



# Karunya INSTITUTE OF TECHNOLOGY AND SCIENCES

(Declared as Deemed to be University under Sec.3 of the UGC Act, 1956)

MoE, UGC & AICTE Approved

NAAC A++ Accredited

## 6.2.1 Total Volume of Water Used in the University



- |                                              |                                                                |                                                 |
|----------------------------------------------|----------------------------------------------------------------|-------------------------------------------------|
| 1. Administrative Block                      | 4. ECE, Biotechnology & Food Processing Technology Departments | 8. Computer Science Department                  |
| 2. Civil, Mechanical & Aerospace Departments | 5. Computer Technology Centre                                  | 9. EEE, Arts, Science & Agriculture Departments |
| 3. Emmanuel Auditorium                       | 6. Central Library                                             | 10. Placement Centre                            |
|                                              | 7. Karunya Media Centre                                        | 11. Ladies Resident Halls                       |



*Location of Water Resources (wells)*

### Sources of Water Supply:

There are 5 open wells and 23 bore wells on campus supplying water to 166 storage tanks which meet the water demand of the students, faculty and staff (Total of 8087).

- Groundwater: 95% of water supply from aquifers to meet the demand in the campus
- Potable water supply from Siruvani reservoir: Drinking water in the campus and hostels
- Desalinated Water using RO plants: For cooking and drinking.
- Ferrocement -based roof top water harvesting structure and recycled water from 4 STP units in the student's hostel: Water demand for gardening and irrigation.

| Facility              | Quantity / Capacity          | Function                                                | Coverage                                |
|-----------------------|------------------------------|---------------------------------------------------------|-----------------------------------------|
| RO Plants             | 2 Units (2000 LPH + 500 LPH) | Centralized purification for hostels and staff quarters | ~60% of potable supply                  |
| Water Purifiers       | 86 Units                     | Secondary purification and cooling                      | 37 buildings (academic, admin, hostels) |
| Self-Closing Taps     | 3,376 Nos.                   | Minimize wastage at outlets                             | 56.4% water-efficient                   |
| IoT-Level Controllers | 119                          | Overflow and refill management                          | All sumps & OHTs                        |
| Overhead Tanks        | 46                           | Water storage                                           | Monitored 24×7                          |
| Sumps                 | 8                            | Ground-level reservoirs                                 | Smart sensor integrated                 |

| Stage                  | Infrastructure                               | Functional Capacity           | Measurement System               |
|------------------------|----------------------------------------------|-------------------------------|----------------------------------|
| Freshwater Input       | Siruvani /TWAD + 23 Borewells + 5 Open Wells | 1.4–1.6 MLD                   | Operational Time and capacity    |
| Treatment              | 4 STPs                                       | Domestic wastewater recycling | Flow meter                       |
| Potable Production     | RO Plants (2000 & 500 LPH)                   | Drinking & cooking supply     | Sensors and RO Logbook Registers |
| Storage & Distribution | Sumps + overhead tanks + Pumps               | Internal distribution network | 119 IoT Level Controllers        |
| Reuse Network          | 113 Reuse Outlets                            | Irrigation                    | -                                |

The volume of water consumed/used in the hostel and university - 291,132 m<sup>3</sup>/year

Total Volume of water consumed per person – 36.0 m<sup>3</sup>/year

### Measurement of water consumption:

- Automatic water flow controllers have been installed in water tanks to measure the flow and avoid overflow. The water supply volume is determined based on motor power,

pumping duration for each tank, and the building height, allowing calculation of the water flow into each tank.

- For hostels, the volume of water used by students was estimated through semi-structured interviews covering water use for bathing, washing, flushing, drinking, and minor uses.
- Similarly, interviews were conducted at the university campus to estimate water consumption in canteens, laboratories, and construction sites.
- Flow meters are installed at STP inlets and outlets to measure the inflow and reuse of treated water, as well as at RO plant intake and delivery points to track the volume of treated water used.



Automotive waterflow controllers

The campus has established extensive **rainwater harvesting and groundwater recharge systems** to enhance sustainable water management. During the monsoon, rainwater collected from building terraces is quantified based on roof area and rainfall depth. A 25,000-litre ferrocement tank at the administrative block stores water from a 1,900 m<sup>2</sup> roof for washing use. Additionally, 33 soak pits—each 3 m deep and 1.8 m in diameter—are distributed near academic buildings and hostels to facilitate groundwater recharge. In total, 33 rainwater harvesting sites have been identified, with terrace areas ranging from 39 m<sup>2</sup> to 5,590 m<sup>2</sup> across key locations such as the administrative block, civil and mechanical departments, auditoriums, guest houses, and hostels, all contributing significantly to replenishing groundwater and promoting sustainable resource utilization.

| Location of Rain Water Harvesting System in KITS Campus |                                  |                      |
|---------------------------------------------------------|----------------------------------|----------------------|
| Sl.No                                                   | Location                         | Area of Terrace      |
| 1                                                       | Behind Administrative Block      | 1900 m <sup>2</sup>  |
| 2                                                       | Adjacent to Administrative Block |                      |
| 3                                                       | Adjacent to Aerospace Lab        | 278 m <sup>2</sup>   |
| 4                                                       | Adjacent to Old Bio Tech Block   | 766 m <sup>2</sup>   |
| 5                                                       | Adjacent to Ebenezer Auditorium  | 1,100 m <sup>2</sup> |
| 6                                                       | Adjacent to CST Department       | 1,247 m <sup>2</sup> |
| 7                                                       | Adjacent to Elohim Auditorium    | 450 m <sup>2</sup>   |
| 8                                                       | Adjacent to Mechanical Lab       | 2960 m <sup>2</sup>  |
| 9                                                       | Adjacent to Civil Department     | 2812 m <sup>2</sup>  |

|    |                                                       |                      |
|----|-------------------------------------------------------|----------------------|
| 10 | Adjacent to Civil Lab                                 |                      |
| 11 | Adjacent to Mechanical Workshop                       | 2,218 m <sup>2</sup> |
| 12 | Adjacent to Food Processing Lab                       | 4,277 m <sup>2</sup> |
| 13 | Adjacent to Computer Centre                           | 1,023 m <sup>2</sup> |
| 14 | Adjacent to S & H Block                               | 5,590 m <sup>2</sup> |
| 15 | Adjacent to Visitor Waiting Hall - LH                 | 150 m <sup>2</sup>   |
| 16 | Adjacent to Old DMR Dinning Hall                      | 600 m <sup>2</sup>   |
| 17 | Adjacent to Sewage Treatment Plant - LH<br>- EVR      | 2,814 m <sup>2</sup> |
| 18 | Adjacent to Sewage Treatment Plant - LH<br>- SRR Extn | 1,502 m <sup>2</sup> |
| 19 | Adjacent to Oprah Residence                           | 1,800 m <sup>2</sup> |
| 20 | Adjacent to Sundaraj Residence                        | 1,600 m <sup>2</sup> |
| 21 | Adjacent to Sevagapandian Residence                   | 1,306 m <sup>2</sup> |
| 22 | Adjacent to PRGR Residence                            | 1,910 m <sup>2</sup> |
| 23 | Adjacent to DMR Residence                             | 1,609 m <sup>2</sup> |
| 24 | Adjacent to Indoor Games - FDR                        | 748 m <sup>2</sup>   |
| 25 | Adjacent to FDR Mess                                  | 1,841 m <sup>2</sup> |
| 26 | Adjacent to FDR Residence                             | 2,324 m <sup>2</sup> |
| 27 | Adjacent to EGR Residence                             | 1,484 m <sup>2</sup> |
| 28 | Adjacent to Student Amenity Centre -<br>AR/HR         | 147 m <sup>2</sup>   |
| 29 | Adjacent to Hepzibah Gents hostel                     | 1,220 m <sup>2</sup> |
| 30 | Adjacent to Post Office                               | 39 m <sup>2</sup>    |
| 31 | Adjacent to Baburaj Residence                         | 2,275 m <sup>2</sup> |
| 32 | Adjacent to Guest House                               | 1,892 m <sup>2</sup> |
| 33 | Adjacent to JMR Mess                                  | 2,185 m <sup>2</sup> |
|    |                                                       |                      |



**Recycled water from sewage treatment plants (STPs)** forms a vital component of the water management system. The university operates four STPs: JMR (1000 KLD capacity), FDR (400 KLD), Ladies Hostel (450 KLD), and PR GARG (600 KLD).

| STP Unit          | Installed Capacity (KLD) | Annual Output (m <sup>3</sup> /year) | End-Use Application        | Measurement |
|-------------------|--------------------------|--------------------------------------|----------------------------|-------------|
| JMR Hostel        | 1000                     | 132,525                              | Irrigation, lawns etc.     | Flow Meters |
| FDR Hostel        | 400                      | 79,729                               | Hostel & garden irrigation |             |
| Ladies Hostel STP | 450                      | 61,778                               | Mess cleaning              |             |

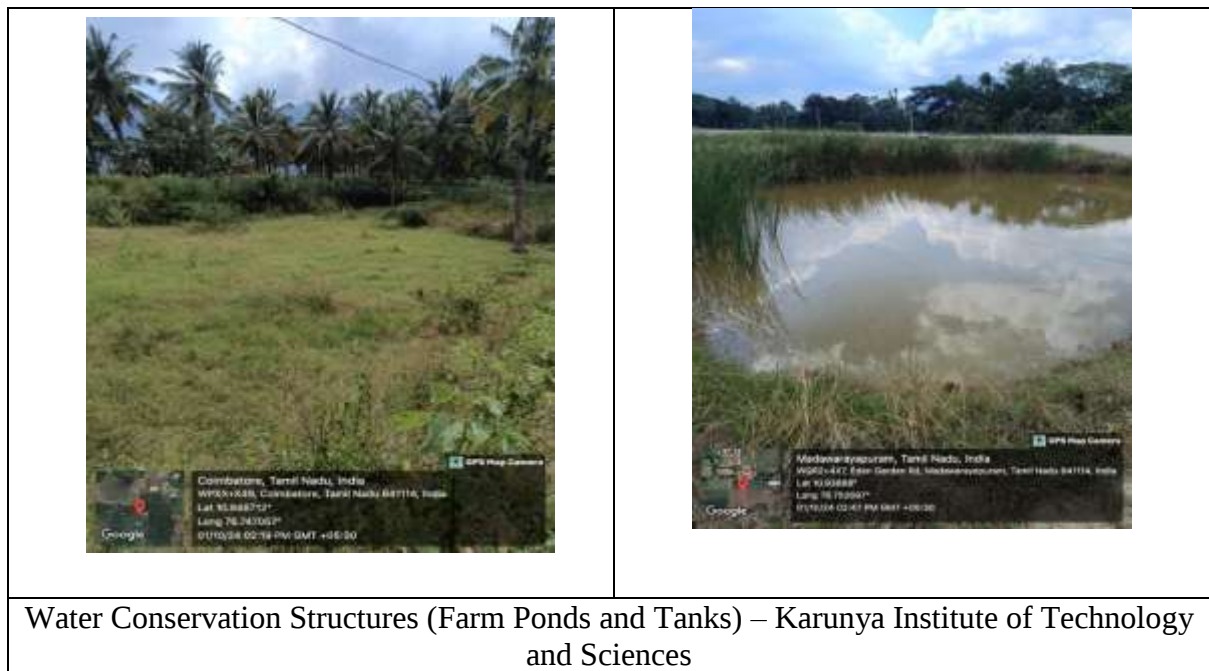
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|-----------------------|-----------|---------------------------------|--------------------------------|--|
| PR GARG<br>Campus STP | 600       | 111,171                         | Farm Irrigation (329<br>acres) |  |
| Total                 | 2,450 KLD | 385,204<br>m <sup>3</sup> /year | 100% Recycled and<br>Reused    |  |



**Desalination units also play an essential role in ensuring potable water availability. Two desalination units** with a total capacity of 2000 litres per day for cooking and 500 litres per day for drinking are operated with flow meters installed to measure intake and delivery volumes. The treated water from RO plants is primarily used for drinking and cooking purposes. **RO Treated Drinking Supply: 2,618 m<sup>3</sup>/year.** Monitoring Tools: FREHNIG IoT Flow Transmitters + Database (LPS + cumulative flow).

Overall, the Karunya Institute of Technology and Sciences has developed an efficient and sustainable water management system by integrating groundwater, surface water, desalinated water, recycled wastewater, and harvested rainwater. Continuous monitoring through flow meters, automated controllers, and pumping records ensures optimal use and conservation of water resources. Through these measures, KITS effectively minimizes wastage, supports groundwater recharge, and promotes sustainability across its academic, residential, and agricultural zones.





### **Water Resources Conservation and Management through**

- a. ponds and tanks
- b. rainwater harvesting and recharge of wells (33 Nos)
- c. use of recycled water
- d. usage of water efficient appliances
- e. rainwater utilization for crops
- f. optimal water usage through drip irrigation
- g. IoT based water level controller for reducing the wastage
- h. Water Quality Monitoring
- i. Capacity building and awareness creation