TEERTHANKER MAHAVEER UNIVERSITY

Moradabad

Accredited with NAAC A Grade

12-B Status from UGC

14 LIFE BELOW WATER

Annual Report 2025

SUSTAINABLE DEVELOPMIENT GOAL

LIFE BELOW WATER

SUSTAINABLE DEVELOPMENT GOALS

Conserve. Protect. Restore.
Our Waters, Our Future.



Healthy Oceans,
Healthy Planet,
Better Tomorrow.

CONSERVE | PROTECT | RESTORE | SUSTAIN

SDG-14

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SDG-14

Teerthaker Mahaveer University has its commitment towards the conservation of aquatic ecosystems through research, environmental education and community-driven initiatives. Recognising the importance of healthy water bodies in sustaining biodiversity and ecological balance, the University promotes research on water pollution, aquatic ecosystem degradation and the environmental impacts of human activities.

Through interdisciplinary research, student engagement and awareness programmes, TMU encourages responsible practices for protecting rivers, lakes and other aquatic habitats. The University also promotes water conservation, pollution prevention and sustainable resource management by integrating environmental responsibility into academic and community activities. By strengthening research-led interventions, promoting environmental stewardship and encouraging collective action, TMU contributes to the broader objectives of United Nations Sustainable Development Goal 14 – Life Below Water, supporting the protection, restoration and sustainable management of aquatic ecosystems for present and future generations.

Introduction

The conservation of aquatic ecosystems is fundamental to maintaining ecological balance, protecting biodiversity and ensuring the long-term sustainability of freshwater and marine resources. SDG-14 Life Below Water, calls for the conservation and sustainable use of aquatic resources by addressing water pollution, ecosystem degradation and unsustainable resource utilization. Recognizing the interdependence of terrestrial and aquatic environments, TMU integrates aquatic ecosystem protection into its institutional policies, environmental infrastructure, academic programmes and community engagement initiatives.

TMU adopts a preventive and resource-conscious approach to aquatic ecosystem conservation through systematic wastewater management, supported by Sewage Treatment Plants (STPs), Effluent Treatment Plants (ETPs) and its Zero Liquid Discharge (ZLD) commitment. These interventions aim to prevent untreated wastewater from contaminating natural water bodies, promote wastewater treatment and facilitate the responsible reuse of treated water for non-potable applications. Institutional water management practices further strengthen pollution prevention and reduce pressure on freshwater resources.

Beyond campus infrastructure, the University extends its commitment through community outreach, environmental awareness and interdisciplinary academic engagement. The College of Agriculture Sciences promotes sustainable agricultural practices, responsible water utilization and awareness of water-related ecological challenges, while the College of Engineering and other relevant academic departments contribute through civil engineering perspectives, environmental technologies, wastewater management and pollution-control initiatives. Student participation, awareness programmes and NSS led community-based activities reinforce the importance of protecting aquatic habitats and preventing water contamination.

Through its environmental policies, wastewater treatment infrastructure, resource-reuse practices and collaborative academic initiatives, TMU seeks to translate SDG 14 from a global sustainability commitment into measurable institutional action. By connecting responsible water management on campus with ecological awareness and community participation, the University strengthens its contribution towards healthier aquatic ecosystems, pollution prevention and the sustainable protection of Life Below Water.

Publications on Various SDGs		
S. NO	**Sustainable Development Goals**	**No of Publications**
1.	No poverty	**12**
2.	Zero hunger	**79**
3.	Good health and well-being	**600**
4.	Quality Education	**246**
5.	Gender equality	**52**
6.	Clean water and sanitation	**43**
7.	Affordable and clean energy	**62**
8.	Decent work and economic growth	**440**
9.	Industry, innovation, and infrastructure	**465**
10.	Reduced inequalities	**20**
11.	Sustainable cities and economies	**65**
12.	Responsible consumption and production	**170**
13.	Climate action	**45**
14.	Life below water	**9**
15.	Life on land	**43**
16.	Peace, justice, and strong institutions	**59**
17.	Partnership for the Goals	**205**

14.1 Research on Life Below Water

S. No	Title of Paper	Author	Journal Name	Year of Publication	ISSN
1	Awareness and Adoption of Eco-Friendly Packaging among Youth: Perceptions, Influencing Factors, and Adoption Intentions	Sethi, Asmeet Kaur;	International Journal of Environmental Sciences	2025	2229-7359
2	Describe the various aspects of climate change, including temperature fluctuations, changes in precipitation patterns, and increased frequency of extreme weather events	RAM KUMAR GARG	International Journal of Environmental Sciences	2025	2229-7359
3	Awareness and Adoption of Eco-Friendly Packaging among Youth:Perceptions, Influencing Factors, and Adoption Intentions	AK Sethi, Bindoo Malviya	International Journal of Environmental Sciences	2025	2229-7359
4	Computer vision in Environmental Monitoring automated detection for biodiversity and climate action	ANIL KUMAR SINGH	International Journal of Environmental Sciences	2025	2229-7359
5	Green Packaging AND Purchase Intention: An Analysis OF Consumer Perception AND Loyalty	Asmeet Kaur Sethi, Dr. Bindoo Malviya	International Journal of Environmental Sciences	2025	2229-7359

6	A Review on Role of Zeolites in Next-Generation Wastewater Treatment and Resource Recovery	NAVNEET KUMAR	International Journal of Environmental Sciences	2025	2229-7359
7	Biogeochemistry Of Pharmaceutical Compounds In Aquatic Ecosystems	ABHISHEK ANAND	International Journal of Environmental Sciences	2025	2229-7359
8	Intelligent node identification and dynamic clustering for underwater acoustic sensor networks	GULISTA KHAN	Discover Computing	2025	2948-2984
9	VEER: a void-aware energy efficient routing algorithm for underwater wireless sensor networks	GULISTA KHAN	Scientific Reports	2025	2045-2322

Teerthanker Mahaveer University (TMU) undertakes direct research and collaborative engagement initiatives aimed at maintaining and enhancing ecosystems and their biodiversity, including those under ecological stress. Through interdisciplinary projects, industry partnerships, and targeted environmental interventions, TMU focuses on protecting both aquatic and terrestrial ecosystems surrounding the Moradabad region. These actions are embedded within the University's broader sustainability strategy, aligning institutional academic expertise with tangible conservation outcomes.

14.2.1 – Fresh-water Ecosystems (Community Outreach)

TMU emphasizes responsible water utilization, pollution prevention and the protection of freshwater resources through infrastructure-led interventions and awareness programmes.

A key component of this commitment is the University's 1.5 MLD Sewage Treatment Plant (STP) and 200 KLD Effluent Treatment Plant (ETP), which support systematic wastewater treatment and

help prevent untreated sewage and industrial effluents from contaminating natural water bodies. The treated wastewater is channeled towards appropriate non-potable reuse applications, including horticulture and agricultural irrigation, reducing dependence on freshwater extraction.

TMU further strengthens water-use efficiency through sprinkler-based irrigation systems, which enable controlled water distribution and minimise avoidable irrigation losses. Its 10-million-litre rainwater conservation lake provides an important institutional intervention for rainwater storage, water conservation and strengthening local water-resource resilience. These initiatives collectively demonstrate the University's commitment to integrating water conservation into campus operations and promoting responsible freshwater management.

Beyond institutional infrastructure, the University encourages environmental awareness and community participation through academic and outreach initiatives involving the College of Agriculture Sciences, Civil Engineering programmes and student engagement platforms. These activities provide opportunities to disseminate knowledge on efficient irrigation, wastewater reuse, freshwater pollution prevention and sustainable water-resource management among students and surrounding communities.

Key institutional interventions and evidence

Intervention	**Institutional provision**	**SDG 14.2.1 contribution**
Sewage Treatment Plant	1.5 MLD	Wastewater treatment and freshwater pollution prevention
Effluent Treatment Plant	200 KLD	Treatment of wastewater before appropriate discharge or reuse
Rainwater conservation lake	10 million litres	Rainwater conservation and freshwater-resource resilience
Sprinkler irrigation	Campus irrigation system	Controlled irrigation and improved water-use efficiency
Treated wastewater reuse	Horticulture and agriculture	Reduces pressure on freshwater resources

Community outreach	Agriculture and Civil Engineering initiatives	Dissemination of freshwater conservation practices

In continuation to this University curriculum integrates the notion of sustainability in its programs and courses. B.Tech Civil Engineering curriculum also contributes to Water Management Education by integrating water-resource conservation, sustainable water infrastructure, environmental protection and scientific water management into engineering education. Courses such as Public Health & Environmental Engineering, Hydrology & Irrigation Engineering, Groundwater Management, Fluid Mechanics, and Design of Hydraulic Structures equip students with the technical knowledge to understand water systems, manage freshwater resources, improve irrigation efficiency and support sustainable water infrastructure. With this multidisciplinary academic approach, TMU prepares future civil engineers to apply scientific principles to water conservation, groundwater protection, pollution control, efficient water use and integrated water-resource management.

Course title	Course code	Syllabus-Relevance with SDG
Public Health & Environmental Engineering	ECE612	Water supply, water/wastewater characteristics, wastewater treatment and sewage disposal.
Public Health & Environmental Engineering (Lab)	ECE661	Lab outcomes cover water/wastewater characteristics, comparison with standards and treatment analysis, listed tests include turbidity/colour, pH, hardness, residual chlorine, alkalinity, TSS/TDS, BOD, COD and fluoride.
Environmental Studies	TMU101	Broad environmental foundation. Water-related units like water resources, pollution, conservation or aquatic ecosystems.
Engineering Chemistry (Lab)	EAS163/263	Syllabus lists water-analysis experiments including hardness, alkalinity, pH, dissolved oxygen, wastewater COD, free chlorine and chloride.
Fluid Mechanics	ECE311	Fluid-flow principles underpin water conveyance and hydraulic systems
Hydrology & Irrigation Engineering	ECE515	Hydrology and irrigation relate to water availability, efficient use, integrated water-resource management and freshwater systems.

Groundwater Management	ECE724	Syllabus includes groundwater assessment, aquifers, artificial recharge/rainwater harvesting, groundwater quality, pollution and monitoring.
Solid and Hazardous Waste Management	ECE734	Potential topics where teaching addresses leachate, hazardous-waste handling and prevention of releases to water.
Design of Hydraulic Structures	ECE812	Syllabus includes dams/storage, diversion headworks, canal regulation, cross-drainage works, river training and hydropower schemes.
Environmental Impact Assessment and Management	ECE816	Syllabus includes water impacts, baseline data, mitigation, environmental management plans, monitoring and auditing.
Project Work / Industrial Training	ECE798 / ECE898 / ECE792	Projects on water supply, sanitation, wastewater, water efficiency, groundwater or aquatic ecosystems.

Source: https://www.tmu.ac.in/faculty-of-engineering/syllabus

TMU emphasizes the translation of water-related knowledge into practical understanding. Engagement initiatives address rainwater harvesting, wastewater treatment, water recycling, pollution prevention and efficient water use in agriculture and landscape management. By bringing together academic expertise and real-world applications, these activities encourage participants to recognise the relationship between water security, ecosystem protection, public health and community resilience.

Key Areas of Engagement and Learning

- **Knowledge Dissemination:** Seminars, awareness programmes and expert interactions introduce participants to sustainable water governance, river conservation and responsible water-use practices, including engagement with environmental experts such as Raman Kant, known for his work in river conservation.
- **Demonstration-Based Education:** Campus water infrastructure, including rainwater harvesting facilities and sewage treatment systems, provides a potential learning environment for understanding water treatment, resource recovery and responsible reuse.

- **Community Outreach:** Engagement with surrounding villages, schools and local stakeholders provides opportunities to communicate practical water conservation measures and strengthen awareness of water pollution prevention and safe water practices.
- **Agricultural and Landscape Applications:** Educational activities highlight water-efficient irrigation, appropriate reuse of treated wastewater and responsible landscape management, subject to applicable quality and safety requirements.

TEERTHANKER MAHAVEER UNIVERSITY
(Established under Govt. of U.P. Act No. 30, 2008)
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Dean Students' Welfare
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Email : studentswelfare@tmu.ac.in
Extn.- 4015 & 4016

Ref. No.: TMU/DSW/2026/009 **Date: 14-May-2026**

CIRCULAR

Subject: Information regarding organization of activities under the Mission LiFE activities during World Environment Day (WED) 2026 Pre – Campaign - Registration (15 May 2026 – 05 June 2026).

In reference to the above cited subject and in compliance of letter no. -1-1/2026(Mission LiFE) dated: 11th May, 2026 issued from सचिव, विश्वविद्यालय अनुदान आयोग) UGC), शिक्षा मंत्रालय, भारत सरकार Faculty Advisors, Environment Club and College NSS Coordinators, Teerthanker Mahaveer University are hereby informed that the following activities are to be organized at the University level as per the schedule mentioned below:

S. N.	Activity	Date	Venue	Responsibility	Coordinator
1	Save Water	16-MAY-26	LT, Faculty of Education	**Environment Club in association with NSS UNIT**	1. **Dr. Vinod Kumar Jain** Faculty Advisor, Environment Club 2. **Dr. Sunil Kumar Pandey** NSS Coordinator, Faculty of Education
2	Save Energy	16-MAY-26			
3	Say No to single use Plastic	23-May-26			
4	Adapted sustainable Food System	23-May-26			
5	Reduce Waste	03-June-26	LT, College of Para-medical		1. **Dr. Shreya Thakral** Faculty Advisor, Environment Club 2. **Dr. Baijnath Das** NSS Coordinator, College of Paramedical
6	Reduce E-Waste	04-June-26			
7	Healthy Lifestyle	05-June-26			

You are kindly requested to conduct the activities as per the above plan and submit the detailed report in the prescribed format to Mr. Ravi Prakash, NSS Coordinator, on or before **06 June 2026**. For any assistance, he may be contacted on **9415058287**.

TEERTHANKER MAHAVEER UNIVERSITY
DEAN
STUDENTS' WELFARE
MORADABAD

Prof. (Dr.) M. P. Singh
Dean Students' Welfare



Event Creative

TEERTHANKER MAHAVEER UNIVERSITY

ENVIRONMENT CLUB REPORT

Name of Activity	**SAVE WATER AWARENESS ACTIVITY**
Date of Activity	16th May, 2026
Offline/Online	Offline
Theme of activity	**SAVE WATER**
Advisors	Dr. Vinod Kumar Jain & Ms. Shreya Thakral
Secretary	Mr. ANSH JAIN
Total no. of Participants	40
Brief Report of Activity	The Faculty of Education, Teerthanker Mahaveer University, Moradabad, in association with the National Service Scheme (NSS), Unnat Bharat Abhiyan, and Environment Club, successfully organized a "Save Water Awareness Activity" on 16th May, 2026 at 10:00 AM in the Lecture Theatre of the Faculty of Education. The programme aimed to create awareness among students regarding the importance of water conservation and sustainable use of natural resources. The programme began with the welcome of the guests and participants. The chief speakers of the activity were **Dr Vinod Kumar Jain, Dr. Pawas Kumar Mandal, Dr. Ravi Prakash Singh, and Dr. Ranjeet Singh**. They addressed the students on the growing water crisis and emphasized the importance of conserving every drop of water for future generations. The speakers discussed practical measures such as rainwater harvesting, prevention of water wastage, fixing leakages, and adopting water-efficient practices in daily life. Students actively participated in the programme and took a pledge to conserve water and spread awareness in society. The activity inspired participants to contribute towards environmental protection and sustainable development. The programme concluded with a vote of thanks and the message, "Save Water, Save Life." . **Prepared by:** **ANSH JAIN** Secretary, Environment Club Club

Approval by- 16/05/2026

Event Report

तीर्थंकर महावीर विश्वविद्यालय, मुरादाबाद

प्रेस विज्ञप्ति

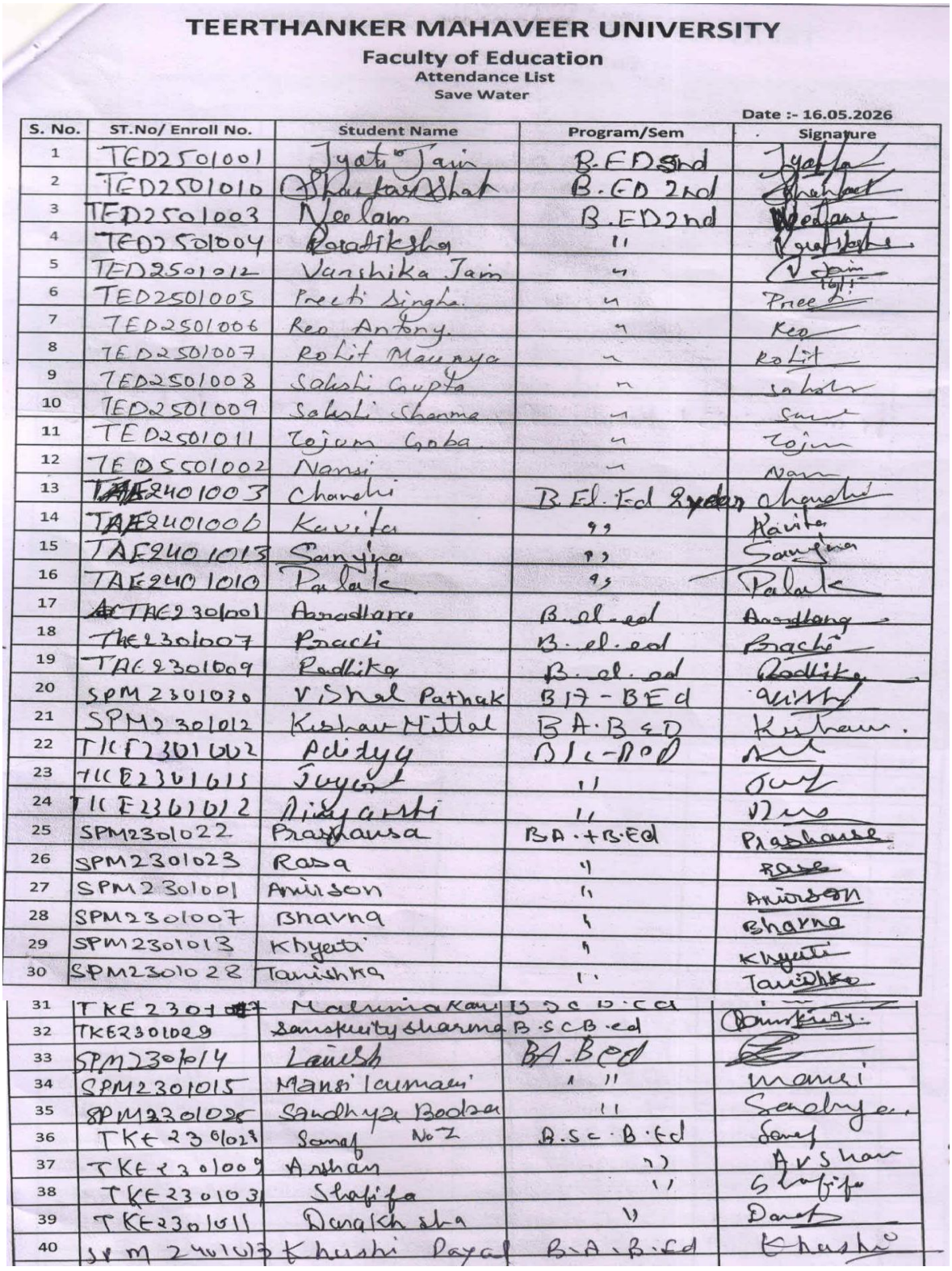
दिनांक: 16 मई, 2026

तीर्थंकर महावीर विश्वविद्यालय, मुरादाबाद के फैकल्टी ऑफ एजुकेशन द्वारा राष्ट्रीय सेवा योजना (NSS), उन्नत भारत अभियान एवं एनवायरनमेंट क्लब के संयुक्त तत्वावधान में "सेव वाटर अवेयरनेस एक्टिविटी" का आयोजन सफलतापूर्वक किया गया। यह कार्यक्रम फैकल्टी ऑफ एजुकेशन के लेक्चर थिएटर में प्रातः 10:00 बजे आयोजित हुआ। कार्यक्रम का मुख्य उद्देश्य विद्यार्थियों एवं समाज में जल संरक्षण के प्रति जागरूकता फैलाना तथा प्राकृतिक संसाधनों के सतत उपयोग का संदेश देना था।

कार्यक्रम का शुभारम्भ अतिथियों के स्वागत के साथ हुआ। इस अवसर पर मुख्य वक्ता के रूप में डॉ. विनोद कुमार जैन, डॉ. पवास कुमार मंडल, डॉ. रवि प्रकाश सिंह एवं डॉ. रंजीत सिंह उपस्थित रहे। वक्ताओं ने अपने प्रेरणादायी विचार व्यक्त करते हुए कहा कि वर्तमान समय में जल संकट एक गंभीर वैश्विक समस्या बन चुका है तथा यदि समय रहते जल संरक्षण के प्रभावी उपाय नहीं अपनाए गए तो भविष्य में स्थिति और अधिक चिंताजनक हो सकती है।

वक्ताओं ने विद्यार्थियों को वर्षा जल संचयन, जल की अनावश्यक बर्बादी रोकने, जल रिसाव को समय पर ठीक कराने तथा दैनिक जीवन में जल बचत की आदतों को अपनाने के लिए प्रेरित किया। उन्होंने यह भी बताया कि "जल है तो कल है" केवल एक नारा नहीं, बल्कि मानव जीवन के अस्तित्व से जुड़ा संदेश है।

कार्यक्रम में लगभग 55 विद्यार्थियों ने सक्रिय सहभागिता की तथा जल संरक्षण की शपथ ली। विद्यार्थियों ने समाज में जागरूकता फैलाने और पर्यावरण संरक्षण हेतु कार्य करने का संकल्प लिया। कार्यक्रम का समापन धन्यवाद ज्ञापन के साथ हुआ।



TEERTHANKER MAHAVEER UNIVERSITY

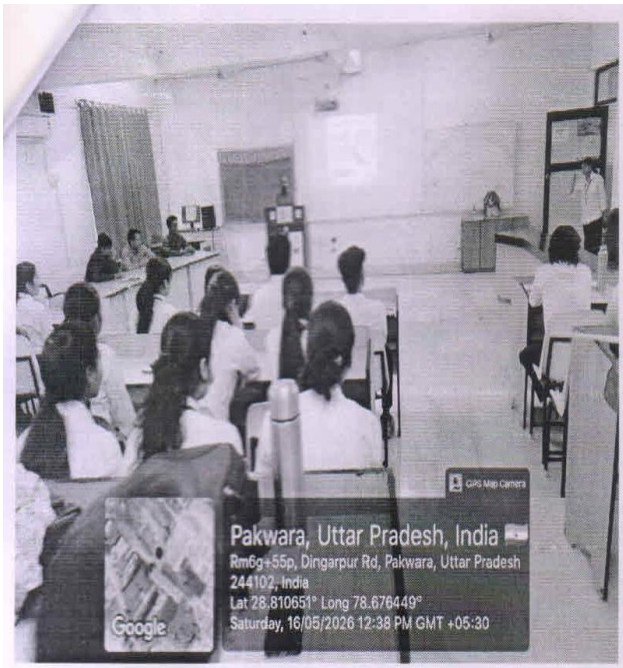
Faculty of Education

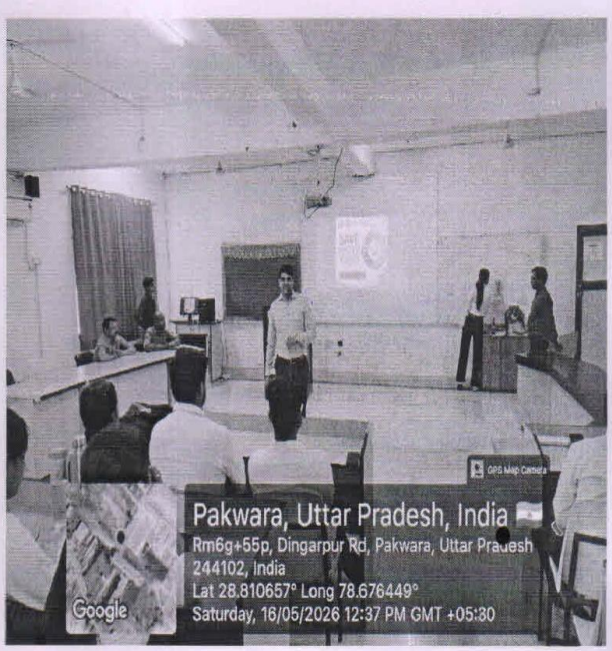
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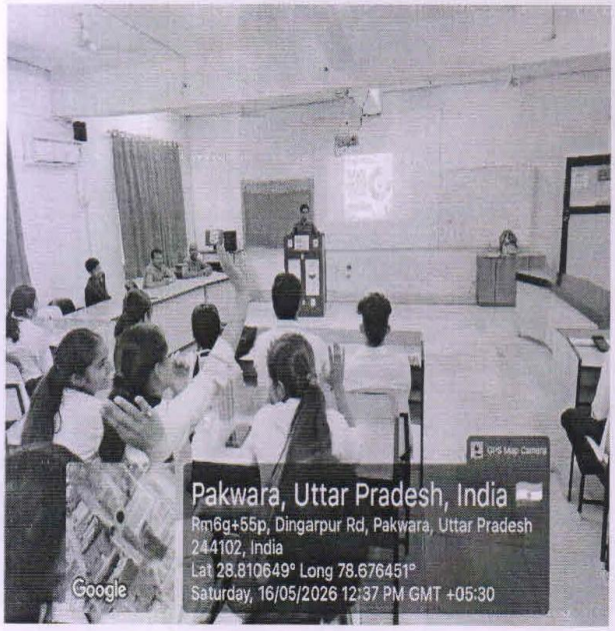
Save Water

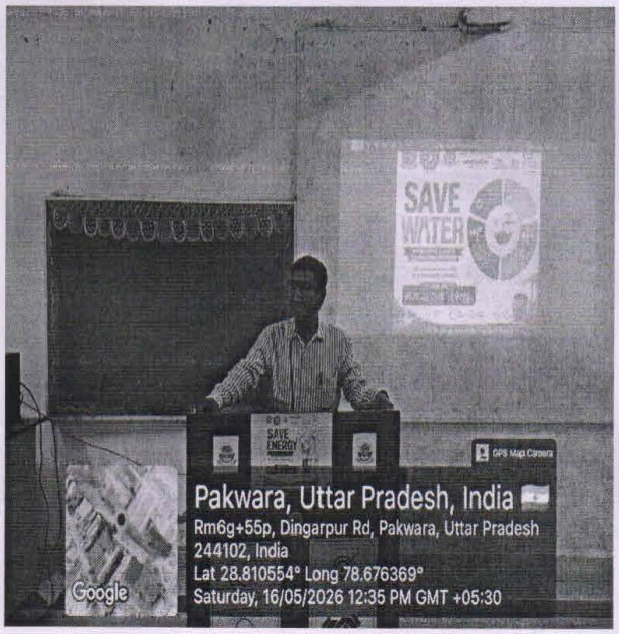
Date :- 16.05.2026

S. No.	ST.No/ Enroll No.	Student Name	Program/Sem	Signature
1	TED2501001	Jyoti Jain	B.ED 2nd	
2	TED2501010	[illegible]	B.ED 2nd	
3	TED2501003	Neelam	B.ED 2nd	
4	TED2501004	Pratiksha	"	
5	TED2501012	Vanshika Jain	"	
6	TED2501005	Preeti Singha	"	
7	TED2501006	Rea Antony	"	
8	TED2501007	Rolit Maurya	"	
9	TED2501008	Sakshi Gupta	"	
10	TED2501009	Sakshi Sharma	"	
11	TED2501011	Tejum Goba	"	
12	TED2501002	Nansi	"	
13	TAE2401003	Chanchi	B.El.Ed 2nd	
14	TAE2401006	Kavita	"	
15	TAE2401013	Sanyjna	"	
16	TAE2401010	Palak	"	
17	TAE2301001	Anadhana	B.el.ed	
18	TKE2301007	Prachi	B.el.ed	
19	TAE2301009	Radhika	B.el.ed	
20	SPM2301030	Vishal Pathak	B17 - BEd	
21	SPM2301012	Kishan Mittal	BA.B.ED	
22	TKE2301002	Adity	BSc-BEd	
23	TKE2301015	Jugal	"	
24	TKE2301012	Aishwarya	"	
25	SPM2301022	Prathamsa	BA.+B.Ed	
26	SPM2301023	Rasa	"	
27	SPM2301001	Anirson	"	
28	SPM2301007	Bhavna	"	
29	SPM2301013	Khyati	"	
30	SPM2301028	Tanishka	"	
31	TKE2301[illegible]	Malvina Kaur	B.Sc.B.Ed	
32	TKE2301029	Sanskruty Sharma	B.Sc.B.ed	
33	SPM2301014	Lavish	BA.B.Ed	
34	SPM2301015	Mansi Jaiman	"	
35	SPM2301026	Sandhya Bodra	"	
36	TKE2301023	Sonaf No 2	B.Sc.B.Ed	
37	TKE2301009	Arshan	"	
38	TKE2301031	Shafija	"	
39	TKE2301011	Dangish sha	"	
40	SPM2401013	Khushi Payal	B.A.B.Ed	


Pakwara, Uttar Pradesh, India
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Saturday, 16/05/2026 12:38 PM GMT +05:30
Google


Pakwara, Uttar Pradesh, India
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Google


SAVE WATER
SAVE ENERGY
Pakwara, Uttar Pradesh, India
Rm6g+55p, Dingarpur Rd, Pakwara, Uttar Pradesh 244102, India
Lat 28.810554° Long 78.676369°
Saturday, 16/05/2026 12:35 PM GMT +05:30
Google



Water Conservation Lake



SBR tank I and II at STP

Initiatives and Activities:

TMU conducts a series of educational and outreach programmes under its Environmental Studies Department and NSS Unit, focusing on:

- **Water conservation practices** and sustainable irrigation awareness for local farmers in the Moradabad district.
- **Training workshops** on rainwater harvesting, groundwater recharge, and wastewater reuse, conducted by the Faculty of Engineering and College of Agricultural Sciences.
- **Community campaigns** under the theme "Save Water, Secure Life," held annually in collaboration with the Municipal Corporation of Moradabad, educating residents on efficient household water management.
- **Student engagement drives** for cleaning and monitoring nearby freshwater bodies such as Ram Ganga river tributaries, emphasizing pollution reduction and biodiversity conservation.





Students Proudly Participating in the Namami Gange Initiative to Restore and Protect our Sacred River.

14.2.2 Sustainable Fisheries (Community Outreach)

Although TMU is geographically located inland, away from coastal and marine ecosystems, it recognises that the sustainability of fisheries and aquatic biodiversity is intrinsically linked to the health of freshwater systems, water quality and the prevention of pollution at its source. The University therefore extends its contribution to sustainable fisheries through an integrated approach encompassing responsible water management, wastewater treatment, pollution prevention, academic engagement and community outreach.

TMU's institutional water management framework emphasises the treatment and responsible reuse of wastewater through its Sewage Treatment Plants (STPs) and Effluent Treatment Plants (ETPs), alongside its Zero Liquid Discharge (ZLD) commitment. These systems are designed to minimise the discharge of untreated wastewater, reduce the risk of contamination of natural water bodies and prevent pollutants from entering interconnected freshwater ecosystems that sustain aquatic organisms and inland fisheries. The reuse of treated wastewater for appropriate non-potable applications further reduces freshwater extraction and strengthens resource conservation.

TMU extends this environmental responsibility beyond its campus through awareness and outreach initiatives involving its academic departments, particularly the College of Agricultural Sciences and Civil Engineering. Academic engagement focuses on the relationship between water quality, sustainable agricultural practices, wastewater management and freshwater ecosystem protection. Community-oriented programmes promote responsible water utilisation, pollution prevention, protection of local ponds and water bodies, and awareness of the ecological consequences of agricultural runoff and untreated wastewater.

Through student participation, environmental education and interdisciplinary knowledge dissemination, TMU encourages communities to recognise that protecting freshwater resources is essential for maintaining healthy aquatic habitats and supporting sustainable inland fisheries. Its approach connects institutional wastewater management with broader ecosystem conservation, demonstrating how an inland university can contribute to the objectives of sustainable fisheries by addressing one of their most critical foundations: clean, healthy and ecologically balanced water systems.

Institutional contribution and impact

- **Pollution Prevention:** Zero Liquid Discharge commitment aims to minimise wastewater discharge and protect receiving water bodies from contamination.
- **Responsible Water Utilisation:** Reuse of treated wastewater for suitable non-potable purposes reduces pressure on freshwater resources.
- **Community Outreach:** Environmental awareness and educational engagement encourage responsible water practices and protection of local freshwater ecosystems.

By integrating wastewater treatment, responsible water utilisation, pollution prevention and community-based environmental education, TMU addresses the upstream environmental pressures that directly influence freshwater biodiversity and inland fisheries. Its institutional approach demonstrates that sustainable fisheries conservation is not limited to coastal interventions; it also requires protecting the quality and ecological integrity of inland water systems through responsible management at the source.

14.2.3 Overfishing (Community Outreach)

TMU recognises that the conservation of aquatic biodiversity and the prevention of overexploitation of aquatic resources extend beyond coastal boundaries. The University adopts a land-to-water conservation approach, acknowledging that responsible freshwater management, pollution prevention and sustainable resource utilization are interconnected with the health of downstream aquatic ecosystems.

TMu's water management framework promotes practices that help reduce the pollution pressures affecting rivers, wetlands and other aquatic habitats. Its Sewage Treatment Plants (STPs), Effluent Treatment Plants (ETPs), wastewater reuse initiatives and Zero Liquid Discharge commitment strengthen preventive measures against the discharge of untreated wastewater into natural water systems. These interventions contribute to maintaining water quality and protecting aquatic habitats that support fish populations and freshwater biodiversity.

Community sensitization also highlights the role of sustainable livelihoods, responsible fish consumption and protection of aquatic breeding habitats.

TMU contributes to the broader objective of reducing anthropogenic pressures on aquatic ecosystems. Its inland institutional setting reinforces the importance of addressing the sources of aquatic degradation on land, demonstrating that the responsibility to prevent overfishing and conserve aquatic biodiversity is not confined to coastal communities but is a shared responsibility across the entire watershed.

Evidence area	Institutional Practices
Overfishing awareness	Expert lectures, student campaigns and community awareness programmes on overfishing and fish biodiversity.
Freshwater fish conservation	Outreach on responsible fishing practices and protection of breeding grounds in local water bodies.
Sustainable livelihoods	Engagement with inland fishing communities, fish farmers and fisheries cooperatives.
Water pollution prevention	STP/ETP operational records, treated wastewater quality reports and reuse data.
Academic engagement	Agriculture and Civil Engineering student projects on freshwater ecosystems, water quality and aquatic biodiversity.
Responsible consumption	Awareness initiatives promoting legally sourced and responsibly produced fish products.

14.3.1 Conservation and Sustainable Utilisation of the Oceans (Events)

TMU recognises that the protection of oceans begins with responsible management of freshwater resources, prevention of water pollution and the conservation of interconnected aquatic environments. Accordingly, the University extends its contribution to SDG 14 through environmental education, expert-led events, international academic collaborations, wastewater treatment infrastructure and sustainable campus water management.

1. Ganga Rejuvenation and Community Environmental Awareness

Ganga Rejuvenation Awareness Programme

Ganga Champions Club of TMU organised an environmental awareness programme on **12 May 2025** bringing together environmental experts, students and change-makers to highlight the importance of Ganga rejuvenation and the protection of freshwater ecosystems.

The programme reinforced the relationship between river health, aquatic biodiversity, pollution prevention and sustainable water utilisation. Through expert interactions and student engagement, the initiative promoted environmental responsibility and the importance of collective action in safeguarding river ecosystems. By connecting freshwater conservation with the broader health of aquatic environments, TMU extends the relevance of SDG 14 beyond geographical boundaries.

Link: https://www.tmu.ac.in/news/tmu-hosts-national-seminar-on-ganga-rejuvenation-and-water-sustainability

2. International Academic Collaboration: University Putra Malaysia – Tree, Tech & Tradition

International Environmental and Academic Exchange

TMU collaborated with Universiti Putra Malaysia to organise a two-day international programme under the theme Tree, Tech & Tradition.

A dedicated component of the programme addressed global environmental challenges, with presentations and research exchanges focusing on marine ecosystem preservation and the growing threat of microplastic pollution in oceans. The academic engagement broadened students' understanding of marine biodiversity, emerging aquatic pollutants and the importance of technological innovation and international cooperation in addressing environmental degradation.

The collaboration provided an important platform for connecting local environmental responsibility with global marine conservation priorities, reinforcing the University's commitment to sustainability-oriented international knowledge exchange.

Link: https://www.tmu.ac.in/news/tmu-and-university-putra-malaysia-host-international-e-mobility-programme-on-tree-tech-tradition

3. Institutional Water Management: Preventing Pollution and Protecting Aquatic Ecosystems

Recognising that the health of rivers and oceans is significantly influenced by pollution originating from land-based activities, TMU places emphasis on wastewater treatment, pollution prevention and responsible water utilisation across its campus. The University's environmental management framework integrates Sewage Treatment Plants (STPs), Effluent Treatment Plants (ETPs) and a Zero Liquid Discharge (ZLD) approach to minimise the risk of untreated wastewater entering natural water systems.

The University's wastewater management infrastructure includes:

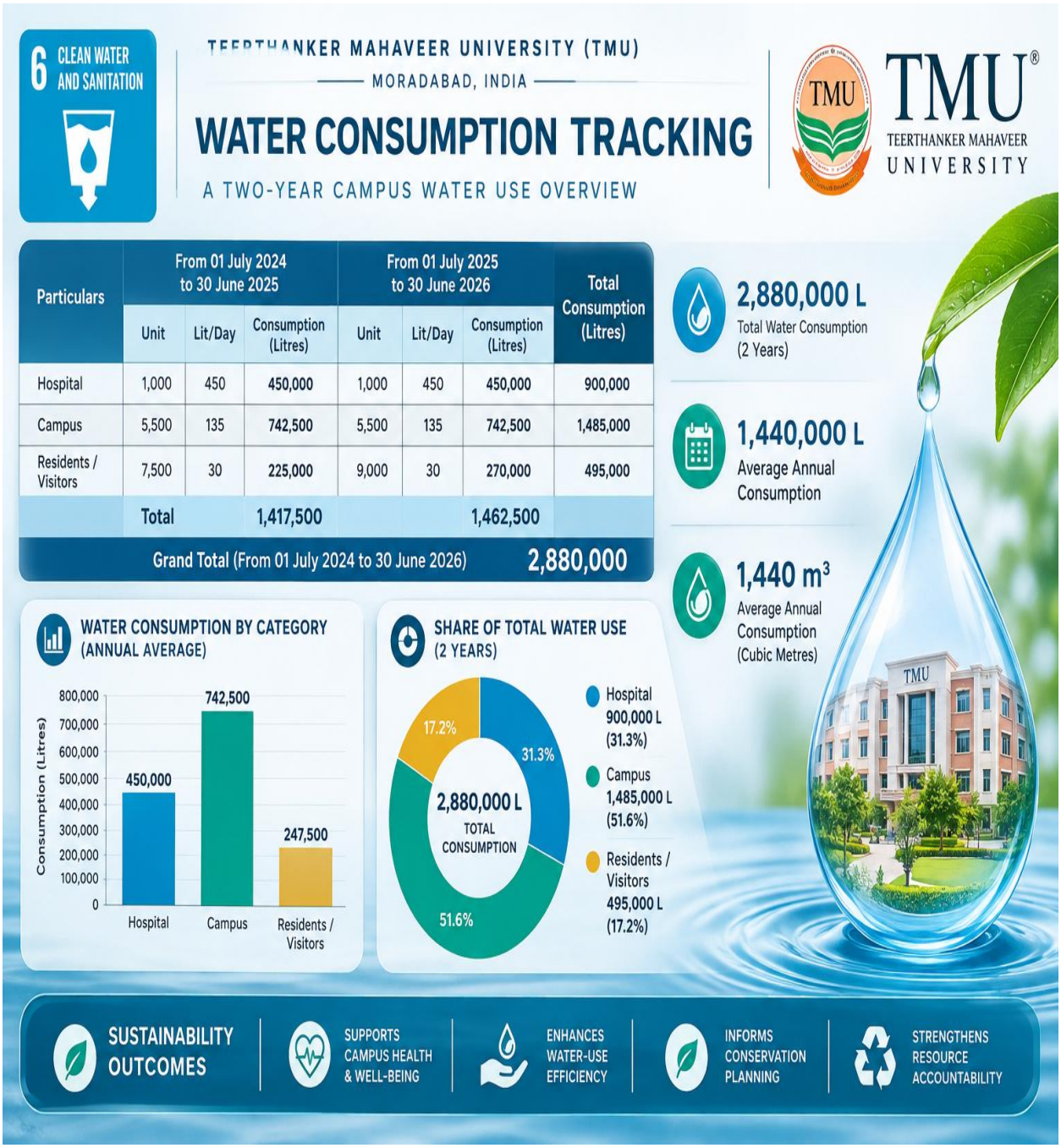
- **Sewage Treatment Plant (STP)**: A 1.5 MLD treatment facility designed to treat campus-generated sewage and facilitate the reuse of treated wastewater.
- **Effluent Treatment Plant (ETP):** A 200 KLD facility supporting the treatment of wastewater generated through relevant institutional activities.
- **Zero Liquid Discharge (ZLD):** An institutional approach aimed at preventing untreated liquid effluent discharge and promoting maximum recovery and reuse of treated wastewater.
- **Treated Water Reutilization:** Reuse of treated wastewater for horticulture, landscaping and agricultural applications, reducing dependence on freshwater resources.

These interventions contribute to reducing land-based sources of water pollution, conserving freshwater resources and supporting the protection of downstream aquatic ecosystems.

4. Sustainable Water Utilisation and Resource Conservation

TMU further strengthens its contribution through systematic water conservation, wastewater recycling and resource optimisation. Its water management strategy connects treatment infrastructure with practical reuse applications across campus operations.

The University has identified the following daily water management requirements and reuse priorities:



Through these initiatives, the University seeks to reduce freshwater extraction, minimise wastewater discharge and strengthen the sustainable utilisation of water resources. Such practices

address an important dimension of aquatic conservation by preventing pollution at its source and reducing the potential environmental burden on connected freshwater and marine ecosystems.

5. Academic Engagement and Community Outreach

TMU extends aquatic conservation awareness beyond infrastructure through interdisciplinary education and community participation. The Faculty of Agricultural Sciences and relevant environmental and engineering disciplines provide opportunities to connect academic knowledge with practical water and ecosystem management challenges.

Activities and educational engagement focus on:

- River rejuvenation, freshwater biodiversity and aquatic habitat protection.
- Sustainable agricultural water management and prevention of water contamination.
- Awareness of microplastic pollution and its implications for aquatic organisms.
- Responsible utilisation of aquatic resources and sustainable fisheries.
- Community participation in water conservation and pollution prevention.
- Student-led environmental awareness campaigns and expert interactions.

These initiatives encourage students to understand the relationship between land-based activities, freshwater ecosystems and marine environmental health.

6. Overall Contribution and Environmental Impact

TMU's approach to SDG 14 recognises that meaningful ocean conservation requires action beyond coastal boundaries. Through Ganga rejuvenation awareness, international knowledge exchange with Universiti Putra Malaysia, wastewater treatment infrastructure, its ZLD commitment and sustainable water management practices, the University addresses important land-based pressures on aquatic ecosystems.

By integrating environmental education with institutional infrastructure and community outreach, TMU promotes a preventive approach to aquatic pollution, responsible freshwater utilisation and biodiversity conservation. These efforts establish a connection between campus-level

environmental responsibility and the global objective of protecting oceans, rivers and aquatic ecosystems for future generations.

TMU demonstrates that geographical distance from coastlines does not limit institutional responsibility towards ocean conservation. By connecting river rejuvenation, international environmental collaboration, pollution prevention, wastewater treatment and sustainable water utilisation, the University translates the global vision of SDG 14 into actionable campus and community-level environmental stewardship.

14.3.2- Food from Aquatic Ecosystems (Policies)

TMU is committed to ensuring that food products derived from aquatic ecosystems and served across its campus are sourced through sustainable, responsible and legally compliant supply chains. Through its Sustainable Procurement and food Policy, the University establishes an institutional framework for promoting the responsible consumption of indigenous aquatic and wetland-derived food products, including makhana, water chestnut, lotus seeds, lotus stem and other vegetables.

Category	Approved food products	Scientific name
Aquatic seeds	Makhana	Euryale ferox
Aquatic fruits	Singhara	Trapa natans / Trapa bispinosa
Aquatic seeds	Lotus seeds	Nelumbo nucifera
Aquatic vegetables	Lotus stem	Nelumbo nucifera
Aquatic leafy vegetables	Water spinach	Ipomoea aquatica

The University further promotes supplier verification, compliance with applicable environmental and food-safety regulations. Through this policy-led approach, TMU integrates aquatic biodiversity conservation into its institutional food system, transforming everyday campus procurement into an instrument of environmental responsibility. The initiative reinforces the University's commitment to sustainable consumption, aquatic ecosystem protection and the long-term conservation of resources under SDG 14 – Life Below Water.

14.3.3- Maintain Ecosystems and Their Biodiversity (Direct Work)

TMU promotes the conservation of aquatic ecosystems and their biodiversity through research-oriented food systems, sustainable agricultural practices and responsible resource management. The University encourages research and academic initiatives that strengthen the relationship between food production, biodiversity conservation and ecological sustainability.

Through the research and academic engagement of its College of Agriculture Sciences, the University promotes awareness of sustainable cultivation practices, aquatic plant resources, biodiversity conservation and environmentally responsible food production. Research on aquatic and wetland-associated food crops, their cultivation potential, nutritional value and sustainable utilisation can contribute to reducing pressure on naturally occurring aquatic resources. The University also seeks to integrate biodiversity considerations into food procurement and consumption through responsible sourcing principles, encouraging cultivated aquatic produce and discouraging destructive harvesting practices.

By connecting research, indigenous food-resource utilization and ecosystem-conscious institutional practices, TMU aims to strengthen the contribution of university research towards aquatic biodiversity conservation. These efforts reflect the University's commitment to promoting food systems that recognize ecosystem integrity, protect biological resources and support the long-term sustainability of aquatic environments.

S. No	Title of Paper	Author	Journal Name	Year of Publication	ISSN
1	Awareness and Adoption of Eco-Friendly Packaging among Youth: Perceptions, Influencing Factors, and Adoption Intentions	Sethi, Asmeet Kaur;	International Journal of Environmental Sciences	2025	2229-7359

2	Describe the various aspects of climate change, including temperature fluctuations, changes in precipitation patterns, and increased frequency of extreme weather events	RAM KUMAR GARG	International Journal of Environmental Sciences	2025	2229-7359
3	Awareness and Adoption of Eco-Friendly Packaging among Youth:Perceptions, Influencing Factors, and Adoption Intentions	AK Sethi, Bindoo Malviya	International Journal of Environmental Sciences	2025	2229-7359
4	Computer vision in Environmental Monitoring automated detection for biodiversity and climate action	ANIL KUMAR SINGH	International Journal of Environmental Sciences	2025	2229-7359
5	Green Packaging AND Purchase Intention: An Analysis OF Consumer Perception AND Loyalty	Asmeet Kaur Sethi, Dr. Bindoo Malviya	International Journal of Environmental Sciences	2025	2229-7359
6	A Review on Role of Zeolites in Next-Generation Wastewater Treatment and Resource Recovery	NAVNEET KUMAR	International Journal of Environmental Sciences	2025	2229-7359
7	Biogeochemistry Of Pharmaceutical Compounds In Aquatic Ecosystems	ABHISHEK ANAND	International Journal of Environmental Sciences	2025	2229-7359

8	Intelligent node identification and dynamic clustering for underwater acoustic sensor networks	GULISTA KHAN	Discover Computing	2025	2948-2984
9	VEER: a void-aware energy efficient routing algorithm for underwater wireless sensor networks	GULISTA KHAN	Scientific Reports	2025	2045-2322

Teerthanker Mahaveer University (TMU) undertakes direct research and collaborative engagement initiatives aimed at maintaining and enhancing ecosystems and their biodiversity, including those under ecological stress. Through interdisciplinary projects, industry partnerships, and targeted environmental interventions, TMU focuses on protecting both aquatic and terrestrial ecosystems surrounding the Moradabad region. These actions are embedded within the University's broader sustainability strategy, aligning institutional academic expertise with tangible conservation outcomes.

Initiatives and Activities:

TMU has engaged in the following research-based and direct ecosystem maintenance initiatives:

Biodiversity Conservation Research: The Faculty of Science conduct ongoing studies on water quality parameters, aquatic flora and fauna diversity in local freshwater bodies, and the impact of pollution on micro-ecosystems. This includes sampling and monitoring of nearby Ram Ganga river tributaries, aimed at understanding biodiversity trends and developing conservation measures.

Rainwater Harvesting and Ecosystem Recharge Projects: As part of the campus sustainability plan, TMU maintains a large rainwater harvesting and recharge lake with an approximate capacity of 1 crore litres. This project supports groundwater replenishment, improves surrounding wetland ecosystems, and provides habitats for native aquatic species and birds.

Workshops and Technical Seminars: TMU hosts seminars on Ganga rejuvenation, ecosystem restoration, and sustainable development, involving researchers, students, and industry

representatives. These events serve as platforms to develop and disseminate innovative conservation solutions.

14.3.4- Technologies towards Aquatic Ecosystem Damage Prevention (Direct Work)

Technology plays a transformative role in preventing aquatic ecosystem degradation through scientific monitoring, early detection of pollution and sustainable management of water resources. The University promotes the adoption of technology-driven approaches to protect freshwater and marine ecosystems, minimise human-induced environmental damage and strengthen biodiversity conservation.

Key technological interventions include IoT-enabled water-quality monitoring, automated wastewater treatment, real-time effluent monitoring and digital biodiversity surveillance. These technologies support the identification of contamination sources, prevention of untreated wastewater discharge, monitoring of ecosystem health and evidence-based environmental decision-making.

Wastewater Treatment

At TMU, wastewater management is an essential component of responsible water conservation, environmental protection and sustainable campus operations. With wastewater treatment infrastructure into campus resource management, we are aligned and committed to reduce the environmental risks associated with untreated effluent while creating opportunities for the productive reuse of treated water.

Our wastewater management infrastructure includes a **1.5 million litres per day (MLD) Sewage Treatment Plant (STP)** and a **200 kilolitres per day (KLD) Effluent Treatment Plant (ETP)**. These facilities provide an infrastructure base for treating sewage and relevant wastewater streams generated through campus and institutional operations. Treatment processes, supported by appropriate monitoring and operational controls, are essential to managing wastewater quality and ensuring that treated water is suitable for its intended application.



Sequencing Batch Reactor (SBR) Tank

The environmental value of wastewater treatment extends beyond the treatment facility itself. Where treated water meets the required quality standards, its reuse for suitable non-potable purposes, including horticulture, landscaping and agricultural activities, can help substitute freshwater demand and improve the efficiency of institutional water use. This resource-recovery approach also supports more circular water management by connecting wastewater treatment with the wider needs of campus operations.

Our progress under this metric is assessed through the treatment capacity of its infrastructure, the volume of wastewater actually treated, the quality of treated effluent, and the quantity reused. These indicators provide a basis for distinguishing installed capacity from operational performance and for evaluating the contribution of wastewater management to environmental sustainability.

Key Performance Statistics

- Sewage Treatment Plant (STP) installed capacity: 547.5 million litre per year
- Effluent Treatment Plant (ETP) installed capacity: 73000 kilo litre per year
- Treated wastewater reused annually: 100%

- Percentage of generated wastewater treated: 80%



Filter Tank

Preventing Water System Pollution

TMU, follows the practice of preventing water system from pollution. It is a critical environmental responsibility extending from the point of wastewater generation to its treatment, reuse, and safe management. Our preventive framework focuses on controlling potential contaminants at source, reducing the risk of accidental releases, and ensuring that wastewater from laboratories, healthcare facilities, and other operational areas is managed through appropriate treatment and handling procedures. We maintain a drainage system designed for the systematic collection and safe conveyance of wastewater and storm water across the campus. The system supports effective drainage management, which helps prevent waterlogging, and promotes campus hygiene.

The Effluent Treatment Plant (ETP) represents an important component of TMU's approach for prevention from pollution, wastewater management and sustainable campus operations. With a designed treatment capacity of 200 kilolitres per day (200,000 litres per day), the plant has the potential to treat up to 73 million litres of wastewater annually, assuming operation at full capacity for 365 days. This is equivalent to approximately 73,000 m^3 per year.

It emphasizes the responsible management of treated wastewater. From a sustainability perspective, the ETP's contribution extends beyond wastewater treatment. It supports a resource-recovery approach in which wastewater is managed as a potential source of reusable water rather than simply as a waste stream. This contribution has reduced pressure on freshwater resources, improved pollution prevention and more responsible management of water across the campus ecosystem. The plant contributes to environmental sustainability by helping reduce the risk of untreated wastewater entering drainage networks and the surrounding environment. Effective treatment, supported by routine monitoring and appropriate operating procedures, reduces the pollutant loads and improve the suitability of treated water for authorized reuse.

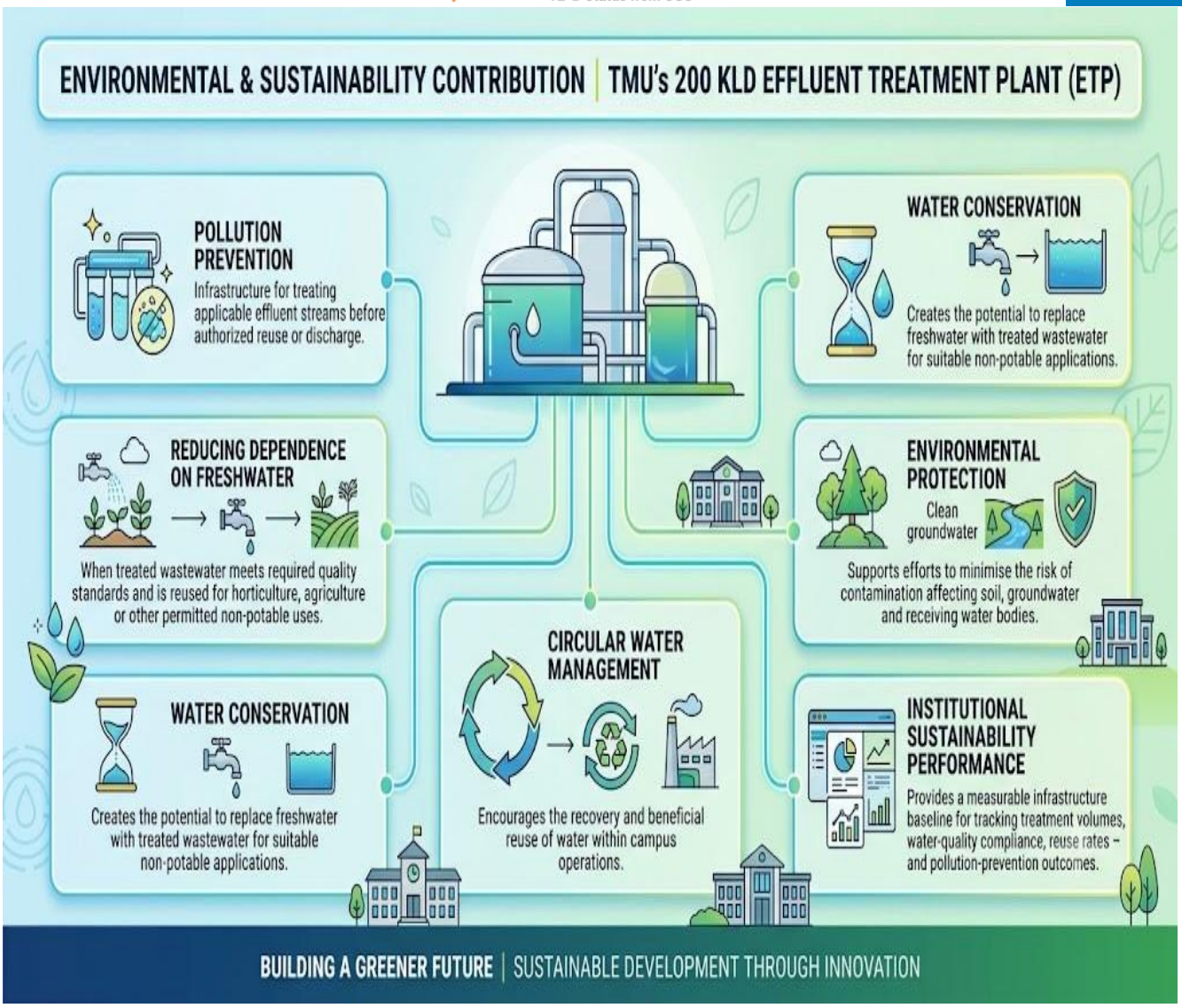
Key Performance Statistics

Effluent Treatment Capacity: 200 KLD

Installed Effluent Treatment Plant capacity: 200 KLD

Wastewater Treated and Reused: 80% treated and 100% reused of treated water

Quantity treated and reused during the year 2025: (KLD or m^3/year)



Environmental and Sustainability Contribution of TMU's 200 KLD Effluent Treatment Plant (ETP)

- **Pollution prevention:** Provides infrastructure for treating applicable effluent streams before authorized reuse.
- **Reducing dependence on freshwater:** When treated wastewater meets the required quality standards and is reused for horticulture, agriculture or other permitted non-potable uses.
- **Water conservation:** Creates the potential to replace freshwater with treated wastewater for suitable non-potable applications.

- **Environmental protection:** Supports efforts to minimise the risk of contamination affecting soil, groundwater and receiving water bodies.
- **Circular water management:** Encourages the recovery and beneficial reuse of water within campus operations.
- **Institutional sustainability performance:** Provides a measurable infrastructure baseline for tracking treatment volumes, water-quality compliance, reuse rates and pollution-prevention outcomes.

14.4.1- Water Discharge Guidelines and Standards

TMU recognises responsible wastewater discharge as a critical component of aquatic ecosystem protection, water quality management and environmental sustainability. The University follows a pollution-prevention-oriented approach to wastewater management, emphasising the treatment, monitoring and responsible disposal or reuse of wastewater before it enters the environment.

TMU's water discharge management framework focuses on ensuring that wastewater generated through academic, residential, healthcare, laboratory and other campus operations is managed in accordance with applicable environmental regulations and prescribed discharge standards. The University operates dedicated wastewater treatment infrastructure, including a 1.5 MLD Sewage Treatment Plant (STP) and a 200 KLD Effluent Treatment Plant (ETP), to facilitate the treatment of domestic sewage and operational effluents.

The framework prioritises the segregation and appropriate treatment of wastewater streams, compliance with applicable effluent-quality parameters, and prevention of untreated or inadequately treated wastewater from contaminating natural water bodies. Treated wastewater is channelled towards non-potable applications, particularly horticulture and agricultural activities, thereby reducing freshwater demand and limiting environmental discharge.

TMU's Water Discharge Management Framework

Key area	Institutional commitment
Regulatory compliance	Adherence to applicable CPCB/SPCB requirements and prescribed wastewater discharge standards.
Wastewater treatment	Treatment of domestic sewage through the 1.5 MLD STP and operational effluents through the 200 KLD ETP.
Water quality monitoring	Periodic assessment of treated wastewater against relevant parameters, including pH, BOD, COD, TSS and other applicable pollutants.
Pollution prevention	Prevention of untreated wastewater discharge into natural drainage systems and receiving water bodies.
Wastewater reuse	Utilisation of treated wastewater for horticulture and agricultural purposes, wherever quality standards permit.
Environmental protection	Minimisation of pollutant loads entering soil, groundwater and downstream aquatic ecosystems.

Applicable Water Discharge Standards

TMU's wastewater management framework should be aligned with the applicable provisions of the Environment (Protection) Rules, 1986, relevant CPCB standards and the conditions prescribed by the Uttar Pradesh Pollution Control Board.

The following are important parameters for institutional wastewater quality monitoring:

Parameter	Indicative standard
pH	6.5–9.0
BOD	30 mg/L (applicable STP standard for areas outside specified metropolitan and state-capital categories)
TSS	100 mg/L (same category)
Faecal Coliform	1,000 MPN/100 mL

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From Wastewater Management to Aquatic Ecosystem Protection

TMU recognises that protecting aquatic ecosystems begins with responsible water management at the institutional level. By establishing dedicated wastewater treatment infrastructure, strengthening effluent-quality monitoring and prioritizing treated wastewater reuse, the University seeks to reduce land-based pollution and prevent harmful contaminants from entering natural water systems. Its integrated approach connects campus-level wastewater management with the wider environmental objective of protecting freshwater resources and downstream aquatic biodiversity.

Impact:

- Maintains high-quality freshwater ecosystems on and around campus, supporting wildlife, aquatic life, and human health.
- Reduces environmental risks associated with untreated sewage and industrial effluents.
- Serves as a best-practice model for higher education institutions seeking to balance campus operations with ecological sustainability.
- Encourages students to become environmentally responsible citizens, integrating conservation principles into academic, professional, and community contexts.



Sewage Treatment Plant

14.4.2- Action Plan to Reduce Plastic Waste

Institutional Plastic Waste Reduction and Circularity Action Plan

1. Strategic vision

The Plastic Waste Reduction Action Plan establishes a comprehensive, measurable and accountable framework to eliminate avoidable plastic consumption, prevent plastic pollution, promote reusable alternatives and strengthen circular material management across institutional operations.

The plan adopts a lifecycle-based approach, addressing plastic at every stage: procurement, consumption, distribution, reuse, segregation, collection, recycling and final disposal. Rather than relying exclusively on post-consumption waste management, the framework prioritises plastic prevention at source, sustainable procurement, material substitution and extended producer responsibility.

Its objective is to transition institutional operations from a linear, single-use plastic consumption model towards a resource-efficient circular economy, while preventing plastic leakage into land, drainage systems, rivers and aquatic ecosystems.

2. Strategic objectives

1. **Prevent plastic generation at source:** Eliminate unnecessary and avoidable single-use plastics across institutional activities.
2. **Transform procurement practices:** Integrate plastic-reduction requirements into purchasing, tendering and vendor selection.
3. **Promote reuse and refill systems:** Replace disposable consumption patterns with durable, reusable and refillable alternatives.
4. **Strengthen segregation and recovery:** Establish an accountable system for plastic waste identification, collection, sorting and recycling.

5. **Prevent environmental leakage:** Ensure that plastic waste does not enter open spaces, storm water drains, rivers or other natural ecosystems.
6. **Institutionalize circularity:** Engage suppliers, service providers, recyclers, students, employees and local communities in sustainable plastic management.

3. Comprehensive strategic action plan

Elimination of unnecessary and single-use plastics

Priority 1 – Source prevention

Objective: Prevent plastic waste before it is generated.

Strategic interventions	Measurable targets by 2030
Prohibit procurement and distribution of identified banned single-use plastic items.	100% compliance with applicable statutory prohibitions.
Eliminate disposable plastic cups, plates, cutlery, straws, stirrers and unnecessary serving materials.	100% elimination of targeted disposable items in institutional operations.
Replace plastic-based event decorations, banners and disposable promotional materials with reusable alternatives.	At least 90% of institutional events conducted using reusable or plastic-free materials.
Introduce a no-single-use-plastic requirement for institutional meetings, conferences, seminars and celebrations.	100% compliance across centrally managed institutional events.
Restrict unnecessary plastic packaging in internal distribution and institutional purchases.	Minimum 50% reduction in avoidable packaging against the baseline.

Implementation mechanism: Issue a formal institutional directive prohibiting the purchase, distribution and use of identified disposable plastic items. Extend the requirement to all departments, hostels, cafeterias, hospital operations, contractors and event organizers.

Sustainable procurement and vendor accountability

Objective: Address plastic consumption at the procurement stage rather than managing it only after disposal.

Strategic interventions	Measurable targets by 2030
Introduce a Plastic-Responsible Procurement Policy.	Policy implemented across all procurement departments.
Include plastic minimisation clauses in purchase orders, tenders and vendor agreements.	100% of relevant new procurement contracts include plastic-reduction requirements.
Prioritize products with minimal, reusable, recyclable or verified recycled-content packaging, where technically and legally appropriate.	At least 80% of eligible procurement categories assessed against plastic-reduction criteria.
Require suppliers to disclose packaging composition and material specifications.	100% of identified high-volume packaging suppliers provide declarations.
Encourage bulk procurement and consolidated deliveries to reduce packaging.	Annual reduction in packaging waste from participating suppliers.
Introduce vendor performance assessment for plastic compliance.	Annual evaluation of all major contracted vendors.

Key procurement categories to be covered:

- Office stationery, files, folders, pens and administrative supplies.
- Laboratory consumables, packaging and equipment supplies.
- Food, beverages, catering and cafeteria supplies.
- Housekeeping chemicals and cleaning products.
- Healthcare and hospital non-clinical packaging.
- IT equipment, electrical goods and furniture.
- Construction materials and maintenance supplies.
- Event management, printing and promotional materials.

Important: Medical-grade, laboratory, sterile and safety-critical plastics must not be indiscriminately eliminated. Their use should be minimized where safe and feasible, with appropriate infection-control, occupational safety and regulatory requirements maintained.

Reusable infrastructure and refill systems

Objective: Replace the disposable consumption model with durable and reusable alternatives.

Strategic interventions	Measurable targets by 2030
Install drinking-water refill stations to reduce dependence on bottled water.	100% of identified high-footfall zones covered by accessible refill facilities.
Promote reusable steel or other durable beverage containers.	Reusable alternatives made available to all institutional users.
Establish reusable crockery and cutlery systems in cafeterias and dining facilities.	100% of institutional dining facilities equipped with reusable serving systems, subject to operational and hygiene requirements.
Introduce returnable food and beverage containers.	At least 80% of eligible takeaway transactions shifted to reusable or returnable systems.
Introduce reusable transport crates and storage containers.	Progressive replacement of eligible disposable transport packaging.
Encourage refillable dispensers for handwash, cleaning agents and other suitable products.	At least 75% of eligible dispensing points converted to refill systems.

Implementation mechanism: Develop a centralised reusable-product system, including distribution, return, washing, sanitisation, maintenance and replacement arrangements. Assign operational responsibility to facility managers and service providers.

Plastic-conscious food services and hospitality

Objective: Reduce plastic consumption associated with food preparation, catering, packaging and distribution.

Strategic interventions	Measurable targets by 2030
Eliminate disposable plastic tableware in institutional dining areas.	100% transition to reusable serving materials.
Restrict individually packaged condiments and unnecessary sachets.	Minimum 75% reduction in eligible single-use sachet consumption.
Introduce reusable food delivery and catering containers.	At least 80% of eligible institutional catering operations use reusable systems.
Require food suppliers to minimize secondary and tertiary packaging.	Annual reduction in packaging material per unit of food supplied.
Promote bulk dispensers for drinking water and suitable food products.	All identified feasible locations equipped with alternatives.
Conduct periodic plastic-waste audits of kitchens, messes and cafeterias.	Four audits annually at each major food-service facility.

Plastic segregation, collection and recycling

Objective: Ensure that plastic waste generated despite prevention measures is recovered through an organized and traceable waste-management system.

Strategic interventions	Measurable targets by 2030
Establish colour-coded, clearly labelled waste segregation stations.	100% coverage of identified waste-generation locations.
Separate plastic waste by material type and recyclability.	100% of collected plastic waste subjected to documented sorting.
Establish designated plastic collection and temporary storage points.	Functional collection infrastructure across all major operational zones.
Partner with authorized plastic waste processors and recyclers.	100% of recyclable plastic transferred through authorized channels.
Establish a digital plastic waste inventory and tracking system.	Institution-wide reporting dashboard operational.
Prevent open dumping and burning of plastic waste.	Zero recorded incidents of institutional open burning or uncontrolled dumping.

Implementation mechanism: Establish a material recovery and traceability system that records the weight of plastic collected, material category, recycler details, dispatch date and processing or recycling evidence.

Plastic leakage prevention and aquatic ecosystem protection

Environmental protection

Objective: Prevent plastic waste from escaping institutional boundaries and entering natural ecosystems.

Strategic interventions	Measurable targets by 2030
Establish plastic-free buffer zones around drains, water bodies and green spaces.	All identified sensitive zones covered.
Organise campus and community plastic-litter removal drives.	At least two documented drives annually.
Conduct awareness programmes on the relationship between land-based plastic waste and aquatic pollution.	At least two major awareness programmes annually.
Collaborate with local authorities and environmental organizations on plastic leakage prevention.	At least two active collaborations by 2030.

Environmental outcome: Reduced plastic litter entering stormwater infrastructure, soil and surrounding aquatic environments, contributing to the objectives of on the prevention and significant reduction of marine pollution, particularly land-based pollution.

Responsible plastic alternatives and material substitution

Objective: Accelerate the transition towards environmentally preferable materials without creating new environmental burdens.

Strategic interventions	Measurable targets by 2030
Evaluate reusable steel, glass, paper and other appropriate alternatives.	Alternatives assessment completed for all major disposable plastic categories.
Promote certified compostable alternatives where suitable waste-processing infrastructure exists.	100% of selected alternatives supported by appropriate certification and end-of-life arrangements.
Evaluate packaging alternatives through lifecycle considerations.	Annual lifecycle assessment of priority product categories.
Encourage suppliers to redesign packaging for reduced material use.	At least 50% of priority suppliers engaged in packaging redesign.
Prioritise products that are durable, repairable and reusable.	Integration into relevant procurement specifications.

Extended Producer Responsibility and supplier take-back

Objective: Ensure that producers and suppliers share responsibility for managing the plastic packaging associated with their products.

Strategic interventions	Measurable targets by 2030
Identify suppliers and producers whose packaging generates significant plastic waste.	Annual supplier and packaging register.
Introduce take-back arrangements for eligible packaging.	Take-back systems established with major participating suppliers.
Require documented recovery evidence for eligible packaging streams.	Annual reconciliation of packaging recovery records.
Encourage suppliers to use recyclable and recycled-content packaging where legally and technically appropriate.	Annual improvement in supplier performance.

Awareness, education and behavioural transformation

Objective: Make plastic reduction an institutional culture rather than a one-time environmental campaign.

Strategic interventions	Measurable targets by 2030
Integrate plastic pollution awareness into student induction and employee orientation.	100% of new student and employee induction programmes include plastic awareness.
Conduct workshops on responsible consumption, plastic segregation and reuse.	Minimum four programmes annually.
Establish a Plastic-Free Campus student ambassador network.	Representation from every participating college or major academic unit.
Introduce inter-departmental plastic reduction challenges.	Annual institution-wide challenge.
Encourage research and student innovation in plastic alternatives and circularity.	At least two student-led projects annually.

Plastic waste audits, research and innovation

Objective: Establish a data-driven approach to plastic reduction and continuous improvement.

- Conduct an institution-wide baseline plastic audit covering all major waste-generating activities.
- Identify the top ten sources of plastic consumption.
- Measure plastic consumption by weight, type, source and operational unit.
- Conduct quarterly waste composition assessments.
- Develop research projects on packaging alternatives, polymer recycling and plastic pollution prevention.
- Encourage student-led innovations for reusable systems, material recovery and plastic-free operations.
- Publish an annual institutional plastic reduction and circularity report.

Target: 100% of major institutional waste-generating units included in the annual plastic audit and reporting system.

Community engagement and institutional partnerships

Objective: Extend plastic reduction beyond institutional boundaries.

- Establish partnerships with municipal bodies, authorized recyclers, NGOs and environmental organizations.
- Conduct community awareness campaigns on plastic segregation and responsible consumption.
- Organize plastic collection and litter-prevention initiatives in nearby communities, subject to local permissions.
- Engage local vendors and retailers in reducing disposable packaging.
- Develop student volunteer programmes for plastic pollution awareness.
- Facilitate knowledge-sharing and collaborative research on circular waste management.

Target: At least three active partnerships and four community-based plastic awareness or prevention initiatives annually by 2028.

Governance, accountability and continuous improvement

Objective: Establish a permanent institutional mechanism for implementing, reviewing and improving plastic reduction performance.

- Constitute an Institutional Plastic Waste Reduction Committee.
- Appoint departmental and operational plastic reduction coordinators.
- Assign responsibilities to procurement, estate, housekeeping, catering, hostel, hospital and academic departments.
- Incorporate plastic reduction into vendor contracts and service-level agreements.
- Establish a central digital monitoring dashboard.
- Conduct quarterly performance reviews and annual compliance audits.
- Introduce corrective action plans for departments that fail to achieve agreed targets.
- Publish an annual plastic waste reduction performance statement.

4. Institutional plastic reduction targets: 2026–2030

The following targets are proposed institutional performance targets. They should be formally adopted after completion of the baseline audit and should not be represented as already achieved.

2030 strategic performance commitments: 80%

Reduction in avoidable plastic consumption Against the verified 2026 baseline: 100%

Segregation coverage: Identified plastic waste generation points: 90%

Year-wise target trajectory

Performance indicator	2026–27	2027–28	2028–29	2029–30
Reduction in avoidable plastic consumption	20%	40%	60%	80%
Recyclable plastic recovery rate	60%	70%	80%	90%
Reusable/returnable systems in eligible operations	40%	55%	70%	85%
Eligible suppliers assessed for plastic compliance	50%	65%	80%	100%
Waste-generation points with segregation facilities	80%	90%	95%	100%
Institutional events meeting plastic reduction standards	70%	80%	90%	100%

5. Implementation roadmap

The action plan follows a phased implementation model to ensure that policy adoption, infrastructure development, operational transformation and measurable outcomes progress **together.**

5.1 Phase I – Baseline assessment and policy establishment First 0–3 months

- Conduct a comprehensive plastic waste audit.
- Map plastic consumption across departments and facilities.
- Identify prohibited, avoidable and essential plastic categories.
- Establish the Institutional Plastic Waste Reduction Committee.
- Approve the Plastic Waste Reduction Policy and procurement guidelines.
- Establish baseline indicators and annual reduction targets.

5.2 Phase II – Infrastructure and procurement transformation (04-09 months)

- Install segregation and collection infrastructure.
- Introduce refill stations and reusable serving systems.
- Revise vendor contracts and purchase specifications.
- Establish authorized recycler and supplier take-back partnerships.

- Introduce plastic-free requirements for institutional events.

5.3 Phase III – Institution-wide implementation (10-18 Months)

- Implement plastic restrictions across all eligible operational units.
- Expand reusable and refill systems.
- Introduce digital plastic waste monitoring.
- Conduct departmental awareness and training programmes.
- Initiate community engagement and environmental partnerships.

5.4 Phase IV – Performance optimization and circularity (19-36 Months)

- Evaluate plastic consumption reduction.
- Strengthen supplier accountability.
- Expand recovery and take-back arrangements.
- Conduct independent waste and compliance audits.
- Introduce corrective measures based on audit findings.

5.5 Phase V – Consolidation and 2030 sustainability outcomes (04-05 Years)

- Achieve the approved 2030 plastic reduction targets.
- Institutionalize circular procurement and reusable systems.
- Publish annual plastic reduction and impact reports.
- Benchmark performance and establish the next sustainability target cycle.

6. Monitoring, evaluation and performance indicators

The following KPI framework shall be adopted for quarterly monitoring and annual sustainability reporting.

KPI	Measurement methodology	Review frequency
Total plastic consumption	kg of plastic procured or consumed	Monthly
Plastic consumption intensity	kg per person per year	Annual

Single-use plastic reduction	Reduction against baseline (%)	Quarterly
Plastic waste generated	kg of plastic waste collected	Monthly
Plastic segregation rate	Segregated plastic / total plastic waste generated × 100	Monthly
Plastic recycling rate	Verified recycled quantity / recyclable plastic generated × 100	Quarterly
Reuse adoption rate	Eligible operations using reuse systems / total eligible operations × 100	Quarterly
Supplier compliance	Compliant suppliers / suppliers assessed × 100	Annual
Plastic leakage incidents	Number of documented incidents	Monthly
Awareness coverage	Participants trained / target population × 100	Annual
Financial savings	Avoided disposable procurement and waste-management expenditure	Annual

7. Institutional governance and accountability structure

Responsible authority	Key responsibilities
University leadership	Policy approval, strategic direction and resource allocation.
IQAC / Sustainability Committee	Coordination, monitoring, performance evaluation and annual reporting.
Procurement Department	Sustainable purchasing, vendor screening and packaging requirements.
Estate and Facilities Department	Waste segregation, collection infrastructure and operational monitoring.
Housekeeping and Waste Management Team	Daily segregation, collection, storage and record maintenance.
Hostel, Mess and Cafeteria Administration	Reusable systems and reduction of food-service plastics.
Hospital and Laboratory Administration	Safe minimisation and segregation of non-clinical and regulated plastic waste.
Departmental Coordinators	Local implementation, awareness and compliance monitoring.
Students and Employees	Responsible consumption, reuse and segregation practices.
Authorized Recyclers and Vendors	Traceable recovery, processing and documentation.



Reduce, Reuse, Recycle

The 5R Plastic Reduction Framework



8. Risk management and sustainability safeguards

For long-term effectiveness, the plan must address the risks associated with implementation.

Potential risk	Recommended mitigation
Higher initial costs of reusable alternatives	Lifecycle cost assessment and phased investment.
Resistance from vendors and service providers	Contractual requirements, vendor orientation and transition periods.
Inadequate recycling infrastructure	Partnerships with authorized recyclers and verified recovery channels.
Contamination of segregated waste	Clear labelling, staff training and periodic inspections.
Greenwashing through alternative materials	Independent certification and lifecycle assessment.
Unsafe elimination of essential plastics	Exemptions for medical, laboratory, hygiene and safety-critical applications.
Inaccurate plastic reduction claims	Weight-based baseline, procurement reconciliation and independent verification.
Rebound consumption	Monitor absolute plastic consumption alongside per-capita intensity.

14.4.3- Reducing Marine Pollution (Policy)

Integrated Institutional Policy Framework for the Prevention and Reduction of Marine Pollution

Institutional Policy Commitment

TMU recognises that the protection of marine and aquatic ecosystems requires a comprehensive approach to environmental pollution prevention, extending beyond coastal and marine locations to the management of pollution-generating activities across terrestrial environments. Improperly managed solid waste, plastic materials, hazardous substances, unsustainable consumption and inadequately managed wastewater can contribute to the contamination of freshwater systems and, through interconnected drainage networks and river basins, create downstream risks for aquatic and marine ecosystems.

Although TMU does not maintain a separately titled Marine Pollution Prevention Policy, its institutional commitment to reducing pollution is operationalized through an integrated framework

of environmental, waste management, climate action, water reuse, sustainable procurement and ethical sourcing policies. Collectively, these policy instruments establish preventive controls over major land-based pollution pathways and embed environmental responsibility into the University's institutional operations, resource utilization, purchasing decisions and waste management practices.

The framework adopts a source-to-disposal perspective, prioritizing pollution prevention at the point of generation, responsible material selection, resource recovery, water conservation, waste minimization and environmentally responsible supplier engagement. It recognizes that protecting aquatic ecosystems requires coordinated action across the entire institutional value chain rather than isolated interventions.

Integrated Policy Architecture and Key Interventions

1. Policy No. 21.0 – Waste Management Policy

The Waste Management Policy establishes institutional provisions for responsible waste generation, segregation, collection, handling, recycling and disposal across academic, administrative, residential, healthcare, laboratory and other university facilities. Its emphasis on source-level segregation and the responsible management of biodegradable, recyclable, electronic, biomedical and non-recyclable waste helps prevent uncontrolled waste accumulation and reduces the risk of environmentally harmful materials entering drainage systems and nearby water bodies.

Link: https://www.tmu.ac.in/assets/pdf/policy/Policy-21.0-Waste_Management_Policy.pdf

2. Policy No. 24.0 – Sustainable Procurement / Purchasing Policy

This policy integrates environmental considerations into institutional purchasing and supplier engagement. By encouraging need-based procurement, life-cycle assessment, reusable and recyclable products, resource efficiency and compliance with environmental requirements, it helps minimize unnecessary material consumption and the procurement of environmentally harmful products. Its preventive approach addresses pollution risks before materials enter the University's operational value chain.

Link: https://www.tmu.ac.in/assets/pdf/policy/Policy-24.0-Sustainable_Procurement_Purchasing_Policy.pdf,

3. Policy No. 27.0 – Sustainability and Climate Action Policy

The Sustainability and Climate Action Policy provides an overarching institutional framework for environmental protection, resource conservation and preventive pollution management. It explicitly promotes responsible water and waste management, discourages harmful practices such as single-use plastic consumption, and encourages environmental awareness, statutory compliance and continuous monitoring of environmental performance. It therefore provides the strategic foundation for integrating pollution prevention into routine university operations.

Link: https://www.tmu.ac.in/assets/pdf/policy/Sustainability_and_Climate_Action_Policy.pdf,

4. Policy No. 31.0 – Water Reuse Policy

The Water Reuse Policy supports the responsible management and reuse of water resources, contributing to reduced freshwater demand and more sustainable water utilization. Its relevance to aquatic pollution prevention lies in the institutional emphasis on responsible wastewater and water-resource management, reducing pressure on freshwater systems and supporting the protection of receiving environments. Water reuse and associated treatment practices constitute an important preventive mechanism in the broader land-based pollution management framework.

Link: https://www.tmu.ac.in/assets/pdf/policy/Policy_31.pdf

5. Policy No. 33.0 – Policy on Ethical Sourcing of Food and Supplies

This policy extends environmental responsibility to the University's procurement ecosystem, including food, consumables, equipment, outsourced services and supplier operations. It encourages locally produced and seasonal food, environmentally responsible agricultural and fisheries practices, reduced plastic packaging, reusable and recyclable materials, minimization of hazardous substances and supplier accountability. Its provisions also discourage procurement associated with environmentally damaging practices, thereby extending pollution prevention beyond the University's immediate operational boundaries.

Link: https://www.tmu.ac.in/assets/pdf/policy/Policy_33_Ethical_Sourcing_of_Food_and_Supplies.pdf

Integrated Institutional Approach

Together, these policies address interconnected stages of the pollution-prevention cycle:

- **Prevention at source:** Sustainable procurement, ethical sourcing and responsible consumption reduce the entry of unnecessary, disposable and potentially harmful materials into institutional operations.
- **Responsible waste management:** Source segregation, material recovery, recycling and appropriate disposal minimize uncontrolled waste accumulation and potential environmental leakage.
- **Water-resource protection:** Water reuse and responsible resource management support reduced pressure on freshwater resources and protection of receiving aquatic environments.
- **Pollution-conscious operations:** Climate action and environmental sustainability provisions integrate preventive environmental practices across campus activities.
- **Supply-chain accountability:** Ethical sourcing and supplier responsibilities extend environmental expectations to contractors, vendors, food suppliers and outsourced service providers.

Institutional Contribution and Expected Environmental Impact

The integrated policy framework establishes a preventive institutional mechanism to address land-based sources of pollution that may adversely affect aquatic ecosystems. Its expected contributions include:

1. Reduced potential leakage of plastic, recyclable and residual waste into surrounding terrestrial and freshwater environments.
2. Improved segregation, recovery and responsible disposal of materials, reducing the environmental risks associated with unmanaged waste.
3. Strengthened water-resource management and reuse practices, supporting the protection of freshwater ecosystems.

4. Reduced procurement-related environmental impacts through responsible purchasing, sustainable materials and supplier accountability.
5. Greater control over the use and disposal of potentially harmful materials through institutional environmental management practices.
6. Increased environmental responsibility among students, employees, suppliers, contractors and other institutional stakeholders.

Policy-wise key initiatives and environmental impact

The following matrix accompany explanation of how the five supplied policies collectively contribute to marine pollution prevention.

Institutional policy	Key initiatives / preventive mechanisms	Contribution to SDG 14
Policy 21: Waste Management	Source segregation, recycling, responsible collection, biomedical and electronic waste management.	Reduces potential leakage of solid waste and harmful materials into aquatic environments.
Policy 24: Sustainable Procurement	Life-cycle-based purchasing, reusable and recyclable products, responsible supplier selection.	Prevents pollution at the procurement and material-consumption stages.
Policy 27:Climate Action	Pollution prevention, single-use plastic restrictions, water conservation and environmental monitoring.	Integrates environmental protection into routine institutional operations.
Policy 31: Water Reuse	Responsible water reuse and resource conservation.	Supports reduced freshwater pressure and responsible water management.
Policy 33: Ethical Sourcing	Sustainable food sourcing, reduced plastic packaging, safer materials and supplier accountability.	Addresses supply-chain pollution and encourages environmentally responsible sourcing.

14.5.1 – Minimizing Alteration of Aquatic Ecosystems (Plan)

Integrated Aquatic Ecosystem Alteration Prevention and Mitigation Plan

1. Policy Statement and Institutional Commitment

The plan adopts a **Prevent–Control–Restore–Monitor** approach, prioritizing pollution prevention at source, environmentally responsible infrastructure, scientific water-quality management and the protection of aquatic biodiversity. It seeks to ensure that wastewater management, land development, storm water movement, chemical handling, landscaping and community engagement are undertaken without compromising the ecological integrity of surrounding freshwater environments.

2. Strategic Action Framework

A. Minimization of Physical Alteration – Protecting Natural Hydrology and Aquatic Habitats

TMU shall priorities interventions that maintain the natural functioning of water systems and prevent physical disturbances to freshwater ecosystems.

- **Hydrological Impact Prevention:** Integrate drainage-sensitive planning into campus construction, road development and infrastructure expansion to minimise disruption of natural drainage channels and surface-water movement.
- **Storm water Runoff Management:** Strengthen rainwater harvesting, groundwater recharge and controlled storm water management to reduce soil erosion, sediment transportation and uncontrolled runoff into nearby water systems.
- **Sediment and Erosion Control:** Introduce vegetative ground cover, soil stabilization, permeable surfaces and sediment-control measures in vulnerable areas to minimize siltation of aquatic habitats.
- **Aquatic Habitat Protection:** Avoid encroachment, unnecessary excavation, dumping and physical disturbance of natural water channels, wetlands and associated ecological zones.
- **Nature-Based Infrastructure:** Promote vegetated drainage systems, native plantations and ecological buffer areas to support natural filtration and hydrological stability.

B. Minimization of Chemical Alteration – Preventing Contamination of Aquatic Environments

TMU will strengthen preventive controls to minimize the introduction of chemical pollutants, excess nutrients and hazardous substances into freshwater ecosystems.

- **Wastewater Quality Assurance:** Ensure appropriate treatment of domestic sewage and institutional effluent before reuse or authorized discharge, supported by periodic testing of relevant water-quality parameters.
- **Nutrient Pollution Prevention:** Promote responsible fertilizer application, organic alternatives and controlled chemical use in horticulture and agricultural activities to minimize nitrogen and phosphorus runoff.
- **Hazardous Chemical Management:** Establish safe procurement, storage, handling and disposal protocols for laboratory chemicals, oils, cleaning agents and other potentially hazardous substances.
- **Source-Level Pollution Control:** Introduce spill-prevention procedures, designated chemical storage areas and emergency containment mechanisms to prevent accidental contamination of drainage networks.
- **Water Quality Surveillance:** Monitor relevant parameters, including pH, dissolved oxygen, biochemical oxygen demand (BOD), chemical oxygen demand (COD), total suspended solids (TSS), nutrients and other applicable pollutants, according to the nature of the water source and regulatory requirements.

C. Minimization of Biological Alteration – Safeguarding Aquatic Biodiversity and Ecological Balance

TMU shall incorporate biodiversity-sensitive practices to prevent disturbances to aquatic organisms, native species and ecological processes.

- **Native Biodiversity Conservation:** Encourage the use of indigenous vegetation around drainage corridors and water-sensitive areas to support ecological connectivity and habitat stability.
- **Invasive Species Prevention:** Discourage the introduction and uncontrolled spread of non-native or invasive aquatic species through appropriate landscaping, water management and biodiversity protocols.

- **Biological Pollution Prevention:** Prevent the entry of untreated sewage, organic waste and contaminated runoff that may promote excessive algal growth, oxygen depletion and ecological imbalance.
- **Community-Based Ecosystem Protection:** Engage students, researchers and local stakeholders in freshwater biodiversity awareness, habitat protection and responsible waste-disposal initiatives.

3. Institutional Implementation and Governance

Implementation will follow five institutional stages:

- **Baseline Assessment:** Identify relevant freshwater pathways, drainage outlets, potential pollution sources and environmentally sensitive areas.
- **Risk Identification:** Evaluate physical, chemical and biological risks associated with campus operations and infrastructure.
- **Preventive Intervention:** Implement engineering controls, pollution-prevention measures and biodiversity-sensitive practices.
- **Performance Monitoring:** Undertake periodic inspections, water-quality assessments and environmental performance reviews.
- **Corrective Action and Improvement:** Document non-compliance, assign corrective responsibilities and evaluate the effectiveness of interventions.

4. Implementation Roadmap

Phase I – Baseline and Risk Mapping (0–6 months)

- Map relevant drainage networks, water outlets and potential pollution pathways.
- Identify physical, chemical and biological alteration risks.
- Establish baseline water-quality and biodiversity assessment protocols.

Phase II – Prevention and Intervention (6–12 months)

- Strengthen wastewater quality assurance and storm water controls.
- Implement chemical handling and spill-prevention procedures.
- Introduce erosion-control and biodiversity-sensitive landscaping measures.

Phase III – Ecological Monitoring and Restoration (12–24 months)

- Conduct periodic freshwater ecosystem assessments.
- Undertake targeted habitat restoration wherever degradation is identified.
- Strengthen native vegetation and invasive-species management.

Phase IV – Evaluation and Continuous Improvement (Annual)

- Review environmental performance against established indicators.
- Publish an annual aquatic ecosystem protection performance report.
- Update preventive measures based on monitoring findings and regulatory developments.

5. Expected Environmental Outcomes

The plan is designed to deliver the following measurable environmental benefits:

- Reduced physical disturbance of natural drainage systems and freshwater habitats.
- Lower risk of chemical contamination and nutrient-driven eutrophication.
- Improved prevention of untreated wastewater and hazardous substances entering aquatic environments.
- Enhanced protection of native aquatic biodiversity and ecological balance.
- Stronger institutional accountability through documented environmental monitoring and corrective action.

6. Long-Term Institutional Vision

TMU aims to establish an environmentally responsible institutional model in which infrastructure development, water resource utilization and ecological conservation operate within a unified sustainability framework. The ultimate objective is not merely to control pollution after it occurs, but to prevent ecological alteration before it takes place, protect the natural functioning of aquatic systems and promote the responsible stewardship of freshwater biodiversity.

14.5.2 – Monitoring the Health of Aquatic Ecosystems

TMU recognizes that the long-term sustainability of aquatic ecosystems depends not merely on water availability but on the ecological integrity, biodiversity, habitat stability and resilience of

freshwater environments. The university adopts an ecosystem-centred monitoring approach that seeks to understand changing environmental conditions, identify ecological stressors and strengthen the scientific basis for conservation interventions.

TMU integrates environmental stewardship, interdisciplinary research and institutional sustainability practices to assess the condition of aquatic and associated freshwater ecosystems. Its approach extends beyond conventional pollution assessment to consider the interconnected dimensions of ecosystem functioning, including water quality, habitat characteristics, biological diversity, seasonal variations and anthropogenic pressures. This enables environmental observations to inform preventive action, conservation priorities and responsible resource management.

Strategic Monitoring and Assessment Initiatives

1. Integrated Ecosystem Health Assessment

TMU promotes the assessment of freshwater ecosystem conditions through the interpretation of interrelated physical, chemical and biological indicators. Parameters such as dissolved oxygen, pH, turbidity, nutrient concentrations and organic pollution indicators provide insights into aquatic environmental quality. Their assessment, alongside biological observations, supports a more comprehensive understanding of ecosystem condition.

2. Aquatic Habitat Integrity and Ecological Resilience

The university emphasizes the importance of maintaining the ecological characteristics of freshwater habitats, including natural drainage systems, water-retention areas, riparian vegetation and associated biodiversity. Attention to habitat degradation, sediment accumulation, encroachment and pollution pressures supports the identification of ecological vulnerabilities and conservation requirements.

3. Biodiversity as an Indicator of Ecosystem Condition

TMU recognizes aquatic biodiversity as an important indicator of environmental stability. The assessment of native aquatic vegetation, macroinvertebrates, fish diversity and water-associated bird populations can provide valuable evidence of habitat quality and ecological changes.

4. Climate-Sensitive and Seasonal Ecosystem Monitoring

Recognizing the influence of changing climatic conditions on freshwater environments, TMU promotes attention to seasonal fluctuations, rainfall variability, water availability, temperature changes and their implications for aquatic habitats. This perspective supports the identification of climate-related ecological vulnerabilities and strengthens the foundation for adaptive environmental management.

5. Monitoring Environmental Pressures and Ecological Risks

The university's environmental sustainability approach recognizes the importance of identifying potential threats to ecosystem health, including untreated wastewater, plastic leakage, excessive nutrient loading, solid-waste accumulation and unsustainable land-use practices. Monitoring these pressures helps establish conservation priorities and encourages preventive measures to minimize adverse environmental impacts.

6. Research-Led Monitoring and Institutional Knowledge Development

TMU encourages interdisciplinary academic engagement in environmental assessment, freshwater ecology and sustainable resource management. Faculty expertise, student research and environmental awareness initiatives can contribute to the development of locally relevant ecological knowledge, strengthen monitoring methodologies and promote evidence-informed conservation practices.

7. Monitoring-to-Action and Continuous Improvement

TMU's ecosystem monitoring framework emphasizes the translation of environmental observations into practical management responses. Monitoring findings can inform pollution-prevention measures, habitat protection, water-resource management, environmental education and institutional sustainability planning. Periodic review of environmental information provides a basis for evaluating interventions and identifying areas requiring further attention.

Institutional Impact and Contribution to SDG 14

TMU's ecosystem-health monitoring approach strengthens the transition from isolated environmental activities to a systematic, science-informed model of freshwater ecosystem stewardship. The framework reinforces the importance of early identification of ecological stress, evidence-based decision-making and collaborative conservation. It also creates opportunities for academic research to address regional freshwater challenges and translate scientific knowledge into practical environmental solutions.

14.5.3 – Programmes towards Good Aquatic Stewardship Practices

TMU advances good aquatic stewardship by integrating responsible water-resource management, pollution prevention, ecosystem protection and sustainable community practices into its institutional sustainability framework. The University promotes a stewardship-oriented approach that connects individual responsibility with collective action, encouraging students, faculty, researchers and local stakeholders to recognise their role in safeguarding freshwater and aquatic ecosystems.

TMU's programmes extend beyond conventional water conservation messaging to emphasise practical responsibility for water quality, sustainable consumption, wastewater management and the prevention of pollutants entering natural water systems.

Key Programmes and Institutional Interventions

1. Water Stewardship through Responsible Resource Management

TMU promotes responsible water use through institutional water-management practices, including wastewater treatment, water recycling, rainwater harvesting and the reuse of treated water for appropriate non-potable applications. These measures demonstrate how responsible resource management can reduce pressure on freshwater resources and strengthen a culture of water stewardship across the campus.

2. Aquatic Pollution Prevention and Responsible Waste Management

TMU encourages pollution-prevention practices through waste segregation, plastic minimisation, responsible disposal and the reduction of waste leakage into drainage channels and natural water systems. Student engagement and institutional sustainability initiatives reinforce the principle that protecting aquatic ecosystems begins with preventing pollution at its source.

3. Experiential Learning and Student-Led Stewardship

Through environmental education, NSS engagement, Eco Club, Ganga Champions Club activities and interdisciplinary academic initiatives, students are encouraged to participate in practical environmental responsibility. Activities focusing on water conservation, waste reduction, ecosystem awareness and sustainable resource utilisation help develop informed environmental citizens and future sustainability leaders.

4. Sustainable Agricultural and Water-Use Practices

The College of Agricultural Sciences promotes knowledge-sharing on efficient irrigation, soil-water conservation, responsible agricultural inputs and sustainable land-management practices. These interventions highlight the relationship between agricultural activities, freshwater quality and the ecological health of downstream aquatic environments.

5. Research, Innovation and Applied Aquatic Sustainability

TMU encourages academic engagement with water-related challenges through interdisciplinary research, technological applications and problem-oriented learning. Areas of institutional relevance include wastewater treatment, water-use efficiency, pollution prevention, water-quality management and sustainable technologies that contribute to the protection of aquatic resources.

6. Community Stewardship and Environmental Partnerships

The University extends its sustainability commitment through community engagement and collaboration with relevant stakeholders. Educational outreach and environmental participation encourage responsible water-use behaviour, improved waste-management practices and collective responsibility for protecting local freshwater resources.

Institutional Impact and Long-Term Commitment

TMU's aquatic stewardship approach establishes a connection between institutional resource efficiency, environmental education and community responsibility. Its emphasis on wastewater treatment and reuse, rainwater conservation, pollution prevention and student participation contributes to reducing avoidable freshwater pressures and strengthening environmental accountability.

14.5.4 – Collaboration for Shared Aquatic Ecosystems

TMU advances the conservation of shared aquatic ecosystems through a collaborative approach that connects academic institutions, environmental stakeholders, local governance structures and communities. Recognizing that freshwater ecosystems transcend administrative and institutional boundaries, TMU promotes coordinated action for the responsible management of interconnected water resources, including the Ram Ganga river system and associated freshwater channels in the Moradabad region.

The University seeks to bridge the gap between scientific knowledge and practical ecosystem management by facilitating interdisciplinary engagement, stakeholder consultations and the application of environmentally responsible water-management practices. Its collaborative framework encourages shared accountability for aquatic ecosystem protection, pollution prevention, freshwater biodiversity conservation and the sustainable use of water resources.

Key Collaborative Approaches

1. Institutional Coordination for Shared Water Governance

TMU promotes engagement with relevant municipal authorities, environmental regulatory institutions and local governance bodies to strengthen coordinated responses to freshwater ecosystem challenges. These engagements provide a platform for exchanging environmental information, identifying local water-management priorities and supporting interventions consistent with applicable environmental regulations and conservation objectives.

2. Academic–Community Partnerships for Ecosystem Resilience

Through its academic and extension activities, particularly those involving the College of Agricultural Sciences, TMU encourages knowledge-sharing with farmers, community representatives and other water-dependent stakeholders. The focus includes responsible irrigation, efficient water utilization, prevention of agricultural runoff and the adoption of practices that minimize pressure on shared freshwater ecosystems.

3. Collaborative Knowledge Generation and Environmental Monitoring

The University promotes the integration of academic expertise, field-based observations and stakeholder knowledge to understand freshwater ecosystem conditions. Faculty members and students contribute through environmental studies, water-quality-related academic engagement and the dissemination of scientific findings that can inform local conservation priorities and evidence-based decision-making.

4. Multi-Stakeholder Engagement for Pollution Prevention

TMU encourages coordinated participation among institutional departments, environmental organizations, local communities and relevant public authorities to address pollution pressures affecting interconnected freshwater resources. Emphasis is placed on responsible waste management, prevention of plastic leakage, improved water-use practices and environmentally sensitive management of drainage systems.

5. Knowledge Exchange and Capacity Development

The University uses academic outreach, expert interactions, extension programmes and community-oriented learning platforms to communicate sustainable aquatic ecosystem management practices. This approach facilitates the transfer of scientific knowledge into practical environmental action while incorporating local experience into conservation-oriented discussions.

Institutional Contribution and Expected Outcomes

TMU's collaborative approach is directed towards:

- Strengthening coordination among academic, governmental and community stakeholders responsible for shared freshwater resources.

- Improving the availability and application of environmental knowledge for local aquatic ecosystem management.
- Promoting responsible agricultural and community water-use practices to minimise freshwater pollution pressures.
- Encouraging preventive approaches to plastic leakage, wastewater contamination and degradation of freshwater habitats.
- Building long-term stakeholder ownership of aquatic ecosystem conservation beyond institutional boundaries.

Impact and SDG Contribution

By positioning academic knowledge, stakeholder participation and institutional coordination at the centre of aquatic ecosystem management, TMU contributes to a more integrated and collaborative approach to freshwater conservation.

The University's contribution to Life Below Water, through collaborative aquatic ecosystem management, reinforces the principle that protecting shared water resources requires collective responsibility, scientific cooperation and long-term institutional commitment. These efforts also complement SDG 6 (Clean Water and Sanitation), SDG 11 (Sustainable Cities and Communities) and SDG 17 (Partnerships for the Goals).

14.5.5 – Watershed Management Strategy

TMU adopts an integrated watershed management approach that recognizes the interdependence of surface water systems, groundwater resources, drainage networks and downstream aquatic ecosystems. Our strategy extends beyond conventional water conservation to address the entire water cycle, prioritizing pollution prevention, hydrological balance, responsible water use and the protection of freshwater ecosystem integrity.

Situated within the Ramganga River basin region, TMU recognises the importance of responsible catchment management in sustaining freshwater resources and reducing environmental pressures on connected aquatic systems. Its institutional approach integrates water infrastructure, wastewater treatment, resource recovery, environmental oversight and academic engagement into a coordinated framework for watershed sustainability.

Strategic Pillars of Watershed Management

1. Integrated Water Resource Management and Catchment Protection

TMU promotes coordinated management of water resources through the integration of water conservation, groundwater recharge, drainage management and sustainable water utilization. The approach seeks to minimize freshwater depletion, maintain hydrological balance and reduce pressures on interconnected freshwater systems.

2. Wastewater Treatment and Pollution Load Reduction

A critical component of the University's watershed strategy is the treatment of wastewater before its environmental discharge or beneficial reuse. The University's wastewater infrastructure includes a 1.5 MLD Sewage Treatment Plant (STP) and a 200 KLD Effluent Treatment Plant (ETP). These facilities support the management of domestic and institutional wastewater, helping minimize untreated wastewater pollution and protect receiving water environments

3. Circular Water Economy and Freshwater Demand Management

TMU integrates water efficiency and wastewater recovery into its resource management framework. Treated wastewater is channeled towards non-potable applications, particularly horticulture and agricultural activities, reducing dependence on freshwater resources.

4. Hydrological Resilience and Rainwater Management

The University incorporates rainwater management into its broader watershed framework to support groundwater replenishment, improve water retention and reduce dependence on external freshwater supplies. Rainwater harvesting and storage infrastructure form part of a long-term approach to strengthening local water security and mitigating seasonal water stress.

5. Water Quality Governance and Environmental Compliance

TMU emphasises the importance of water quality assurance through the monitoring of relevant physical, chemical and biological parameters. Particular attention is directed towards treatment performance, wastewater quality, safe reuse and compliance with applicable environmental

standards. This approach supports early identification of potential pollution risks and strengthens evidence-based environmental management.

6. Academic Engagement and Institutional Accountability

The University leverages its academic expertise through the SDG Cell, relevant academic departments, agricultural sciences and student engagement platforms to promote watershed literacy and responsible water governance. Environmental awareness, applied research and institutional monitoring contribute to a culture of shared accountability for freshwater ecosystem protection.

Measurable Institutional Contributions

TMU's watershed management framework is supported by the following institutional water-management infrastructure and resource indicators:

- **1.5 MLD STP:** Institutional sewage treatment capacity.
- **200 KLD ETP:** Dedicated effluent treatment infrastructure.
- **10 million litres:** Rainwater storage and harvesting infrastructure.
- **6 lakh litres/day:** Proposed treated-water utilization for horticulture.
- **4 lakh litres/day:** Proposed treated-water utilization for agricultural applications.

Environmental and SDG 14 Impact

TMU's watershed management strategy contributes to SDG 14 by addressing land-based pressures that can adversely affect freshwater and downstream aquatic ecosystems. Effective wastewater treatment helps reduce the risk of contaminant transfer into receiving water bodies, while water reuse and demand management help reduce pressure on natural freshwater resources.

By integrating treatment infrastructure, circular water practices, hydrological management and institutional environmental governance, the University advances a preventive rather than purely corrective approach to aquatic ecosystem protection. The strategy also reinforces the relationship between responsible campus operations and the long-term ecological health of the wider river-basin environment.

Institutional Commitment

TMU is committed to strengthening watershed sustainability through continuous improvement in wastewater management, freshwater conservation, pollution prevention and responsible water governance. Its long-term vision is to establish an accountable, resource-efficient and environmentally resilient institutional water-management system that contributes to the protection of interconnected aquatic ecosystems and advances the objectives of Life Below Water.

Summary

TMU contributes in climate action through an integrated institutional approach that connects environmental governance, responsible resource utilisation, pollution prevention, research and community participation. Guided by its Sustainability and Climate Action Policy, the University incorporates sustainability principles into campus operations, academic engagement and environmental initiatives.

TMU's contributions include systematic wastewater treatment through its 1.5 MLD Sewage Treatment Plant and 200 KLD Effluent Treatment Plant, responsible reuse of treated water, and rainwater conservation through its 10-million-litre water conservation lake. These interventions strengthen water security, improve resource efficiency and support environmental resilience.

The University also promotes preventive environmental action through its institutional Plastic Waste Reduction Action Plan, waste segregation, recycling, sustainable procurement and responsible sourcing policies. Its 2026 Mission LiFE and World Environment Day campaign included activities on saving water, saving energy, eliminating single-use plastics, adopting sustainable food systems, reducing waste and managing e-waste.

Research and academic engagement further reinforce this commitment, with 45 publications mapped to SDG-13 Climate Action in the University's reported SDG publication portfolio. Interdisciplinary research, environmental education, NSS activities and student engagement encourage climate awareness and responsible environmental behaviour.

Through these interconnected initiatives, TMU demonstrates a practical institutional commitment to climate-conscious resource management, pollution prevention, environmental responsibility

and long-term sustainability. The University's approach positions climate action not as an isolated campaign, but as an integral part of institutional planning, operational practices, academic contribution and community engagement.

Future plan

Strategic Future Action Plan

I Community Awareness and Outreach

Freshwater Ecosystems

- Organize awareness campaigns on river, lake, pond and wetland conservation.
- Engage students and local communities in freshwater protection and biodiversity awareness.
- Conduct periodic visits and documentation of nearby freshwater ecosystems.

Sustainable Fisheries

- Organize expert lectures on sustainable fisheries and responsible aquaculture.
- Collaborate with fisheries departments and academic institutions for knowledge-sharing activities.
- Promote awareness of indigenous fish species and sustainable aquatic food practices.

Overfishing

- Conduct awareness programmes on overfishing, illegal fishing and aquatic biodiversity loss.
- Promote responsible fish consumption and protection of threatened aquatic species.
- Disseminate information on sustainable fishing regulations and seasonal restrictions.

II Conservation, Research and Innovation

Ocean Conservation Events

- Observe World Oceans Day through seminars, expert lectures, poster competitions and awareness campaigns.
- Organize virtual interactions with marine scientists and coastal conservation organizations.

Food from Aquatic Ecosystems

- Develop responsible aquatic food procurement guidelines, where institutional procurement is applicable.
- Encourage traceable and legally sourced fish and aquatic food products.
- Promote awareness of sustainable aquaculture and aquatic food security.

Aquatic Biodiversity Conservation

- Undertake biodiversity documentation of selected local ponds, wetlands and freshwater habitats.
- Organise native vegetation plantation and freshwater habitat cleanliness initiatives where ecologically appropriate.
- Encourage student and faculty research on aquatic biodiversity conservation.

Technology for Ecosystem Protection

- Utilise available laboratory facilities for periodic water-quality assessment.
- Encourage GIS-based mapping and digital documentation of selected water bodies.
- Promote student research projects on wastewater treatment, microplastics and aquatic pollution prevention.

III Pollution Prevention and Water Governance

Water Discharge Guidelines and Standards

- Ensure wastewater treatment and discharge comply with applicable CPCB/SPCB standards and statutory requirements.
- Conduct periodic STP/ETP performance assessments and treated wastewater quality testing.
- Strengthen treated wastewater reuse for horticulture and other permissible non-potable purposes.

Action Plan to Reduce Plastic Waste

- Gradually reduce single-use plastics across campus, hostels, cafeterias and institutional events.
- Promote reusable alternatives, waste segregation and authorised plastic recycling.
- Conduct annual plastic waste audits to measure consumption and reduction.
- Target a 30% reduction in avoidable single-use plastic by 2030 against the 2026–27 baseline.

Reducing Marine Pollution

- Strengthen institutional controls on plastic waste, chemical disposal and wastewater management.
- Develop awareness initiatives on the connection between inland waste pollution, rivers and marine ecosystems.
- Promote responsible disposal practices to prevent pollutants from entering natural drainage systems.

IV Ecosystem Monitoring and Collaborative Stewardship

Minimising Alteration of Aquatic Ecosystems

- Incorporate aquatic ecosystem considerations into relevant campus infrastructure planning.
- Protect existing natural drainage channels and water-retention areas.
- Promote rainwater harvesting and sustainable storm water management.

Monitoring Aquatic Ecosystem Health

- Undertake periodic water-quality monitoring of selected freshwater bodies.
- Document parameters such as pH, dissolved oxygen, turbidity and other relevant indicators.
- Maintain digital records of monitoring results and identified environmental concerns.

Good Aquatic Stewardship Practices

- Integrate aquatic conservation activities into NSS, student clubs and environmental awareness programmes.
- Organise water-body cleanliness and freshwater conservation campaigns in coordination with local authorities.
- Encourage student participation in responsible water and biodiversity stewardship.

Collaboration for Shared Aquatic Ecosystems

- Develop collaborations with environmental NGOs, local authorities, fisheries departments and academic institutions.
- Participate in joint awareness, research and freshwater conservation initiatives.
- Facilitate expert lectures and knowledge-sharing programmes on aquatic ecosystem protection.

Watershed Management Strategy

- Prepare an institutional watershed management framework focusing on rainwater harvesting, groundwater recharge and surface runoff management.
- Map campus drainage and water-retention features.
- Promote soil erosion prevention, catchment protection and community awareness on watershed conservation.

2. Implementation and Monitoring

Period	Key institutional priority
2027	Baseline assessment, policy development and stakeholder identification
2028	Implementation of awareness, plastic reduction and monitoring initiatives
2029	Expansion of conservation projects and collaborative research
2030	Impact assessment, evidence documentation and programme continuity

Our Commitment

The University is committed to advancing SDG 14 through practical, locally relevant and scientifically supported interventions. By prioritizing freshwater ecosystem protection, responsible

waste management, pollution prevention, environmental education and collaborative research, the University aims to strengthen its contribution to the conservation of aquatic biodiversity and the sustainable management of water resources.

TEERTHANKER MAHAVEER UNIVERSITY

Moradabad

Accredited with NAAC A Grade

12-B Status from UGC

SUSTAINABLE DEVELOPMENT GOALS

17 GOALS TO TRANSFORM OUR WORLD



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