SDG 14
LIFE BELOW WATER

SDG 14 Content Overview

01	Freshwater Ecosystem (Community Outreach)	Page 2 - 4
02	Sustainable Fisheries and Overfishing (Community Outreach)	Page 5 - 8
03	Conservation and Sustainable Utilisation of the Oceans (Events)	Page 9 - 12
04	Maintain Ecosystems and Their Biodiversity (Direct Work)	Page 13 - 16
05	Technologies Towards Aquatic Ecosystem Damage Prevention (Direct Work)	Page 17 - 22
06	Water Discharge Guidelines and Standards	Page 23 - 24
07	Action Plan to Reducing Plastic Waste	Page 25 - 26
08	Minimizing Alteration of Aquatic Ecosystems (Plan)	Page 27 - 28
09	Monitoring the Health of Aquatic Ecosystems	Page 29
10	Programmes Towards Good Aquatic Stewardship Practices	Page 30 - 32
11	Collaboration for Shared Aquatic Ecosystems	Page 33 - 36
12	Watershed Management Strategies	Page 37 - 39

01 Freshwater Ecosystem (Community Outreach)

Universiti Malaya provided free educational programmes and community outreach in 2025 to strengthen understanding of freshwater ecosystems and responsible water management and conservation. Activities combined local and national expert-led learning, citizen science, hands-on training and field-based experiences, engaging the wider public, school students and other community participants in topics including water quality, freshwater ecosystem monitoring, clean water management, filtration and sustainable water use.

Examples include:

Local communities:

- **Scientific Seminar on Clean Water Management with Air Selangor** (Page 3)
- **Citizen Science Water Quality Monitoring Programme** (Page 3)

National communities:

- **Hands-On Learning on Clean Water and Filtration at SMK Muadzam Jaya** (Page 4)

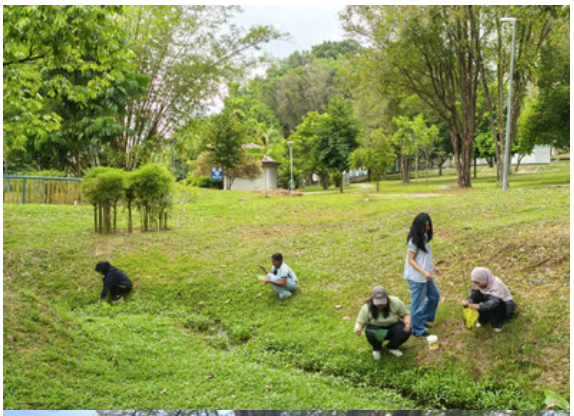
Scientific Seminar on Clean Water Management with Air Selangor





On 14 March 2025, the Institute of Ocean and Earth Sciences (IOES) hosted a free Scientific Seminar Series featuring experts from Pengurusan Air Selangor Sdn Bhd to strengthen public understanding of effective water management. The free two-hour session introduced participants and varied stakeholders to Air Selangor's operations, including the production of clean and treated water, key processes that ensure water quality, and a live demonstration of monitoring methods. The speakers also highlighted the organisation's sustainability initiatives, particularly its circular economy practices and strategies for addressing climate change. This educational programme provided valuable, accessible knowledge to the UM community and the wider public, supporting informed awareness of responsible water resource management.

Citizen Science Water Quality Monitoring Programme





Free citizen science training on freshwater ecosystem monitoring was conducted on different dates in 2025 involving AIESEC in UM (local and international university students) and UM STEM Education students (local university students). Participants were trained in water quality assessment using low-cost monitoring kits and macroinvertebrate biological indicators, gaining hands-on experience in freshwater ecosystem monitoring and water conservation awareness.

Hands-On Learning on Clean Water and Filtration at SMK Muadzam Jaya



As part of the SULAM project “Bridging Knowledge: Engineering for Youth and Community Development”, students from the Faculty of Engineering, Bachelor of Civil Engineering programme, Universiti Malaya, collaborated with Global Peace Foundation (GPF) to promote free awareness of clean water and sustainable water management among rural primary school Form 4 students at SMK Muadzam Jaya, Muadzam Shah, Rompin, Pahang on November 2025.

A dedicated water filtration activity introduced students to the importance of clean water and the basic principles of water filtration. Following a briefing by the person in charge, students worked in groups to construct simple water filters using cotton, sand, activated charcoal, gravel and recycled bottles. Guided by facilitators, they arranged the filtration materials in the appropriate order before pouring soil-contaminated water through their filters to observe the purification process. A Kahoot quiz was conducted at the end of the session to reinforce key concepts. The hands-on activity encouraged teamwork, problem-solving and practical understanding of how filtration can improve water quality.

02 Sustainable Fisheries and Overfishing (Community Outreach)

Universiti Malaya provided free community education and outreach on sustainable fisheries management and responsible fishing practices in 2025. Through engagement at Tasik Varsiti and the Sekolah Sahabat Perikanan programme, participants gained knowledge of freshwater and marine fisheries, aquatic biodiversity, responsible resource use and sustainable fishing practices. The programmes also raised awareness of pressures on aquatic resources, including overfishing and illegal, unreported and unregulated (IUU) fishing, while connecting scientific knowledge with practical fisheries activities and engagement with local fishing communities.

Evidences include:

- **Community Outreach on Sustainable Freshwater Fisheries at Tasik Varsiti** (Page 6)
- **Sustainable Fisheries Education Through Sekolah Sahabat Perikanan** (Page 7)
- **Community Outreach on Sustainable Fisheries and Marine Resource Management at Mersing** (Page 8)

Community Outreach on Sustainable Freshwater Fisheries at Tasik Varsiti



Universiti Malaya used its ongoing fish conservation activities at Tasik Varsiti as a platform to promote awareness of sustainable freshwater fisheries management and responsible aquatic resource use. Conducted in collaboration with the Department of Fisheries Wilayah Persekutuan Kuala Lumpur / Putrajaya, the activities provided free opportunities to engage participants among UM staff and students, as well as visitors on the importance of conserving native fish populations, maintaining ecosystem balance and managing freshwater fisheries responsibly.

The 24-hour fish inventory study conducted from 13–14 November 2025 documented fish populations and species distribution in the lake, providing a practical basis for explaining the importance of monitoring fish communities in supporting sustainable fisheries management. The activities also built on earlier fish conservation efforts, including the release of native Puyu fish, allowing participants to better understand the relationship between native species conservation, fish population management and the long-term health of freshwater ecosystems. Through these engagements, UM supported greater public understanding of responsible practices for maintaining freshwater fish resources.

Sustainable Fisheries Education Through Sekolah Sahabat Perikanan







The Sekolah Sahabat Perikanan: Kembara Ekologi Biru programme provided free practical education on sustainable fisheries, marine biodiversity and responsible management of aquatic resources, while raising awareness of threats including overfishing and illegal, unreported and unregulated (IUU) fishing. Organised by the EcoBio Society of Universiti Malaya in collaboration with the Selangor State Department of Fisheries on 3–4 September 2025, the two-day programme engaged 50 Form 3 and Form 4 school students from Sekolah Menengah Sains Kuala Selangor and Sekolah Berasrama Penuh Integrasi Sabak Bernam, together with 25 students from UM's Ecology and Biodiversity programme.

The programme combined expert-led learning, practical fisheries activities and direct engagement with the local fishing community. Dr Muhammad Rasul bin Abdullah Halim from Universiti Malaya introduced participants to the diversity of freshwater fish in Peninsular Malaysia, while Assoc. Prof. Dr Amy Then Yee Hui discussed the ecological roles of sharks and rays in marine ecosystems. A fisheries officer from the Selangor State Department of Fisheries introduced the department's role in protecting and managing fisheries resources, including the challenges posed by unsustainable fishing practices. These sessions provided participants with a broader understanding of aquatic biodiversity, sustainable fisheries management and the importance of protecting marine resources from overexploitation.

Participants also gained practical exposure through activities including net mending, fish preservation and fish cleaning, as well as a visit to Bagan Sungai Kajang Jetty. Interaction with local fishers and community members provided insights into fisheries-related livelihoods and the challenges of maintaining marine resources sustainably. Discussions highlighted threats to marine ecosystems, including overfishing and IUU fishing, and the importance of responsible fishing and sustainable harvesting practices. An innovative pitching activity further encouraged participants to develop ideas related to environmental conservation and responsible resource management.

By combining scientific knowledge, awareness of unsustainable fishing practices, practical fisheries activities and community engagement, the programme strengthened participants' understanding of sustainable fisheries management and the need to protect aquatic resources from overfishing, IUU fishing and other pressures on marine ecosystems.

Community Outreach on Sustainable Fisheries and Marine Resource Management at Mersing

The Seagrass Eco Tourism Experience on the 2nd July 2025 in the Mersing region brought together researchers, government agencies, fisheries authorities and local communities to raise awareness of sustainable fisheries and responsible marine resource management. Organised through a collaboration between Yayasan JCorp and Universiti Malaya, with support from the Mersing District Office and Tourism Johor, the programme combined environmental education with community engagement to promote the sustainable use of marine resources.



Through scientific briefings and technical sharing sessions led by researchers and fisheries authorities, participants gained insights into the importance of protecting marine habitats and maintaining sustainable fish populations. The programme encouraged awareness of responsible fishing practices and the impacts of unsustainable fishing on marine ecosystems, supporting community understanding of the need to prevent overfishing and protect marine resources.



03 Conservation and Sustainable Utilisation of the Oceans (Events)

Universiti Malaya supported and organised a range of events in 2025 to promote the conservation and sustainable use of marine and aquatic ecosystems. These activities brought together researchers, government agencies, conservation organisations, local communities, students and the wider public through community-based programmes, experiential learning, expert discussions and public outreach. Topics included seagrass and coral reef conservation, marine biodiversity, sustainable coastal resource management and the impacts of plastic pollution, providing opportunities to strengthen understanding of responsible use and protection of oceans and marine resources.

Evidences include:

- **Seagrass Ecosystem Conservation through Nature-Based Learning** (Page 10)
- **Marine Conservation Outreach at Pulau Perhentian** (Page 11)
- **Antarctic to Ocean Plastic Pollution Forum** (Page 12)
- **Coral Conservation Panel & Outreach** (Page 12)

Seagrass Ecosystem Conservation through Nature-Based Learning

The Seagrass Nature Walk on 2nd July 2025, conducted as part of the Seagrass Eco Tourism Experience in the Mersing region, promoted awareness and appreciation of seagrass ecosystem conservation. The activity brought participants from Tanjung Genting to Pulau Setindan, providing an opportunity to explore seagrass habitats and understand their ecological importance.

The nature walk was complemented by a conservation documentary and scientific sharing sessions led by researchers, highlighting the role of seagrass ecosystems in supporting marine biodiversity and maintaining coastal ecosystem health. Through this experiential learning activity, participants gained a better understanding of the importance of conserving seagrass habitats and protecting marine ecosystems for sustainable utilisation.







Marine Conservation Outreach at Pulau Perhentian

ASTREC Community Splash, organised by ASTREC (ASTAR Recreational and Educational Club) of First Residential College, Universiti Malaya, brought 42 students to Pulau Perhentian, Terengganu from 18 to 20 April 2025 for activities focused on marine environmental awareness and conservation. Conducted in collaboration with Fuze Ecoteer, an organisation involved in environmental conservation and sustainability education, the programme promoted greater understanding of the importance of protecting marine ecosystems, particularly coral reefs and turtle habitats.



The programme combined environmental education with experiential learning and community engagement. Participants conducted an interactive teaching session at Sekolah Kebangsaan Pulau Perhentian, introducing primary school students to the importance of protecting coral reef habitats. They also visited Kampung Pasir Hantu, where engagement with the local community provided opportunities to learn about the relationship between coastal communities and their surrounding marine environment.

A key activity was a snorkelling session in the waters around Pulau Perhentian, allowing participants to observe coral reefs and marine life directly in their natural environment. The experience helped participants connect marine biodiversity with the need for responsible interaction and conservation of ocean resources. Educational materials and activities provided through the collaboration with Fuze Ecoteer further introduced participants to responsible practices for protecting marine ecosystems and the importance of collective action in addressing threats to these environments.

By combining marine conservation education, direct exposure to coral reef and marine habitats, and engagement with the local community, ASTREC Community Splash provided a practical platform for promoting awareness of marine ecosystem conservation and responsible interaction with the marine environment.

Antarctic to Ocean Plastic Pollution Forum



As part of UMPOLAR25, the workshop "Plastic Pollution from Pole to Pole: Scientific Insights and Global Mitigation Strategies" brought together 15 local and international experts, researchers, and policymakers to discuss the latest scientific findings on microplastic pollution and explore effective mitigation strategies. Co-organized by the National Antarctic Research Centre (NARC), Institute of Ocean and Earth Sciences (IOES), Nanotechnology & Catalysis Research Centre (NANOCAT), and Air Selangor Sdn Bhd, the workshop highlighted green solutions, legal frameworks, and science communication efforts aimed at reducing plastic pollution and supporting the conservation and sustainable use of marine and aquatic ecosystems.

Coral Conservation Panel & Outreach



Researchers from Project PULIH (Protecting Underwater Life Through Integrated Rehabilitation), Institute of Ocean and Earth Sciences (IOES), participated in a panel discussion titled "*Corals: So What? Is Saving Corals Enough in Saving the Oceans?*" at the Malaysian International Dive Expo (MIDE 2025) on 15 June 2025. Project PULIH was also invited to set up a booth in the RHB Pavilion from 13–15 June 2025, providing interactive displays and educational materials to engage visitors on coral, seagrass, and mangrove conservation. Through expert dialogue and public outreach, the initiative promoted awareness of marine ecosystem protection and sustainable use of ocean resources.

04 Maintain Ecosystems and Their Biodiversity (Direct Work)

Universiti Malaya undertook direct research, conservation and ecosystem management activities to maintain and extend existing ecosystems and their biodiversity, supporting the protection of both plant (seagrass) and animal species (coral reef, native fish) and the long-term health and resilience of natural habitats.

Evidences include:

- **Fish Biodiversity Monitoring and Conservation at Tasik Varsiti** (Page 14)
- **Mersing Seagrass & Coral Reef Conservation Programme** (Page 15)
- **Pulau Setindan Seagrass Mapping Programme** (Page 16)

Fish Biodiversity Monitoring and Conservation at Tasik Varsiti

Universiti Malaya continued its efforts to maintain freshwater biodiversity at Tasik Varsiti through ecological monitoring and native fish conservation in collaboration with the Department of Fisheries Wilayah Persekutuan Kuala Lumpur / Putrajaya. A 24-hour fish inventory study conducted from 13–14 November 2025 documented fish populations and species distribution in the lake, contributing to ongoing ecological monitoring and a better understanding of the lake's fish community.

The collaboration also included the release of 5,100 native Puyu fish into Tasik Varsiti to support native fish populations. Building on earlier fish releases and inventory studies, these activities contributed to the continued monitoring, conservation and management of aquatic biodiversity within the university's freshwater ecosystem.

Released in 2025

5,100 native fish into Tasik Varsiti for freshwater ecosystem conservation







Native fish observed

- Lampam sungai (*Barbonymus schwanefeldii*)
- Ketutu (*Oxyeleotris marmorata*)
- Kelah (*Tor tambra*)
- Kerai kunyit (*Hypsibarbus wetmorei*)
- Baung (*Hemibagrus capitulum*)
- Terbul (*Osteochilus vittatus*)

Mersing Seagrass & Coral Reef Conservation Programme

Yayasan JCorp, in collaboration with UM and local stakeholders, organised the Seagrass Exploration Programme in Mersing, involving 50 participants including representatives from the Mersing District Office, JCorp volunteers, company staff, researchers, and local tourism operators. The programme focused on direct conservation and protection of marine habitats, particularly seagrass areas, as part of ongoing efforts linked to earlier coral reef rehabilitation work initiated in 2023. Activities included environmental briefings, field visits, and community engagement sessions to strengthen understanding of marine ecosystem conservation.

The rehabilitation efforts have contributed to improved habitats supporting more than ten marine species, including Bluefaced Angelfish, Regal Angelfish, and False Clown Anemonefish, enhancing biodiversity and ecosystem resilience in the Mersing coastal region. The initiative demonstrates direct conservation action supported by scientific input and community participation, while also aligning with sustainable eco-tourism development in the area.









Pulau Setindan Seagrass Mapping Programme

A seagrass mapping study was conducted around Pulau Setindan, Mersing, Johor to identify seagrass species and assess their role in supporting coastal biodiversity conservation. The programme involved multiple stakeholders, including local communities, district authorities (Majlis Daerah Mersing), Reef Check Malaysia, Yayasan Petronas, and other organisations, ensuring collaborative and participatory implementation.

The study provides important baseline data for ongoing conservation efforts, supporting the protection and sustainable management of seagrass habitats. It contributes to biodiversity preservation in Mersing's coastal waters and strengthens long-term ecosystem resilience through science-based conservation planning.



05 Technologies Towards Aquatic Ecosystem Damage Prevention (Direct Work)

Universiti Malaya undertook research and applied practices in 2025 to develop and support technologies and approaches that help minimise or prevent damage to aquatic ecosystems. These efforts focused on applying scientific knowledge and practical solutions to promote more sustainable management of marine and aquatic environments and reduce pressures arising from human activities.

Evidences include:

- **AquaPhage Technology for Sustainable Aquaculture** (Page 18)
- **Artificial Coral Structures for Marine Ecosystem Restoration and Coastal Protection** (Page 19)
- **Malaysia–China Collaboration on Harmful Algal Bloom Mitigation** (Page 20)
- **Advancing Research on Harmful Algal Blooms** (Page 21)
- **Marine Ecosystem Monitoring at Bachok Marine Research Station** (Page 21)
- **Biopolymer-Based Therapeutics** (Page 22)

AquaPhage Technology for Sustainable Aquaculture

AquaPhage, developed by Dr Tang Swee Seong and his team from the Institute of Biological Sciences, Faculty of Science, is a sustainable innovation designed to tackle bacterial infections in aquaculture without the use of antibiotics. The technology encapsulates a cocktail of bacteriophages, which are natural viruses that target harmful bacteria, within biodegradable alginate microcapsules derived from brown algae. These capsules can be delivered through fish feed, providing an environmentally friendly solution for aquaculture operations.



AquaPhage supports the health of freshwater and marine aquatic ecosystems used for aquaculture by reducing reliance on antibiotics in fish farming. By using phage therapy to target harmful bacteria, the technology helps address antimicrobial resistance, promotes healthier farmed fish and reduces the risk of antibiotic residues entering surrounding aquatic environments. This innovation contributes to more sustainable aquaculture practices while supporting the protection of aquatic ecosystems and the responsible use of aquatic resources.

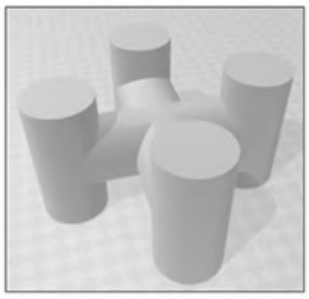
Artificial Coral Structures for Marine Ecosystem Restoration and Coastal Protection



Universiti Malaya, through the research of Ts. Gs. Dr. Muhammad Shazril Idris bin Ibrahim, is developing innovative engineering technologies to support aquatic ecosystem restoration and coastal protection. His research includes artificial coral structures that provide suitable foundations for corals and other marine organisms to settle, encouraging the recovery of damaged reef ecosystems and supporting marine biodiversity.



In addition, Dr Shazril is developing MYPODE, a sustainable geopolymer concrete armour unit designed to strengthen coastal protection structures and address shoreline erosion. The technology incorporates industrial waste materials, including fly ash, ground granulated blast furnace slag (GGBFS) and palm oil fuel ash (POFA), as alternatives to conventional cement. This reduces reliance on carbon-intensive construction materials while promoting the reuse of industrial waste and conserving natural resources.



MyPODE

MYPODE also features an interlocking design that improves structural stability against wave forces, alongside enhanced resistance to seawater corrosion. Its development involves material testing, wave stability modelling and physical experiments in collaboration with the National Hydraulic Research Institute of Malaysia (NAHRIM). In 2025, the research team is progressing towards its first real-world deployment at a coastal protection site in Kuala Terengganu.

Through these research initiatives, Universiti Malaya is contributing to the development of engineering technologies that support marine habitat restoration, minimise environmental impacts and strengthen coastal resilience.

Malaysia–China Collaboration on Harmful Algal Bloom Mitigation



In 2025, Universiti Malaya (UM), through its Institute of Ocean and Earth Sciences (IOES), collaborated with the Institute of Oceanology, Chinese Academy of Sciences, to evaluate the potential application of modified clay technology for mitigating harmful algal blooms (HABs) in Malaysia. Featured in a CGTN report published on 10 June 2025, the collaboration focused on investigating the effectiveness of the technology against different algal species under local environmental conditions. Developed by Chinese researchers, the technology modifies the surface of clay particles to bind with harmful algae, causing them to aggregate and settle to the bottom of the water body.

Harmful algal blooms can threaten coastal and marine ecosystems by depleting dissolved oxygen, producing toxins and causing mass mortality among aquatic organisms, with significant consequences for aquaculture and marine biodiversity. Through this research collaboration, UM contributes to evaluating a potentially environmentally friendly approach to controlling harmful algal blooms and reducing their impacts on aquatic ecosystems. The findings could help inform the future application of this technology in Malaysia's aquaculture industry, supporting efforts to protect aquatic environments and promote more sustainable marine resource management.

Advancing Research on Harmful Algal Blooms



The Fisheries Research Institute (FRI), Batu Maung, Penang, visited the Bachok Marine Research Station (BMRS) in January 2025 to discuss ongoing studies on Harmful Algal Blooms (HABs) in Malaysia. The visit included in-depth discussions on monitoring, mitigation strategies and potential research collaborations aimed at preventing ecosystem damage. These efforts focus on protecting coastal and marine ecosystems, where harmful algal blooms can disrupt marine food webs, reduce dissolved oxygen levels and threaten marine biodiversity. This research collaboration strengthens scientific understanding and supports the development of effective monitoring and mitigation strategies for the protection and sustainable management of marine ecosystems.

Marine Ecosystem Monitoring at Bachok Marine Research Station





On 20 October 2025, a delegation from the First Institute of Oceanography (FIO), China, visited the Bachok Marine Research Station (BMRS) to support the maintenance and enhancement of the Automated Weather Station (AWS) system. The system supports the monitoring of environmental conditions affecting the coastal and marine ecosystems of Bachok, particularly the nearshore marine environment. The visit included sensor upgrades and equipment calibration to improve the accuracy of environmental data collection, supporting research and informed decision-making for marine ecosystem conservation. By maintaining and enhancing this monitoring infrastructure, Universiti Malaya (UM) and its partners strengthen the capacity to understand environmental changes and support the sustainable management and protection of coastal and marine resources.

Biopolymer-Based Therapeutics

Researchers from the Faculty of Engineering are exploring the use of biopolymers as a sustainable method to deliver biotherapeutic agents—such as bacteriophages, vaccines, and antibodies—into freshwater fish like tilapia, patin, and keli. These natural polymers, derived from sources like seaweed and cassava, encapsulate the therapeutic agents, protecting them from environmental factors such as sunlight, temperature, and pH changes, and enabling controlled, targeted release directly to affected tissues.

This technology reduces reliance on antibiotics, helping to prevent antimicrobial resistance and minimizing chemical residues in water, while promoting healthier fish and more environmentally responsible aquaculture practices. By combining innovative science with ecosystem protection, biopolymer-based therapeutics offer a practical, eco-friendly solution for sustainable aquaculture and the long-term health of aquatic ecosystems.



06 Water Discharge Guidelines and Standards

Water Discharge Management and Pollution Prevention at Universiti Malaya

(1) National Environmental Regulations

Universiti Malaya's wastewater management arrangements are guided by national environmental regulations established under the Environmental Quality Act 1974, including the Environmental Quality (Sewage) Regulations 2009. These regulations prescribe acceptable sewage discharge conditions and effluent quality standards to prevent water pollution and safeguard environmental and public health.

(2) Wastewater Collection, Treatment and Discharge

All wastewater generated within Universiti Malaya's main campus is connected to the public sewerage network managed by Indah Water Konsortium (IWK) and channelled to the Pantai 2 Regional Sewage Treatment Plant (RSTP) for treatment.



According to UM's Water Management Report 2022 and IWK's official Pantai 2 RSTP brochure, the facility serves the Pantai sewerage catchment, which includes Universiti Malaya. The plant employs the Advanced Anaerobic-Anoxic-Oxic (A2O) treatment process and is designed to meet Standard A effluent discharge requirements under the Environmental Quality (Sewage) Regulations 2009.

Following treatment, the final effluent is discharged into Sungai Klang, within the river basin in which the campus is located. The plant also incorporates an effluent reclamation system, allowing treated wastewater to be reused for non-potable purposes within the facility.

This centralised wastewater treatment arrangement supports the University's efforts to ensure that sewage undergoes appropriate treatment before being released into the receiving water body.

(3) UM Sustainability Policy 2021–2030

Universiti Malaya's Sustainability Policy 2021–2030 (Second Edition), reviewed on 1 September 2023, establishes the University's commitment to protecting water quality and preventing water pollution. Under its water sustainability commitments, the policy identifies the introduction of water discharge guidelines as an institutional measure to safeguard water quality, ecosystems, wildlife, and human health and welfare.

This commitment provides a policy direction for strengthening institutional water discharge management and establishing appropriate measures to protect water resources across the University.

(4) UM Development Checklist (Revision 03, May 2024)

Universiti Malaya has incorporated water quality protection and pollution prevention requirements into its Development Checklist (Revision 03, May 2024), prepared by the UM's Estate Department (JHB).

The checklist establishes several environmental considerations for campus development projects, including:

- Section 1.5.10 – Pollution Control: Requires development projects to identify plans for pollution control and other environmental mitigation measures.
- Section 1.5.11 – Water Bodies: Emphasises integrated and long-term water management covering lakes, rivers and groundwater. It also identifies the objective of maintaining campus water bodies within Class I–II water quality classifications, supported by consistent monitoring of water quality and other water-related data. These classifications represent receiving-water quality objectives rather than sewage effluent discharge standards.
- Section 6.5.2–6.5.5 – Waste Management: Includes requirements to consider wastewater treatment, sewage management, wetlands, and oil and grease traps.
- Section 6.5.6 – Prevention of Direct Discharge: Specifically asks whether there is any direct discharge into the nearest drain or river.
- Section 6.7 – Rainwater Management: Addresses surface water runoff, on-site detention ponds and the use of permeable materials to support water infiltration.

These requirements integrate water pollution prevention, wastewater management and water quality protection into the planning and assessment of campus development projects. In particular, the requirement to prevent direct discharge into drains or rivers and the emphasis on maintaining Class I–II water quality based on national standard provide relevant institutional measures for protecting campus waterways and surrounding aquatic ecosystems.

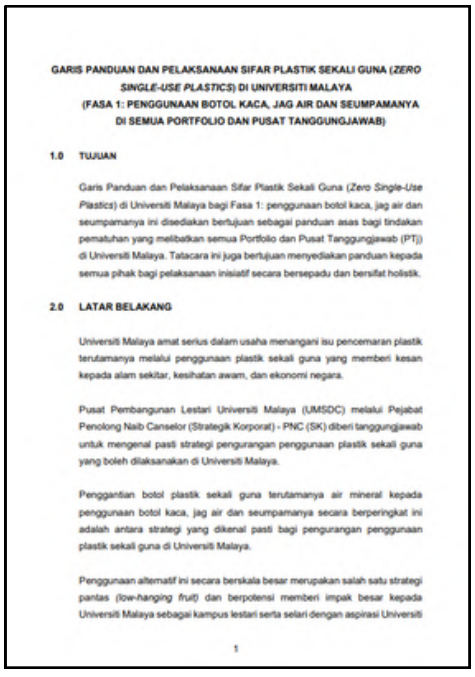
07 Action Plan to Reducing Plastic Waste

Campus Action Plan to Reduce Plastic Waste

Universiti Malaya established a campus-wide action plan to reduce plastic waste through the phased implementation of its Zero Single-Use Plastics initiative. The approach combines institutional guidelines, phased implementation mechanisms and requirements for Portfolios, Pusat Tanggungjawab (PTj), food premises, programme organisers and vendors. Building on measures introduced from 2024, the action plan progressively strengthened controls on single-use plastics across campus, including the use of plastic drinking bottles and plastic food and beverage packaging. The framework was further expanded in 2026 towards the elimination of single-use plastic food and beverage items across University activities.

(1) Zero Single-Use Plastics Guideline for Responsibility Centres (PTj) in UM (2024)

The Guideline and Implementation of Zero Single-Use Plastics at Universiti Malaya: Phase 1 – Use of Glass Bottles, Water Jugs and Similar Alternatives across All Portfolios and Centres of Responsibility provides a common framework for implementing plastic reduction measures across the University. Its objectives include reducing the use of single-use plastic drinking bottles, increasing awareness of sustainable consumption among the campus community, and reducing plastic use that contributes to environmental pollution. Phase 1 therefore established a practical campus-wide measure by progressively replacing single-use plastic mineral water bottles with reusable glass bottles, water jugs and similar alternatives. The guideline also aligns with the Universiti Malaya Sustainability Policy 2021–2030, the University's policy on single-use plastics and food waste separation, and national initiatives on reducing single-use plastics.



GARIS PANDUAN DAN PELAKSANAAN SIFAR PLASTIK SEKALI GUNA (*ZERO SINGLE-USE PLASTICS*) DI UNIVERSITI MALAYA
(FASA 1: PENGGUNAAN BOTOL KACA, JAG AIR DAN SEUMPAMANYA DI SEMUA PORTFOLIO DAN PUSAT TANGGUNGJAWAB)

1.0 TUJUAN

Garis Panduan dan Pelaksanaan Sifar Plastik Sekali Guna (*Zero Single-Use Plastics*) di Universiti Malaya bagi Fasa 1: penggunaan botol kaca, jag air dan seumpamanya ini disediakan bertujuan sebagai panduan asas bagi tindakan pematuhan yang melibatkan semua Portfolio dan Pusat Tanggungjawab (PTj) di Universiti Malaya. Tatacara ini juga bertujuan menyediakan panduan kepada semua pihak bagi pelaksanaan inisiatif secara bersepadu dan bersifat holistik.

2.0 LATAR BELAKANG

Universiti Malaya amat serius dalam usaha menangani isu pencemaran plastik terutamanya melalui penggunaan plastik sekali guna yang memberi kesan kepada alam sekitar, kesihatan awam, dan ekonomi negara.

Pusat Pembangunan Lestari Universiti Malaya (UMSDC) melalui Pejabat Penolong Naib Canselor (Strategik Korporat) - PNC (SK) diberi tanggungjawab untuk mengenal pasti strategi pengurangan penggunaan plastik sekali guna yang boleh dilaksanakan di Universiti Malaya.

Penggantian botol plastik sekali guna terutamanya air mineral kepada penggunaan botol kaca, jag air dan seumpamanya secara berperingkat ini adalah antara strategi yang dikenal pasti bagi pengurangan penggunaan plastik sekali guna di Universiti Malaya.

Penggunaan alternatif ini secara berskala besar merupakan salah satu strategi pantas (*low-hanging fruit*) dan berpotensi memberi impak besar kepada Universiti Malaya sebagai kampus lestari serta selari dengan aspirasi Universiti

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(2) Zero Single-Use Plastics Implementation at All Food Premises in UM (2025)

The action plan was further implemented through the Notification on the Second Phase of the Zero Single-Use Plastics Implementation Mechanism at All Food Premises, Universiti Malaya, issued on 25 February 2025 by the Deputy Vice-Chancellor (Development). This phase extended plastic reduction measures to food premises across the University. All tenants were informed that conventional plastic carrier bags with handles and plastic food and beverage containers were not permitted for use or provision at their premises. Food operators were instead encouraged to provide alternatives such as paper or cardboard containers and to encourage customers to bring their own reusable containers.



UNIVERSITI MALAYA

UM.TNC4/JHB/BA/757/SP/2025
25 Februari 2025

SENARAI EDARAN

Tuan/Puan,

PEMAKLUMAN FASA KEDUA MEKANISME PELAKSANAAN SIFAR PLASTIK SEKALI GUNA (*ZERO SINGLE-USE PLASTICS*) DI SEMUA PREMIS MAKANAN, UNIVERSITI MALAYA

Dengan segala hormatnya surat edaran (no. rujukan: UM.TNC4/JHB/BA/757/SP/2024) bertarikh 21 November 2024 berkaitan perkara di atas adalah dirujuk.

2. Merujuk kepada notis terdahulu, projek ini akan dilaksanakan secara berperingkat.

3. Sehubungan dengan itu, berkuatkuasa **01 April 2025**, semua Penyewa **tidak dibenarkan** untuk menggunakan atau menyediakan barangan seperti berikut,

a) Beg plastik bertangkai konvensional mahupun jenis biodegradasi; dan
b) Bekas makanan plastik kecuali plastik bagi makanan berkuah.

4. Penyewa **diberi pilihan** untuk menyediakan alternatif seperti bekas kotak makanan kertas dan caj maksima dibenarkan ialah RM0.50/bekas. Walau bagaimanapun, pelanggan digalakkan untuk membawa bekas sendiri bagi pesanan bawa pulang (*take-away*).

5. Pihak UM akan menjalankan pemeriksaan secara berkala pada bila-bila masa bagi memastikan tuan/puan mematuhi syarat-syarat yang telah ditetapkan di atas. Tindakan **penamatan sewaan** boleh diambil sekiranya tuan/puan didapati **gagal** mematuhi syarat-syarat yang telah ditetapkan.

6. Sebarang pertanyaan lanjut, tuan/puan boleh menghubungi Sr Muhammad Hariz Jamaludin, Bahagian Aset, Jabatan Harta Benda, UM di talian 03-7967 6830 atau En. Affan Nasaruddin dari Pusat Pembangunan Lestari di talian 03-7967 4635. Kerjasama dan keprihatinan daripada tuan/puan berkenaan perkara ini amatlah dihargai.

Sekian, terima kasih dan salam hormat.

Home of the Bright, Land of the Brave
Di Sini Bersinarlah Petir, Tanah Tumpahnya Berani

Yang menjalankan amanah,

PROFESOR IR DR RAMESH SINGH
Timbalan Naib Canselor (Pembangunan)

s.k. Penolong Naib Canselor, Strategi Korporat
Pengarah, UMSDC
Pengarah Eksekutif, JHB

JHB/BA/MHJ

PEJABAT TIMBALAN NAIB CANSELOR (PEMBANGUNAN)
Aras 1, Canselori, Universiti Malaya, 50603 Kuala Lumpur, MALAYSIA
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The 2025 mechanism continued measures introduced through earlier notices issued in August and November 2024, providing a progressively strengthened approach to reducing single-use plastics in campus food premises. Together, the phased measures established requirements that could be applied consistently by food operators and other relevant campus stakeholders.

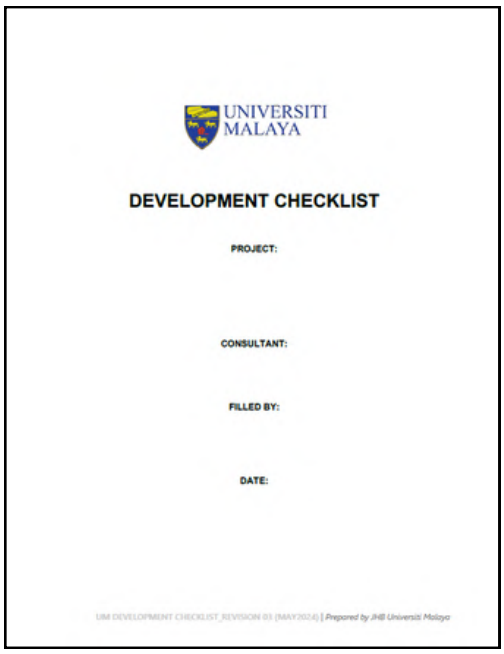


(3) Comprehensive Zero Single-Use Plastics Guideline (2024 - 2026)

In 2024 - 2026, the University further expanded the guideline into a comprehensive Zero Single-Use Plastics Guideline covering all Portfolios, PTj and temporary or mobile hawkers under PTj supervision. The expanded guideline aims to stop the use of all types of single-use plastic food and beverage utensils for serving, presenting, packaging or handing over food and beverages at official University events and programmes, including activities organised with external parties, whether held on or off campus. It prioritises reusable utensils and considers environmentally friendly alternatives, while strengthening compliance among the University community, programme organisers, vendors, external agencies and temporary or mobile hawkers. This expansion demonstrates the continued strengthening of the action plan beyond the measures established by 2025.

08 Minimizing Alteration of Aquatic Ecosystems (Plan)

Universiti Malaya (UM) has established institutional policies, development guidelines and site-specific management measures to minimise physical, chemical and biological alterations to aquatic ecosystems. Through the UM Development Checklist, UM Sustainability Policy 2021–2030 and Fishing Activity Guidelines for Tasik Varsiti (2023), the University integrates environmental protection into campus development planning, water quality management and recreational activities.



These frameworks provide a structured approach to identifying and managing potential environmental impacts arising from development activities, water discharge and human interactions with aquatic environments. The measures address three key aspects of aquatic ecosystem protection:

(1) Minimising Physical Alterations to Aquatic Ecosystems

The UM Development Checklist incorporates environmental considerations into campus development planning, requiring developers to assess potential impacts associated with water sources, slope clearing and site conditions. It also identifies measures to manage development-related impacts that could affect surrounding water bodies and their physical environments.
Complementing this, the UM Sustainability Policy 2021–2030 establishes the University's commitment to protecting and conserving campus water bodies. These provisions support the management of development activities and the protection of aquatic environments from physical disturbances.



(2) Minimising Chemical Alterations to Aquatic Ecosystems

The UM Development Checklist requires environmental considerations relating to water quality, soil pollution and pollution control to be addressed during development planning. These requirements help prevent or minimise contamination of nearby water bodies arising from construction and other development activities.

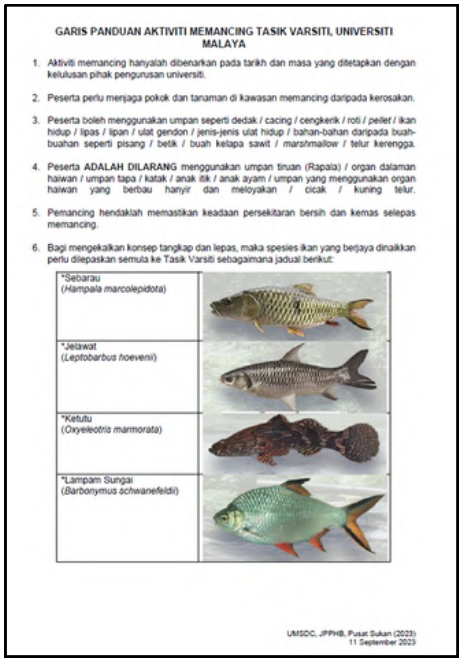
In addition, the UM Sustainability Policy 2021–2030 reinforces the University's commitment to maintaining water quality and introducing water discharge guidelines. These measures provide an institutional basis for managing potential pollutants entering aquatic environments and safeguarding water quality for aquatic wildlife and human health.

(3) Minimising Biological Alterations to Aquatic Ecosystems

At the site-specific level, UM has established the Fishing Activity Guidelines for Tasik Varsiti, developed in 2023 by the UM Sustainable Development Centre (UMSDC), UM Estates Department (JHB) and UM Sports Centre. The guidelines regulate fishing activities to minimise disturbances to aquatic biodiversity and maintain the ecological balance of the lake.

Fishing is permitted only on designated dates and times with prior approval from university management. Native and indigenous fish caught during fishing activities must be released back into the lake to support the conservation of native fish populations. Conversely, invasive species must not be released into public waters, helping to prevent their introduction or spread. Anglers are also required to avoid damaging trees and surrounding vegetation, supporting the protection of habitats associated with the lake.

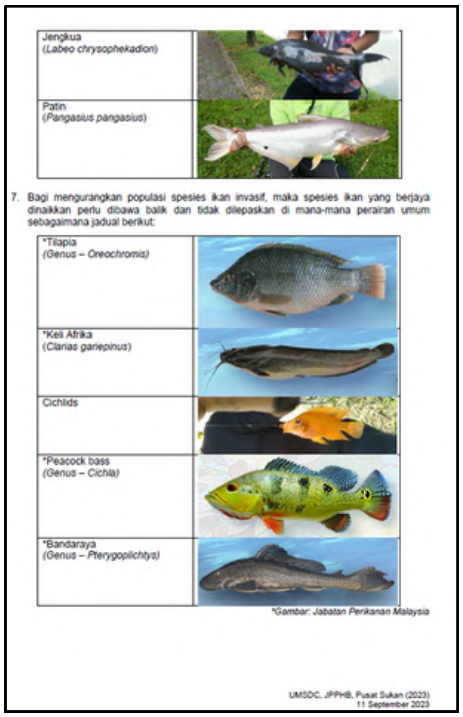
Together, these institutional frameworks and management measures demonstrate UM's commitment to minimising physical, chemical and biological alterations to aquatic ecosystems. By integrating environmental safeguards into campus development, water quality management and recreational activities, UM provides a coordinated approach to protecting the ecological integrity and biodiversity of its campus water bodies.


GARIS PANDUAN AKTIVITI MEMANCING TASIK VARSITI, UNIVERSITI MALAYA

1. Aktiviti memancing hanyalah dibenarkan pada tarikh dan masa yang ditetapkan dengan kelulusan pihak pengurusan universiti.
2. Peserta perlu menjaga pokok dan tanaman di kawasan memancing daripada kerosakan.
3. Peserta boleh menggunakan umpan seperti dedak / cacing / cengkerik / roti / pellet / ikan hidup / lipas / lipan / ulat gendon / jenis-jenis ulat hidup / bahan-bahan daripada buah-buahan seperti pisang / betik / buah kelapa sawit / *marshmallow* / telur kerengga.
4. Peserta **ADALAH DILARANG** menggunakan umpan tiruan (Rapala) / organ dalaman haiwan / umpan tapa / katak / anak itik / anak ayam / umpan yang menggunakan organ haiwan yang berbau hanyir dan meloyakan / cicak / kuning telur.
5. Pemancing hendaklah memastikan keadaan persekitaran bersih dan kemas selepas memancing.
6. Bagi mengekalkan konsep tangkap dan lepas, maka spesies ikan yang berjaya dinaikkan perlu dilepaskan semula ke Tasik Varsiti sebagaimana jadual berikut:

*Sebarau (*Hampala marcolepidota*)	
*Jelawat (*Leptobarbus hoevenii*)	
*Ketutu (*Oxyeleotris marmorata*)	
*Lampam Sungai (*Barbonymus schwanefeldii*)	

UMSDC, JPPHB, Pusat Sukan (2023)
11 September 2023


Jengkua (*Labeo chrysophekadion*)	
Patin (*Pangasius pangasius*)	

7. Bagi mengurangkan populasi spesies ikan invasif, maka spesies ikan yang berjaya dinaikkan perlu dibawa balik dan tidak dilepaskan di mana-mana perairan umum sebagaimana jadual berikut:

*Tilapia (*Genus – Oreochromis*)	
*Keli Afrika (*Clarias gariepinus*)	
Cichlids	
*Peacock bass (*Genus – Cichla*)	
*Bandaraya (*Genus – Pterygoplichtys*)	

*Gambar: Jabatan Perikanan Malaysia

UMSDC, JPPHB, Pusat Sukan (2023)
11 September 2023

Above: *"Fishing Activity Guidelines for Tasik Varsiti, Universiti Malaya", published in September 2023. Link to download the guideline: https://sustainability.um.edu.my/doc/Sustainability%20UM/Policies,%20Guidelines,%20Handbook/Garis%20Panduan%20Memancing%20Tasik%20Varsiti.pdf*

09 Monitoring the Health of Aquatic Ecosystems

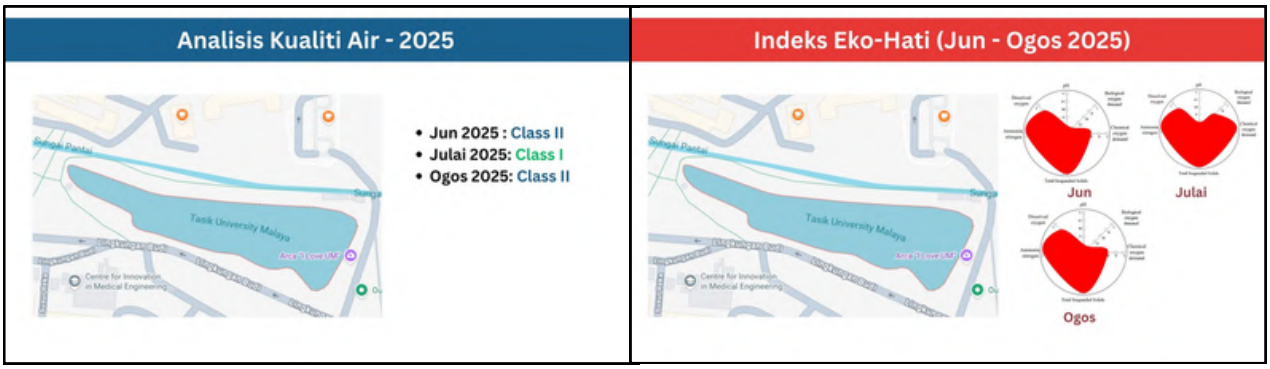
Campus Freshwater Quality Monitoring and Assessment





In 2025, the UM Estates Department (JHB) continued to conduct water quality analyses in June, July and August 2025 to assess and monitor the condition of selected water bodies across the campus. The monitoring aimed to evaluate the health of these aquatic ecosystems and assess compliance with relevant environmental and safety standards. Three sampling locations were identified: Tasik Varsiti, Sungai Anak Air Batu and Sungai Mustafa, representing key freshwater ecosystems within Universiti Malaya.

The analysis covered a comprehensive range of water quality parameters, including ammoniacal nitrogen, biochemical oxygen demand, chemical oxygen demand, dissolved oxygen, pH (potential of hydrogen), total suspended solids and the presence of *Escherichia coli* (E. coli). These indicators provide valuable insights into the ecological condition of the water bodies, helping to identify potential pollution sources and inform targeted conservation and management measures. The Department of Environment (DOE) Water Quality Index Classification was used as the benchmark for assessing overall water quality, ensuring consistency with national environmental assessment standards.



Above: *The image above presents the 2025 water quality analysis results for Tasik Varsiti, one of the three sampling locations, with the overall results indicating water quality between Class I and Class II. The results for six key parameters, namely ammoniacal nitrogen, biochemical oxygen demand, chemical oxygen demand, dissolved oxygen, pH and total suspended solids, were also visually presented using the Eco-Heart Index. This visual tool translates water quality data into an accessible format, with a fuller heart representing better water quality and a less complete heart indicating poorer water quality. This approach helps the public understand the condition of the lake and its key water quality indicators more easily.*

10 Programmes Towards Good Aquatic Stewardship Practices

Universiti Malaya supports ongoing programmes that promote responsible aquatic ecosystem management, biodiversity conservation and community participation. Through volunteer initiatives, citizen science, research and community-based conservation activities, the University is strengthening aquatic stewardship practices among its campus community and coastal communities, while building their capacity to monitor, protect and sustainably manage freshwater and marine ecosystems.

Evidences include:

- **UM Water Warriors: Ongoing Aquatic Aquatic Stewardship and Freshwater Conservation Programme** (Page 31)

- **Yayasan PETRONAS Seagrass Mapping and Community-Based Programme (2025–2026)** (Page 32)

UM Water Warriors: Ongoing Aquatic Aquatic Stewardship and Freshwater Conservation Programme







UM Water Warriors is an ongoing staff and student volunteer group at Universiti Malaya, established in 2013, that promotes freshwater conservation and responsible aquatic ecosystem management through education, citizen science and community engagement. The group continues to facilitate activities that encourage the university community and wider public to participate in protecting aquatic environments.

Throughout 2025, UM Water Warriors facilitated several initiatives to promote good aquatic stewardship practices. In collaboration with the Department of Fisheries, the group supported the establishment of a native fish bank at Tasik Varsiti to strengthen the conservation of indigenous freshwater fish species. The group also conducted citizen science activities involving water quality and biodiversity monitoring at Tasik Varsiti, campus rivers and other green spaces, encouraging active participation in observing and understanding the health of freshwater ecosystems.

In addition, UM Water Warriors engaged students and visitors through educational and knowledge-sharing activities on responsible water management practices at Universiti Malaya. The group also collaborated with the UM Estates Department on flood preparedness, contributing to campus awareness and engagement on freshwater-related risks and management.

Through its continued activities since 2013, UM Water Warriors provides an ongoing platform for staff, students and community members to participate in freshwater conservation, biodiversity protection and responsible water management, supporting a culture of aquatic stewardship within the university.

Yayasan PETRONAS Seagrass Mapping and Community-Based Programme (2025–2026)

Led by Associate Professor Dr. Jillian Ooi Lean Sim from the Department of Geography, Faculty of Arts and Social Sciences, Universiti Malaya, the Yayasan PETRONAS Seagrass Mapping and Community-Based Programme (2025 - 2026) is supporting long-term seagrass conservation and community participation along the Johor coast. The two-year initiative, supported by RM1,140,894 in funding, focuses on mapping priority seagrass habitats, conducting ecological assessments and strengthening local capacity for community-led conservation.





Through regular field training and citizen science activities, coastal communities in Mersing and around the Johor River estuary are learning to identify seagrass species, collect ecological data and monitor potential threats such as propeller scarring and sediment runoff. Community members are also participating in Seagrass Nature Walks to gain first-hand understanding of seagrass ecosystems and their importance in supporting fisheries, coastal protection and blue carbon storage.



The programme works alongside local conservation partners, including Reef Check Malaysia, Kelab Alami Mukim Tanjung Kupang and community volunteers in Mersing, to establish sustained local participation in seagrass monitoring and protection. The information collected is contributing to habitat mapping and Malaysia's emerging blue-carbon strategies, while strengthening community awareness and responsibility for coastal ecosystem conservation.

Through this ongoing programme, Universiti Malaya is developing a community-based approach to aquatic stewardship by equipping local communities with the knowledge and skills to monitor, understand and protect seagrass ecosystems beyond the duration of the research project.

11 Collaboration for Shared Aquatic Ecosystems

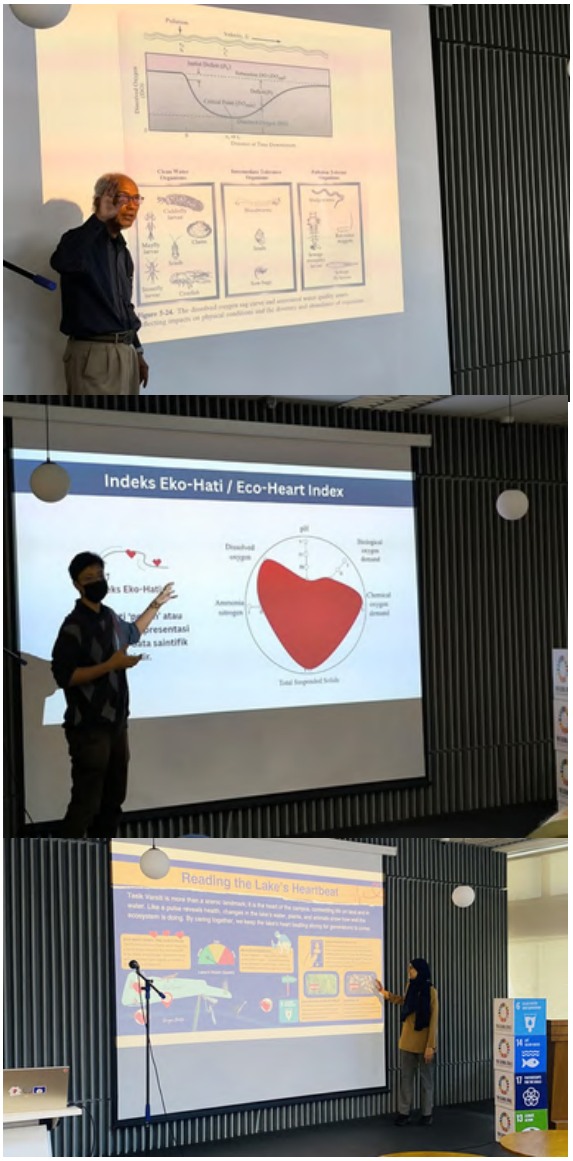
Universiti Malaya promotes collaboration with its local campus community, including students, residential colleges and university departments, to support the protection and sustainable management of shared aquatic ecosystems. Through collective initiatives and community participation, these efforts contribute to healthier aquatic environments and strengthen shared responsibility for their long-term conservation.

Evidences include:

- **Tasik Varsiti Conservation Dialogue** (Page 34)
- **Community River Cleanup for Freshwater Ecosystem Protection** (Page 35)
- **Residential College Initiative for Sustainable Lake Management** (Page 36)

Tasik Varsiti Conservation Dialogue

Tasik Varsiti, a cherished lake in Universiti Malaya, served as the focus of a conservation briefing, feedback, and communication strategies session organised by the UM Sustainable Development Centre to share best practices in lake conservation, provide updates on water quality, and strengthen community engagement in sustainable lake management. The session featured insights from Dr Abdul Halim Sulaiman, a limnology specialist, who highlighted the ecological importance of lakes in Malaysia, the threats they face, and strategies for sustainable management. Current water quality findings were also presented, alongside discussions on the future direction of the lake and improvements to interpretive materials for visitors. The session brought together representatives from multiple university departments such as UM Estates Department, Sports Centre, Faculty of Engineering, UM Library, Faculty of Science as well as the Urban Biodiversity Initiative as an external collaborator.





Community River Cleanup for Freshwater Ecosystem Protection







Several river and green-space clean-up activities were conducted around Universiti Malaya in 2025, including in-river waste collection to support the protection of campus freshwater ecosystems.

In April 2025, a river clean-up programme was organised by the Universiti Malaya Community Engagement Centre (UMCares) and UMCares Club, with support from UMSDC and Water Warriors UM. The programme engaged 45 local and international participants from Indonesia and the Philippines as part of a student and staff mobility exchange programme involving Universiti Malaya, Universitas Negeri Malang, Universitas Muhammadiyah Sidoarjo (Indonesia) and Cor Jesu University (Philippines). The activity provided an opportunity for participants to contribute directly to river conservation while strengthening cross-cultural collaboration and environmental awareness.

Further clean-up activities were carried out in May and June 2025 by students undertaking the volunteerism course under the Centre for Integral Learning (CITRA), Universiti Malaya. Through repeated volunteering sessions at Sungai Pantai, one of the rivers flowing through the campus, students participated in waste collection and riverbank clean-up efforts, contributing to the maintenance of a cleaner and healthier freshwater environment.

Together, these initiatives demonstrate Universiti Malaya's continued efforts to engage students, staff and international partners in practical freshwater ecosystem protection through community participation and volunteerism.

Residential College Initiative for Sustainable Lake Management

Raja Dr. Nazrin Shah Residential College (KK12), Universiti Malaya, initiated a lake deepening project within its residential college grounds in 2025 to improve the management and ecological condition of the aquatic environment. The initiative aims to reduce flooding risks, improve water quality and manage invasive fish species, particularly tilapia, within the lake.

The initiative also highlights the potential for collaboration between college management and students in maintaining shared aquatic ecosystems. Through joint efforts, college management can facilitate lake management and maintenance activities, while students can contribute through awareness initiatives, monitoring activities and participation in conservation efforts. Such collaboration can encourage a shared sense of responsibility among the residential community towards maintaining a healthier aquatic environment.



12 Watershed Management Strategies

Universiti Malaya (UM) adopts an integrated approach to watershed management through institutional planning, water body rehabilitation, aquatic biodiversity conservation, pollution prevention and community participation. Located within the Klang River Basin, UM's main campus encompasses important freshwater ecosystems, including Sungai Pantai, Sungai Anak Air Batu, Tasik Varsiti and the streams within Rimba Ilmu. These water bodies provide habitats for aquatic species and form part of the University's broader efforts to protect urban freshwater ecosystems.

1. Institutional Planning and Policy Framework

UM refers to the following institutional planning and policy documents to guide its watershed management strategy:

UM Master Plan (Page 78):
Read more about the Master Plan here.

The Master Plan identifies the rehabilitation of existing water bodies as a strategic intervention to restore river ecosystems and mitigate flash floods on campus. It specifically highlights the treatment of river water to benefit wildlife in Rimba Ilmu and reduce pollution levels. The plan also emphasises the conservation of Rimba Ilmu's native species and biodiversity through the protection of its natural habitat.

UM Sustainability Policy 2021-2030 (Pages 4, 6, 16):
Read more about the UM Sustainability Policy here.

The policy establishes UM's commitment to improving water quality by reducing pollution, promoting integrated water resources management and protecting water-related ecosystems, including rivers, lakes, wetlands and forests.

It also addresses the reduction of land-based pollution and the prevention of physical, chemical and biological alterations to aquatic ecosystems through research, capacity-building and technology transfer. At the campus level, the policy emphasises protecting and conserving water bodies to safeguard water quality, ecosystems, wildlife and human health.

2. Water Body Rehabilitation and Ecosystem Restoration

UM has translated its institutional commitments into practical rehabilitation initiatives, particularly through Project ReviVaL (Revive Varsity Lake), initiated in 2014. The project brought together university departments, researchers, Water Warriors and student volunteers to restore the ecological condition of Tasik Varsiti.

Rehabilitation measures included rechanneling point-source pollution drainage, dredging the lake, installing riprap to manage surface runoff and constructing a mini wetland to provide natural filtration. These interventions aimed to improve water quality, restore aquatic habitats and support the reintroduction of aquatic life.

UM Water Warriors, established as a UM Living Lab initiative since 2012, has also contributed to campus water body conservation through the rehabilitation of Tasik Varsiti, the development of complementary wetland and stream areas, and the establishment of Sungai Mustafa.

3. Aquatic Biodiversity Conservation and Monitoring

UM's watershed management initiatives incorporate aquatic biodiversity monitoring to assess ecosystem conditions and support species conservation.

At Tasik Varsiti, UM collaborates with the Department of Fisheries Malaysia (DOF) to conduct fish inventories and conserve native freshwater species. A 24-hour fish inventory conducted on 13–14 November 2025 documented six native fish species, including lampam sungai (*Barbonymus schwanenfeldii*), ketutu (*Oxyeleotris marmorata*), kelah (*Tor tambra*), kerai kunyit (*Hypsibarbus wetmorei*), baung (*Hemibagrus capitulum*) and terbul (*Osteochilus vittatus*).

The collaboration also resulted in the release of 5,100 native Puyu fish into Tasik Varsiti on 7 November 2025 to support native freshwater fish conservation and strengthen aquatic biodiversity.

At Sungai Pantai, UM undergraduate students have participated in citizen science water quality monitoring under the guidance of the Biodiversity and Ecological Research Network (BEN), with technical training provided by the Global Environment Centre (GEC). The programme incorporates physical, chemical and biological assessments, including monitoring aquatic macroinvertebrates and fish as indicators of river ecosystem health.

4. Community Partnerships and Watershed Stewardship

UM extends its watershed management efforts beyond campus through collaborations with community organisations, environmental agencies and other stakeholders.

The Sungai Pantai River Monitoring Programme adopts a citizen science approach involving Universiti Malaya, Fujitsu Malaysia, Bukit Bandaraya Residents' Association, PPR Kerinchi and PPR Kampung Limau. Supported by Fujitsu Systems Global Solutions Management Sdn Bhd, the programme engages surrounding communities in river monitoring and environmental stewardship.

UM also works with the Global Environment Centre (GEC) through River Ranger training and citizen science activities, enabling students and community participants to undertake basic river health assessments and contribute to pollution monitoring.

Through these initiatives, UM integrates institutional planning, ecosystem rehabilitation, aquatic biodiversity conservation and community participation into its broader watershed management strategy. The initiatives demonstrate the University's efforts to protect campus waterways while contributing to the conservation of the wider Klang River Basin.