CHITKARA UNIVERSITY
PUNJAB

RESPONSIBLE WATER CONSUMPTION – A REPORT (2024-25)

PUNJAB CAMPUS

2024 - 25

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1. Introduction –

Chitkara University, Punjab, is committed to achieving environmental sustainability through efficient resource management, with water conservation being one of its most critical focus areas. Recognizing that water scarcity is a pressing global issue, the University has adopted a comprehensive, integrated approach to ensure that every drop of water is used responsibly, reused effectively, and replenished naturally.

The University's Water Management Plan (2024–2025) focuses on three core pillars:

- Sustainable water operations and infrastructure.
- Awareness, monitoring, and community engagement.
- Eco-smart plantation and landscape management.

Through these measures, the campus continues to evolve into a water-resilient ecosystem

Water Tank

Underground Water Tank

2. SUSTAINABLE WATER OPERATIONS

A. RECYCLING WATER – TREATMENT PLANTS

Chitkara University operates two fully functional Sewage Treatment Plants (STPs) utilizing Moving Bed Biofilm Reactor (MBBR) technology, a modern biological treatment process that ensures high efficiency and low energy consumption.

Each plant follows a four-stage treatment process:

1. Primary Treatment: Screening and oil/grease removal to separate large solids and floating materials.
2. Secondary (Biological) Treatment: MBBR reactor uses suspended biofilm carriers to remove organic matter.
3. Tertiary Treatment: Pressure sand filters, activated carbon filters, and chlorination ensure pathogen-free and clear water.
4. Sludge Treatment: Sludge drying beds convert biosolids into nutrient-rich compost used in campus gardens.

The treated water is reused for horticulture, flushing, and floor cleaning, effectively reducing dependency on freshwater sources. Automated monitoring ensures compliance with CPCB discharge standards, and periodic sampling confirms the water's quality for reuse.

Sewage Treatment Plant (STP)

B. DOUBLEPLUMBING –

1. The University's water supply infrastructure integrates dual plumbing systems in all academic and residential blocks.
2. One network carries potable water for drinking and laboratory use.
3. The second network supplies treated water for non-potable purposes.
4. Smart flow meters and IoT-based monitoring systems have been introduced to measure real-time water consumption and detect leaks. Automatic pump controls ensure timely refilling of overhead tanks and prevent overflow, helping maintain a zero-water-loss policy.
5. This digital integration allows maintenance teams to access water usage data through dashboards, aiding in long-term planning and benchmarking

C. RAINWATER HARVESTING

Rainwater harvesting is a central component of Chitkara University's water management strategy. The campus currently operates **18 recharge pits** strategically distributed across rooftops, open grounds, and paved areas.

- Each pit is connected to a filtration chamber that removes silt, sand, and organic debris.
- Open grass pavers in parking and courtyard areas promote infiltration and reduce surface runoff.
- Collected rainwater is directed into recharge wells that percolate water back into the aquifer.

The estimated groundwater recharge capacity of all systems combined is approximately 48095 litres per day during the monsoon months. A digital rainfall monitoring system records precipitation data and evaluates the efficiency of recharge structures.

D. WATER-EFFICIENT FIXTURES AND AUTOMATION–

To minimize wastage, the University has installed water-saving fixtures throughout its infrastructure:

- Sensor-based taps and urinals in high-traffic washrooms.
- Low-flow showerheads and aerators in hostels and guest houses.
- Automatic motor controls to regulate tank refilling and prevent overflow.

3. AWARENESS ON CONSCIOUS WATER CONSUMPTION

Students and staff are made aware of the need to consume water and not waste water. While there are strict regulations to not use water for washing vehicles and for prudent usage of water for cleaning of venues, utmost importance is given to concerns of water leakages. Further, posters to draw attention of users are displayed at strategic locations like rear of washroom doors, at drinking water stations to remind users to not waste water, to raise alarms in case of water leakages and switch off taps when not in use.

Water Awareness

4. ECO-SMART PLANTATION PRACTICES

Chitkara University's lush and eco-diverse green spaces exemplify **sustainable landscape management**. The plantation program emphasizes reduced water dependency, enhanced soil health, and biodiversity enrichment.

- **Use of Treated Water for Landscaping**

  Over **85% of the water** used for landscaping originates from treated wastewater generated by the campus STPs.
  This reuse significantly reduces groundwater extraction, making horticultural practices both cost-effective and environmentally friendly.

- **Drip and Sprinkler Irrigation Systems**

Modern **drip and sprinkler systems** have replaced manual watering across campus.

- **Drip irrigation** directly delivers water to plant roots, minimizing evaporation and runoff.
- **Sprinkler systems**, now, ensure uniform water distribution.

These systems have reduced irrigation water use by **nearly 40%** while maintaining vibrant green spaces throughout the year.

Water Sprinklers

Drip irrigation is a process where instead of irrigating the entire plant from above, pipes are used to drip water slowly onto the roots of the plants. This conserves between 20-50% of the water while reducing other negatives like running off, surface evaporation and the potential for overwatering. For most vertical gardens of the campus, drip irrigation is used.

- **Plantation of Native and Drought-tolerant**

The University continues to expand its collection of **native, drought-tolerant plant species**, which are adapted to Punjab's semi-arid climate. Approximately **one-fourth of total plant cover (25%)** now consists of low-water-demand species such as **Cassia fistula, Bougainvillea, Nerium oleander, and Ficus religiosa.**

This approach not only supports water conservation but also enhances biodiversity and creates microhabitats for pollinators.

Drought Tolerant Plants

- **Karnal Technology**

The University applies **Karnal Technology** for eco-friendly disposal of treated wastewater.
In this system:

- **Trees are planted on ridges**, and treated wastewater is directed through furrows for controlled absorption.
- The design ensures **no stagnant water** after 12–18 hours, preventing mosquito breeding and Odor formation.
- The process enriches soil organic content and supports rapid tree growth.