6.3.2 Prevention of Water Pollution

Karunya Institute of Technology and Sciences (KITS) is a fully residential campus located in an ecologically sensitive region near the Western Ghats, spanning 720 acres (2.9 million m^2).

Campus Population Considered for Calculation: 8087 persons. As part of its commitment to SDG 6 – Clean Water and Sanitation, KITS follows a zero untreated discharge approach, prioritizing wastewater treatment, recycling, and groundwater protection.

Policy and Governance

Parameter	Details
Policy Framework	Environmental Sustainability Policy – Section *5 (Water Conservation & Wastewater Reuse)*
Supervisory Authority	Registrar and Chief Engineer
Monitoring Frequency	Daily via IoT database + Green Audit verification
Regulatory Compliance	TNPCB norms + IS:10500 (2012) potable standard

Wastewater Management Infrastructure

Facility Type	Location / Units	Capacity (KLD)	Function	% Reuse / Efficiency
Sewage Treatment Plants (STPs)	JMR (1000), FDR (400), Ladies Hostel (450), PR GARG (600)	2,450 KLD total	Treat greywater from hostels, kitchens, washrooms	96–98% removal efficiency- BOD/COD
Biogas Plants	FDR (100 m^3), JMR (80 m^3), LH (100 m^3), EVR (80 m^3)	360 m^3 total	Treat blackwater + organic waste; generate biogas	6–7 LPG cylinders/day replaced (~2,200/year)
Reuse Outlets	Campus-wide	113 nos.	STP-treated water used for irrigation	100%

IoT Water Control Systems	Sumps + OHTs	119 controllers	Regulate overflow, optimize pumping	10% water & energy savings
Total Recycled Wastewater	—	385,204 m^3/year	Reused for irrigation and gardening	92.10% reuse rate

Quantitative Indicators (FY 2023–24)

Indicator	Value	Source
Wastewater Generated	385,204 m^3/year (including wastewater from kitchen since it is fully residential)	Flow monitoring
Treated Wastewater Reused	385,204 m^3/year	STP Records
Reuse Efficiency	100%	Calculation
STP Biochemical Efficiency	95–97% BOD reduction	Lab Reports
Biogas LPG Equivalent Saved		Hostel kitchen consumption logs
Overflow Reduction via IoT	~42,000 m^3/year saved	Database IoT logs
Sludge Reuse	Converted to manure for campus cultivation	Compost yard records
Solid Waste Segregation Bins	3,000	Solid Waste Management Unit
Paper Recycling Plant Output	25–30 tons/year	Green Audit Records

KITS achieves near-zero discharge with 100% treated water reuse, minimizing pollution and protecting groundwater

Pollution Prevention Measures

Measure Category	Implementation	Outcome
Greywater–Blackwater Segregation	Differential pipeline networks	Higher treatment efficiency, prevents mixing contamination
Biological + Tertiary Treatment STPs	Aeration → Clarification → Sand Filtration	Treated water meets reuse norms
Sludge Handling	Sludge dried & reused as organic compost	Reduces landfill waste & fertilizer requirement
Stormwater Management	33 soak pits + 6 farm ponds (14,334 m^3 capacity)	Recharges groundwater annually
IoT Water Level Systems	Automated pump cut-off controls	Prevents overflow + lowers operational wastage

Routine Water Quality Testing	PHED + internal testing every 6 months once	Environmental Lab- Civil Division

Awareness & Capacity Building

- Nature Club (3 Units): Organizes 10+ water conservation and clean-water drives annually.
- Workshops on wastewater management for students & community (2 per semester).
- Karunya Technology Missions: *Water and Desalination, Wetland Conservation, Smart Farming*.
- Public outreach: Students trained to test water quality in nearby villages using field kits.

Impact Summary

Impact Parameter	Status / Value	Description
Treated Water Reuse Rate	100%	Supports zero untreated discharge
Biogas Fuel Offset	~6–7 LPG cylinders/day	Reduced fossil fuel dependence
Overflow Loss Reduction	~10%	IoT-based automated control
Groundwater Recharge	Consistently improving	Due to soak pit + pond integration
Pollution Control Compliance	Achieved	Green Audit

Governance & Monitoring

- Monitoring Dashboard: IoT-based flow and level system logging real-time data.
- Verification: Green Audit Committee; annual report to IQAC.
- Calibration: Flow meters and TDS meters verified by PHED annually.

Evidences and Supporting Documents

1. STP and Biogas Log Registers (2023–24)
2. IoT Database
3. Water Quality Reports- Testing Record
4. Green Audit Summary Report 2024
5. Environmental Sustainability Policy (Section 5)

KITS has evolved into a zero-discharge, data-driven campus, demonstrating exemplary water pollution prevention through technology, infrastructure, and continuous governance. The integration of STPs, biogas plants, IoT monitoring, and community engagement ensures a resilient, replicable model aligned with SDG 6 (Clean Water and Sanitation) and SDG 12 (Responsible Consumption and Production).