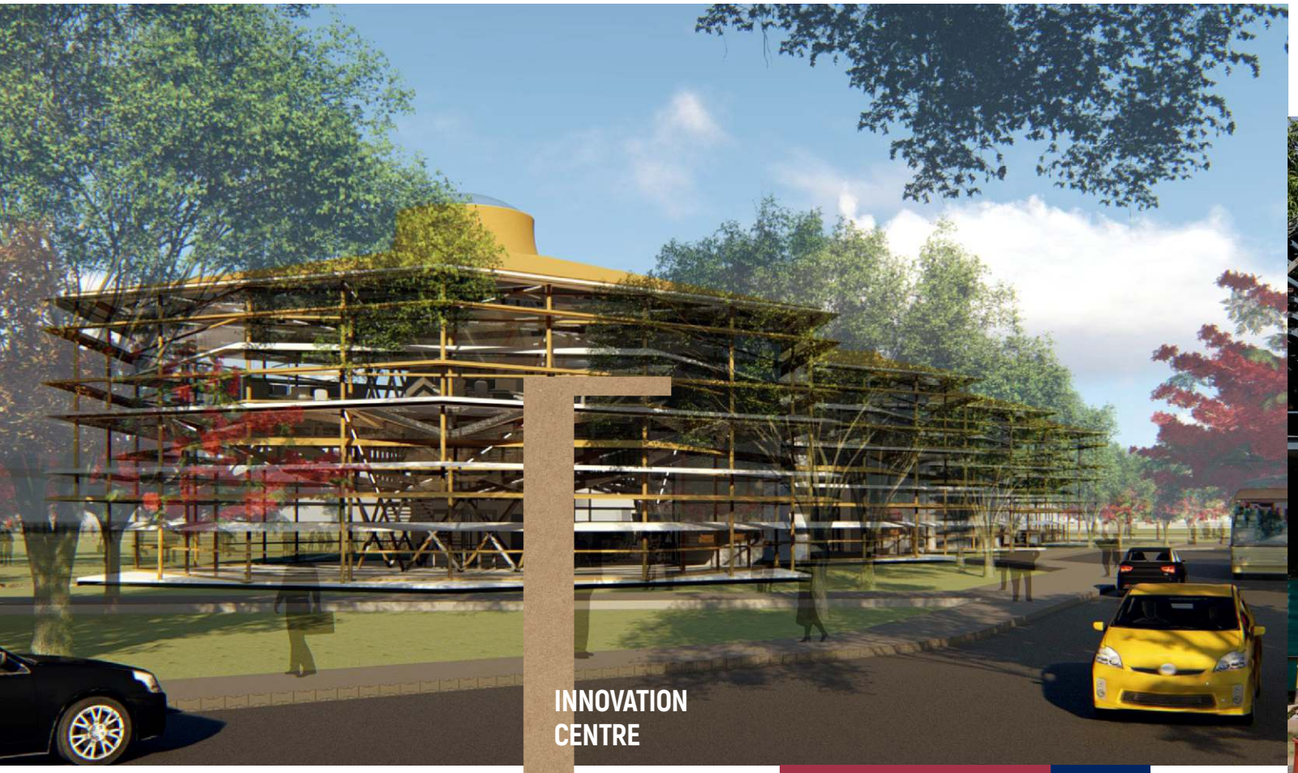
BRIDGING THE WATER CONSERVATION GAP

Arvind Limited and global apparel retailer Gap Inc., have joined hands to open a new innovation centre with the objective of promoting the adoption of proven techniques and technology that reduce water use by the textile manufacturing industry. Arvind and Gap are also investing in a new water treatment facility that will eliminate the use of freshwater at Arvind's denim mill in Ahmedabad, India.



INNOVATION CENTRE

ARVIND GAP

The new innovation centre will be a hub for apparel companies, manufacturing suppliers, vendors and other stakeholders, to advance and scale water stewardship across the apparel sector. The centre, spread across 18,000 sq. ft space, will feature installations that showcase water management best practices and recycling technologies, a library, lab space to develop water management solutions, as well as classroom training and conference space. Once completed, the centre will generate scalable solutions that can be replicated at other mills and laundries.

As water becomes increasingly scarce due to climate change and growing human needs, the apparel industry is facing pressure to reduce its freshwater demand. In India, 54% of the population faces high to extremely high water risk, according to Gap. The partnership wants to make the industry more efficient in water use.

The facility will replace

100%

of the mill's freshwater use with reclaimed water.

The facility will use membrane bio reactor (MBR) technology to treat domestic wastewater drawn from the surrounding community, without the use of chemicals in the treatment process.

Currently, the mill consumes 8 million litres of freshwater per day. Beyond eliminating the use of freshwater at the denim mill, the facility will also reduce business risk for Arvind, Gap and the other brands that source from the mill due to local water scarcity challenges.

TREATMENT FACILITY

By the end of FY 2020-21

3 billion litres

of fresh water will be saved and will preserve the local community's vital freshwater resources.

INITIATIVES AT DENIM (NARODA)

OPTIMISING WATER USE THROUGH MONITORING

Monitoring water use is the first step in reducing its consumption. Arvind Mills installed water meters and started monitoring water in 2016, following the suggestions made by cKinetics during the baseline assessment. The water meter readings are taken every day from all the locations in a log register. These readings are then transferred to a dashboard for monthly machine-wise consumption review. Through a month-on-month comparison of water consumption and water meters, and communication of results to all the departments, significant reduction has been observed in per metre consumption of water.

Other initiatives taken up to optimise water use include:

- Corrected the counter current system with optimum water flow rate in the AE Desizing machine. The initiative led to resource-saving of 5.5 litres/metre to 5.0 litres/metre of water.

The average production per day at AE Desize machine is 27,000 metres which will save 4,860 kl/annum of water.

- Set up new connecting valves within the wash tanks for establishing counter-current system by which the water from the wash boxes can be used in the next (5 boxes were connected with 4 valves). The flow of water reduced from 8 litres/metre to 6 litres/metre.

The average production per day at the facility is 35,000 metres resulting in the total water saving of 70,000 litres/day or 25,200 kl/annum. Further, it saved INR 718,200 by way of eliminating raw water use & through water treatment at ETP.

REUSING THE PRE-WETTING BATH WATER

Water is picked up from the pre-wetting bath when the machine has non-sulphur dyeing load. The water is recovered and carried through pumps and a piping system to where the dyed yarn is washed. This water is utilised for washing purposes.

This initiative led to a resource saving of 80 kld of water and 28,800 kl/annum, financial savings of INR 806,400 and treatment cost in ETP.

RECOVERING AND REUSING WATER ON MONFORTS MACHINES

Monforts machines are used for textile finishing. In the zero-zero finish, a huge amount of water is sprayed on to the rubbers of the machine to simply cool them down. This water is clear and its quality equal to the raw water. The project aimed at reusing this water for the finishing of fabric at Arvind Mills. The water was collected by placing the troughs beneath the machines and the water was pumped back into the process.

The project was implemented on 6 machines achieving resource-saving of 61,920 kl/annum (192 kld) - saving around 40% of projection, including financial savings of INR 1,969,920. The raw water and ETP treatment costs were also saved.

FOAM DYEING

Arvind has invested in advanced technologies such as foam dyeing for denim which uses 90% less water compared to conventional dyeing technologies.

The main dyeing element in this process is foam, using air instead of water to carry the chemicals or dye onto the fabric.

INITIATIVES AT WOVEN & KNITS (SANTEJ)

Production capacities at Arvind's Santej Plant are 12 million metres of a shirt and trouser fabric and 800 tonnes of knit fabrics monthly. A sustainable water supply of 17 million litres per day is required to achieve this monthly production. However, Gujarat is prone to rainfall deficits and droughts, which is a material risk for Arvind's business and for the neighbouring community, who depend on water for their domestic use.

Arvind has been working towards responsible management of water. Our water conservation and recycling initiatives have helped us to lower our dependence on water resources. Some of the key initiatives taken up during the reporting period include:

MAKING WATER CONSERVATION MORE EFFICIENT

Santej unit is equipped with a Wastewater Treatment Plant which recycles up to 98% of effluent.

Thus, the net withdrawal of the water from borewells is limited to evaporation and consumption losses. That's not all. The plant is working to make water conservation more energy efficient through new and ongoing initiatives.

USING GREENHOUSE FOR SLUDGE DRYING

While Santej is a ZLD plant and doesn't generate liquid waste, the safe disposal of sludge, which comprises 20% solid and 80% water, is a challenge. The plant used to transport this sludge earlier without achieving the required dryness, leading to higher costs.

With the objective of making the whole process of drying the sludge environmentally friendly and cost efficient, Santej unit decided to install a greenhouse for sludge drying. The greenhouse uses sun radiance to heat the surface of the sludge bed and aeration to evaporate the water contained in the sludge. The evaporated water is then evacuated through natural convection, assisted by the ventilation system. Santej unit set up the greenhouse with the capacity to treat up to 10 tons of ETP wet sludge.

The initial moisture content of the wet sludge was 82%, however on the fourth day the final moisture content of the sludge was reduced to just 20%.

JOINING FORCES TO REDUCE FRESHWATER USE

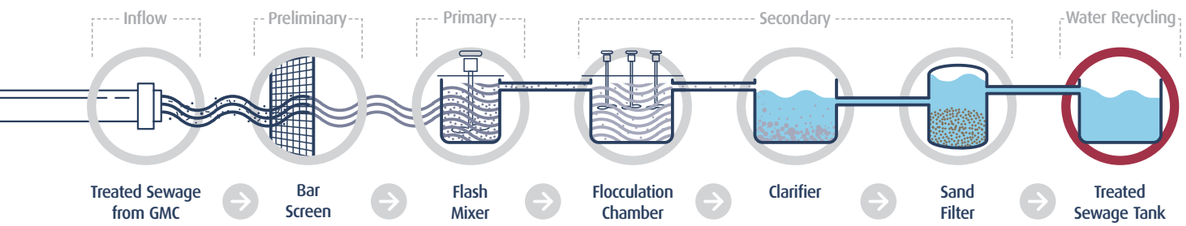
Arvind Limited, Santej and Gandhinagar Municipal Corporation (GMC) signed an agreement for usage of 4,000 KL/day treated sewage from a domestic sewage treatment plant, reducing the use of groundwater.

The partnership will enable Arvind to curb groundwater use for domestic and industrial purposes, leading to higher groundwater level in the region and avoid any water scarcity for the neighbouring community.

Arvind Envisol has designed the state-of-the-art Sewage Treatment Plant (STP) plant based on analysis of composite samplings at pumping stations. The water is treated and further polished at our STP through various technologies such as bar screening, pH correction, flash mixer, primary clarifier and sand filter.

Later, this treated water is disinfected with Hypochlorite to remove the bacterial colony. The parameters are checked thoroughly at our ETP lab against an existing set of water quality standards. Once it is confirmed safe for use in the domestic usage, the stream is released in H-plant, boilers and domestic usage.

Treatment Process



Note: Treated sewage is disinfected with hypochlorite to remove bacterial colony

We have reduced ground water extraction for domestic purpose in our industrial premises by providing treated sewage water tapping. It will help us to build ground water level and avoid water scarcity.

WATERLESS DYEING AT KNITS

Waterless dyeing technology has been piloted at Knits Division by replacing water with supercritical carbon dioxide. When CO_2 is heated to a point, it acquires the liquid-like density which is advantageous for dissolving hydrophobic dyes, and gas with low viscosities and diffusion properties, which can lead to shorter dyeing times compared to water. We have done a series of trials to study this as a proof of concept and are working to implement this at scale in near future.

Through waterless dyeing, we will be able to reduce our water use by 100 KL/day.

OTHER INITIATIVES

Reducing Water Use

- Installation and maintenance of float valve in open tank and cooling tower to stop the overflowing of water
- Reuse of machine cooling water as hot process water
- Regular checking for wasteful use of water followed by remedial action
- Steam condensate recycling in various areas adopted in order to reduce water and steam consumption
- The effective operation of condensate and cooling recovery system
- COC Winder and CBR cooling water collected and reused which remained unused earlier
- Sanfo/Curing cooling water collected by pump modification and reused which was going to the drain
- Condensate water recovered from dryers, Sanfo machine, caustic recovery reused

Conserving Ground Water

- Anmol/Achal spinning plant started using sewage water in place of groundwater
- In ETP sewage water was used for chemical preparation
- Increased the recycled water recovery by 10% by installing RO-IV stage

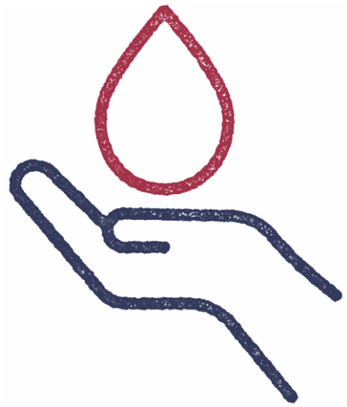
DEPENDING ON TREATED SEWAGE FOR PROCESS WATER

To decrease our dependence on groundwater and reduce the use of freshwater, Ankur Textiles has partnered with Ahmedabad Municipal Corporation to treat 1,500 KL of raw sewage every day at Ankur's Sewage Treatment Plant.

50% of our process water is derived from treated sewage water.

OTHER INITIATIVES

- Installed pressure transducers in water supply system and linked with inverter drive pump to maintain optimum water supply pressure leading to savings of 40,000 KL of water per year
- Reused condensate water at boiler saving 674 M Kcal of heat energy/year
- Checked wasteful use of water followed by remedial action
- Adopted steam condensate recycling in various areas in order to reduce water and steam consumption
- Reused 120 KL of water per day, used for machine cooling in processing area



INITIATIVES AT GARMENTS EXPORT DIVISION (BENGALURU)

The Mysore Road Garmenting Unit at Bengaluru has always been responsible towards water since it was commissioned in 2005. However, we continually improve the productivity of water and work towards its conservation through various initiatives. For instance, using Environmental Impact Measuring (EIM) software to monitor and control its washing activities. This software analyses the environmental impact of a garment finishing process across parameters such as water consumption, energy consumption, chemical product use and worker health.

100%

of the water used at this unit is sourced from the waste water treatment plant of the local municipality through a specially built pipeline.

INITIATIVES AT BOMMASANDRA UNIT

WATER CONSERVATION BY ADOPTING NEW TECHNOLOGY

Rainforest Machine

The machine is designed with 3mm+ 3mm double layered drum structure which runs with pump free water circulation technology. When the distance between the inner and outer drum of the machine reduces, 50% of water consumption is reduced for stone and enzyme wash, which results in chemical savings as well.

Many of the wash cycles are done at 1:3 Liquor ratio thereby saving close to 30% water in the overall process.

Reverse Osmosis System

With the objective of reducing the freshwater use for processes, RO System was installed at our Bommasandra Unit as an economic and effective way to treat wastewater and reuse the same.

This initiative led to using 60% of the treated water for process, saving 60,053 KL of water at the unit.

Nano Spray Technology

We are using machines with Nano Spray Technology to reduce environmental and economic impact. Machines such as Eflow, Jeanius, and Bcloud are designed to reduce the water needed for washing by almost 80% in some of the processes. The machines use MSIT as a medium to hold the chemicals instead of water.

This process reduces the amount of wastewater substantially as only the amount needed for garment absorption is sprayed and there is no discharge in this step.

WATERLESS WASHING RULES

While water cannot be substituted completely in the manufacturing processes, we take water saving initiatives to manage it responsibly. We have adopted some of Levi's waterless washing rules to conserve water during the washing process. Among these, Arvind practices removing desize step, low liquor ratio for stone wash, combine fixing and softener prominently to conserve water.

Water less washing can be attained by following any one of the following steps:

Levi's®

WATER<LESS™

Levi's Water Less is Levi's latest innovation. Their jeans and denim jackets are the result of the union of style and sustainability, without compromising the quality of fabrics and finishes. Same result = less water. The idea is to carry out the traditional process of creating a pair of jeans but in a less harmful way for our environment.

Levi's Waterless Washing Rules

- ✓ Remove desizing step
- Use ozone instead of powerful bleach
- ✓ Low liquor ratio for stone wash
- Use foam dye
- Water free stone wash
- Foam bleach
- Use spray softener
- Sky Bleach / Rags Bleach
- Use Soft rigid technique
- ✓ Combine fixing and softener
- Ozone Mist
- Combine enzyme and softener
- Low liquor ratio bleach
- Low liquor ratio reactive garment
- Water free stone wash

HARVESTING WATER FOR WASHING

Arvind has implemented rooftop harvesting systems to capture rainwater from the roof catchments and store them in the tanks. The harvested water is then used in the washing process, which is a water-intensive activity in the textile processing.

A total of three rooftop harvesting systems with rooftop area of 65,800 sq. feet and tanks with cumulative water storage capacities of 615 KL of water have been installed at various places for washing purposes.