the vendors.

HCC is establishing a dialogue with membrane based water-free lavatory vendors and collecting regular performance feedback from a membrane based water-free lavatory user institution (named Adarsh Vidya Mandir with 2,500 users) through Kulgaon Badlapur Municipal Council, Maharashtra.



Processes

HCC evolved a system for UN Water Mandate implementation consisting of following elements:

- HCC's UN Water Mandate Team and Communication Mechanism
- Implementation Process
- Methodology and Tools
- Monitoring water related activities on sites and internal accountability mechanisms

HCC's CEO Water Mandate Team

HCC has a dedicated team to implement 'The CEO Water Mandate' activities. The team comprises specialists in the water sector with multi-sectoral experience from voluntary sectors, regulatory and industrial sectors, community development and engineering. The CSR department coordinates and monitors this implementation. The team provides technical and engineering support to the project sites. All water related technical and community interventions are coordinated and monitored by this team.

Role of Water Mandate Team

Technical support, advisory support in identifying 3R's (Recharge, Recycle, Reuse) opportunities collaboratively with project sites and in reducing water consumption, procurement of specialist technical services, developing resource tools and methodologies, raising the water profile in the corporate environment, creating awareness about water within the organization, interface with stakeholders and interface with global, national and state actors in the water sector.

Communication Mechanism

HCC's construction sites are geographically dispersed. 33 officers from sites serve as nodal persons for the implementation of 'The CEO Water Mandate.' Communication between the corporate office and project sites is channelled through the nodal officers at the respective project sites.

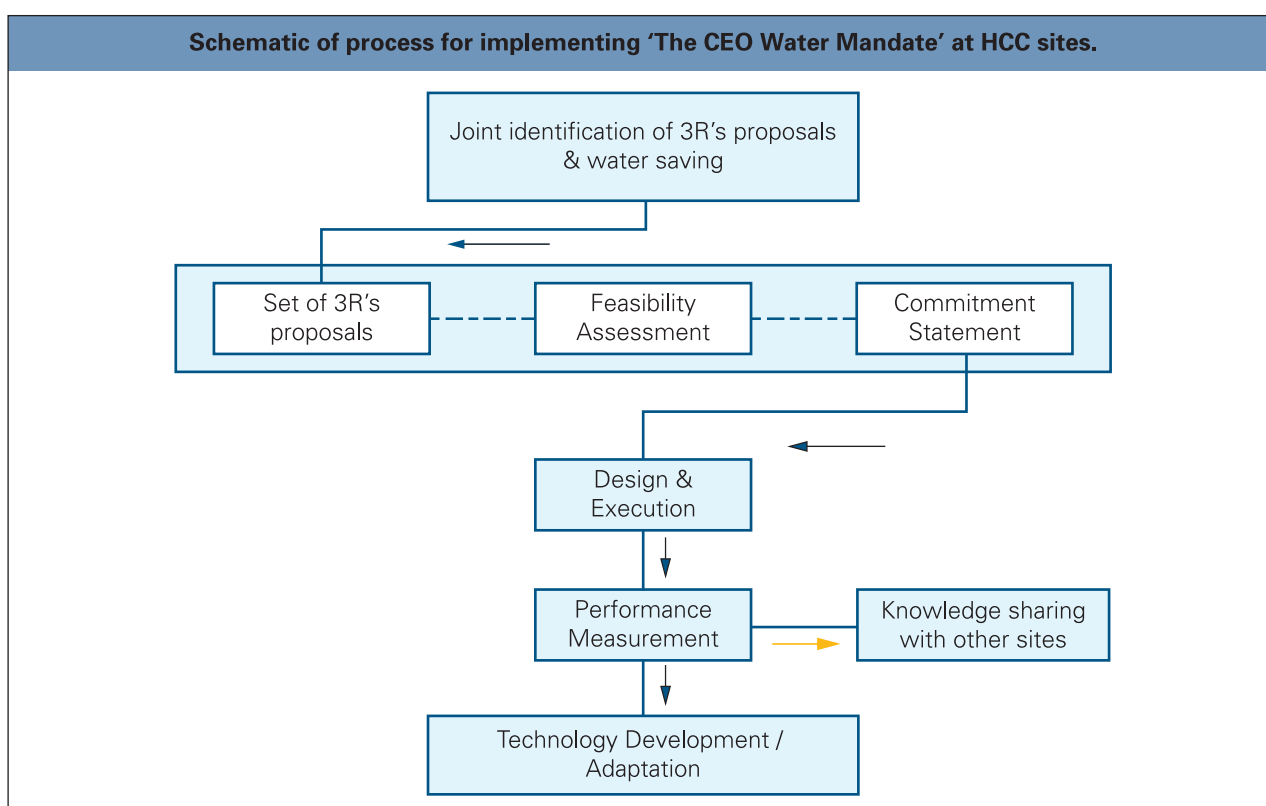
Implementation Process

Primary activities include exhaustive identification of opportunities for 3R's (Recharge, Recycle, Reuse) and for water saving. The exhaustive set of proposals assessed within a feasibility matrix comprises:

- Technical feasibility with respect to site conditions.
- Financial feasibility with respect to investment requirements and life of water related assets/actions.
- Social feasibility: Community response to the proposal.
- Contract constraints: Client response to the proposal.
- Institutional feasibility: Ownership of land for 3R's proposals and ownership of water.
- Maintenance commitments from the community.
- Other public health hazards such as malaria risks, water quality risk assessment/responsibility ownership. An exhaustive set of proposals is incorporated in the 'commitment statement' and then the feasible proposals are marked for implementation.

An implementation report for each site supports the commitment statement for the specific project site.

A simplified schematic of the implementation process is presented below:



Methodologies & Tools for Implementation

A set of resource documents have been created to serve as implementation tools.

Key resource documents include:

1. Guidelines for implementing the UN Water Mandate at project sites.
2. Water treatment advice for project sites in remote areas.
3. UN Water Mandate implementation report/model report.
4. Guidelines for community development.

Key features of the document on 'Guidelines for implementation of UN CEO Water Mandate at Sites':

- Relies on hybrid modelling on a theoretical and empirical basis for developing a water forecast of consumption
- Water consumption forecasting, specific water consumption as the basis for forecast
- Documentation of utility mapping and water sourcing as a good practice tool in water management
- A specific water consumption guideline has been established empirically

This document has been effective in terms of increased standardization and amenable for systematic performance measurement.

Key features of the implementation report are:

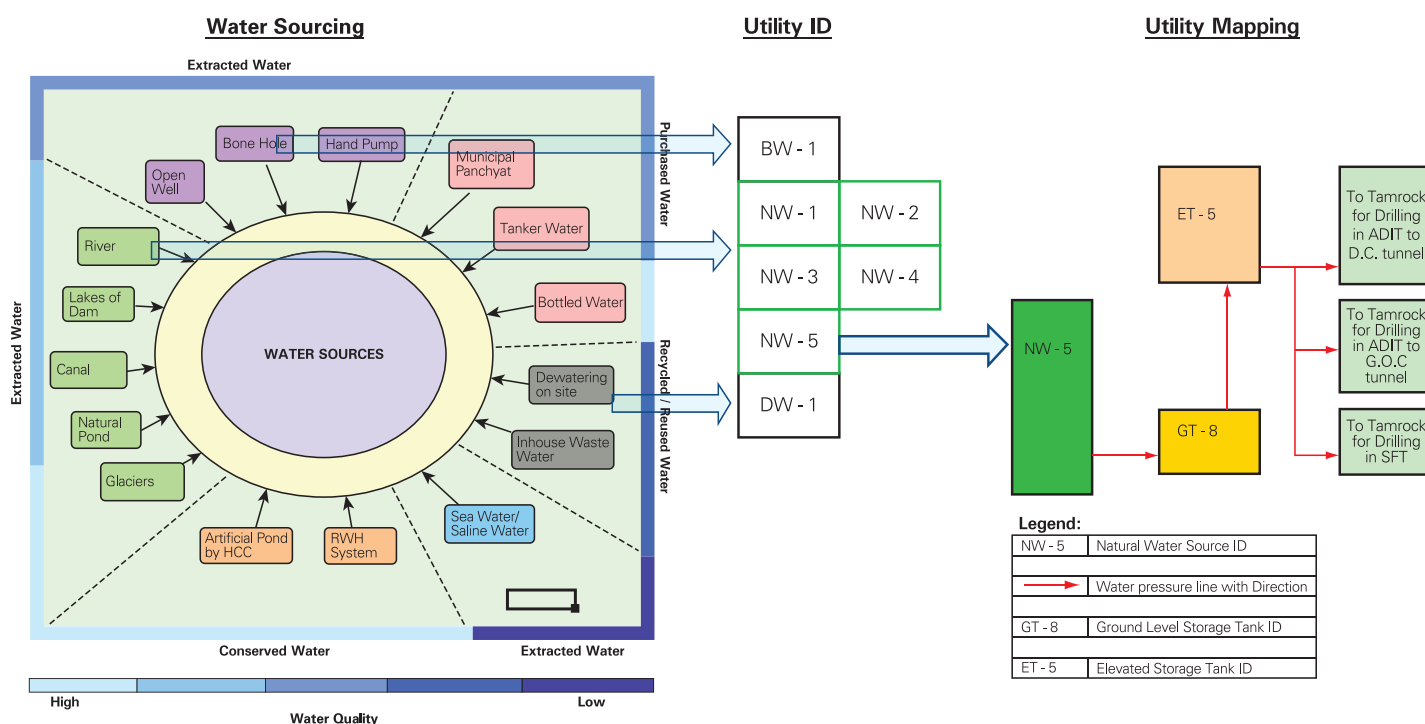


Illustration from Loharinagpala Hydro power Project, Uttaranchal

Monitoring the Implementation at HCC Project Sites

1. Documentation of best practices.
2. Ideas and assertion of site personnel, community and client help in identifying best practice opportunities.
3. Commitment statement comprises clear lists and aspects of water interventions on and around construction sites and in the community.

This report has been effective in terms of comparison of intrinsic participation levels of various project sites and helps in sharing knowledge and best practices

within the organization.

Primary Performance Assessment of 'The CEO Water Mandate' Implementation

Responsiveness of project sites is qualitatively categorized as responsive and active. The sites taking initiatives in identifying and executing water consciousness proposals are classed as active sites. Responsive sites are those which respond to the implementation calls from HCC's Water Mandate Team.

Internal Accountability Mechanisms Commitment Statement

Internally, HCC uses the commitment statements as a vehicle of accountability for the project sites to pursue implementation on the sites. The Project Manager for

the project site signs a commitment statement with HCC's Water Mandate Team. The statement covers a full list of identified water consciousness proposals, marked with the feasible ones ready to be taken up for execution at the project site.

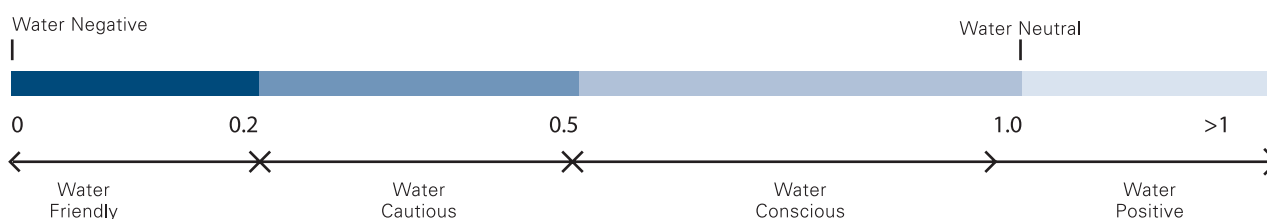
An illustrative commitment statement has been reproduced below:

Commitment for 'The CEO Water Mandate' Implementation

Vizag Cavern Project, Visakhapatnam, Andhra Pradesh - Commitment Proposal

Location	Set of Proposals	Code	Cost Estimate (Rs.)	Accepted	Shelved	Reason	CEO Water Mandate Tagging
Workers' Camp	Rooftop Rainwater Harvesting System - Workers' Camp	VCP-RWH-20	3,00,000		✓	Workmen camp will be dismantled within 1 year	D01 D02
Workers' Camp	Ground recharge by waste - water through the soak pit	VCP-WWW-21	25,000		✓	Workmen camp will be dismantled within 1 year	D02
Project Site	Rooftop Rainwater Harvesting HCC Project Office	VCP-RWH-22	30,000	✓			D01 D02
Project Site	Rooftop Rainwater Harvesting - Client's Project Office	VCP-RWH-23	65,000	✓			D01 D02
Project Site	Rooftop Rainwater Harvesting - Generator House	VCP-RWH-24	40,000		✓	Generator House will be dismantled within 1 year	D01 D02
Project Site	Rooftop Rainwater Harvesting - Workshop Building	VCP-RWH-25	85,000		✓	Building location will be shifted in 1 year	D01 D02
Project Site	Rooftop Rainwater Harvesting - Store Building	VCP-RWH-26	30,000		✓	Building location will be shifted in 1 year	D01 D02
Project Site	Increasing capacity of Natural Pond by Constructing Embankment	VCP-RWH-27	45,000	✓			D01, D02 CE1, CE2
Project Site	Reuse of water dewatered from Tunnel	VCP-WWW-28	34,00,000	✓			D02
Project Site	Rainwater Harvesting at Shaft II	VCP-RWH-29	10,000	✓			D01 D02
	Total		40,30,000	35,50,000			

Water Neutrality Index



Notes on Commitment Statement:

- 1) HCC has a standardized proposal numbering system. The numeric component of proposal code provides a unique identification within HCC.
- 2) Tagging is coded along 6 key areas listed in 'The CEO Water Mandate' Document on 'A call to action and strategic framework'. DO2 relates to 'set targets for our operations related to water conservation and wastewater treatment, framed in a corporate cleaner production and consumption strategy.'

Linking KRAs of Nodal Officers

HCC's water mandate implementation instructions from the team at the Head Office are communicated to the sites through 33 nodal officers. The employee performance of these officers is linked to their active participation in Water Mandate implementation at the sites. This has been done by including the Water Mandate activity in their employee Key Result Areas (KRAs).

Lessons in Selected 'Beyond Fence' Interventions

At the infrastructure project location, the history of clients' relationship with the local community serves as

an endowment for HCC to engage with the community. In some cases, this constrains community engagement in water consciousness interventions.

HCC operates within a framework of contract conditions laid by its client. At an HCC site, a client proactively supported use of seepage water in tunnels in the construction of camp toilet blocks and community toilets. Whilst at the other site, the client refused the permission to recharge the community well with the water used for pipe testing (incidental recharge proposal). Client assigned the reason that, 'community may expect similar recharge intervention from us [client] or may expand their expectations that the bulk pipeline project will supply them water on a regular basis.' The client supported their refusal with the fact that the community besides the bulk pipeline project does not and cannot fall under the client's agreement with the State.

In the former intervention, the water treated to 'secondary water use' standards, was planned to be supplied to the community for secondary use. The client raised the issue of risk of misuse of water by the community for primary use. HCC's team assessed the risk, and agreed to the client's stance.



Snapshot of Water Consciousness Actions on Ground

HCC carried out several water consciousness actions at its sites (within fence), around its sites (around fence) and in locations unlinked to its business activity (beyond fence). A snapshot of a few selected actions is described further. HCC's effort to engage with the academia so as to motivate students towards 'water professions', and at the same time to deliver realistic water projects to the society, are also briefed.

Within Fence

Water Reuse Plant at HCC's Vizag Cavern Project, Andhra Pradesh



Water Reuse Plant at HCC's Vizag Cavern Project, Andhra Pradesh

Tunnelling is the primary activity in the Vizag Cavern Project. Earlier, the construction activity generated 0.6 to 1 ML of wastewater. A water reuse plant of 1 MLD capacity was installed to produce treated water with an investment of INR 3.6 million.

The reuse of water has led to substantial savings on the cost of water, but moreover, drastically reduced the stress on local aquifers, which would have otherwise catered to the water needs. The plant uses inclined plate settlers and pressure filters as principal technology for treatment. The plant was designed with a rigorous treatability assessment. Laboratory analyses of variations in influent parameters inform the process control; thus producing dependable output water.

- Water saved in a span of 1 month after commissioning = 11.57 ML
- Expected water saving till completion of construction project = 152.45 ML

The investments in the water reuse plant returned in 55 days, due to water saving. It also helped in maintaining continuity of business operations during the delayed and scanty monsoon experienced in 2009.

Mirzapur Artificial RWH Pond at HCC's Badarpur Elevated Highway Project, Delhi and Haryana

At the Mirzapur Casting Yard of Badarpur Highway Road Project, an artificial pond with a capacity of



Mirzapur Artificial RWH Pond at HCC's Badarpur Elevated Highway Project, Delhi

1614 Cu. m. was created with an investment of INR 274,000. The peak run-off in its catchment is approx. 1,200 Cu. m. The recharge performance of the pond was closely monitored. The 6 rainfall spells between July 27, 2009 to August 29, 2009, were well spaced with a precipitation ranging 25 mm-72 mm. A recharge of 4,800 Cu. m. was observed till August 31, 2009. The nearby farms are likely to benefit due to the recharge.

Roofwater Harvesting at HCC's Middle Vaitarna Pipeline Project, Dist. Thane, Maharashtra

The Middle Vaitarna Pipeline Project is located in the Konkan region which is a high rainfall area. However, it is characterized by water scarcity in pre-monsoon periods, as the basaltic ground has limited water retention capacity at shallow aquifers. As per the contract conditions, the client supplied adequate water to the project free of cost through an existing bulk water pipeline. Regardless of the abundance, the Middle Vaitarna site installed rain barrels at its office locations with an investment of INR 135,000. Particularly in August 2009, a poor monsoon created seasonal shortage in the locality. The site office saved 5,000 litres of water in August 2009.

Roofwater and Rainwater Harvesting for Groundwater Recharge (under construction) at HCC's Lift Irrigation Project (PCLIS Pkg 10), Andhra Pradesh

The PCLIS 10 site is in the process of constructing systems for roofwater harvesting, and to route the rainwater for recharging existing boreholes. An investment of INR 130,000 is underway. The project is located in a water stressed area with 600 mm rainfall (normal) but the location has severe rainfall variability and low reliability. Thus a groundwater reserve is the primary source of survival. The results of the recharge intervention will be known after the completion of works and occurrence of rains.

Around Fence

Integrated Stormwater Management, Groundwater Recharge Project at HCC's Badarpur Elevated Highway Project, Delhi and Haryana

Badarpur is located at the Delhi-Haryana border. The water stress in the locality is increasing rapidly. HCC is integrating the road stormwater with engineered groundwater recharge. Using the principles of Managed Aquifer Recharge a portion of stormwater from the bridge deck and road surface will be recharged. The engineering design of the system is underway. A minimum investment of INR 4 million is expected. The system will include pre-cast modular step-wells designed by M/s. Furaat Earth Pvt. Ltd., Ahmedabad. Gale (2005)⁵ highlights, that 'the physical success of a Managed Aquifer Recharge Scheme depends largely on the local hydrogeological conditions', and forewarns about the clogging issues. HCC's Badarpur site is designing the recharge scheme based on basic 2D modelling of available geotechnical data for 20-35 m of upper aquifer. Initial hydrogeological assessment by Furaat estimates a potential of 60 ML recharge per year at 14 hydrogeologically appropriate locations, assuming well spaced rainfall spells. Currently, HCC is exploring the field feasibility of these 14 recharge locations.

It is anticipated that the scheme will recharge approx. 525 ML of water, compared to 175 ML expected to be used for the entire project construction. Being a BOT Project with 20 years' span, HCC will be able to operate and maintain the scheme in a technically sound manner and avoid any clogging risks.

Irrigation Channel (Kul) Restoration at HCC's Chutak Hydropower Project, Kargil, Ladakh, Jammu & Kashmir

India has a tradition of water harvesting that goes as far back as four to five millennia. Evidence of water harvesting in India since antiquity, is found on inscriptions, texts and archaeological remains.

An example of this age-old tradition is 'Kul Irrigation' in the Himalayan regions.

Villages in the Himalayan regions utilize 'Kuls' (diversion channels) to carry water from glaciers to the farms. The kuls often span long distances, running down precipitous mountain slopes and across crags and crevices. Some kuls are 10 kms long, and have existed for centuries. Earlier the farmers received water (through these kuls) for their crop and for other uses; kuls carry water through gravity and were constructed by unlined excavation in the earth. When a good snowfall assures abundant water, kul water is freely dispensed, but when water is scarce, equality gives way to a preferential system among the villagers. Thus, water distribution from kuls can create tension among groups of villagers, for, when there is a water shortage, the villagers with high priority in the village in effect are in a dominant position and suffer the least, unlike those with secondary access who have to await their turn, but are not certain if their share will be adequate; water availability in the downstream is further reduced by leakage of water and because of insufficient carrying capacity of the channels. These 'kuls' are the lifeline of the local villagers in Kargil, Ladakh, Jammu & Kashmir, the location of HCC's Chutak Hydroelectric Power Project. At 8,000 feet altitude in the Himalayan mountains, the Kargil area receives heavy snowfall in the winter months. Water pipes and canals become frozen during this time. In April 2008, the local villagers faced a major problem, of getting water for irrigating their crop in time for the harvest season. The kul irrigation channel was choked and needed clearing fast. To restore the capacity of the kul, HCC took the initiative of removal of muck, ice, slush & waste from the channel and a section of the kul was also lined with stone masonry. The resulting increased water carrying capacity of the kul, has enabled the community to receive sufficient water for their crop and other uses. Above all, sustaining the centuries old water harvesting culture in India.



Kul Restoration at Chutak Hydro Power Project, Jammu & Kashmir.



The 4.7 km Bandra-Worli Sea Link, Mumbai, Maharashtra - India's first and longest open sea cable stayed bridge.



Kudankulam Nuclear Power Project, Tamil Nadu

Beyond Fence

Stimulating good maintenance culture for Public Water Supply System at Kudankulam Nuclear Power Project, Tamil Nadu.

In India, the sustainability of public water supply systems is threatened by poor maintenance at local bodies. To overcome these practices, HCC operates on a system of conditional assistance. The locality where HCC's Kudankulam Nuclear Power Project is located, HCC provided assistance of INR 15,00,000 to augment the water supply through a bore-well in the absence of any other water source that could cater to an additional population of 2,000. However, HCC sought a commitment from the local body to maintain the catchments, and prevent contamination of water. The commitment of the local body is a small step towards introducing 'maintenance culture' and inducing a sense of responsibility amongst the local bodies.

Ujjivana-Integrated Water Environment Enhancement Project at Kihim, Maharashtra, supported and co-ordinated by HCC Corporate Office



Kihim Beach before Ujjivana.

Kihim Beach after 3 months of project implementation.

Kihim is a coastal village in Maharashtra with a scenic beach, and is primarily a tourist destination. The local population is about 4,000, with a weekly variable count of 1,000 visitors. Prior to HCC's intervention 'Ujjivana', the environmental condition of the village was poor. Ujjivana means revival. HCC introduced Ujjivana as an integrated water environment enhancement project, with an informed involvement of the village local body. This is a multi-objective intervention that approaches the water environment improvement through multiple ground actions such as solid waste management, sanitation, and enhancing the water supply. HCC invested INR 5.85 million in software and hardware for Ujjivana.

HCC has made some progress in institutionalizing effective Solid Waste Management (SWM), covering door-to-door planned garbage collection, segregation of waste, reuse of waste plastic for creating useable polyloom products, which in turn creates employment for local women.

The project has demonstrated that Solid Waste Management (SWM) can improve the water environment as well as generate employment and can strengthen enterprise development. HCC's lesson from Ujjivana projects suggest that the local bodies need diverse inputs and technical support (as well as investment support) in their range of activities, such as D2D infrastructure route planning, recycling training, enterprise operation and marketing of the products.



Ujjivana Product - A sample bag woven at the Polyloom Unit.

HCC's presence in all the activities has enabled the proper functioning of the water environment enhancement intervention. The village local bodies were also benefited by HCC's awareness campaign on solid waste management and sanitation by distributing Information, Education and Communication (IEC) material to the community in collaboration with CEE (Centre for Environment). HCC also helped in soliciting public water supply scheme proposals to the State Government and in leveraging funds for public projects.

Key outputs of Ujjivana include a full-fledged Solid Waste Management (SWM) system, with rigorous monitoring mechanism for SWM functions and a Polyloom enterprise. HCC observed the key outcomes of the Ujjivana Project to be a fair improvement in the capacity of the local village community and the improved hygiene practices in the village. A visible improvement in water environment, especially at the beach also reasonably raised the bar as far as the tourists' comfort is concerned.

HCC Academia Collaboration: Gestating live projects and a cadre of junior water professionals

HCC collaborated with Walchand College of Engineering (WCE), Sangli, Maharashtra for gestating live water at the harvesting project for the benefit of the community. Rajasthan Community Business Alliance for Water (RCBAW) interfaced with The Govt. of Rajasthan, HCC and WCE. RCBAW plays a role in pursuing IBAW's objectives of creating a pipeline under the Public Private Community Partnership Projects (PPCPP). The project involves a detailed project report to construct a weir across river Kalisind near village Haripura in Kota district, Rajasthan.

HCC provided technical support for the identification of the site location, feasibility assessment, and for the engineering design of the Water Harvesting Structure (WHS). The project report deals with the feasibility, social survey, investigations, data analysis, and design of the proposed weir. The project offered a sense of socio-engineering of dimension of water projects to junior professionals in the Engineering College and demonstrated that involvement of academia in live projects can add value to the community.



Way Forward

For HCC, 'The CEO Water Mandate' endorsement offered an opportunity to vet many of its business actions with a water conscious perspective. The initial year of endorsement was primarily invested in capacity building and developing organizational infrastructure.

This year on HCC will strive to institutionalize the water consciousness within HCC. In the coming years, HCC will make efforts to constructively induce its clients to appreciate the need for water related good practices and follow these in their other projects.

Endorsing 'The CEO Water Mandate'

For HCC, 'The CEO Water Mandate' endorsement has helped in streamlining the processes within the Company. As an endorser, HCC has been able to expand its sphere of influence for the well-being of the water sector. HCC will be pleased to share HCC's Water Mandate implementation experience with aspiring endorser companies.

Nourishing the Endorsers' Actions

In order to assist companies in the development of comprehensive water sustainability strategies, 'The CEO Water Mandate' convenes two working conferences per year, designed to focus on key water related issues and specific aspects of 'The CEO Water Mandate.' These conferences bring corporate water experts and practitioners together with a range of key stakeholders and partners, including civil society organizations, specialized water institutes, UN agencies, public authorities, and other interests.

In addition, 'The CEO Water Mandate' initiative seeks to provide partnership opportunities for endorsers with key organizations and interests – including relevant UN agencies and programmes.

'The CEO Water Mandate' also develops and disseminates research and intelligence, in the form of studies, surveys and mapping papers, in addition to developing guidance resources such as the Transparency Framework, Phase One and Phase Two.

Finally, 'The CEO Water Mandate' offers endorsing companies the opportunity to join United Nations events and key inter-governmental and other public policy discussions and deliberations on the topic of water sustainability.

How to Join

'The CEO Water Mandate' seeks to build an international movement of committed companies, both leaders and learners. In this spirit, the initiative is open to companies of all sizes and from all sectors, and from all parts of the world. The initiative requires the endorsement of a company's Chief Executive Officer, or equivalent. Please endorse 'The CEO Water Mandate' and indicate your company's commitment at the UN Global Compact.

Website at: <http://www.unglobalcompact.org/>

For further information, please feel free to contact us at: HCCUNwatermandate@hccindia.com

Footnotes

1. Partial reporting of consumption
2. <http://www.asiasociety.org/files/pdf/WaterSecurityReport.pdf>
3. http://www.greenbusinesscentre.org:9080/site/mmbase/attachments/185459/Mr_Mangesh_Gupte.pdf;jsessionid=E10B8422A1BEB4A43B20CC3C89CF783D
4. <http://www.ficci-habitatbusinessforum.com/>
5. Gale (2005) Strategies for Managed Aquifer Recharge (MAR) in semi-arid areas..org/images/0014/001438/143819e.pdf

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