



Clean Water and Sanitation

Ensure availability and sustainable management of water and sanitation for all

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Buang Yang Keruh, Ambil Yang Jernih

In 2024, Universiti Malaya advanced SDG 6—ensuring access to clean water and sanitation for all—through initiatives that integrate cultural wisdom, education, and practical action. This commitment aligns with the Malay proverb “*Buang yang keruh, ambil yang jernih*” (“discard what is impure and keep what is clean”), which reflects the principle of maintaining water purity and promoting responsible stewardship. UM provided educational opportunities for local communities to learn about good water management, supported off-campus water conservation, and engaged citizens in activities that foster awareness, shared responsibility, and sustainable practices.

On campus and beyond, UM promoted conscious water usage and strengthened cooperation on water security at local, regional, national, and global levels. These efforts included campaigns, community engagement, research, and knowledge-sharing initiatives designed to reduce water waste, improve water quality, and encourage sustainable water habits among students, staff, and the wider community. Collectively, these initiatives demonstrate UM’s holistic approach to water stewardship, combining education, practical action, and collaborative governance to safeguard water resources for present and future generations.

Local Community Water Management Education

In 2024, Universiti Malaya provided a range of educational opportunities for local communities to learn about good water management through hands-on engagement, research, and public outreach. Campus-based initiatives included annual gotong-royong river clean-ups at Sungai Pantai, Tasik Varsiti, involving UM Global Buddies and SEKRUM volunteers to remove debris and prevent downstream pollution. Complementing these efforts, the “Guarding Our Water Together” project at Tasik Taman Aman, implemented jointly with Monash University Malaysia under the Petaling Jaya Sustainable Community Grant, engaged citizen scientists in regular water monitoring, addressing microplastics, algal blooms, and other water quality issues. Public forums, exhibitions, and workshops—including lake clean-ups, composting sessions, and recycling programmes—provided practical guidance for sustainable water practices and fostered community stewardship.

Universiti Malaya also extended its educational impact through research and professional training. Studies such as the soundscape ecology assessment of campus streams highlighted ecological and emotional values of urban water bodies, while workshops like WWF-Malaysia’s flood preparedness training strengthened local capacity for disaster and water management. Faculty members delivered talks on place-based citizen science, watershed management, and community-driven environmental stewardship, emphasising the role of citizens in sustainable water governance. Together, these initiatives demonstrate UM’s commitment to combining scientific research, hands-on learning, and public engagement to promote effective water management within and beyond the campus community.

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Campus Volunteers in Action: Protecting Sungai Pantai

Within the Universiti Malaya campus, Sungai Pantai, located beside Tasik Varsiti, has become an annual site for volunteers to join UM Water Warriors in gotong-royong (community clean-up) activities along this urban river. On 18 May 2024 and 7 June 2024, UM Global Buddies (UMGB) and the Sekretariat Sukarelawan Universiti Malaya (SEKRUM) collaborated in river clean-up efforts, removing rubbish and debris to prevent them from being carried downstream into Sungai Klang.

Below and right: Students entering Sungai Pantai to participate in the clean-up activity



Guarding Our Water Together with Local Community at Tasik Taman Aman, Petaling Jaya

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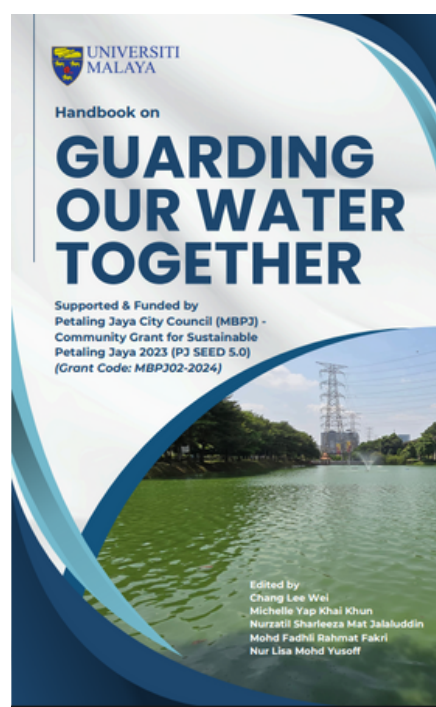
The “*Guarding Our Water Together*” project, awarded under the Petaling Jaya Sustainable Community Grant (PJ SEED 5.0) by the Petaling Jaya City Council (MBPJ), is a 12-month initiative launched on 1 January 2024. Jointly implemented by Universiti Malaya (UM) and Monash University Malaysia, the project adopts an action-oriented, participatory approach to investigate and address water quality issues at Tasik Taman Aman.

Central to its strategy is the engagement of citizen scientists in the continuous monitoring of key water parameters, including dissolved oxygen, pH, turbidity, microalgae identification, cyanotoxin levels, and the presence of microplastics and heavy metals. Sampling activities were conducted twice monthly from March to May, and monthly from June to August, totalling nine sampling sessions in 2024. The project focuses on the dual threats of microplastics and algal blooms, combining scientific research with community involvement to develop targeted interventions.

Below: Event poster for the Mini Exhibition @ Taman Aman (left) and the front cover of the Handbook on Guarding Our Water Together (right)

Key outreach activities included stakeholder engagement during the Friends of Taman Aman (FoTA) AGM and a progress presentation held on 18 May 2024. A public forum on 24 June 2024, co-organised with Monash University Malaysia during the World Environment Day Symposium, spotlighted environmental issues such as water conservation and plastic pollution. In July, the project introduced the SAMPAH SNAGGER 002—a waste interception system installed at the Taman Aman lake to prevent pollution at its source. Community engagement culminated in a mini exhibition on 23 November 2024 at Taman Aman, featuring activities such as lake and park clean-ups, awareness talks, composting workshops, and a recycling buy-back programme. The Handbook on Guarding Our Water Together was published for public viewing by the Universiti Malaya Centre for Civilisational Dialogue (UMCCD) in 2024.

Through its integrated scientific and community-based approach, the project aims to serve as a model for sustainable freshwater management in urban public spaces.





Above: Water sampling activities at Tasik Taman Aman

Below: The Sampah Snagger 002 installed at Tasik Taman Aman prevents waste from entering the lake



Below: Activities during the Mini Exhibition @ Taman Aman



Soundscape Ecology of an Urban Green Campus Water Body: A Tale of Two Streams

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A recent study published in the *Malayan Nature Journal* (2024) titled “Soundscape Ecology of an Urban Green Campus Water Body: A Tale of Two Streams” highlights Universiti Malaya’s innovative approach to sustainability through the lens of soundscape ecology. Conducted at the Rimba Ilmu Botanic Garden and the Faculty of Science, the research revealed how natural and built environments shape the acoustic quality and ecological health of campus water bodies. The Rimba Ilmu stream, flowing through a largely natural landscape, exhibited rich biophonic and geophonic elements such as birdsongs and flowing water—indicators of a calm, vibrant, and healthy ecosystem. In contrast, the Faculty of Science stream, heavily modified by urban structures like drains and culverts, produced harsh, noisy soundscapes, reflecting reduced ecological quality and disrupted water flow.

The study introduced the Natural Soundscape Quality (NSQ) framework as a useful tool for assessing the environmental and emotional value of campus landscapes. It emphasises the importance of integrating soundscape-based monitoring and design into sustainability planning to enhance biodiversity, human well-being, and ecological empathy.

Overall, the research reinforces the need to preserve natural water bodies and manage urban streams with ecological sensitivity, ensuring that UM’s green campus continues to function as both a living laboratory and a sanctuary for biodiversity. By valuing the “music of nature”, Universiti Malaya demonstrates how sustainability can harmonise science, art, and environmental stewardship.

Right: Photos of the water bodies at Universiti Malaya



Strengthening Flood Preparedness Through Municipal Training

On 12–13 December 2024, WWF-Malaysia, in collaboration with several strategic partners, organised a training workshop titled “Enhancing Municipal Preparedness for Flood Hazards: A Practical Approach.” The workshop served as a platform for discussion and exchange of knowledge on various aspects of flood management including preparedness measures before, during, and after flood events and featured training on the Town Watching method.

A total of 36 participants attended, comprising representatives from local authorities, government agencies, non-governmental organisations, and universities across Selangor and the Federal Territory of Kuala Lumpur, including Universiti Malaya. Participants actively engaged in discussions, planning, and strategy development to enhance municipal readiness and strengthen effective flood disaster management. Associate Professor Dr. Fauziah Shahul Hamid represented Universiti Malaya and delivered a presentation titled “Flood-Driven Solid Waste Pollution: Challenges and Strategies for Urban Resilience.”



Above: Associate Professor Dr. Fauziah Shahul Hamid presenting during the training workshop (top), and the group photo (bottom)

Place-based Citizen Science as a “Heartware” Tool to Build Shared Values and Capacity for Watershed Management

In October 2024, Associate Professor Dr. Zeeda Fatimah Mohamad spoke at the Open Science Forum, sharing her expertise on community engagement and environmental stewardship. Her presentation, “Place-based Citizen Science as a ‘Heartware’ Tool to Build Shared Values and Capacity for Watershed Management,” emphasised the importance of involving citizens in sustainable natural resource governance.

She highlighted how place-based citizen science strengthens community connection to local ecosystems, values local knowledge, and builds trust. This collaborative approach encourages shared responsibility and improves decision-making for effective watershed management.

Below: Associate Professor Dr. Zeeda Fatimah Mohamad at the Open Science Forum



Extending Water Conservation Beyond Campus

In 2024, Universiti Malaya promoted practical water conservation beyond campus through community engagement, education, and hands-on projects. Initiatives included the SULAM programme at Sungai Lalang, combining geotourism awareness with hot spring revitalisation, and water quality monitoring at Sungai Hulu Langat with 54 Geography undergraduates. UM Water Warriors also led talks on waste management and water protection at Kolej Sultan Abdul Hamid, Kedah, and participated in the “*Air Kita, Tanggungjawab Bersama*” campaign in Labuan.

UM researchers addressed local water challenges in Bachok, Kelantan, including low-cost rice husk-based filtration solutions. Off-campus advocacy extended to KLEFF 2024, youth water webinars, and workshops on freshwater bioindicators and sustainable waste practices. Associate Prof. Dr. Zeeda Fatimah Mohamad delivered a keynote at the Webinar for Signpost to Bali: Youth for Water, highlighting youth engagement and intergenerational collaboration in water governance. These efforts demonstrate UM’s commitment to promoting water conservation through research, education, and community outreach.

Reviving The Sungai Lalang’s Hot Spring for Geotourism

A two-day SULAM (Service Learning Malaysia–University for Society) project was carried out in the Sungai Lalang area, Semenyih, organised by students from the Faculty of Science, Bachelor of Applied Geology programme. The project aimed to raise community awareness about local geology and promote the Sungai Lalang Hot Springs as a potential geotourism destination. On 25 May 2024, the project began with a community engagement programme in Kampung Pasir Baru, featuring a geology exhibition and door-to-door outreach. The exhibition showcased infographics on geotourism and geo-disasters, along with rock and prehistoric fossil displays. In the afternoon, volunteers visited households to distribute brochures and introduce residents to the geological uniqueness of their surroundings.

On 26 May 2024, the project continued with a *gotong-royong* (communal work) activity to revitalise the Sungai Lalang Hot Springs. Volunteers distributed brochures to visitors and carried out improvement works, including cleaning algae, collecting litter, painting, and washing the hot spring area. The initiative encouraged the community to appreciate and care for their natural assets, supporting geotourism development while fostering environmental stewardship.



Above: UM students explaining hot spring formation using an infographic poster (top), and distributing brochures to local residents with a brief explanation about the hot springs (bottom)

A Socio-economic Impact Assessment of Water and Sanitation Needs Among Poor Households in Kelantan

A community engagement visit was conducted on 23 July 2024 in Kampung Repek, Bachok, Kelantan, as part of the research project “A Socio-economic Impact Assessment of Water and Sanitation Needs among Poor Households in Kelantan” under Grant IIRG003C-2021IISS, led by Dr Adilah Abdul Ghapor. The visit aimed to present findings collected from 2022 to 2023 and to discuss local water issues with community representatives. Residents highlighted several ongoing problems, including low or inconsistent piped water pressure, poor confidence in tap water quality, and contamination of groundwater particularly in areas near paddy fields where the water emits an unpleasant odour or appears discoloured.

The research team shared key findings on water quality and the development of a rice husk-based filtration membrane designed to treat groundwater. Laboratory tests showed that Kampung Repek’s water, with a pH of 6.5, falls within acceptable limits for consumption but still requires filtration. The team explained that the rice husk membrane, made from organic materials, can reduce odour and discolouration at a low cost and minimal environmental impact, though further research is needed before commercial use.

The session also included a socio-economic presentation, which revealed that all respondents were in the B40 income group, with 77% relying on groundwater and 20% purchasing bottled water for daily use, including religious practices. Despite challenges, most respondents expressed satisfaction with recent improvements in water access through local efforts.

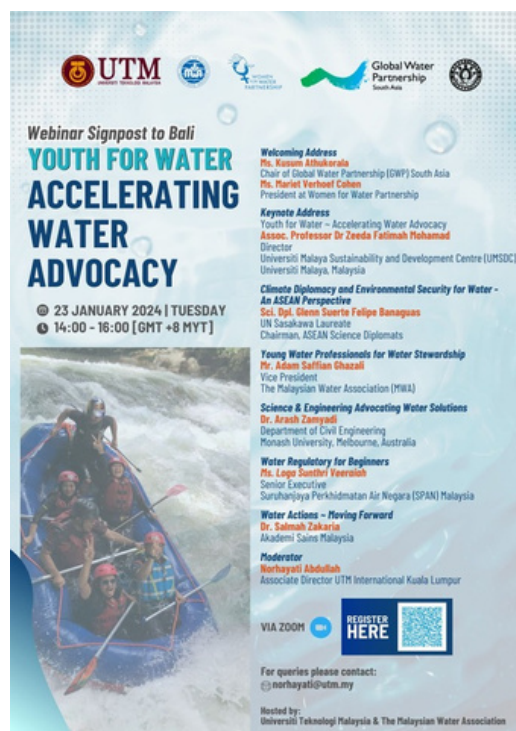
Right: Community engagement visit in Bachok, Kelantan, presenting local water issues based on research findings (top and middle), and the poster displayed during the session (bottom)



Signpost to Bali Youth for Water ~ Accelerating Water Advocacy

On 23 January 2024, Associate Prof. Dr. Zeeda Fatimah Mohamad was invited as a keynote speaker for the “Webinar for Signpost to Bali: Youth for Water ~ Accelerating Water Advocacy.” The event was jointly organised by Universiti Teknologi Malaysia (UTM) and The Malaysian Water Association (MWA).

The webinar aimed to empower youth in preparation for the 10th World Water Forum in Bali, by strengthening their advocacy, communication, and leadership skills in addressing global and local water challenges. Dr. Zeeda shared valuable insights on the importance of youth participation in water governance, highlighting how intergenerational collaboration and community-driven initiatives can contribute to more sustainable water management.



Above: Event poster for the webinar

Water Quality and Benthic Monitoring at Sungai Hulu Langat

On 9 November 2024, the Department of Geography, UM, organised a Water Quality and Benthic Monitoring programme at Sungai Hulu Langat, in collaboration with Bamboo Camp & Resort Hulu Langat. A total of 54 undergraduate Geography students participated in the activity, which was led by Dr. Nik Noor Athirah. The programme aimed to expose students to physical, chemical, and biological methods of water quality monitoring while fostering greater awareness of river conservation and the importance of protecting freshwater ecosystems. This initiative reflects UM's contribution to off-campus water conservation efforts and supports the indicator on practical water conservation initiatives beyond campus.

Right: Geography students conducted water quality and benthic monitoring at Sungai Hulu Langat



KLEFF 2023: UM Highlights Water Stewardship and Sustainable Living

Universiti Malaya Sustainable Development Centre (UMSDC) received an invitation from EcoKnights to participate as an exhibition partner and invited judge for the esteemed 15th International Kuala Lumpur Eco Film Festival (KLEFF) 2023, held from 17 to 28 February 2024. Associate Professor Dr. Zeeda Fatimah Mohamad, Director of UMSDC, served on the judging panel for the KLEFF 2023 submissions. KLEFF is Malaysia's first and longest-running creative platform promoting sustainable living.

As an exhibitor at the KLEFF x AirKita Exhibition, UMSDC and Water Warriors had the opportunity to showcase campus sustainability efforts in promoting eco-friendly practices and advancing the green agenda within the context of Higher Education Institutions (HEIs).

Highlights included an exhibition on urban rivers and sustainable lifestyle activities, as well as submissions featured in the Kita Jaga Air Challenge, which aimed to raise public awareness of water stewardship and responsible urban living. From sustainable initiatives to pioneering action research projects under the UM Living Labs, visitors engaged with informative displays, participated in interactive sustainability workshops and forums, and experienced firsthand the award-winning eco films showcased at the festival. Two workshop sessions were conducted by the UM team: 'Creepy, Crawly & Aquatic'—a sharing session on freshwater macroinvertebrates as biological indicators of water quality; and 'From Waste to Melting Plastic-Keychain'—a hands-on activity turning plastic waste into useful items.

Right: UM team at KLEFF 2023 (top) and exhibition booth highlighting urban rivers, freshwater macroinvertebrates, and plastic waste upcycling (middle and bottom)



Awareness Talk on Domestic Waste and Water Protection with UiTM Kedah

On 12 October 2024, Forum Air Malaysia, in collaboration with UiTM Kedah, organised “Program Anugerah Hijau: Cekap Air Kita” to promote water efficiency and environmental awareness among youth. UMSDC and UM Water Warriors, invited by EcoKnights as Water Ambassadors, delivered a talk on domestic waste management and water source protection. The session engaged 120 students from Kolej Sultan Abdul Hamid, Kedah, in discussions and activities highlighting the link between waste disposal and water pollution. Practical guidance on waste segregation, composting, and responsible plastic use was shared, inspiring students to adopt sustainable habits and advocate for water and environmental protection in their communities.

Water Stewardship Message in Labuan

On 28 October 2024, Jabatan Bekalan Air Wilayah Persekutuan Labuan and EcoKnights jointly organised the Program Hari Bertemu Pelanggan Bahagian Bekalan Air Wilayah Persekutuan Labuan, featuring a session under the *Air Kita, Tanggungjawab Bersama* (Our Water, Our Shared Responsibility) campaign. Affan Nasaruddin from Universiti Malaya delivered an engaging talk on water conservation, sustainable water management, and community participation.

The session highlighted collective responsibility in safeguarding water resources and how behavioural change and community-driven initiatives contribute to national water sustainability goals. Insights from UM’s water conservation programmes, including campus projects like Tasik Varsiti restoration and citizen-focused water education, were shared. This collaboration underscored the importance of multi-stakeholder partnerships in addressing water challenges.



Above: Awareness session with students from Kolej Sultan Abdul Hamid, in collaboration with UiTM Kedah

Below: Awareness session during Program Hari Bertemu Pelanggan by Bekalan Air Wilayah Persekutuan Labuan



Cooperation on Water Security

In 2024, Universiti Malaya (UM) intensified its commitment to strengthening water security through collaborations with multiple stakeholders across various governance levels—local, regional, national, and global. At the local level, UM partnered with Majlis Bandaraya Petaling Jaya (MBPJ) through the “Guarding Our Water Together” project at Tasik Taman Aman (see page 128 - 129 in this SDG 6 report), focusing on community-based lake monitoring, water quality awareness, and citizen stewardship. At the regional level, UM collaborated with Air Selangor Sdn. Bhd. (Air Selangor)’s management to support initiatives on sustainable water management and resilient water supply systems, contributing scientific expertise and knowledge-sharing platforms. Also at the regional level, Water Warriors—an initiative under the UM Sustainable Development Centre, were officially recognised as Friends of Rivers (FOR) Negeri Selangor.

At the national level, UM participated in the National Seminar on Sustainable Management of Lakes and Wetlands, organised by Perbadanan Putrajaya, to contribute research insights supporting national strategies on lake and basin sustainability. Global collaboration was further strengthened as UM served as a co-organiser for the Water Security: 14th International Symposium on Southeast Asian Water Environment (SEAW-14), a platform that gathered international researchers, policymakers, and water agencies to exchange ideas on water governance and resilience in Southeast Asia and beyond. Together, these partnerships demonstrate UM’s leadership in championing multidisciplinary and multilevel cooperation to ensure secure, sustainable water futures.

Recognition as Friends of Rivers (FOR) Negeri Selangor for Water Warriors and Inspirasi Kawa (2024)

In 2024, Water Warriors—an initiative under the UM Sustainable Development Centre—and its former spin-off social enterprise, Inspirasi Kawa, were officially recognised as Friends of Rivers (FOR) Negeri Selangor for their dedication to river stewardship and community education. Their initiatives encompass regular river clean-ups, water quality monitoring, and educational programmes that raise public awareness about sustainable water management and the importance of protecting freshwater ecosystems. By partnering with state agencies, local communities, and other stakeholders, Water Warriors and Inspirasi Kawa have fostered a culture of shared responsibility for river conservation, encouraging active participation from citizens of all ages. This recognition highlights not only their tangible contributions to safeguarding Selangor’s rivers but also reinforces UM’s role as a leader in promoting environmental sustainability and nurturing impactful, community-driven initiatives.

Below: Certificate for Friends of Rivers Negeri Selangor for Inspirasi Kawa and UM Water Warriors



Let's Get Candid! Engagement with Air Selangor

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On 10 June 2024, Universiti Malaya was invited by Air Selangor's Customer Experience Department (CXD) to participate in the Let's Get Candid! 2024 programme, held at the Sg. Semenyih Water Treatment Plant, Putrajaya. This annual engagement initiative serves as a two-way communication platform to exchange ideas and gather feedback through focus group discussions, aimed at improving the quality of water supply services for all consumers. Since its inception in 2021, the programme has received highly positive responses from participants across various sectors.

The 2024 edition focused on key themes such as Water Tariff and the Value of Water, Water Quality, Water Conservation, and Non-Revenue Water (NRW) Mainstream. The programme began with a guided tour of the water treatment plant, providing participants with first-hand exposure to the water treatment process, followed by roundtable discussions and dialogues attended by Air Selangor's top management, including the Acting Chief Executive Officer (ACEO).

In addition, on 21 August 2024, Air Selangor Petaling Region invited Universiti Malaya to another engagement session at the Tropicana Golf & Country Resort. This session centred on discussions related to water quality, e-billing systems, and water tariffs, providing a deeper understanding of the operational and service improvement measures undertaken by Air Selangor.

These engagements represent regional cooperation on water security, as Air Selangor is the largest water service provider in Malaysia, supplying treated water across multiple districts and municipalities within the state of Selangor and the Federal Territories of Kuala Lumpur and Putrajaya. By contributing expertise in community engagement, water stewardship, and sustainable management practices, Universiti Malaya supported regional-level decision-making on water service delivery, conservation strategies, and consumer-focused improvements.

Below: Documentation of the focus group discussion involving Air Selangor representatives, UM delegates, and invited experts



National Seminar on Sustainable Management of Lakes and Wetlands

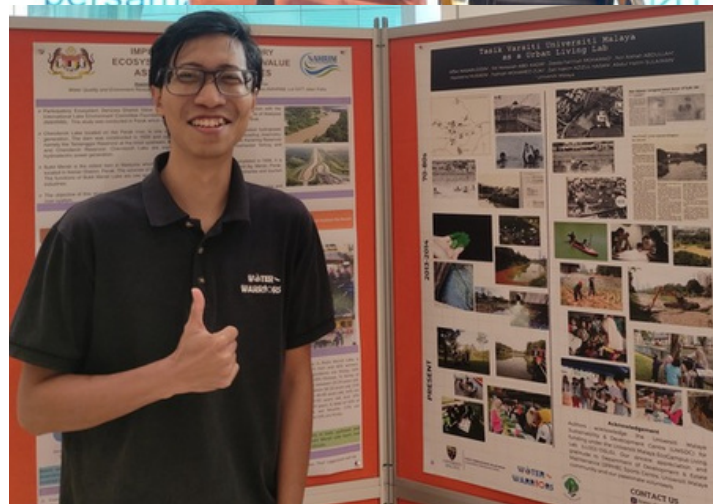
The National Seminar on Sustainable Management of Lakes and Wetlands, organised by Perbadanan Putrajaya, was held from 7 to 9 February 2024 at Dewan Seri Melati, Kompleks Perbadanan Putrajaya. The seminar brought together around 250 participants from various government agencies, non-governmental organisations, research institutions, universities, local authorities, developers, and organisations involved in water body management and sustainable development across Malaysia. The event served as a key platform for sharing knowledge, exchanging best practices, and promoting collaboration towards integrated and sustainable freshwater ecosystem management.

This year's seminar highlighted the ecosystem services provided by lakes and wetlands, focusing on their roles in supporting the economy, promoting sustainable development, enhancing eco-tourism, and preserving conservation and research sites. Discussions also covered innovative practices such as the creation of constructed wetlands, green area conservation, and the integration of Nature-based Solutions (NbS) in large-scale urban and commercial projects across the country.

Associate Prof. Dr. Zeeda Fatimah Mohamad from Universiti Malaya served as one of the moderators for the Sustainable Development session, facilitating discourse on the intersection between environmental conservation and sustainable urban growth. Meanwhile, Affan Nasaruddin presented a poster titled “Tasik Varsiti Universiti Malaya as an Urban Living Lab,” showcasing the lake’s transformation into a centre for research, education, and community engagement in sustainability. The participation of Universiti Malaya in this national platform reflects the university’s ongoing commitment to sustainable water management, interdisciplinary collaboration, and evidence-based policymaking in support of Malaysia’s sustainability agenda.



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Above: Group photo with representatives from Perbadanan Putrajaya (top), Associate Prof. Dr. Zeeda Fatimah Mohamad serving as session moderator (middle), and Affan Nasaruddin presenting the research poster (bottom)

Global Cooperation on Water Security: 14th International Symposium on Southeast Asian Water Environment (SEAW-14)

Universiti Malaya demonstrated global cooperation on water security through its active involvement in the 14th International Symposium on Southeast Asian Water Environment (SEAW-14), held from 3 to 5 December 2024 in Kuala Lumpur. The symposium was co-organised by the Sustainable Process Engineering Center (SPEC), Universiti Malaya, in collaboration with the Research Center for Water Environment Technology (RECWET), The University of Tokyo, along with participation from regional government agencies, research institutions, and international organisations.

SEAW-14 provided a scientific and policy dialogue platform focused on freshwater quality, sustainable water management, wastewater treatment innovations, aquatic ecology, and climate-resilient water governance within Southeast Asia. The symposium strengthened multi-country partnerships, enabling the exchange of expertise and solutions on transboundary river basin management and sustainable water practices in rapidly urbanising regions.

As a co-organiser, Universiti Malaya played a key role in shaping the programme and contributing research insights, demonstrating the university's leadership in advancing water security beyond Malaysia. UM researchers delivered oral presentations based on ongoing research in water quality management, wastewater treatment technologies, and freshwater ecosystem monitoring.

UM presenters included:

- Dr. Mohamad Fairus Rabuni (Universiti Malaya) – presentation on water treatment process development and innovation.
- Tan Yan Ying (Universiti Malaya) – research presentation on water chemistry and pollutant analysis.

Through this international symposium, Universiti Malaya not only shared scientific findings but also strengthened research cooperation with global partners. Its role as a collaborating organiser and presenter demonstrates the university's commitment to advancing global water security and contributing to evidence-based solutions for sustainable water environments.



Above: SEAW-14 opening ceremony attended by speakers, delegates, and organisers

Below: Official symposium poster featuring Universiti Malaya as a co-organiser



The 14th International Symposium on Southeast Asian Water Environment

3-5 Dec 2024, Kuala Lumpur, Malaysia

Conscious Water Usage Promotion on Campus

In 2024, Universiti Malaya actively promoted conscious water usage on campus through a combination of awareness initiatives and practical interventions. In response to the revised domestic water tariff starting 1 February, the UM Water Warriors, under the Sustainable Development Centre and in collaboration with Pengurusan Air Selangor Sdn. Bhd., distributed over 100 free water thimbles to staff and students. This simple, easy-to-install device helps reduce water flow from taps and showerheads while maintaining consistent pressure, encouraging the campus community to adopt efficient water-use habits in daily life.

Complementing these efforts, the university implemented innovative technologies and infrastructure improvements to enhance water efficiency. Regenerative precoat filters (AQUASWIFT RPF) were installed at the UM Swimming Pool, achieving up to 90% water savings compared with traditional filtration systems. At UMMC, tap aerators were introduced in surgical hand-scrubbing stations, and 16 automated bidets were installed in Faculty of Engineering toilets under a new MoA with Coway Malaysia to optimise water use while improving hygiene. Together with routine maintenance of water pipes, storage tanks, and related infrastructure carried out by the Estates Department, these initiatives demonstrate UM's holistic approach to conserving water, fostering sustainability, and engaging the campus community in responsible water management.

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UM Water Warriors Promote Water-Saving with Free Water Thimbles

Starting from 1 February 2024, the domestic water tariff in Peninsular Malaysia and Labuan was revised, prompting increased attention to water conservation efforts among consumers. In response, the UM Water Warriors, under the Universiti Malaya Sustainable Development Centre (UMSDC), in collaboration with Pengurusan Air Selangor Sdn. Bhd., launched an initiative to promote efficient water use within the campus community.

As part of this campaign, the team distributed over 100 free water thimbles to Universiti Malaya staff and students. This small, easy-to-install device can be fitted manually onto taps and showerheads to reduce water flow while maintaining a steady and consistent stream, regardless of pressure. The initiative aimed to help the community lower household water consumption, reduce utility costs, and cultivate sustainable water habits in daily life.



Above: Awareness stickers on water savings and toilet etiquette were placed in various campus toilets to promote conscious water usage

Saving Life, Saving Water at UM Medical Centre

A pilot study conducted in one of the operating theatres at Universiti Malaya Medical Centre (UMMC) revealed significant wastage of unused clean water during the surgical hand scrubbing process. In response, a team led by Prof. Dr. Shireen Anne Nah Han Yien, in collaboration with the UM Water Warriors, initiated an effort to conserve water by installing tap aerators to reduce water flow without compromising hygiene standards.

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This initiative demonstrated that aerator installation is a low-cost, low-maintenance solution compared with replacing existing taps or plumbing systems. The simple yet effective modification not only minimises water wastage but also supports sustainable water management practices within healthcare facilities. The pilot study serves as an important step towards developing green hospital initiatives at UMMC.



Above: Water taps at Dewan Bedah Pediatrik, UMMC, fitted with tap aerators to reduce water flow

AQUASWIFT - Regenerative Precoat Filtration (RPF) -Sustainable/ Green technology installed at University Malaya Swimming Pool managed by NADIM Swim School.

A key initiative is the installation of regenerative precoat filters at the Universiti Malaya swimming pool, operated by Nadim Swim School. This advanced filtration system has significantly reduced both water and chemical consumption, marking a major milestone in the university's efforts toward environmental stewardship and resource efficiency.

Unlike traditional sand filters, regenerative precoat filters utilise a fine perlite or diatomaceous earth medium to trap impurities. Through a unique “bumping” process, the system cleans and reuses the filter medium instead of discharging large volumes of water for backwashing. This innovative technology enables up to 90% reduction in water usage, saving thousands of cubic metres of water each month, while also minimising chemical demand and associated costs.

Below: The AQUASWIFT at UM's swimming pool



Pilot of Automated Bidet Technology to Promote Water Efficiency on Campus

Coway Malaysia officially signed a Memorandum of Agreement (MoA) with Universiti Malaya to advance collaborative research on automated bidet technology, exploring innovative ways to enhance hygiene, optimise water flow, and improve everyday living. As part of the initiative, 16 bidet units were installed in faculty toilets across the campus in 2024.

This project demonstrates UM's commitment to promoting conscious water usage on campus by integrating advanced sanitation technology with sustainable practices. The automated bidets help reduce unnecessary water use compared with conventional flushing systems, while maintaining comfort and hygiene for users. By combining infrastructure innovation, research, and behavioural awareness, UM encourages staff and students to adopt responsible water habits, reflecting a holistic approach to water efficiency and resource management.



Above: Coway Malaysia officially signed a Memorandum of Agreement (MoA) with Universiti Malaya

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Regular Maintenance by UM Estates Department

To ensure the quantity and quality of water supply across all buildings, the UM Estates Department actively carries out regular maintenance of water pipes, storage tanks, and related infrastructure. These proactive measures play a vital role in preventing leaks, improving water efficiency, and reducing non-revenue water (NRW) within the campus. Routine inspections and timely maintenance help ensure that the university's water systems remain reliable and operate at optimal capacity.

The campus community is also encouraged to play an active role in maintaining water sustainability by reporting any leaks, faults, or irregularities through the UM Helpdesk system. Reports submitted through this platform allow the Estates Department to respond promptly, with repair works prioritised according to the level of urgency and technical complexity.



Right: Photos showing maintenance work on water pipes

Encouraging Responsible Water Use in the Community

In 2024, Universiti Malaya promoted conscious water usage through public engagement and practical solutions. The UM Sustainable Development Centre, in collaboration with UM Water Warriors, participated in the Kuala Lumpur Eco Film Festival (KLEFF). At the festival, visitors learned ways to reduce water consumption at home through interactive displays and demonstrations, and received free water-saving devices with guidance on installation.

Complementing these outreach efforts, UM developed the Solar-Powered Automated Ultrafiltration Self-Cleaning System, SMART AQUA-EZ, to provide safe and sustainable drinking water to rural and disaster-affected communities. One installation at Sekolah Kebangsaan Kuala Sungai, Gua Musang, Kelantan, included a sharing session with schoolchildren on the system and practical water-use habits. Together, these initiatives reflect UM's commitment to raising awareness and fostering sustainable water practices in the wider community.

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Promoting Water Conservation at Kuala Lumpur Eco Film Festival 2024

From 24 to 27 October 2024, the Universiti Malaya Sustainable Development Centre (UMSDC), in collaboration with UM Water Warriors, participated in the Kuala Lumpur Eco Film Festival (KLEFF) organised by EcoKnights, held at Semua House, Kuala Lumpur. The festival, Malaysia's premier platform for environmental awareness and sustainable living, attracted a diverse crowd of visitors eager to learn about eco-friendly practices and green innovations.

At the UMSDC-Water Warriors booth, the team engaged with members of the public through interactive demonstrations and educational displays on water conservation and sustainable water management. Visitors learned practical ways to reduce water consumption at home and gained insights into UM's ongoing environmental initiatives. As part of the outreach, the team also distributed free water-saving devices and provided hands-on guidance on how to install them, encouraging participants to take immediate action towards reducing daily water use.

Right: UM team demonstrating installation of water restrictor devices on household pipes (top) and engaging visitors on water conservation at the booth (bottom)



SMART AQUA-EZ: Solar-Powered Self-Cleaning Ultrafiltration System for Sustainable Drinking Water

The Solar-Powered Automated Ultrafiltration Self-Cleaning System, known as SMART AQUA-EZ, is an innovative and self-contained solution developed to provide safe, reliable, and sustainable drinking water from various raw water sources. Designed to serve rural and disaster-affected communities, this system integrates solar power and automated ultrafiltration (UF) technology to deliver clean water efficiently and affordably. The project is led by Prof. Emeritus Dr. Ir. Mohd Azlan Hussain, with team members Dr. Mohd Usman Mohd Junaidi, Dr Mohamad Fairus Rabuni, Dr Faidzul Hakim Adnan, and Dr Zulhelmi Amir from the Faculty of Engineering. Supported by NBOS, MyIS Komuniti, and the UAE Water Aid Foundation, the system evolved from extensive research, including a PhD project on UF process control and a real-world deployment during the 2014 Kelantan floods.

SMART AQUA-EZ incorporates an automatic self-cleaning mechanism, eliminating the need for chemical cleaning agents and ensuring easy, low-maintenance operation. It can filter water from rivers, wells, lakes, and ponds into safe drinking water, producing up to 1,000 litres per hour—enough to meet the daily needs of over 1,000 people. The system's solar-powered design allows for low energy consumption and continuous operation even in off-grid locations, functioning at lower pressure compared to conventional systems such as nano-filtration or reverse osmosis.

Locally assembled at Universiti Malaya, the system benefits from reduced manufacturing costs, local expertise, and IoT-ready capabilities that enable remote monitoring and control. One successful installation took place at Sekolah Kebangsaan Kuala Sungai, Gua Musang, Kelantan, where the system now provides a consistent and sustainable clean water supply to the local community. A sharing session was also conducted with the schoolchildren, educating them about the system, its operation, and practical water usage habits, fostering early awareness of sustainable water management.

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Right: UM researchers from the Faculty of Engineering briefing school representatives (top) and students (middle) on the SMART AQUA-EZ system, followed by a group photo (bottom)