



Life on Land

Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, halt and reverse land degradation, and halt biodiversity loss.



Universiti Malaya's Commitment to Life on Land

Universiti Malaya (UM) has made significant advancements in promoting and supporting SDG 15, which emphasises the protection, restoration, and sustainable use of terrestrial ecosystems, management of forests, combating desertification, halting and reversing land degradation, and halting biodiversity loss.

UM's initiatives in 2023 reflect its dedication to environmental stewardship, as detailed in the UM Transformation Plan 2030 and the UM Master Plan 2050. These efforts align with global sustainability trends, underscoring UM's role as a leader in the academic community's contribution to global SDG achievements.

Supporting Land Ecosystems Through Education

Education is a cornerstone of UM's strategy to promote sustainable land use and biodiversity conservation. In 2023, the university hosted several programs to raise awareness and engage the campus community and public in conservation efforts.

One initiative by Rimba Ilmu Botanic Garden UM was the Rimba Ilmu Open Day 2023, held on 17 June in collaboration with The Habitat Foundation. The event featured a sharing session promoting land conservation and sustainable use, including forests and wild areas. This initiative successfully raised awareness about the importance of protecting natural ecosystems for future generations.



Above: Poster for Rimba Ilmu Open Day 2023 (Source: Rimba Ilmu)

Below (left): Photo exhibitions during Rimba Ilmu Open Day 2023
Below (right): Guided walk at Rimba Ilmu



Other than that, [OleoRangers@UM](#), the Living Lab of Universiti Malaya, had organised an event with the title “Navigate Sustainability: The Palm Oil Map to a Greener Future” on 23 and 24 November 2023, focused on the sustainable utilisation of land for oil palm plantations. The event highlighted strategies and practices for managing oil palm cultivation in an environmentally responsible manner, aiming to balance agricultural productivity with conservation goals. By addressing key issues and promoting best practices, the event sought to guide the industry toward more sustainable and eco-friendly land use.

These events went beyond traditional classroom learning by incorporating hands-on activities that allowed students and the community to directly engage with nature. Through these programs, UM demonstrated its commitment to not only teaching about environmental issues but also involving participants in active conservation efforts.



Above: The “Navigate Sustainability: The Palm Oil Map to a Greener Future” event poster (Source: OleoRangers)

Below: Researchers engaging with visitors at the event



Besides, Karst Biodiversity of Bukit Anak Takun event played critical roles in educating participants about the importance of local ecosystems. The conservation talk series, presented by the Malaysian Cave and Karst Conservancy and supported by Rimba Ilmu Universiti Malaya on 20 September 2023, delved into the unique biodiversity of this karst landscape. By examining both historical and current conservation efforts, the series emphasised the importance of conserving and sustainably managing these distinctive landforms and their ecosystems. The talks aimed to enhance understanding and support for the preservation of such critical land resources.

Universiti Malaya (UM) has made significant advancements in promoting and supporting SDG 15, which emphasises the protection, restoration, and sustainable use of terrestrial ecosystems, management of forests, combating desertification, halting and reversing land degradation, and halting biodiversity loss. UM's educational initiatives align with these global trends, emphasising the importance of experiential learning in fostering a deeper understanding of and commitment to biodiversity conservation.



Top: The conservation talk series on karst biodiversity (Source: Malaysian Cave and Karst Conservancy)
Below: During the Karst Biodiversity of Bukit Anak Takun event at Rimba Ilmu, UM



Commitment to Sustainably Farmed Food Through University Policies

UM has taken proactive steps to ensure that the food consumed on campus is sustainably sourced, reflecting its broader commitment to promoting food security and sustainable agricultural practices. The university's Sustainability Policy 2021-2030 outlines its dedication to green procurement and sustainable farming, which are essential components of its efforts to reduce its environmental footprint.

UM encourages the purchase of supplies, services, and works that adhere to ethical standards and guidelines. This includes high recycled content, environmentally sustainable production methods, durability, biodegradability, reparability, energy efficiency, non-toxicity, and recyclability. Specifically, the policy advocates for procuring organic and sustainably farmed food and responsibly harvested aquatic products. UM aims to promote sustainable agriculture by coordinating and conducting programs and educational activities focused on food and agricultural sustainability. These activities will be further discussed in the next.

Besides, UM takes the initiative to provide local farmers and food producers with knowledge, skills, and technology related to food security and sustainable agriculture through research and capacity-building programs.

[#UM Sustainability Policy 2021-2030](#). Please refer to page 3, page 19 (Green Procurement) and page 25 (End hunger, promote food security and sustainable agriculture).

UM has released the Green Events Guideline which includes three sections related to sustainably farmed foods. The first section is Select a Healthy and Sustainable Food Menu. This aligns with UM's commitment to food produced through sustainable farming practices by choosing menu options that prioritise both nutritional value and environmental sustainability.

Secondly, use local food vendors. As this will support the university's policy by engaging local food vendors who promote local products. This reduces the carbon footprint and reinforces the commitment to sustainably farmed food.

Thirdly, partnering with vendors known for sustainable practices. This ensures that vendors are recognised for their sustainable practices, reflecting UM's policy to source food that adheres to ethical and environmentally friendly standards.

[#UM Green Events Guideline](#). Please refer to page 9 & 10.



Left: *UM Sustainability Policy 2021-2030*

Right: *UM Green Events Guideline*

Implementation and Practice of Sustainable Food Policies on Campus

In 2023, the **Mini AgroBazaar at the Faculty of Science** became a platform for showcasing and selling sustainably farmed products, such as durian and goat meat from UM's Glami Lemi research center. Durian varieties including Musang King, D24, and Durian Kampung, sourced from the Pusat Penyelidikan Bioteknologi Glami Lemi in Jelebu, Negeri Sembilan, were sold for RM12.00 per kilogram at the Mini AgroBazaar organised by the Faculty of Science, Universiti Malaya on 28-29th August 2023. Premium Barbados Blackbelly goat meat from the goat farming at Glami Lemi was also sold at the AgroBazaar. This initiative highlighted the importance of supporting local agriculture and demonstrated how sustainable farming practices can be integrated into the university's operations.

By promoting these products, UM encouraged the campus community to make more sustainable food choices, contributing to the goal of reducing the environmental impact of food production.

The global movement towards sustainable agriculture is gaining momentum, with universities playing a crucial role in advancing these practices. UM's initiatives in promoting sustainably farmed food on campus are in line with these global efforts, positioning the university as a model for integrating sustainability into everyday operations.



Harga Istimewa Hanya Untuk UM!

Isi Durian Segar

	Musang King	D24
1 Kotak	RM50.00 RM45.00	RM25.00 RM22.00
3 Kotak	RM138.00 RM110.40	RM69.00 RM55.20

PERCUMA!!!
1kg manggis setiap 3 kotak durian!
(semangka tidak termasuk)



Right: The Mini AgroBazaar at the Faculty of Science selling sustainably farmed products, such as durian and goat meat from UM's Glami Lemi research center (Source: UM's Faculty of Science)

Maintaining and Extending Ecosystems' Biodiversity

Biodiversity conservation is a key focus for UM, particularly in maintaining and extending the biodiversity of ecosystems both on and off campus. This effort includes implementing strategies to maintain the health and functionality of ecosystems that are under threat. UM focuses on monitoring and protecting these ecosystems, engaging in conservation initiatives, and supporting research that contributes to their long-term sustainability.

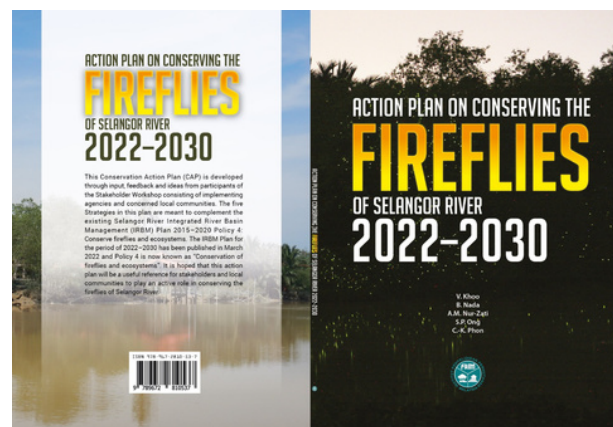
In 2023, UM participated in the **Selangor River Fireflies Conservation Management Studies Workshop**, bringing together experts and stakeholders to discuss strategies for conserving this unique species. The workshop highlighted the critical role that local ecosystems play in maintaining biodiversity and the importance of collaborative efforts in conservation. The primary aims of the workshop were to update participants on the status of two key studies which are Firefly Population Monitoring at Selangor River, Kuala Selangor, and Fireflies Genetics Studies and Genetic Rescue Plan for Selangor River Fireflies. These studies are integral to Forest Research Institute of Malaysia (FRIM)'s Policy 4: Fireflies Conservation and Ecosystem of the Selangor River Integrated Watershed Management Plan (2022-2030).

The workshop served as a platform to gather input and feedback from stakeholders before finalising the report in April 2023. The event was officiated by LUAS Director Ts. Hj. Hasrolnizam Shaari S.I.S, A.M.S., followed by progress updates presented by FRIM. Representing UM were Prof. Dr. Subha Bhasu from the Institute of Biological Sciences, Faculty of Science, members of Water Warriors UM, and Mr. Affan Nasaruddin from Universiti Malaya Sustainable Development Centre (UMSDC).



Above: The Selangor River Fireflies Conservation Management Studies Workshop (Source: UMSDC)

Below: The Action Plan on Conserving the Fireflies of Selangor River 2022-2030

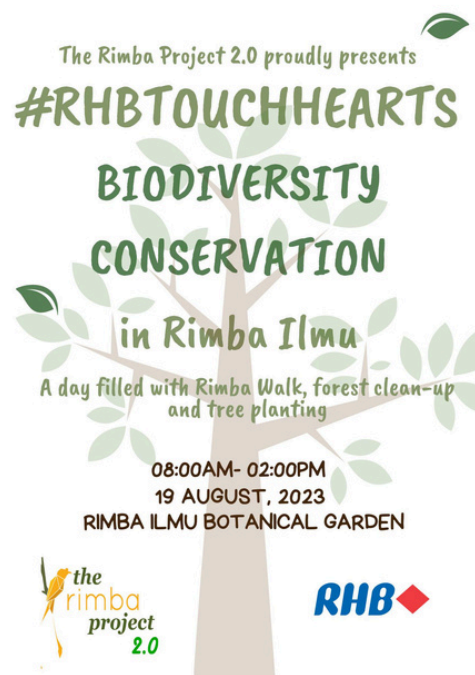


UM's involvement in the conservation of endangered species further underscores its commitment to protecting biodiversity. On November 4, Rimba Ilmu Universiti Malaya, in collaboration with the Malaysian Nature Society Selangor Branch and the Bornean Sun Bear Conservation Centre, organised an event titled **"Saving the World's Smallest Bear of Sabah"**. This initiative aimed to raise awareness about the conservation of the endangered Bornean Sun Bear, the smallest bear species in the world, and to highlight ongoing efforts to protect their habitat in Sabah. The event brought together experts and conservationists to discuss strategies for ensuring the survival of this vulnerable species. These efforts are not only about preserving individual species but also about maintaining the health and resilience of entire ecosystems.

The University's Rimba Project 2.0 serves as a living lab for campus sustainability, monitoring and preserving the biodiversity of plants and animals. In collaboration with RHB Bank (Group Retail Credit Risk), the project hosted the **#RHBTouchHearts Biodiversity Conservation at Rimba Ilmu** event on 19 August 2023, focusing on biodiversity and aligned with the theme #ItStartsWithUs. Participants began with an introductory briefing by Dr. Khairunnisa Hasikin. Following this, project leaders Dr. Sarah Abdul Razak and Dr. Yong Kien Thai led a guided walk through Rimba Ilmu. Main activities included a forest clean-up, emphasising the importance of conserving forests and biodiversity by removing litter. This was followed by a symbolic tree planting ceremony with representatives from RHB and UMSDC. The event concluded with a plastic-free lunch and a tour of the Rimba Ilmu gallery and the orchid and rare plants conservatory, highlighting sustainable practices and waste separation.



Above: Saving the World's Smallest Bear of Sabah event poster. (Source: Malaysian Nature Society)
Below: #RHBTouchHearts Biodiversity Conservation at Rimba Ilmu event (Source: Rimba Project 2.0)



Under the Rimba Project 2.0, UM encourages students from undergraduate and postgraduate studies to conduct research on existing forest ecosystem services at Rimba Ilmu Botanical Garden. UM's research on forest ecosystem services at Rimba Ilmu Botanical Garden directly supports its mission to preserve and enhance the biodiversity of existing ecosystems, particularly those under threat. In 2023, 3 UM students conducted their respective research on **Assessing the Ecosystem Services of Tropical Urban Forest, Floristic Composition and Species Diversity, and the Urban Microclimate of the Wild Fruit Trees Area**, which are essential to understanding the vital role urban forests play in maintaining biodiversity and ecological health. These research initiatives underscore UM's commitment to actively maintain and extend biodiversity, ensuring that even in an urban setting, ecosystems thrive and support both plant and animal life.

In addition, UM is committed to preserve and enhance the biodiversity of existing ecosystems by having guest lectures on partnering universities. In a guest lecture for postgraduate students at Universitas Negeri Malang, Indonesia on 14 September 2023, Dr. Sarah Abdul Razak addressed threats to biodiversity and its conservation. Her lecture, titled "**Environmental Problems: Threats to Biodiversity and Its Conservation**" highlighted the various factors endangering ecosystems globally, including habitat destruction, climate change, and pollution, with a focus on strategies for conservation. This reflects UM's broader mission to work directly to maintain and extend biodiversity, particularly in ecosystems under threat. The lecture emphasised both the importance of preserving plant and animal life and the need for proactive conservation measures. Dr. Sarah's insights reinforce UM's active role in conservation efforts and its dedication to supporting global biodiversity through research, education, and collaboration with international institutions.



Above: UM students conducted research on *Assessing the Ecosystem Services of Tropical Urban Forest, Floristic Composition and Species Diversity, and the Urban Microclimate of the Wild Fruit Trees Area*

Below: Guest lecture for postgraduate students at Universitas Negeri Malang, Indonesia, titled "*Environmental Problems: Threats to Biodiversity and Their Conservation*" (Source: Dr. Sarah Abdul Razak)



On a global scale, the conservation of biodiversity is recognised as a fundamental component of sustainable development. UM's initiatives align with global best practices in biodiversity conservation, demonstrating the university's leadership in protecting and enhancing local ecosystems.

Educational Programs on Ecosystems

UM offers a diverse range of educational programs focused on ecosystems, targeting both the campus community and the wider public. These programs include nature walks, seminars, and workshops that provide participants with a deeper understanding of the importance of preserving wild flora and fauna.

One of the notable events organised by UM is the **Asian Student Environmental Platform (ASEP) 2023**. On 11 August 2023, UM Community Engagement Centre (UMCares) successfully conducted a visit to Rimba Ilmu as part of the Asian Student Environmental Platform (ASEP) 2023, having obtained the necessary approval for the event. Rimba Ilmu provided a guided tour (Rimba Walk) led by Dr. Sarah Abdul Razak, the leader of The Rimba Project 2.0, allowing participants to engage with the botanical garden and learn about its biodiversity.

Universiti Malaya's commitment to fostering sustainable practices is exemplified through its Education for Sustainable Development (ESD) initiatives, with one of the key programs being the recently launched **Short-term Mobility Program**. The initiative was established through a collaborative effort between the International Students & Mobility Centre and the Universiti Malaya Sustainable Development Centre (UMSDC). This program was designed to provide participants with a hands-on, interactive approach to sustainability, allowing them to immerse themselves in real-world sustainability challenges and solutions. This program encompasses an extensive array of sustainability topics, including an introduction to Sustainability@UM, the Regional Centre of Expertise on ESD, EcoCampus living labs, citizen science, and practical sustainability interventions.



Above: Rimba Walk during Asian Student Environmental Platform (ASEP) 2023

Participants, primarily international students, engaged in intellectual exchanges and explored how Education for Sustainable Development (ESD) is localised in Malaysia, leveraging the experience of Universiti Malaya. The program also focused on educational opportunities related to ecosystems, including wild flora and fauna. Through visits to various ESD initiatives from the Regional Centre of Expertise network - such as RCE Penang, RCE Iskandar, RCE Greater Gombak, and RCE Kuching - participants gained valuable insights into diverse sustainability practices and their application in various contexts. This exposure aimed to deepen their understanding and foster future engagement in sustainability efforts locally and nationally.



About the Programme

This brand-new short-term mobility program offers the participant a first-hand experience on Education for Sustainable Development (ESD) in a new interactive way!

This 3-week program covers a wide range of sustainability topics, including an introduction to the Sustainability@UM, Institute Centre of Excellence on ESD, EcoCampus living labs, urban science, and actual sustainability intervention in different contexts.

Participants will gain exposure to intellectual exchange and better understand the localisation of ESD in Malaysia from the experience of Universiti Malaysia, the oldest Malaysia's public university and Asia's Most Sustainable University in City-Centres category (2017-2022) in U.S. GreenMetric World University Rankings.

Scan me to know more!

LEARNING OUTCOMES

Participants will...

- Foster networking among international participants while exploring future engagement opportunities in various forms
- Better understand the fundamental sustainability knowledge (Both theory and practical) on Education for Sustainable Development
- Learn the consequences of sustainability practices on business through the localisation of the sustainable development agenda
- Explore the ESD initiatives from the Regional Centre of Excellence (RCE) on ESD network members (RCE Penang, RCE Iskandar, RCE Greater Gombak or RCE Kuching)

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Left: The Education for Sustainable Development Mobility Programme at UM includes educational programmes covering the topic of ecosystems (Source: International Students & Mobility Centre)

Moreover, another notable collaboration in 2023 was with the Malaysian Nature Society, where UM engaged children in biodiversity conservation through the **Climate Action Kids Engagement (CAKE)** series. Aligned with Rimba Ilmu Universiti Malaya's mission to offer educational programs on ecosystems focusing on wild flora and fauna, the Climate Action Kids Engagement (CAKE) Series 4 program is a dedicated initiative that introduces local communities, particularly children, to the importance of environmental conservation.



Above: "Field-trip: Explore a Rain Forest Garden under Climate Action Kids Engagement (CAKE)" series poster (Source: Malaysian Nature Society)

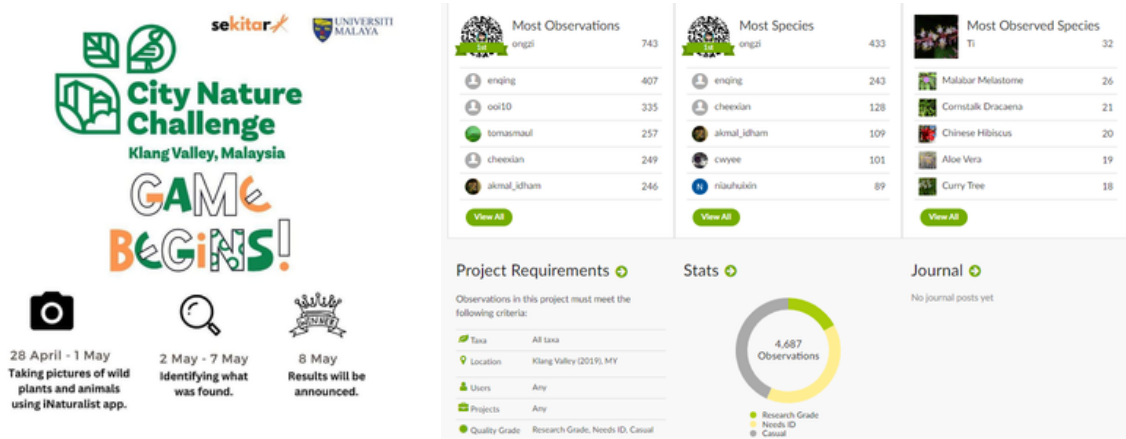
This program, organised in collaboration with the Malaysian Nature Society Selangor Branch, provides young participants with an immersive educational experience at the Rimba Ilmu Botanic Garden, a 50-year-old botanical collection designed to resemble a tropical rainforest. Through guided field trips, children are encouraged to explore and learn about Malaysia's diverse flora and fauna in a safe, accessible environment. The program's structure emphasises hands-on learning, allowing participants to use their senses to understand the complexities of ecosystems, thus fostering an early appreciation for biodiversity. This initiative is part of Rimba Ilmu's ongoing efforts to engage local communities in ecosystem education, aligning with its broader objective to enhance public awareness and conservation efforts for both plant and animal species.

Below: CAKE activities held at Rimba Ilmu, UM



In line with UM's efforts to offer educational programs on ecosystems, focusing on wild flora and fauna, the **City Nature Challenge (CNC) 2023** provided a platform for local communities to engage in a global citizen science initiative aimed at documenting urban biodiversity. Held between 28 April and 1 May 2023, the event encouraged residents and visitors in urban areas to capture and document images of plants, animals, and other organisms. Participants in the Klang Valley were invited to join the Klang Valley CNC community, coordinated by Sekitar Kita, a university-linked social enterprise and spin-off from Water Warriors UM.

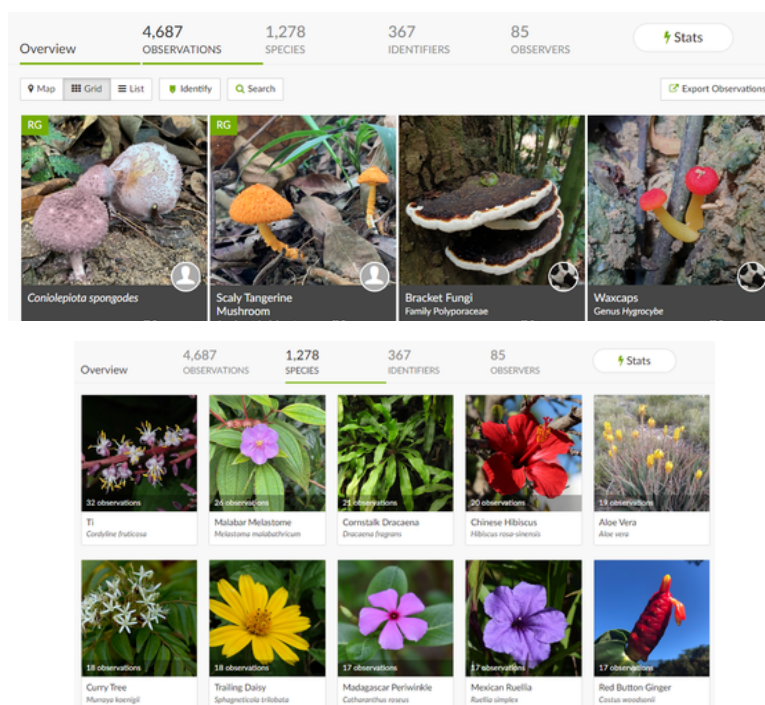
The challenge, part of an annual global competition, served as a bioblitz event where individuals could contribute to the documentation of urban ecosystems while promoting local biodiversity awareness. This initiative aligned with UM's mission to educate communities on ecosystem preservation, providing participants with hands-on experience in observing and recording urban wildlife. Through participation in the City Nature Challenge, community members enhanced their understanding of urban flora and fauna, contributing to a larger global effort to track and protect biodiversity in cities worldwide.



Above (left): The City Nature Challenge 2023: Klang Valley, Malaysia event poster (Source: Sekitar Kita)

Above (right): The results of the City Nature Challenge 2023 in Klang Valley on iNaturalist include participants with the most observations, the most species found, and the most observed species

Below: Pictures of the most observed species in Klang Valley in 2023, based on iNaturalist



As part of UM's ongoing efforts to offer educational programs on ecosystems, the **Botanical Garden Walk and Tiger Documentary event**, held on 18 February 2023 at Rimba Ilmu, was designed to engage the public in learning about the conservation of wild flora and fauna. This event provided an opportunity for the local community to explore the tropical rainforest ecosystem within the city at Rimba Ilmu Botanic Garden, while also raising awareness about the critical plight of Malayan Tigers.

Through this program, participants gained insight into the challenges faced by this endangered species and learned practical ways they could contribute to tiger conservation. By combining education on local biodiversity with a guided exploration of Rimba Ilmu's unique urban rainforest, the event aligned with UM's commitment to fostering ecological awareness and promoting the sustainable management of ecosystems among local and national communities.

The Department of Social and Preventive Medicine, Faculty of Medicine, Universiti Malaya, contributes to offering educational programs on ecosystems, focusing on wild flora and fauna for local communities. The free nature walk organised on 28th November 2023 at Taman Botani Rimba Ilmu is a prime example of this initiative. Participants who are the member of the Department of Social and Preventive Medicine, Faculty of Medicine were guided through the diverse flora of Rimba Ilmu, gaining knowledge on local plant species, their ecological significance, and the importance of preserving urban green spaces. By engaging participants in both outdoor exploration and educational exhibitions, the department effectively promotes ecological awareness and understanding, aligning with Universiti Malaya's commitment to offering ecosystem education to broader communities.



Above: The Botanical Garden Walk and Tiger Documentary event poster
(Source: Malaysian Nature Society)

Below: Members of the Department of Social and Preventive Medicine, Faculty of Medicine guided through UM Rimba Ilmu



UM collaborated with the Malaysia Cave and Karst Conservancy (MCKC) to offer ecosystem education programs. The MCKC Karst Talks, held at Rimba Ilmu, Universiti Malaya, on 27 May 2023, featured the topic “**Caving into Extinction? Threats to Malaysia’s Endemic Cave-Dwelling Spiders**”. This free event was part of a series aimed at raising awareness about conserving Malaysia’s unique karst ecosystems and the endemic cave species they support. The talk discussed habitat loss and environmental degradation’s impact on these species, emphasising the importance of preserving fragile cave ecosystems in line with UM’s mission to promote biodiversity conservation.

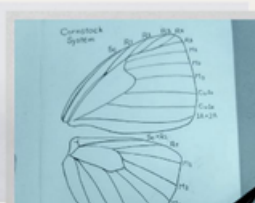


The collaboration between The Habitat Foundation and Rimba Ilmu UM offers an innovative approach to ecosystem education. The event “**Illustrate with Entomologist**”, held on 10 December 2023, explored the fascinating world of insects and pollinators and their critical roles in soil health and ecosystem support. Participants enjoyed hands-on learning with entomologist Dr. Thary Gazi Goh, who led an illustration workshop on insect anatomy. Dr. Thary, managing partner of the Urban Biodiversity Initiative (UBI), an organisation dedicated to urban ecology and conservation, provided a unique opportunity for communities to connect with wildlife and gain insight into the web of life sustaining our environment.



ILLUSTRATE WITH ENTOMOLOGIST

10 DECEMBER 2023 RIMBA ILMU BOTANIC GARDEN 10AM-1PM



Insects are all around us, hidden from the human eye amongst the shrubs and leaves. Insects play an important role in the ecosystem as pollinators, maintaining the health of soil and many more. Being able to identify these tiny critters would help us to understand the species and the diversity around us.

You will learn to observe, distinguish, and illustrate anatomy of insect.

REGISTER HERE

RM65 (ADULT)
RM55 (STUDENT PROMO)
RM50 (CHILDREN AGED 10-15)
LIGHT REFRESHMENTS PROVIDED

ORGANISED BY THE HABITAT FOUNDATION

INSTRUCTOR



DR THARY GAZI GOH

An entomologist, conservationist and wildlife educator with a master's degree in forensic entomology from the University of Malaya. He holds a PhD on the ecological relationship between the scarabs and elephants of Peninsular Malaysia. An experienced field worker that knows his way around the jungle, his penchant for exploration has brought him from the humid forests of Malaysia to as far as the frigid islands of Antarctica. With over 10 years of experience working with the University of Malaya Museum of Zoology, he is full of insights into the hidden world of Malaysian fauna.

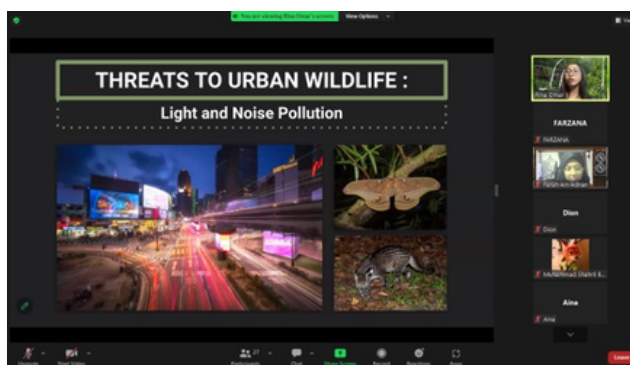
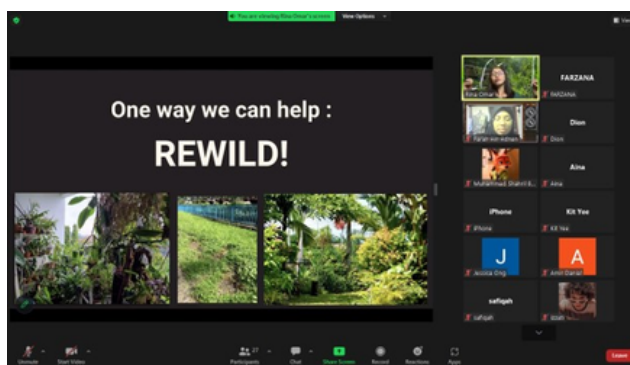
Dr Thary is the managing partner of Urban Biodiversity Initiative (Ubi), an independent collective for urban ecology research, conservation and environmental education.



Other than that, **The Rewild UM (Greening Urban Spaces & Biodiversity)** project is conducted as part of the course TIX2020 (Introduction to Sociolinguistics) in the Bachelor of English/French/Tamil Language and Linguistics program at the Faculty of Language and Linguistics. Coordinated by Dr. Noor Aqsa Nabila Mat Isa, the project focuses on raising environmental awareness among Universiti Malaya (UM) students about native plants through an Instagram campaign. In collaboration with the Free Tree Society, it also promotes effective ecosystem preservation practices. By integrating linguistic elements, the project aims to effectively communicate the significance of native flora and the importance of maintaining natural habitats, offering educational opportunities to both local and national communities.

Finally, under the UM Living Labs and Research Cluster in Sustainability Science, the Ijarah Eco-Friends initiative offers educational programs that delve into ecosystems, focusing on wild flora and fauna, for both local and national communities. The program includes **Usrah Alam Sekitar (IEF)**, which provides educational sessions on ecological issues and sustainable practices, and a visit to the Zero Waste Centre (ZWC) at Universiti Malaya (UM), which gives practical insights into effective waste management. These activities aim to enhance understanding and appreciation of ecosystems, fostering community involvement in environmental preservation and sustainability.

These programs are designed to be interactive and engaging, helping participants develop a strong connection to the natural world. By involving children and young adults in these activities, UM is fostering a new generation of environmental stewards who are well-equipped to tackle the challenges of biodiversity loss. The global trend towards environmental education is increasingly emphasising the need for experiential learning. UM's approach to ecosystem education aligns with this trend, ensuring that students and the public are not only informed about environmental issues but also actively involved in conservation efforts.



Above: The Rewild UM (Greening Urban Spaces & Biodiversity) online talk with Free Tree Society

Below: Ijarah Eco-Friends activities, under UM's Academy of Islamic Studies

ANTARA AKTIVITI IMARAH ECO-FRIENDS



Usrah Alam Sekitar (IEF)



Lawatan ke ZWC, UM

Sustainable Management of Land for Agriculture and Tourism

Universiti Malaya (UM) has made significant contributions to sustainable land management through its educational outreach programs. These initiatives aim to promote sustainable agricultural practices and land conservation, which are essential for maintaining the health of ecosystems and supporting local communities.

In 2023, UM collaborated with Sekolah Menengah Agama Sheikh Haji Mohd Said to organise **Kem SPM** program which held in two sessions: Siri 1 from December 4 to 7 and Siri 2 from December 11 to 14. The program took place at the Glami Lemi Biotechnology Research Center and involved 120 high school students. It focused on sustainable agricultural practices, offering participants hands-on experience with these techniques. The program aimed to illustrate how sustainable farming can enhance food security and environmental sustainability, providing students with practical knowledge that supports both ecological balance and community well-being.

The **Wild Banana Exploration Programme**, held on 16 December 2023 at Rimba Ilmu, Universiti Malaya, was a collaboration with MARDI that successfully enhanced participants' understanding of banana diversity in Malaysia and globally, with a focus on conserving wild banana species. The event featured welcoming remarks, an introduction to banana diversity, and sessions on morphological and molecular characterisation, highlighting the importance of preserving these unique species. Participants engaged in a practical exploration in the garden, learning about the ecological roles of wild bananas. Attendees had opportunities to connect and network during breaks and lunch. The event concluded with positive feedback, underscoring the importance of conservation efforts. The participants were undergraduate students of Universiti Malaya.



Above: Kem SPM at UM's the Glami Lemi Biotechnology Research Center

Below: The Wild Banana Exploration Programme at Rimba Ilmu, UM



The **UM Explorace 2023**, part of the Universiti Malaya Research Carnival (UMRC), provides a dynamic example of how UM blends outreach with education, particularly in promoting sustainable land management and tourism. The UM Explorace 2023 kicked off the Universiti Malaya Research Carnival (UMRC) on 8 January 2023, serving as an engaging and dynamic start to the three-day event. Co-organised by the UM Sustainable Development Centre (UMSDC) and UM Community Engagement Centre (UMCares), this exciting competition challenged teams of five to navigate eight checkpoints across the UM campus, testing their physical endurance and mental agility.

The Explorace had three main objectives: to promote UM's research activities while introducing edu-tourism and eco-tourism destinations within the campus, to engage the UM community with the external public through healthy recreational activities, and to provide a platform for participants to learn about the university in an enjoyable and informal setting. A total of 13 teams, comprising 65 participants, competed for the title of UM Explorace Champion 2023, supported by 40 student and staff volunteers. This event highlighted UM's efforts to blend education, research, and community engagement into a fun and informative experience.



Above: Participants of the UM Explorace 2023 event were introduced to various edu-tourism and eco-tourism destinations within the campus, enhancing their awareness of UM's unique natural and educational sites throughout the explorace

Below: Winners of the UM Explorace 2023 event (left) and a group photo with fellow participants (right)



UM also hosted seminars on sustainable agriculture in Malaysia, where experts discussed the challenges and strategies for promoting sustainability in the sector. These events provided a platform for knowledge exchange and highlighted UM's role in advancing sustainable land management practices. One notable event is the public lecture series titled **“Sustainable Agriculture in Malaysia: Issues, Strategies, and Challenges”**, held on 30 November 2023. Led by Professor Emeritus Chamhuri Siwar and moderated by Puan Siti Noridayu Abd Nasir, this event brought together experts to discuss the importance of sustainable agricultural practices in Malaysia, the challenges faced by the sector, and potential strategies to overcome these hurdles.



Above: The “Sustainable Agriculture in Malaysia: Issues, Strategies, and Challenges” seminar event poster (Source: Ungku Aziz Centre for Development Studies)



Above: The “Small Ruminant Farming Seminar” event poster (Source: UM Glami Lemi Biotechnology Research Centre)

Another remarkable event was **“Small Ruminant Farming Seminar”** held on 29 October 2023, where distinguished experts, including Pak Faisal KS, Prof. Dr. Ramli Abdullah, Dr. Nuradilla Mohamad Fauzi, and Dr. Ong Jin Seng, addressed key topics such as small ruminant nutrition, genetic innovations in livestock, and marketing challenges. This event served as an educational outreach program for both local and national communities, providing valuable insights into the sustainable management of land for agriculture. Through these efforts, the university reinforces its pivotal role in advancing sustainable agricultural practices.

Sustainable land management is a critical focus of global efforts to achieve SDG 15. UM's initiatives in this area reflect its commitment to promoting sustainable agricultural practices and land conservation, aligning with global trends and contributing to the broader goal of sustainable development.

Policies on Conservation, Restoration, and Sustainable Use of Terrestrial Ecosystems

Universiti Malaya (UM) has established comprehensive policies to ensure the conservation, restoration, and sustainable use of terrestrial ecosystems within the campus. These policies are articulated in the UM Sustainability Policy 2021-2030 and the Guidelines for Landscape Management and Biodiversity Conservation, aligned with Pillar 3: Environment, focusing on Landscape and Biodiversity Management.

As part of Core Area 1 of the UM Eco-Campus Blueprint, the university aims to guide landscape management in alignment with biodiversity preservation and conservation efforts. The primary objectives are as follows - UM seeks to provide a platform for awareness and educational activities, emphasising the importance of biodiversity and landscape management for the entire campus community.

The key implementation mechanism includes conducting activities and providing support for biodiversity awareness and sustainable landscape management. Furthermore, the University is dedicated to conserving, restoring, and sustainably using terrestrial ecosystems and landscapes associated with the university, especially Rimba Ilmu's forest. This involves advising on landscape design that considers cost, suitable plants for conservation and reforestation, and long-term environmental value and maintenance.

Besides, UM promotes local studies and research on landscape and biodiversity management. This involves monitoring protected species (including those on the IUCN Red List and national conservation lists), alien species, and reviewing the impact of landscape management on biodiversity. The research is aimed at developing strategies for the best landscape management practices. To ensure progress, UM mandates that all activities under Core Area 1 be documented, updated, and reported to a central clearinghouse. Faculties, Centre of Responsibility, and Residential Colleges are required to submit biannual progress reports to the Estates Department (JHB).

For more info, please refer to:

- [UM Sustainability Policy 2021-2030](#) (Page 6 & 14).
- [Guidelines for Landscape Management and Biodiversity Conservation, University of Malaya](#) (Page 1 - 16).
- [UM Eco Campus Blueprint](#) (Page 11 - 16).

These comprehensive strategies ensure that UM continues to be a leader in sustainable landscape and biodiversity management, fostering a green and sustainable campus environment.



Policies on Monitoring IUCN and Other Conservation Species

In 2023, Universiti Malaya (UM) intensified its efforts to monitor and protect IUCN Red Listed species, ensuring that its operations do not negatively impact these vulnerable populations. A key aspect of this initiative, outlined in the [UM Sustainability Policy 2021–2030](#) (see page 14, statement 3), is the monitoring of protected species in accordance with the IUCN Red List and national conservation guidelines. By identifying areas of concern, UM can develop targeted strategies to mitigate impacts and maintain a thriving habitat for native species.

This year, the university particularly focused on the IUCN Red Listed *Elephas maximus* (Asian elephant), classified as Endangered since 1986. One notable project is Dr. Sarah Abd Razak's research on the Geo-Spatial and Temporal Seasonal Analyses of Elephant Intrusion at palm oil plantations. Supported by a university grant, this study will run from 2023 to 2025 at UM Plantation in Kota Tinggi, Johor. The aim is to find sustainable solutions for human-elephant conflicts (HEC), especially concerning elephant intrusions in oil palm plantations, which lead to financial losses and human casualties. The research will collect data on elephant movement, behavior, and health. Dr. Sarah Abdul Razak and her team plan to develop a framework for reporting and monitoring intrusions using a deep learning detection system, potentially enhancing conservation decision-making and helping authorities mitigate HEC. Additionally, the study will assess elephant health to evaluate potential disease spread within populations.

Right: The academic poster for the study on “The Intensity of Human-Elephant Conflict in UM Plantation Oil Palm Estate, Kota Tinggi” (Source: Dr Sarah Abdul Razak)

Below: The *Elephas maximus* (Asian elephant) species in Malaysia can also be found at the UM Plantation Oil Palm Estate, Kota Tinggi

UM Plantation (N2.02916, E103.87076) is a 402.6-hectare area in Kota Tinggi, Johor, established in 1999, focusing on production and profit. The Basir Ismail Research Complex, linked to UM, specialises in environmental science for oil palm plantations. Dr. Sarah's team initiated elephant tracking in June 2023, visiting areas of detected elephant activity within UM Plantation to gather data on footprints, coordinates, and other signs. Despite challenges like rain, tracking will continue until May 2024. Data collected include intrusion dates, detection methods, damage extent, and group sizes. Analysing this human-elephant conflict (HEC) data will provide insights into intrusion patterns, supporting decisions to mitigate HEC through visual analyses like bar graphs showing correlations across years, months, and plantation blocks.



Other than that, Universiti Malaya (UM) is known for its rich biodiversity, including various species of the *Musa acuminata* (wild banana), which is currently on the threatened species list. Despite the significance of the area's flora, little is known about the distribution patterns of Musa species in the region.

On 2023, UM supports the research project that aims to bridge this gap by conducting a comprehensive analysis of the distribution of Musa species within UM's boundaries. The study focuses on the geographical spread of banana occurrences across the university's campus, contributing to broader conservation and restoration efforts for this threatened species. Through random sampling, 128 individual plants representing 2 species, and 4 subspecies were identified and cataloged. Plant specimens were collected from various locations across the campus, and for each observed species, GPS coordinates and morphological features were recorded for further analysis. The data were analysed using biodiversity metrics such as the Shannon-Wiener Diversity Index and the Simpson Index of Dominance (1949). These indices helped evaluate the species diversity and dominance within the study area. The research contributes valuable knowledge on the distribution and ecological characteristics of Musa species at UM, aiding in future conservation strategies to protect and preserve this vital component of the region's biodiversity.



DISTRIBUTION OF MUSA SPECIES IN UNIVERSITI MALAYA
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INTRODUCTION

The Universiti Malaya region is recognized for its rich flora, although little is known about *Musa* species distribution patterns in the area. The purpose of this study is to fill this information gap by performing a thorough analysis into the distribution of *Musa* species throughout the Universiti Malaya by examining the geographical distribution of banana occurrences.

METHODOLOGY



Figure 1. Map for sampling area in Universiti Malaya

- A total 128 individual which from 2 species and 4 subspecies were found in the study area
- Plant specimens were collected from various locations around Universiti Malaya using a random sampling strategy. For each species observed, GPS locations and morphological features were recorded.
- Data analysis- Species diversity was evaluated by using the Shannon-Wiener Diversity Index and the Simpson (1949) Index of Dominance

DISCUSSION

- The result showed that a total of 2 species and 4 subspecies has been successfully identified and recorded
- Musa acuminata subsp. burmannica* is the most abundance species at Faculty Built Environment
- The species observed in Universiti Malaya campus are *Musa violascens*, *Musa acuminata subsp. burmannica*, *Musa acuminata subsp. acuminata*, *Musa acuminata var. flava*, *Musa acuminata var. alaisensis*.
- The identification of the banana was done by examining its physical characteristics for example, the pseudostem height, color and texture of bract external face, fruit shape and position and also fruit quantity.
- For the Simpson's Diversity Index or known as Simpson index that have be measure, the value of diversity in University Malaysia is 0.753814

CONCLUSION

The purpose of this study poster is to provide insight on the distribution patterns of *Musa* species at the Universiti Malaya. The research advances our understanding of local biodiversity and advances evidence-based conservation efforts. Further study and monitoring are needed to detect changes in plant distribution through time and manage the Universiti Malaya ecosystems efficiently time in contributing to banana conservation efficiently.

OBJECTIVES

- To know the distribution and identify banana species in Universiti Malaya
- To compare the morphology between *Musa* species.

RESULTS



Figure 2. *Musa acuminata subsp flava* Figure 3. *Musa violascens*



Figure 4. Distribution of each species based on study sites

- The findings indicated various *Musa* species distribution patterns in the Universiti Malaysia.
- Certain places were found to have high levels of species richness, suggesting more biodiversity.
- The statistical research revealed strong connections between certain plant species and probable ecological parameters, shedding light on the elements that influence their distribution.

ACKNOWLEDGEMENT

I would like to express my gratitude to Dr Sarah Abdul Razak as my supervisor for guide my study. Not to forget to all my family and friends that give support to me. Thank you so much.

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Above: The academic poster for the study on "Distribution of Musa Species in Universiti Malaya" (Source: Dr. Sarah Abdul Razak)

Below: The *Musa acuminata* banana species can be found abundantly at UM



The Ex-Situ Conservation and Use of Banana Species in Peninsular Malaysia project, running from 2022 to 2024, plays a pivotal role in safeguarding the threatened *Musa acuminata* species and other banana varieties across the region. Led by Dr. Sarah as a Co-Researcher, the initiative focuses on engaging local communities in managing, monitoring, and protecting key biodiversity areas and environmentally sensitive zones. The project actively promotes biodiversity conservation and the sustainable management of natural resources, aligning with national environmental policies and goals. A significant aspect of the initiative is fostering community participation through educational programs, such as Citizen Science, which allows the public to contribute to biodiversity conservation efforts.

Both ex situ and in situ conservation strategies are employed in this project, aimed at protecting local species and preserving genetic resources. Ex situ efforts are centered around the Rimba Ilmu Herbarium at Universiti Malaya and the collection of data from selected highland and lowland regions, including Cameron Highlands. These efforts ensure that valuable plant species like wild bananas are protected and that their genetic material is stored for future research and conservation efforts. In situ conservation efforts complement this by focusing on managing natural habitats to protect ecosystems and biodiversity.

The project also involves a comprehensive research and data collection component, utilising modern tools like the MusaHunter Data Collection mobile application. This app is designed to collect georeferenced data on banana species, including images and geographical locations, from field trips, citizen science contributions, and herbarium records. Data is consolidated from various sources, including herbarium specimens from Rimba Ilmu, images published in studies on banana species, and contributions from the citizen science program. This multidisciplinary approach provides valuable insights into the diversity, abundance, and distribution of *Musa* species across Peninsular Malaysia, informing both conservation and research decisions.

A critical element of the project is capacity building in collaboration with MARDI, with workshops and training programs aimed at strengthening expertise in taxonomy, curatorship, and Citizen Science. These activities equip new taxonomists, curators, and Citizen Scientists with essential skills, helping bridge gaps in expertise and competencies in biodiversity conservation. Through this, the project not only strengthens human resource development but also promotes greater public awareness of conservation issues, contributing to long-term sustainable natural resource management. Additionally, the project is designed to integrate biodiversity conservation into broader efforts to mitigate and adapt to climate change. By emphasising the sustainable management of natural resources, the initiative contributes to national policies and commitments to multilateral environmental agreements. This aligns the project's goals with global and national strategies for environmental protection and sustainable development, ensuring that biodiversity conservation efforts are mainstreamed into policy frameworks and contribute to climate resilience.



Above: The capacity building workshop in collaboration with MARDI

Incorporating Local Biodiversity into Planning and Development

The university also incorporated local biodiversity considerations into its campus planning and development processes, demonstrating its commitment to preserving the natural environment. Universiti Malaya (UM) is committed to advancing environmental sustainability through its campus planning and development processes, guided by the **UM Masterplan 2050** (please refer to page 48, 49, 78 & 95).

Central to this commitment is the creation of an **Urban Ecological Campus**, as outlined in the Masterplan. This initiative focuses on several key areas to foster a sustainable and biodiverse campus environment. The Masterplan emphasises the enhancement of UM's existing environmental landscape to support better biodiversity, physical access, and connectivity between green areas. Efforts will be made to conserve the existing flora and fauna on campus, while connecting pockets of forested areas to enrich biodiversity. Additionally, all existing water bodies within the campus will be rehabilitated to improve their aesthetic and ecological value, contributing to a more vibrant urban ecology.

A significant component of UM's sustainability strategy is the Rimba Ilmu Botanical Garden, which is a focal point of the UM Masterplan 2050. This area will focus on conserving native species and enriching biodiversity. To protect this ecological gem, no new developments will be allowed within Rimba Ilmu's boundaries. Comprehensive research and data collection will support conservation efforts, and existing water bodies will be rehabilitated to maintain ecosystem balance and prevent pollution. Incorporating green technologies is another critical aspect of UM's environmental strategy.

The Masterplan outlines the integration of these technologies into infrastructure development, campus planning, and public amenities. This approach is aimed at achieving sustainable Carbon Neutral Campus development, ensuring that

environmental and landscape infrastructures are developed with sustainability in mind. The action plan for UM's sustainability efforts includes several key initiatives. First, Rimba Ilmu will be conserved by protecting its native species and preventing new developments within its area. Second, existing water bodies will be rehabilitated to enhance their ecosystems, support wildlife, and reduce flood risks. Third, public access to campus ecology will be improved with minimal impact on wildlife, fostering a stronger connection between the community and the environment. Fourth, potential nodes for outdoor learning and recreation will be developed within Rimba Ilmu Research Botanical Garden to create more educational opportunities and promote well-being. Lastly, Rimba Ilmu is envisioned as a potential tourist destination, with proper protection and maintenance to attract sponsorship and support for its research and conservation efforts.

Overall, guided by the UM Masterplan 2050, UM is dedicated to employing green best practices and research breakthroughs to achieve carbon neutrality and manage its growing campus population and facilities. This comprehensive strategy reflects the university's commitment to enhancing environmental biodiversity and physical infrastructure while advancing sustainability.

The adoption of stringent conservation policies is a hallmark of global efforts to achieve SDG 15. UM's policies and practices align with these global standards, ensuring that the university remains a leader in environmental stewardship and sustainable development.

Right: UM Master Plan 2050 can be accessed here: <https://jpphb.um.edu.my/img/UMMP2050/230821%20-%20Blueprint%20Pelaksanaan%20Induk%20UM%202050.pdf>



Policies on Alien Species Impact Reduction

Universiti Malaya (UM) has implemented a robust policy to address the impact of alien species on its campus, as part of its **Universiti Malaya Sustainability Policy 2021-2030** (please refer to page 14, statement 3). This policy reflects UM's commitment to landscape and biodiversity management, ensuring the preservation, conservation, and restoration of the campus's terrestrial ecosystems. One of the primary objectives is to mitigate the potential harm caused by invasive alien species, which can threaten the native flora and fauna, and disrupt the ecological balance of the university grounds.

A key mechanism of this policy is monitoring protected and alien species, in accordance with the IUCN Red List and national conservation guidelines. This allows the university to closely observe and assess the influence of alien species on existing biodiversity. By continuously evaluating these species, UM can identify areas of concern and develop strategies to reduce their negative impact, ensuring that the campus remains a thriving environment for native species.

Furthermore, **UM's Guidelines for Landscape Management and Biodiversity Conservation** provide clear steps for minimising the effects of alien species. This includes conducting local studies to gather data on the presence and influence of these species and reviewing landscape management practices to prevent their spread. The guidelines also emphasise the importance of restoring affected ecosystems and promoting native biodiversity through strategic planning and active intervention.

One notable research conducted by UM, which relates closely to the issue of invasive alien species, is the **“Assessment of the Impact of Climate Change, Environmental Pollutants, and Invasive Alien Fish Introduction into Native Freshwater Ecosystems Through Ecological, Molecular, and Educational Approaches”**.

This project, led by **Prof. Dr. Subha Bhassu**, focuses on the introduction of invasive alien fish species into Malaysia's freshwater ecosystems, specifically in Perak. By utilising environmental DNA (eDNA) technology, the research team can monitor changes in fish species diversity and identify invasive alien species.

This project is crucial for understanding how alien species, climate change, and pollution affect native ecosystems, providing insights for managing these impacts. The “Fish Bank” initiative highlights the importance of public education on the dangers of invasive species and their effects on biodiversity. UM's research supports global biodiversity conservation and sustainable ecosystem management, aligning with its goal to mitigate alien species' impact.

Through these these comprehensive research, policies, and guidelines, UM is committed to maintaining a sustainable campus ecosystem, reducing the impact of alien species, and advancing its biodiversity and sustainability goals.



Top: An excerpt from the UM Sustainability Policy 2021–2030, highlighting Pillar 3: Environment, which focuses on reducing the impact of alien species

Collaboration for Shared Land Ecosystems

Universiti Malaya (UM) actively collaborates with local communities to maintain shared land ecosystems. These collaborations are crucial for the university's broader sustainability goals and involve various stakeholders in conservation and restoration activities. In 2023, UM organised several **gotong-royong (community cleanup) events**, such as those at Rimba Ilmu and the Second Residential College. These events brought together students, staff, and community members to work towards common environmental goals, fostering a sense of shared responsibility for the environment.

For instance, the Second Residential College UM (Kolej Kediaman Tuanku Bahiyah) organised a gotong royong activity which took place on 11 and 12 September 2023. All Student Facilitators and administrative staff from Kolej Kediaman Tuanku Bahiyah participated in a collective effort to beautify the college grounds. The gotong royong involved tasks such as cleaning and maintaining the college environment, demonstrating a strong spirit of community cooperation. This initiative improved the college's aesthetic and ecological conditions and fostered a sense of shared responsibility among participants. The university expressed gratitude for the collaboration of both student facilitators and staff in enhancing the campus environment and emphasised the importance of continuing to uphold and maintain the cleanliness of the beloved college.

Next, Rimba Ilmu UM also held a gotong royong activity on 4 November 2023 at Rimba Ilmu Botanical Garden. Approximately 20 UM students from various backgrounds participated in a collective clean-up session. The focus of the activity was on one of Rimba Ilmu's living plant collections, the Bambusetum. Participants undertook several tasks, including trimming and removing broken or dead parts of bamboo, cleaning up waste from the area, and fertilising selected trees. This hands-on engagement helped maintain the health and appearance of the bamboo collection and fostered environmental stewardship among the students.

Community collaboration is essential for the success of conservation efforts. UM's approach to involving local communities in its environmental initiatives is in line with global best practices, ensuring that conservation efforts are inclusive and effective.



Above: Rimba Ilmu community cleanup
(Source: Rimba Ilmu)

Bottom: UM students participating in the cleanup



Guidelines and Standards of Water Discharge

Universiti Malaya (UM) adheres to strict water quality standards and guidelines for water discharges to safeguard ecosystems, wildlife, and human health. Water management in Malaysia is governed by the Government of Malaysia, which oversees both water supply and water sanitation/treatment. The responsibility for water supply lies with state companies, while water sanitation and treatment are centralised under **Indah Water Konsortium (IWK) Sdn. Bhd.**, a government-owned entity under the Ministry of Finance. At UM, water treatment services are outsourced to IWK, ensuring compliance with national standards.

The **Environmental Quality Act (1974)** forms the legal foundation for water management, setting provisions for effluent and water discharges to maintain public health and prevent pollution. In addition to this, the Environmental Quality Regulations (Industrial Effluent) provide more detailed schedules and guidelines on water discharge quality, reflecting the government's commitment to ecosystem and public safety. UM follows these regulations rigorously to maintain water quality and prevent harm to its surrounding environment.

Based on the **UM Water Management Report**, it highlights its connection to the Pantai 2 Sewage Treatment Plant, a significant project under the 10th Malaysia Plan. This plant serves as a central sewage treatment facility for various Kuala Lumpur areas, including UM. With a design capacity increased from 550,000 PE to 1.423 million PE, the plant employs the Advanced Anaerobic-Anoxic-Oxic (A2O) process, which effectively removes nitrogen and phosphorus from wastewater, achieving Standard A effluent discharge quality as per the Environmental Quality (Sewage) Regulations (2009).

Pantai 2 Sewage Treatment Plant also incorporates green technologies in its water management approach. For instance, treated effluent is reused for cleaning and landscaping purposes, while biogas obtained from sludge treatment is used to generate electricity.

Moreover, UM mandates the installation of oil and grease traps in all cafés on campus. These traps are crucial for preventing oil and grease from entering wastewater streams, ensuring cleaner wastewater discharge before it is sent for treatment. This further supports UM's efforts to uphold water quality standards, protect local ecosystems, and contribute to a sustainable campus environment.

P.U. (A) 434.

4010

ENVIRONMENTAL QUALITY ACT 1974
ENVIRONMENTAL QUALITY (INDUSTRIAL EFFLUENT) REGULATIONS 2009
ARRANGEMENT OF REGULATIONS

Regulation
1. Citation
2. Interpretation
3. Application
4. Obligation to notify the Director General
5. Design and construction of industrial effluent treatment system
6. Compliance with specifications of industrial effluent treatment system
7. Monitoring of discharge of industrial effluent or mixed effluent
8. Proper operation of industrial effluent treatment system
9. Performance monitoring of effluent treatment system
10. Competent person
11. Acceptable conditions for the discharge of industrial effluent other than parameter of chemical oxygen demand (COD)
12. Acceptable conditions for the discharge of industrial effluent for parameter of chemical oxygen demand (COD)
13. Acceptable conditions for the discharge of mixed effluent for parameter of chemical oxygen demand (COD)
14. Best management practice for the discharge of industrial effluent or mixed effluent for other parameters
15. Licence to contravene the acceptable conditions for the discharge of industrial effluent or mixed effluent
16. Methods of analysis and sampling of industrial effluent or mixed effluent
17. Point of discharge of industrial effluent or mixed effluent
18. Prohibition against industrial effluent or mixed effluent discharge through by-pass
19. Dilution of industrial effluent or mixed effluent
20. Spill, accidental discharge or leakage of industrial effluent or mixed effluent

Sewage Disposal

Pantai 2 Sewage Treatment Plant is a project under the 10th Malaysia Plan to upgrade sewage treatment capacity in the catchment area of beach from the existing capacity of 550,000 PE to 1,423 million PE.

Catchment area covers 6,700 hectares of the New Town Sentul, Sentul Raya, part of the commercial center of Kuala Lumpur, Bangsar, Bukit Kiara recreation area, part Old Klang Road and Petaling Jaya and others including **Universiti Malaya**. The main sewage treatment plant is built below ground level whilst the sludge treatment facility is above the ground level, over 17 ha of land area which also includes an above ground recreational park and amenities. Pantai 2 RSTP utilizes the Advanced Anaerobic-Anoxic-Oxic (A2O) process that is effective in removing nitrogen and phosphorus in the wastewater compared to the conventional treatment system. The plant is designed for Standard A effluent discharge quality as prescribed in the Environmental Quality (Sewage) Regulations 2009.

Various elements of green technology have been incorporated into the project design Pantai 2 Sewage Treatment Plant and in between is the reuse of treated effluent (cleaning & landscaping purposes) and electricity generation through biogas engine (biogas obtained through the sludge treatment).

Additional Link:

https://www.iwk.com.my/cms/upload_files/files/English%20Brochure-Pantai%202.pdf

Treatment for up cycling

Indah Water Konsortium Sdn. Bhd. (INCORPORATED IN MALAYSIA)
BIDANG PERKHIDMATAN PASAR AIR
No. 03-22847828
Tarikh: 24/09/2018
No. Bil. Perkhidmatan: 3020743
08 OCT 2018
03-22847828
UNIVERSITI MALAYA, JALAN LEBUH PASTAR 50250 KUALA LUMPUR, WILAJAYA LUMPUR
Indication of location address for Universiti Malaya sewerage treatment plant

Left: Environmental Quality Act (1974)

Right: UM's Indah Water Konsortium (IWK) bill

Policies on Waste Disposal and Hazardous Materials

Universiti Malaya (UM) has implemented robust policies for the disposal of waste and hazardous materials, ensuring that its operations do not negatively impact the environment. These policies are part of the broader **UM Sustainability Policy 2021 - 2030**, which emphasises responsible waste management practices across the campus.

UM's waste management approach is guided by **Core Area 2 of the UM Eco-Campus Blueprint** (page 17-20), which focuses on sustainable solid waste management practices aimed at reducing costs while maintaining ecological balance. The first objective within this framework is to monitor and measure the amount of waste generated across campus, including the amount sent to landfills and the percentage of waste that is recycled. This monitoring allows the university to assess the effectiveness of its waste reduction efforts and implement necessary adjustments to achieve higher sustainability outcomes.

In addition to tracking waste, UM actively promotes the 3R principles (Reduce, Reuse, Recycle) throughout campus activities. Students, staff, and administration are encouraged to adopt sustainable practices in all aspects of their daily lives, from academic endeavors to administrative tasks. The university has established programs to reuse materials, particularly in administrative functions, and has introduced initiatives to raise awareness about waste reduction. These efforts aim to foster a culture of environmental responsibility among the campus community.

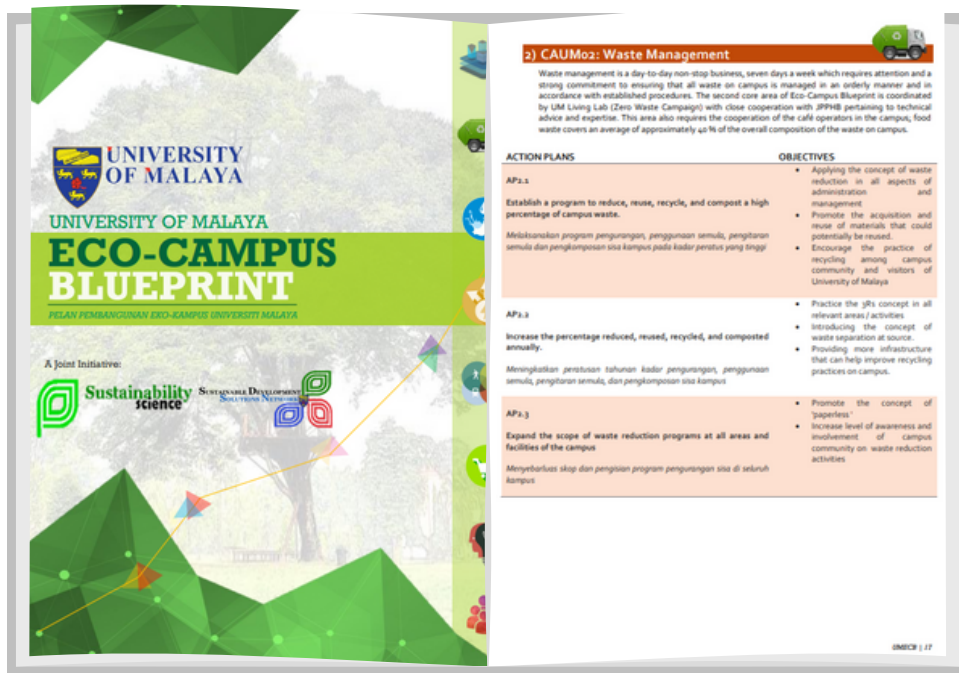
UM is expanding its infrastructure to support recycling and composting. Recycling bins are strategically placed across campus for easy recycling. Composting initiatives also help manage organic waste. These efforts are key to increasing the annual percentage of recycled and composted waste, moving UM closer to its sustainability goals.

Recognising the environmental challenges posed by single-use plastics, UM has implemented policies (**UM Action Plan on Single Use Plastic and Disposable Items**) to reduce the use of disposable items across the campus. The university encourages the adoption of paperless initiatives and responsible consumption practices, particularly within its supply chain, to reduce unnecessary waste generation. By raising awareness about the environmental impact of disposable plastics, UM is fostering behavioral change towards more sustainable consumption patterns.

In addition, UM is actively addressing plastic waste and promoting sustainable practices on campus. One significant initiative in this regard was the seminar titled "**The Plastic Treaty and Ocean Governance: Opportunities and Challenges**" jointly organised by the Faculty of Law and the Institute of Ocean and Earth Sciences (IOES) in July 2023. The event featured Dr. Alexandra Harrington, a renowned expert in ocean governance and plastic pollution, who discussed the implications of the Plastic Treaty in establishing effective governance systems to manage marine environmental challenges.

The seminar highlighted the importance of the Plastic Treaty in addressing plastic waste, particularly regarding its governance and the preservation of marine ecosystems. It also served as a platform to discuss key developments in the treaty's acceptance and progress in mitigating plastic pollution. Researchers, students, and policymakers were encouraged to engage with the issues presented, fostering a culture of learning and action.

UM's commitment to reducing plastic waste on campus is reflected in educational initiatives like this seminar. By facilitating discussions on plastic governance, the university raises awareness and promotes sustainability within its community, aligning with its broader goals to minimise waste generation and encourage responsible consumption.



Above: An excerpt from UM Eco-Campus Blueprint, highlight waste management

Below (left): UM Action Plan on Single Use Plastic and Disposable Items

Below (right): The Plastic Treaty and Ocean Governance: Opportunities and Challenges seminar



In 2023, UM refined its hazardous materials management guidelines to comply with national and international standards. The university enforces strict protocols for safely handling and disposing of solid and liquid hazardous waste, following the UM Safety Handbook. These measures protect human health and the environment from contamination and align with UM's sustainability goals to reduce its environmental footprint.

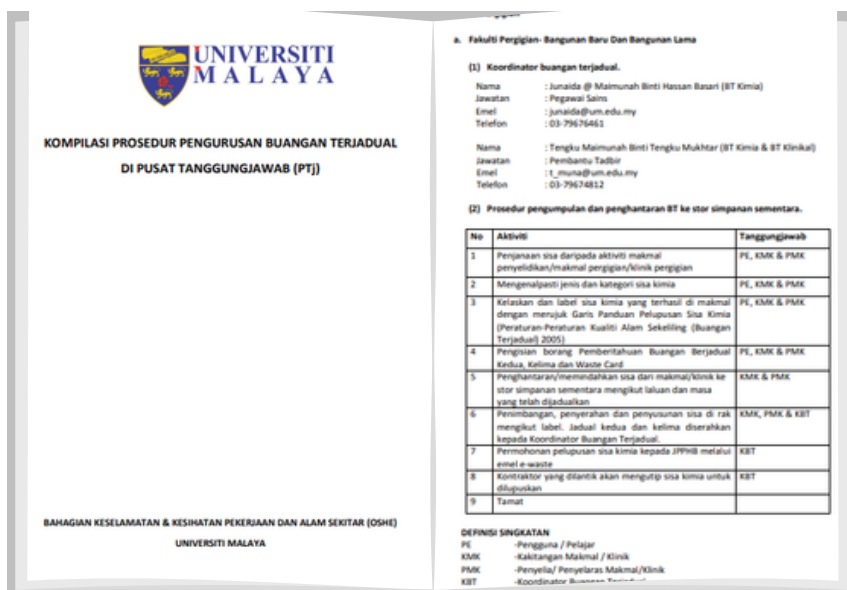
The policy delineates clear roles and responsibilities for different stakeholders involved in waste management, including the waste producers, hazardous waste coordinators, and custodians. Waste producers, such as laboratories and research facilities, are responsible for correctly identifying, labeling, and segregating hazardous materials. The hazardous waste coordinators oversee the entire waste disposal process, ensuring compliance with regulations and coordinating with external authorities for proper disposal. Custodians are tasked with the safe storage of hazardous materials until they are disposed of according to established procedures.

Several UM faculties, including Built Environment, Pharmacy, Engineering, Dentistry, Medicine, and Science, generate significant hazardous waste through research and teaching.

They follow UM's hazardous waste policy to ensure safe management. For example, Engineering handles materials with heavy metals and chemicals, while Science deals with various biological and chemical hazards.

UM's hazardous waste policy extends to all departments and units, including the Centre for Sports and Exercise Science, the Deputy Vice-Chancellor of Research & Innovation, and the Health Clinic. Each of these units plays a critical role in ensuring that hazardous waste is handled according to the university's guidelines. This coordinated approach helps to ensure that hazardous materials are managed in a safe and environmentally sound manner, in line with national regulations and best practices for sustainability.

Effective waste management is a critical component of sustainable development. UM's policies on waste disposal and hazardous materials align with global trends, reflecting the university's commitment to reducing its environmental impact and promoting sustainable practices.



Left: This document is the compilation of policy, process and practice on waste disposal covering hazardous materials from central UM, several faculties and labs:
https://strategy.um.edu.my/files/THEIR_2024/Additional/Compilation%20of%20Policy%20waste%20disposal%20-%20hazardous%20materials.pdf

UM's Contribution to Global Sustainability Goals

In 2023, Universiti Malaya demonstrated its commitment to achieving SDG 15 through a range of initiatives focused on education, conservation, sustainable land management, and community collaboration. These efforts are aligned with the university's long-term strategic goals as outlined in the UM Transformation Plan 2030 and the UM Master Plan 2050.

By aligning its initiatives with global trends in sustainability, UM continues to play a leading role in the global effort to protect life on land and achieve the SDGs by 2030.

The university's contributions not only benefit the local environment but also set a benchmark for other institutions to follow in their sustainability journeys.

This report highlights UM's ongoing commitment to SDG 15 and underscores the university's role as a leader in environmental stewardship and sustainable development. As the world moves closer to the 2030 deadline for the SDGs, UM's initiatives provide a valuable blueprint for how universities can contribute to a more sustainable future.

