

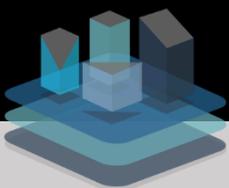


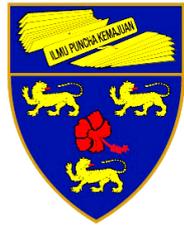
CAMPUS SUSTAINABILITY REPORT



UNIVERSITY
OF MALAYA

2015





**UNIVERSITY
OF MALAYA**

CAMPUS SUSTAINABILITY REPORT 2015

Abstract

This report aims to provide the University of Malaya's Higher Management and other interested stakeholders information that can help them contribute to and improve upon strategies for solving campus sustainability challenges. The University of Malaya Sustainable Development Solutions Network (UM SDSN) Unit and the Sustainability Science Research Cluster hopes the information provided inspires a long term creativity, commitment and progress toward a more sustainable UM.

UM Sustainable Development Solutions Network – UM SDSN
c/o Sustainability Science (SuSci) Research Cluster, UM

On the cover: The Varsity Lake with Chancellery building on the background. It is a must-see place of interest in the campus. Varsity Lake is one of the University Malaya site for the UM Living Lab Programmes initiated in 2015. Water Warriors and several other stakeholders mainly the JPPHB (Department of Estate Management and Maintenance) under the purview of Deputy Vice-Chancellor of Development.



University of Malaya Sustainable Development Solutions Network
(UM SDSN) Unit
c/o Sustainability Science (SuSci) Research Cluster
Level 6, Research Management & Innovation Complex (RMIC)
University of Malaya
50603 Kuala Lumpur, MALAYSIA

www.um.edu.my
susci.um.edu.my
umsdsn.strikingly.com

Acknowledgements

This report was prepared by the UM SDSN Unit with contributions and input from many individuals and departments across campus, reviewed and edited by the Sustainability Science Research Cluster, UM SDSN Sustainability Associate Groups. The Vice-Chancellor endorse this report and appreciate the effort by all involved that made this publication possible.

Note: The 6 indicators in UI GreenMetric World University Ranking is to be credited for the listing elements used in this report which applies basis foundation of the Sustainability Tracking, Assessment and Rating System™ (STARS) framework.



UNIVERSITY OF MALAYA COLLECTIVE EFFORTS TOWARD A SUSTAINABLE CAMPUS IN THE FUTURE

About UM

University of Malaya (UM), the foremost and premier Research University (RU) in Malaysia. It is a multidisciplinary RU that has more than 27,000 students and 1700 academic staff with 17 faculties and research centres which covers the whole spectrum of learning from the Arts, Sciences and Humanities. The university's beginning at the Kuala Lumpur campus dates back to 1957 and thus far has a huge alumni of over 100,000, among them renowned and illustrious personalities and leaders in various fields.

We are the first choice of Malaysia's top students and our international student population comes from more than 80 different countries. Our beautiful 750-acres campus lies within the heart of Kuala Lumpur city and this strategic location is truly an advantage for our international academic staff and visitors. The University of Malaya, being a comprehensive, research-intensive university, confers degrees in a large variety of academic programmes at the Bachelor's, Master's and PhD levels.

[Reference: <http://www.um.edu.my>]

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Letter from the Vice-Chancellor, University of Malaya

Professor Dr. Mohd Amin Jalaludin

Assalamualaikum w.b.t and Warmest Greetings,

At the University of Malaya, 'sustainability' is relatively, still a new jargon. In 2014, UM introduced UM Living Lab Programs; UM chapter on sustainability effort by focusing on three important areas: water, waste and biodiversity management. I am hoping such effort could portray a best practices model on which multi-stakeholders could work together toward a common goal. UM vis-à-vis campus sustainability initiatives is a work-in-progress and it requires in-depth understanding and strong commitment from the higher management to the people working on the ground.

I am pleased to share University of Malaya's Campus Sustainability Report 2015 (UMCSR2015). This is the first report and has been compiled by the University of Malaya Sustainable Development Solutions Network (UM SDSN) Unit under the purview of Sustainability Science Research Cluster.

The session 2014/2015 marked an important phase in preparing UM toward embracing sustainability in a holistic manner to be aligned with the United Nations' Sustainable Development Goals (SDGs) officially known as Transforming our world: the 2030 Agenda for Sustainable Development, an intergovernmental set of aspiration of 17 Goals announced in September 2015 at the United Nations General Assembly (UNGA). UMCSR2015 covers the University's key sustainability initiatives: past, present as well as the future projection planning as UM's way forward. The whole University of Malaya community especially the responsibility stakeholders needs to step up to do their bit to ensure the sustainability of UM's commitment on safeguarding UM's campus environmental performance as one of UM's common goals beside academic and research-based performance.

Thank you for taking the time to learn about UM's sustainability efforts toward sustainable campus and I invite you to join us in this exciting venture on the Age of Sustainable Development.

'In preparing UM toward a sustainable and greener campus, we need to work together'

Professor Dr Mohd Amin Jalaludin

Vice-Chancellor

University of Malaya

50603 Kuala Lumpur

MALAYSIA

Tel. No: +603 7967 3213 / 3510 / +603 7956 8400

Fax No.: +603 7954 7551

Email: vc@um.edu.my / aminj@um.edu.my

NOTES FROM THE

Dean, Sustainability Science (SuSci) Research Cluster,
Professor Dr. Nik Meriam Nik Sulaiman



Assalamualaikum w.b.t and Greetings,

On behalf of the Sustainability Science Research Cluster, this report is just one of the many 'firsts' to come for UM's journey toward a sustainable campus. The journey require attention, cooperation and commitment of those interested and have strong wills to join and assist UM at all phases of the journey.

Be it at planning, actions and reflections phase of UM sustainability initiatives, the campus community need to be represented and none should be excluded. At the very least of all, the people need to know how does UM perform in a period of one year and what-and-how they can contribute at their own capacity to be part of the exciting endeavour.

As you read through this report, everyone should be able to reflect upon themselves about what was accomplished this year and how to move forward. It is our utmost gratitude to thanks all contributors that made the 1st UM's Campus Sustainability Report 2015 (UMCSR2015) a possible chapter.

'Sustain-ability would not be a reality if we prefer to live our day on "business-as-usual" basis'

Professor Dr Nik Meriam Nik Sulaiman

Dean, Sustainability Science Research Cluster

- Professor, Department of Chemical Engineering, Faculty of Engineering
- Senior Advisor, UM Sustainable Development Solutions Network (UM SDSN)

University of Malaya

NOTES FROM THE

Coordinator,
UM Sustainable Development Solutions Network
(UM SDSN) Unit
Dr. Zul Ilham Zulkiflee Lubes



Assalamualaikum w.b.t and Greetings,

On behalf of UM SDSN Unit, allow me to convey our utmost appreciation to the Vice-Chancellor, Deputy Vice-Chancellors, Dean of SuSci Research Cluster, Responsibility Centers (PTjs) and any individuals who had directly or indirectly contributed their ideas, support, and data throughout the process of preparing this report.

UM's Campus Sustainability Report 2015 (UMCSR 2015) is an inaugural of its kind for the University of Malaya. It would not be possible without the consent and full support from the Vice-Chancellor of UM. The idea of preparing this report 'sparked' at the time of UM SDSN was mandated a task to manage the participation of UM for the Universitas Indonesia GreenMetric World University Ranking 2015 (UI GreenMetric). This year, a new direction coordinated by UM SDSN initiated a strong partnerships with the Department of Estate Management and Maintenance (JPPHB) under the purview of Deputy Vice-Chancellor (DVC) of Development, Academic Division (DVC of Academic & International), Transport Stickers and Traffic Unit (UM's Security Office), Student Registered Bodies Division, Shuttle Bus Services Division, Residential Colleges (DVC of Student Affairs and Alumni), and the Institute of Research Management & Monitoring (IPPP) and Research Clusters (DVC of Research & Innovation).

Throughout the preparation phase of UMCSR2015, UM SDSN was closely assisted by the UM Living Lab Programs, UM SDSN Core Volunteers as well as the team assistants consist of students and staff. Thanks to all for your time, energy and support.

'A report is indeed an important document to plan our way forward more sustainably'

Dr Zul Ilham Zulkiflee Lubes

Coordinator, UM SDSN Unit

- Senior Lecturer, Institute of Biological Sciences, Faculty of Science
- Advisory Group Member (Internal), Youth for Education on Sustainability and Peace (YESPeace) Network Malaysia Chapter

University of Malaya

GUIDELINES & COMMITMENT

Sustainability efforts in UM based on chronological timeline

University of Malaya is committed toward introducing and promoting sustainability efforts in the campus. The following guidelines provide the basis for the campus' sustainability initiative efforts:

1950 – 1980's

The establishment of **University of Malaya** [1959]

Talloraies Declaration [1976]

1990's

Centre for Environmental Management / CEM [1997]

The Malaysian Consortium for Environment & Developmet / MUCED [1997]

Courses on environment introduced as Man & Environment, Environmental Engineering, Environmental Technology, Science and Environmental Management Programme, Environmental Studies (Geography) [1997]

2000's

Bottom-up: The starting point of **Environmental Movement** based on volunteerism - UM 1st Earth Hour [2008]

The setup of **Sustainability Science (SuSci) Research Cluster** [2009]

Top-down: Environmental Movement in UM recognized by the Higher Management as **University of Malaya Cares (UMCares)** [2009]

The setup of **Asian Core Programme (ACP) - Japanese Society for the Promotion of Science (JSPS)** [2011] - Integrated Watershed Management

UM via UMCares participated on the **UI GreenMetric World University Ranking** [2011]

2013

UM initiative toward sustainability efforts:

UMCares is known as the **University of Malaya Centre for Community Engagement and Sustainability - Institutionalization: Merging and Restructuring Phase** [2013]

The setup of the unit called **University of Malaya Sustainable Development Solutions Network (UM SDSN)** c/o SuSci Research Cluster under the initiative of DVC of Research & Innovation [Late 2013]

UM under the purview of UMCares became member of **the International Sustainable Campus Network / ISCN** [2013]

2014 - Present

The setup of **University of Malaya Living Labs: Zero Waste Campaign, The RIMBA project, Water Warriors, & Rainwater Harvesting** under the initiative of two (2) Deputy Vice-Chancellors of UM i.e. DVC of Research & Innovation and DVC of Development [2014]

UM as the **1st Youth for Education on Sustainability & Peace Network National Chapter - YESPeace Malaysia** in collaboration between Sustainable Development Solutions Network (SDSN) Malaysia Chapter & UNESCO Mahatma Gandhi Institute of Education on Sustainable Development and Peace (UNESCO MGIEP)

The **internal collective efforts on identifying the current status of University of Malaya** on sustainability efforts [September - November 2015]

UM's 5th years participation in UI Green Metric World University Ranking 2015 - coordinated by UM SDSN & SuSci Research Cluster [2015]



DEFINITION OF SUSTAINABILITY: UNIVERSITY OF MALAYA

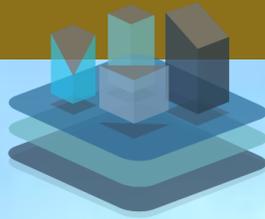
‘Sustain-ability’ is the ability to endure, to maintain original state of the subject. It is an elusive concept which mean different things to different people.

At the University of Malaya, we believe that sustainability is a path worth-venture and looking forward to. It is a set of conditions and trends in a given system that can continue progressively over the years. It requires a long term commitment by focusing on-and-beyond the common three-pillars of Sustainable Development (SD) namely economic, social and environmental goals. We acknowledge the need to put limits to natural, social and built system. The path to sustainability in UM would not be possible if the campus community be it staffs or students from multidiscipline and backgrounds are not ‘talking’ to one another. Sustainability requires inter-and-intra connection among all stakeholders. We aim at fostering local sustainability to be in harmony with global sustainability rather than at expense of others.



Photo of an *Albizia saman* or called Rain Tree or *Pukul Lima* tree at the UM Main Library, courtesy of the UM Living Lab Programme: The RIMBA Project

1



SETTING & INFRASTRUCTURE

Photo of the new Examination Building of University of Malaya located near the 1st and 2nd Residential Colleges.

Photo courtesy of the University of Malaya



"Community engagement and engagement for sustainability"

JPPHB UM

SETTING & INFRASTRUCTURE

The University of Malaya campus setting and infrastructure information provide the very foundation of the university commitment towards green environment or in this case, sustainability efforts.

Campus Site		Total Area (m ²)	Total Ground Floor Area (m ²)	Total Open Space (m ²)	Land / Building Status
1	1a. Main Campus 1b. UM Medical Centre [PPUM] SUB-TOTAL	3,550,000 173,000 3,723,000	350,053	3,373,000	UM owned-property
2	Wisma R&D	6,100	3,642	2,400	UM owned-property
3	Glami Lemi Biotechnology Research Centre (PPBGL), Jelebu, Negeri Sembilan	607,000	2428	604,572	UM owned-property
4	Faculty of Agriculture, UM, Gemas, Negeri Sembilan	809,000	-	809,000	UM owned-property
5	UM Marine Research Station, Bachok, Kelantan	27,500	-	27,500	UM owned-property
6	Nilam Puri, Kelantan	43,700	8,013	32,500	Rental property from Yayasan Islam Kelantan
7	Fraser's Hill Biodiversity Research Center (UMCares)	325	325	-	Rental property from Perbadanan Kemajuan Bukit Fraser
TOTAL		5,216,625	364,136	4,849,297	-

Credit: Property Management Division, Department of Development and Estate Maintenance (JPPHB), University of Malaya Centre for Community Engagement and Sustainability (UMCares) and University of Malaya International and Corporate Relations (ICR) office.

1.1 Campus Setting

In city centre and high rise building

University of Malaya is located at the heart of the 'green-lung' of the city centre of Kuala Lumpur, the capital of Malaysia. We can observe the high-rise building surrounding the campus area especially the area of Bangsar South, the KL Eco City as well as the KL Gateway most recent development area.

1.2 Climate

Tropical Wet and Dry

Malaysia is within the equatorial region, where a tropical rainforest climate (wet and dry) is apparent all year round.

1.3 Type of Higher Education Institution

Comprehensive Higher Education Institution

The University of Malaya, being a comprehensive, research-intensive university, confers degrees in a large variety of academic programmes at the Bachelor's, Master's and PhD levels. The university also offers joint PhD degrees with international partner universities such as the University of Sydney, University of Melbourne, University of Nottingham, and the Consortium of Presidents of Universities (CPU) in France.

[Source: Welcome Message from Vice-Chancellor of UM, UM official Website]

1.4 Number of Campus Sites

Seven (7) Campus Sites with buildings for academic and research purposes. This include campuses in different districts, towns or cities separated from the main campus.

1.5 Total Campus Area (m²)

The total campus area inclusive of those in which academic activities are being conducted:
5,216,625 m²

1.6 Total Ground Floor Area of Buildings (m²)

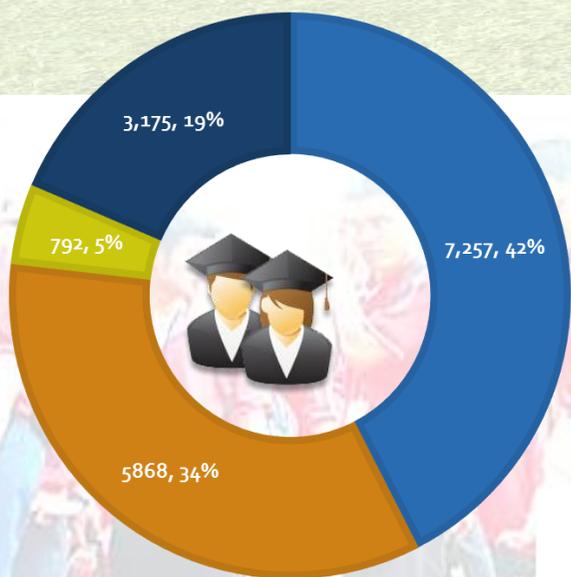
This indicate the overall area occupied by buildings – the total area of the first floor-part of UM buildings:
899,800 m²



POPULATION

PEOPLE OF UNIVERSITY OF MALAYA

■ Malaysian Undergraduate ■ Malaysian Postgraduate
■ International Undergraduate ■ International Postgraduate



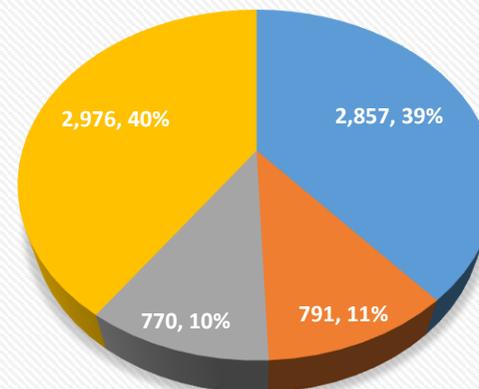
1.7 Number of students (part time & full time students)

17,092 [Malaysian & International Students]*

1.8 Number of academic & administrative staff

7,394 [Malaysian & Foreign Staff]*

Note: * data is as of March 2015 intake as provided by ICR UM.



Staff Population

■ Malaysian Academic Staff
■ Foreign Academic Staff
■ Non-Academic Staff (Management & Professional)
■ Non-Academic Staff (Support Staff)

Category of Student		Sub-total based on categories	Overall total
1	Malaysian Undergraduate	13,125	17,092
2	Malaysian Postgraduate		
3	International Undergraduate (45 countries)	3,967	
4	International Postgraduate (84 countries)		
Category of Staff		Sub-total based on categories	Overall total
5	Academic Staff (Malaysian)	3,648	7,394
6	Academic Staff (Foreign)		
7	Non-Academic Staff (Management & Professional)	770	
8	Non-Academic Staff (Support-staff)	2,976	



THE STATE OF THE CAMPUS

Forest, Planted Vegetation, Non-retentive surfaces & Sustainability Budget of the Campus

1.9 Area on campus covered in vegetation in the form of forest (%)

30.4%

[Source: UM Living Lab – RIMBA & FRIM 2013]

1.10 Area on campus covered in planted vegetation (%)

22%

[Source: UM Living Lab – RIMBA & FRIM 2013]

1.11 Area of non-retentive surfaces on campus for water absorption (%)

47.6%

[Source: UM SDSN & SuSci Research Cluster UM]

1.12 University budget for sustainability effort (%)

15.6 %

The following formula applied:

$$\frac{\text{Maximum Total of Development Budget \& Sustainability based Budgets}}{\text{Total Budget of University of Malaya}} \times 100\%$$

rimba

The 'RIMBA' Book



rimba
the RIMBA project
at Rimba Ilmu botanic garden

W: www.umrimba.com
E: um.rimba@gmail.com
F: facebook.com/umrimba



Begun in April 2014, we are a Living Lab for campus sustainability, focusing on **Biodiversity Conservation** and **Environmental Education**



150 acres: size UM's Rimba Ilmu botanic garden, located within a 60-year-old city forest on campus

3 times increase in the capacity of Rimba Ilmu to handle visitors and school groups, since The RIMBA Project's inception

20 average number of regular student volunteers/mentees

Encounter Nature
Field surveys and tree tagging; environmental education/outreach programmes; raising of awareness through website and social media



Involve Community
Big Year "crowdsourced" bird documentation; nursery for raising of native, wild plant species (ex-situ conservation); junior nature guide training and mentorship, greening policy and guidelines



Inspire, Impact
Creative Nature "arts & nature" programme; publishing books, posters, and hand guides on urban biodiversity

conserve educate
Protect Life. Promote Life.



It begins with trees: how much do we really know about them? It is said that children today can recognise more brand logos than trees.



A deep separation exists between conservationists who work on urban environmental issues, and those who work in nature conservation, often far away from cities.

IUCN, 2006

While cities concentrate opportunities, jobs, and services, they also concentrate health hazards and risks

World Health Organization (WHO), 2012

The UM campus: an urban oasis?

Google

Our **biodiversity surveys** aim to help open the eyes of urban communities to the beauty of nature around them. "Urban biodiversity" is an emerging field with implications on urban sustainability/livability and biocultural heritage.

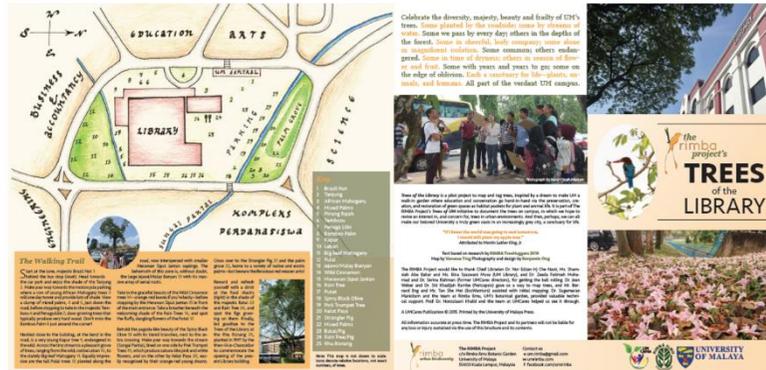
Finding survival value AND discovering what gives value to survival ☺



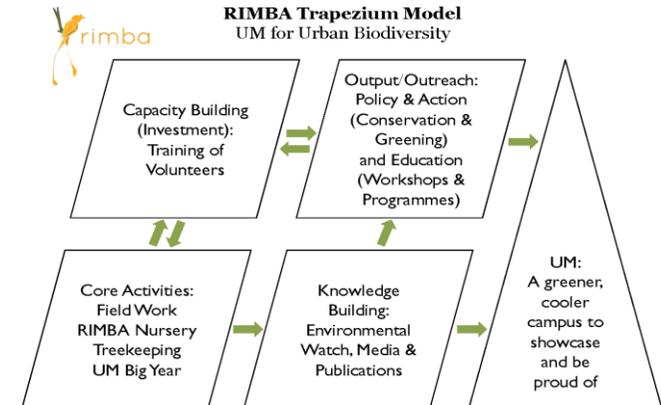
The RIMBA Project: Flagship Initiatives 2015

conserve educate
Protect Life. Promote Life.

- Campus Greening & Biodiversity Conservation**
To design and implement conservation landscaping strategies, increase tree cover and improve green spaces on campus.
- RIMBA Conservation Nursery**
To develop an in-house nursery for long-term greening and reforestation, as well as for conservation and community engagement initiatives.
- Capacity Building & Environmental Education**
To expand the knowledge base of UM's biodiversity for public education and access, and produce supporting digital and print material/publications.



Trees of the Library brochure.



For more information, contact us via these channels and ask for a copy of the RIMBA Prospectus 2015

E: um.rimba@gmail.com
W: www.umrimba.com
F: www.facebook.com/umrimba



ENERGY & CLIMATE CHANGE

Photo of the evening scenery taken from the *Dataran Sains* of the Faculty of Science University of Malaya. Solar Energy is one of the alternative efforts in venturing toward a possible greener environment. Photo courtesy of the University of Malaya Sustainable Development Solutions Network (UM SDSN) Unit

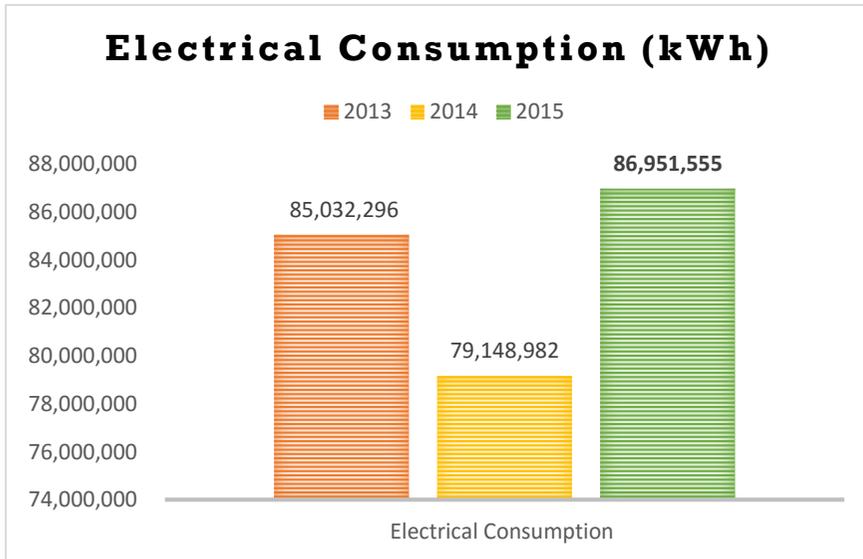


Figure 2.0: Electrical Consumption for the Main Campus of University of Malaya from 2013 – 2015
 [Source: JPPHB UM – Electrical & Electronic Division]

MALAYSIA'S SUSTAINABLE ENERGY DEVELOPMENT AUTHORITY ACT 2011



Defined “Sustainable energy” as energy which, in its generation, provision and use, is such that it meets the needs of the present without compromising the ability of future generations to meet their needs, and includes renewable energy.

[Source: Sustainable Energy Development Authority Malaysia]

THE STORY OF ENERGY

Electrical Consumption in Campus

In 2013, the electrical consumption was at 85 M kilo watts per hour (kWh). However, there was a significant drop in 2014 by 5, 883, 314 kWh equivalent to 6.92 % decrease. In 2015, the total electricity consumption rose significantly, even higher than the record in 2013 by 1, 919, 259 kWh (2.26%). Several underlying reasons in explaining such significant increase will be explained on the following sub-section.

How can we understand the figures in simpler terms?

The record for 2015 of 86, 951, 555 kWh is equivalent to 59, 958 metric tons of Carbon Dioxide Equivalent. Do you know that with the same amount of energy, it is equal to:

Greenhouse Gas (GHG) emissions from:



12,623
 Passenger vehicles driven in one year



21,490
 Tons of waste sent to landfill

Carbon Dioxide (CO₂) emissions from:



8,247
 Homes' electricity use for one year



6,746,656
 Gallons of gasoline consumed

ENERGY CHECKLIST

2.1 Energy Efficient Appliances usage are replacing conventional appliances

Most EE appliances are now partly replacing conventional appliances inclusive of Motion-Sensor lighting for almost 97% progress on all public washrooms in the campus and LED Lighting at 30% by phases throughout the campus.

2.2 Smart Building Program Implementation

Status: The Smart Building Program is currently been implemented but with some degree of challenges. For a start, motion sensor is one of the alternative effort applied throughout the campus as a pilot program. One of the critical point shared by the JPPHB team: there are still some researchers in UM keeping their valuable information 'tightly sealed' on their desktop, papers and lab – lack of sharing between the thinkers and the do-ers.

2.3 Renewable Energy Usage Policy

At UM level, the following Renewable Energy (RE) usage are currently under consideration with some of them have been pilot-tested in the campus through the medium of research. These is to show that UM is on board in supporting the National Energy Policy of Malaysia:

- ✓ **Solar power** [solar panel have been pilot tested and installed at several hotspot in the campus, especially on all bus stop stations]
- ✓ **Biodiesel** [Research and lab test have been carried out. Pilot tested on campus buses. Project is now under review for future enhancement]
- ✓ **Clean Biomass**
- ✓ **Wind-power** [Pilot test have been done by the Engineering team, some part of the output have been successfully commercialised – the project is currently under consideration for future enhancement]
- ✓ **Hydropower**



Energy Efficient Replacement: Work in Progress for the University of Malaya

The following list are the current works-in-progress by the JPPHB UM for the main campus on the replacement of the conventional appliances:

[Source: JPPHB UM – Electrical & Electronic Division]



Academy of Islamic Studies (API UM)

Target : washrooms
Type : LED, Motion Sensor, LED Emergency Light

Faculty of Language & Linguistic (FBL UM)

Target : washrooms
Type : LED Motion Sensor

Sports Centre (PSUM)

Target : washrooms & street lantern
Type : Motion sensor detection & 90W LED Street lantern

Examination Building

Target : washrooms & hall
Type : Motion sensor detection & LED lights

11th Residential College (KUAZ / KK11)

Target : street lantern
Type : 90W LED Street lantern

4th Residential College (KBUM/ KK4)

Target : Office Washrooms, Light
Type : Motion sensor detection & LED lights

Student Affairs' Campus Bus Central Point

Target : spotlight
Type : 140W LED spotlight

Research Centre for Malay Excellence (APM)

Target : Office Washrooms
Type : Motion sensor detector, LED Emergency Lights

New Store of JPPHB

Target : high-bay LED
Type : High bay LED 120W

Faculty of Medicine (FP UM)

Target : Faculty buildings
Type : Motion Sensor detector – infra red

Faculty of Science (FS UM)

Target : Institute of Mathematical Sciences, Washrooms
Type : LED Tube, Motion Sensor

Research & Development Complex

Target : The whole complex
Type : Variety

Academy of Malay Studies (APM UM)

Target : Washrooms, Emergency Light
Type : Variety



ENERGY CHECKLIST

2.4 Electricity Usage per Year (in kilo watt hour)

In 2015, total electrical consumption surged considerably to 86.9 M kWh from 79.1 M kWh in 2014 – an 8.98 % increase.

In late 2014, several physical and construction development projects have took place in the main campus, these include UMCIC's Incubator Building, Information Technology Centre (PTM) New Building, the RM25 million project development under the auspices of Yayasan Azman Hashim for the new faculty building of the Faculty of Business and Accountancy UM, as well as the new building for the Faculty of Education.

Several other new buildings have fully operationalized and occupied in 2014: The New Examination Building & Department of Chemistry of Faculty of Science Laboratory Building. The above listing resulted in an electrical intensity level.

2.5 Energy Conservation Program

UM is fully committed toward Energy Conservation Program in the campus. The efforts put up by the coordination of the Deputy Vice-Chancellor of Development through JPPHB have fully implemented such programs by phases.

2.6 Elements of Green Building implementation as reflected in all construction and renovation policy

- ✓ Natural ventilation,
- ✓ Full-Day Natural Lighting, and
- ✓ Building Efficiency

LIVING PROOF



The Story of the 1st Malaysian University's Green Office – UMCares: The Community and Sustainability Centre

[Source: UMCares & Sustainability Science Research Cluster UM]

University of Malaya, Kuala Lumpur: **On March 12, 2015**, the first ever refurbished green office space in a Malaysian university was officially launched by UM Vice-Chancellor, Professor Dato' Dr. Mohd Amin Jalaludin. The project was initially kicked-off as a research project under the purview of the Sustainability Science Research Cluster.

Focal objective of the Green Office: to minimize, or completely avoid negative impacts of 'regular' built environments on staff health and the environment.

FACTS AND FIGURES:

Project team members: Pn. Ati Rosemary Mohd Ariffin (Faculty of Built Environment, UM) assisted by Pn. Sharifah Noor Nazim Syed Yahya (Architect of JPPHB UM)

Collaborator: Panasonic Malaysia Sdn Bhd, with the signing of Memorandum of Intent (MoI) as part of the CSR programmes.

The total renovation cost: about **RM170,000** and the process of refurbishing an existing office space within a regular (non-green) building through regular government procurement systems took 2 years.

Sponsorship: about **RM90,000** by Panasonic included the donation of a photovoltaic (solar) panel and system, an energy recovery ventilator (ERV) and furniture made from recycled material and electrical appliances.

Total office space: 146.451 square metres [21.06 m (L) x 6.954 m (W)]

Total number of personnel occupying the office: 9 staffs (Officers, Administrative Team)

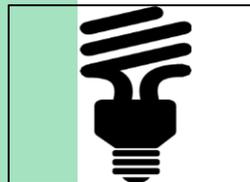
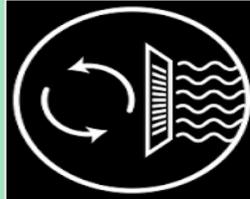


Element of Green Building and Smart Appliances – UMCares Green Office

[Source: UMCares]

Green Building element

- ✓ Indoor environmental quality (IEQ) (conduct research to improve indoor air quality, daylighting, acoustic quality & thermal comfort)
- ✓ Energy efficiency (using centralized photocopying/printer machine, less air-conditioning, install alternative power sources)
- ✓ Sustainable site planning & management
- ✓ Material & resources (recycled materials, low VOC painted, certified eco-furniture & organic material)



Smart / efficient technology appliances

- ✓ Energy saving photocopying/printer machine
- ✓ PV Solar panel
- ✓ Air purifiers
- ✓ Energy recovery ventilator
- ✓ LED light bulb



2.7 Climate Change Adaptation & Mitigation Program and Greenhouse Gas Emission Reduction Policy

In late 2014, UM through two respective Deputy Vice-Chancellors (DVC) i.e. DVC of Research and Innovation as well as the DVC of Development initiated the pilot campus sustainability programme as part of UM commitment on Climate Change Adaptation & Mitigation Program in close collaboration with the operational team of JPPHB. Thus, the program and its relevant policy is in its initial implementation stage. The program is named UM Living Programs with four (4) pilot programs with given timeframe of 1 year as follow:

- ✓ The RIMBA Project: Biodiversity
- ✓ Water Warriors: water management and the revival of Varsity Lake project
- ✓ Zero Waste Campaign (ZWC): Waste management
- ✓ Rain-Water Harvesting (RWH)

2.8 Annual Carbon Emission Calculation & Total Carbon Footprint (CO₂) of 2015 (in metric tons)

By Mr Jaron Keng and his team, Zero Waste Campaign

The carbon emission calculation in the campus of University of Malaya is one of the critical contribution of the UM Living Lab: Zero Waste Campaign. It should be highlighted that the calculation however is strictly taken into consideration the following four (4) areas:

- ✓ Waste disposal
- ✓ Transportation
- ✓ Compost
- ✓ N-fertilizer replacement by compost

In 2015, UM Carbon Footprint is at 1,127.13 metric tons for the last 12 months. Thanks to UM Living Lab Program: Zero Waste Campaign efforts on waste management managed to reduce campus carbon footprint by 4.28%

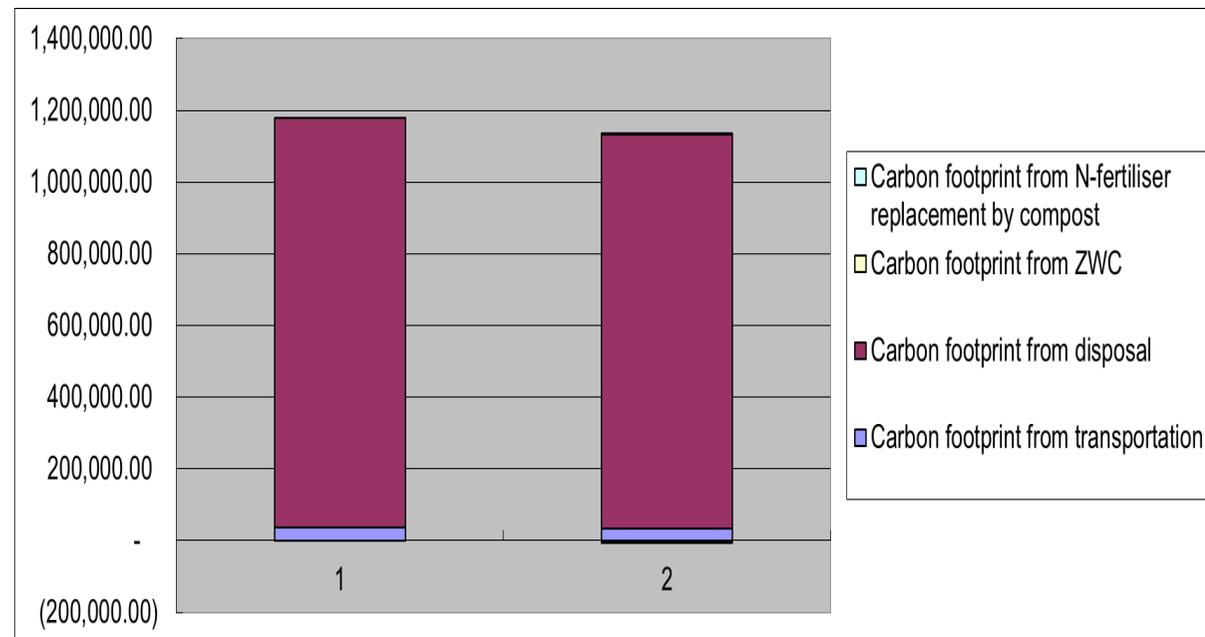


Figure 2.1: University of Malaya Carbon Footprint Calculation of 2015.
[Source: UM Living Lab: Zero Waste Campaign]

The details of Carbon Emission Calculation (CO₂)

By Mr Jaron Keng and his team, Zero Waste Campaign

Calculation of carbon emission reductions with on-site composting project @ UM campus (12 months period)		
Factors and information for calculation	Data	Unit
Total MSW disposal to landfill	1,456.140	ton
Total organic waste composted/digested	57.179	ton
Based on Life Cycle Ecoinvent model database, disposal of 1kg of municipal solid waste (MSW) in landfill produce:	0.755	kg CO2-eq
Based on Life Cycle Eco-Invent model database, transportation of 1kg of MSW to landfill produce:	0.198	kg CO2-eq /TKM
	78,553.800	TKM
Total carbon emission from disposal of MSW in landfill	1,098,657.630	kg CO2-eq
Total carbon emission from transportation of MSW to landfill	15,589.002	kg CO2-eq
Thus, total carbon emission of MSW disposed to landfill	1,114,246.632	kg CO2-eq
Carbon emission of per ton of food waste disposed to landfill is	1,701.140	kg CO2-eq
Based on LCA software and data by ZWC, composting of 1kg of food waste produce:	0.017	kg CO2-eq
Thus, total carbon emission of food waste on-site composting at ZWC site	956.605	kg CO2-eq
Calculated carbon emission if BAU (the 57.179 ton of food waste disposed to landfill)	97,269.478	kg CO2-eq
Thus, the ZWC's carbon emission reduction is	96,312.873	kg CO2-eq

Figure 2.2: University of Malaya Carbon Emission Calculation (CO₂)

[Source: UM Living Lab: Zero Waste Campaign]

The details of Carbon Emission Calculation (CO₂)

By Mr Jaron Keng and his team, Zero Waste Campaign

Carbon Footprint	Scenario 1: (without ZWC)		Scenario 2: (with ZWC)	
	Amount	unit	Amount	unit
Carbon footprint from transportation				
Total trip to landfill	770.00	trips	746.00	trips
t*km per trip	234.00	tkm/trip	234.00	tkm/trip
total tkm	180,180.00	tkm	174,564.00	tkm
carbon emission per t*km	0.20	kg CO ₂ -eq /TKM	0.20	kg CO ₂ -eq /TKM
Total carbon emissions	35,756.72	kg CO ₂ -eq	34,642.23	kg CO ₂ -eq
Carbon footprint from disposal				
Total waste disposed	1,513.32	ton	1,456.14	ton
carbon emission per kg waste disposed	0.75	kg CO ₂ -eq/kg	0.75	kg CO ₂ -eq/kg
Total carbon emission	1,141,799.19	kg CO ₂ -eq	1,098,657.63	kg CO ₂ -eq
Carbon footprint from ZWC				
total waste composted or digested	-	ton	57.18	ton
carbon emission from ZWC operation per kg waste input	0.02	kg CO ₂ -eq/kg	0.02	kg CO ₂ -eq/kg
Total carbon emission	-	kg CO ₂ -eq	0.96	kg CO ₂ -eq
Carbon footprint from N-fertiliser replacement by compost				
total compost produced	-	ton	1.17	ton
carbon emission from production of N-fertiliser per kg	10.57	kg CO ₂ -eq/kg	10.57	kg CO ₂ -eq/kg
replacement coefficient	0.50		0.50	
Total carbon emission/saving from fertiliser replacement	-	kg CO ₂ -eq	(6,175.39)	kg CO ₂ -eq
Grand Total carbon footprint from waste management	1,177,555.91	kg CO₂-eq	1,127,125.43	kg CO₂-eq

Figure 2.2: University of Malaya Total Carbon Footprint Calculation for 2015
[Source: UM Living Lab: Zero Waste Campaign]

3



Photo of the UM Zero Waste Campaign (ZWC) site located at the Damansara Gate. Photo courtesy of the University of Malaya Living Lab Programme: Zero Waste Campaign (ZWC)



WASTE



JPPHB UM

WASTE MANAGEMENT IN UM

3.1 Recycling program for university waste

In University of Malaya, one of the UM Living Lab Programme i.e. Zero Waste Campaign (ZWC) undertaken the responsibility of the waste management for the main campus. ZWC is put under supervision of the project leader, Associate Professor Dr. Sumiani Yusoff of the Department of Civil Engineering, Faculty of Engineering UM.

Status: Partial

Justification: ZWC acknowledged one of the challenges in waste management is the 'people' itself; skilled labor as well as the well-trained official retention planning. It requires daily basis attention and manage by a dedicated team willing to contribute beyond the so-called 'black-and-white' job-scopes.

3.2 Toxic waste handled

University of Malaya adhered to the Occupational Safety and Health regulation when it comes to toxic waste management.

Status: completely contained, inventoried and handled

3.3 Organic waste treatment

University of Malaya is definitely against open dumping as one of the option in waste management. ZWC is fully committed in organic waste treatment of the campus.

Status: Partly composted

3.4 Inorganic waste treatment

Be it organic or inorganic waste, ZWC management on waste include the treatment of both type.

Status: Partially recycled

3.5 Sewerage disposal

Centralized treatment before disposal is the only viable and environmentally sound solution. This is the same case for other universities or commercial buildings including residential houses in Malaysia. It is currently managed by Indah Water Konsortium (IWK); a national wholly government-owned sewerage company in Malaysia which has been entrusted with the task of developing and maintaining a modern and efficient sewerage system for all Malaysians



3.6 Policy to reduce the use of paper and plastic in campus

Policy implemented with some degree of problems. All faculties and responsibility centers across the campus have been encouraged to practice at their best efforts on the following activities:

- **Black-and-white printing** is preferred over the colored printing
- **Double-sided printing** is preferred over single sided printing
- **Draft quality printing** should be the default output
- **Used paper** will be used for internal and informal documents printing
- **Café operators** across the campus are responsible to adhere to the **non-polystyrene usage for food container**
- **Students and staff are encouraged to bring their own food-and-drink container** for take-away purpose.

Several challenges include:

- Lack of monitoring
- Lack of effective reporting system
- The culture is still at initial level of participation

UM Waste Collection for Recycle from October 2014 - September 2015 [Source: Zero Waste Campaign]

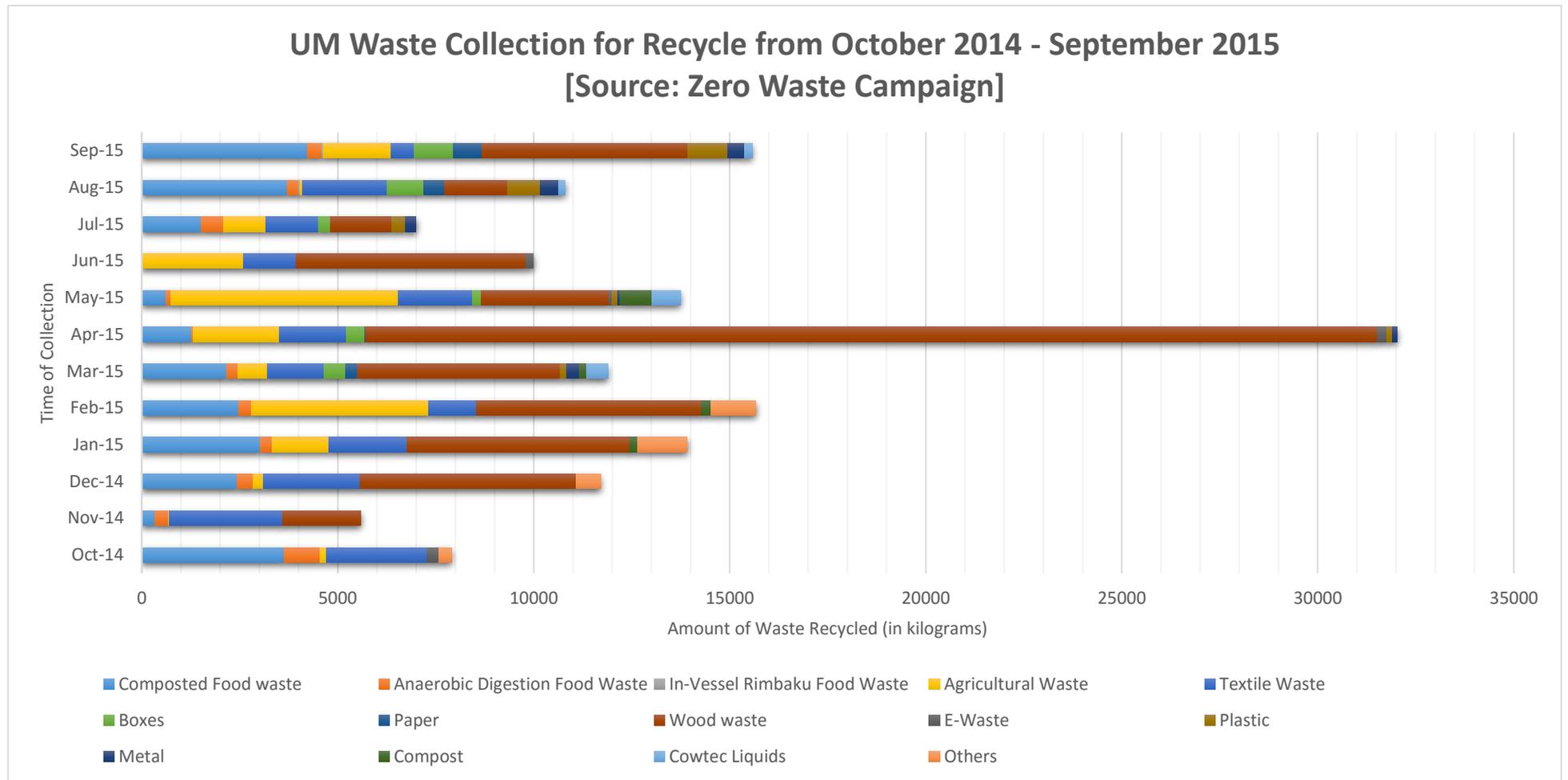


Figure 3.0: University of Malaya Waste Collection for Recycle from October 2014 – September 2015 (1 year period)
[Source: UM Living Lab: Zero Waste Campaign]

THE STORY OF ZERO WASTE CAMPAIGN (ZWC)



- Zero Waste Campaign (ZWC) aims to spearhead the development of an **integrated and sustainable waste management** model in UM.
- The history of ZWC rooted from a students' group, "**VeeCYCLE**" which developed a recycling project in Faculty of Engineering with "**PRO bin**" to promote the best practice of waste segregation at source.
- The inception of Green Bag Scheme in 2010 was inspired by the fact that **food waste is the major problem** in Malaysia.
- Subsequently, a composting centre was developed with funding from **CIMB Foundation**, support from UM top management especially **DVC (Development)** and **JPPHB** as well as technical assistance by **IGES (Institute for Global Environment Strategies)** in 2011.
- In 2012, **UMCares** continued the funding to ZWC until 2014. ZWC signed a MOU with **CH Green** in 2013 for a research collaboration on **COWTEC anaerobic digester**.
- In 2014, ZWC cooperates with **Life Line Clothings** to introduce an **used clothes collection** and recycling program and **TSP Waste** for separate collection of **wood waste for energy recovery**.
- In 2015, ZWC initiated the collaboration between **SWCorp (Solid Waste Corporation)** and **UM** on ZWC projects by signing a MOU.
- **JPPHB** established a ZWC centre with **container-reuse concept**, installed a **weighbridge station** and **green waste chipper**.
- ZWC also collaborates with **Climb Optima** for a research on small-scale in-vessel composter.



Memorandum of Understanding (MoU) Signing between University of Malaya (UM) and Solid Waste and Public Cleansing Management Corporation (SWCorp)



April 15, 2014 - endeavor to take necessary steps to encourage and promote co-operation of the two parties in the following areas:



- (a) Development of integrated waste management model in UM campus
- (b) Joint research in separate collection and mechanical biological treatment
- (c) Waste and recycling data collection system (general waste, recyclable materials, organic waste (food / green / wood / cooking oil), waste textiles, construction waste and scheduled waste such as e-waste and clinical waste)
- (d) Joint research and collaboration in technology related to waste handling, storage, sorting, composting, anaerobic digestion, pyrolysis and
- (e) Collaboration in monitoring and enforcement of proper waste disposal (including construction, demolition and renovation waste) and data provision by waste and recycling contractors
- (f) Any other areas of cooperation to be mutually agreed upon by the Parties.



CHALLENGES AND WAY FORWARD ON WASTE MANAGEMENT IN CAMPUS

- It is a challenge for ZWC to obtain full commitment and cooperation from all cafe operators to segregate food waste for the continuity of ZWC's composting operation which is the key KPI to achieve the organic waste recycling target as ZWC has no power to enforce and implement without cooperation from JPPHB, OSH, and Bursary etc.
- High nutrient loss (evaporation) of the existing open air composting method which results in 90% of mass loss and thus not very efficient in compost production.
- Linkages of ZWC to researchers who are interested to carry out research related to organic waste treatment.
- Weighbridge station is operated manually, thus if collection happens during off-hours, the data is not recorded (JPPHB will install automated data collection system soon).
- Extensive research, patent of product and process, and commercialization of ZWC compost has not commence yet due to limitation in resources.
- Sustainability and continuity of ZWC project in UM in a long term basis.

Target



Composting (food waste): 60,000 kg
 Anaerobic digestion (food waste): 5,000 kg
 Composting (green waste/aquatic): 30,000 kg
 Waste textiles recycled/reused: 18,000 kg
 Wood waste energy recovery: 50,000 kg
 Compost production: 3,600kg
 Capacity building sessions: Ten (10) sessions
 Media appearance: Five (5) times
 Network & linkage: Four (4) collaborations

Progress



Composting (food waste): 33,801 kg
 Anaerobic digestion (food waste): 1,934 kg
 Composting (green waste/aquatic): 18,394 kg
 Waste textiles recycled/reused: 12,885.2 kg
Wood waste energy recovery: 53,360 kg (achieved)
 Compost production: 1,421kg
 Capacity building sessions: Six (6) sessions
 Media appearance: Four (4) times
 Network & linkage: Three (3) collaborations



SUCCESSFUL STORY OF ZERO WASTE CAMPAIGN (ZWC)

- Articles/ Manuscripts: ISI / Non-ISI Index Journal :

2 Published Articles

- Proceeding(s): International / National :

4 Proceeding Papers

- Proposed Policy: Implementation of food waste segregation practice with introduction of clause related to food waste segregation in the contract agreement between UM and café operators

2015

- Proposed guideline (in collaboration with JPPHB and OSH UM): Food waste segregation and collection in UM campus

2015

- Media coverage (e.g. Newspaper, TV channels and magazine articles)

9 appearance: 7 newspapers & 2 TV interviews



UM is the first university I've seen that has implemented Takakura composting for its food waste and implements an integrated waste management system in campus. In Japan, there is no university that has embark on similar effort. Well done!

[Professor Koji Takakura on his official visit to UM & ZWC's site]



- Human Capital Development: 1 Phd student (on-going), 10 Masters student (on-going), 2 final year undergraduate students
- 1 Temporary Project Officer, 1 Temporary Project Assistant
- 7 Stakeholders Training through smart-partnership

15 individuals in-training

- Received "2015 Green Era Award" on behalf of UM in conjunction with the Green Economy Forum in Berlin, Germany on 22-Mar 2015

1 Award Receiver (International)

- Community engagement:
- CETDEM (Centre for Environment, Technology and Development Malaysia)
- NGO Kenanga Waja (environment and charity NGO)
- Chow Kit kids

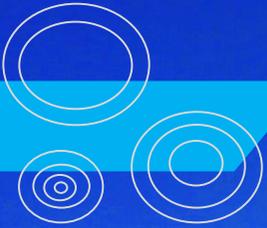
3 Activities on Community Engagement

- Received a total of 23 visits or interviews both from local and international visitors

23 Visits / Interviews from Visitors

- Media coverage (e.g. Newspaper, TV channels and magazine articles)

9 appearance: 7 newspapers & 2 TV interviews



WATER



Photo of a drone flying across the UM Living Lab Programme: Water Warriors' site i.e. the Varsity Lake of University of Malaya located at the heart of the campus. The lake is located just the opposite of 2nd Residential College and the Faculty of Engineering as well as the Chancellery Building and Perdana Siswa Complex on the other side of this lake. *Photo courtesy of the University of Malaya Sustainable Development Solutions Network (UM SDSN) Unit*



THE STORY OF H₂O

4.1 Water conservation program

In University of Malaya, water conservation program is part of the portfolio for the UM Living Lab Program: Water Warriors. Water Warriors is an initiative lead by Dr. Abdul Halim Sulaiman, Senior Research Fellow of the Academic Development Centre (ADEC), an expert on the fields of freshwater ecology, water pollution, water quality and environmental education. Several programs is currently managed by Water Warriors with close partnership with JPPHB team include: monitoring program on water usage of the main campus, groundwater project for the Varsity Lake, Flood Monitoring System, Rainwater Harvesting Program (RWH), Occasional Event related to Awareness and Sharing Sessions with campus community.

However, this initiative is still at its' fresh year phase, the current status of the water conservation program in UM have been implemented but with some degree of problem. One of the challenges for this initiative is the setup and preparation toward the Revival of the Varsity Lake as a recreational and educational site for UM. It is our utmost hope that this program will successfully reach its maturity stage with a plausible future.

4.2 Water recycling program

In this particular phase, water recycling program is in full implementation phase.

4.3 Water efficient appliances usage are replacing conventional appliances

University of Malaya currently is still using a conventional appliances for water management of the campus. The shift toward replacing them with water efficient appliances is put into consideration for future development phase. Some of the challenges that should be addressed will include big operational budget, skilled personnel, and the capacity for proper maintenance of the appliances in the long run.

4.4 Treated water consumed (%)

Campus community can rest assured that the treated water consumed of the campus is at full capacity of 100 %, managed by the Syarikat Bekalan Air Selangor Sdn Bhd (SYABAS); a water supply company serving the state of Selangor and the Federal Territories of Kuala Lumpur (WPKL) and Putrajaya in Malaysia founded in 1996. The term 'consumed' is only related to water used for daily basis by any individuals in the campus such as drinking, cooking and sanitary activities.

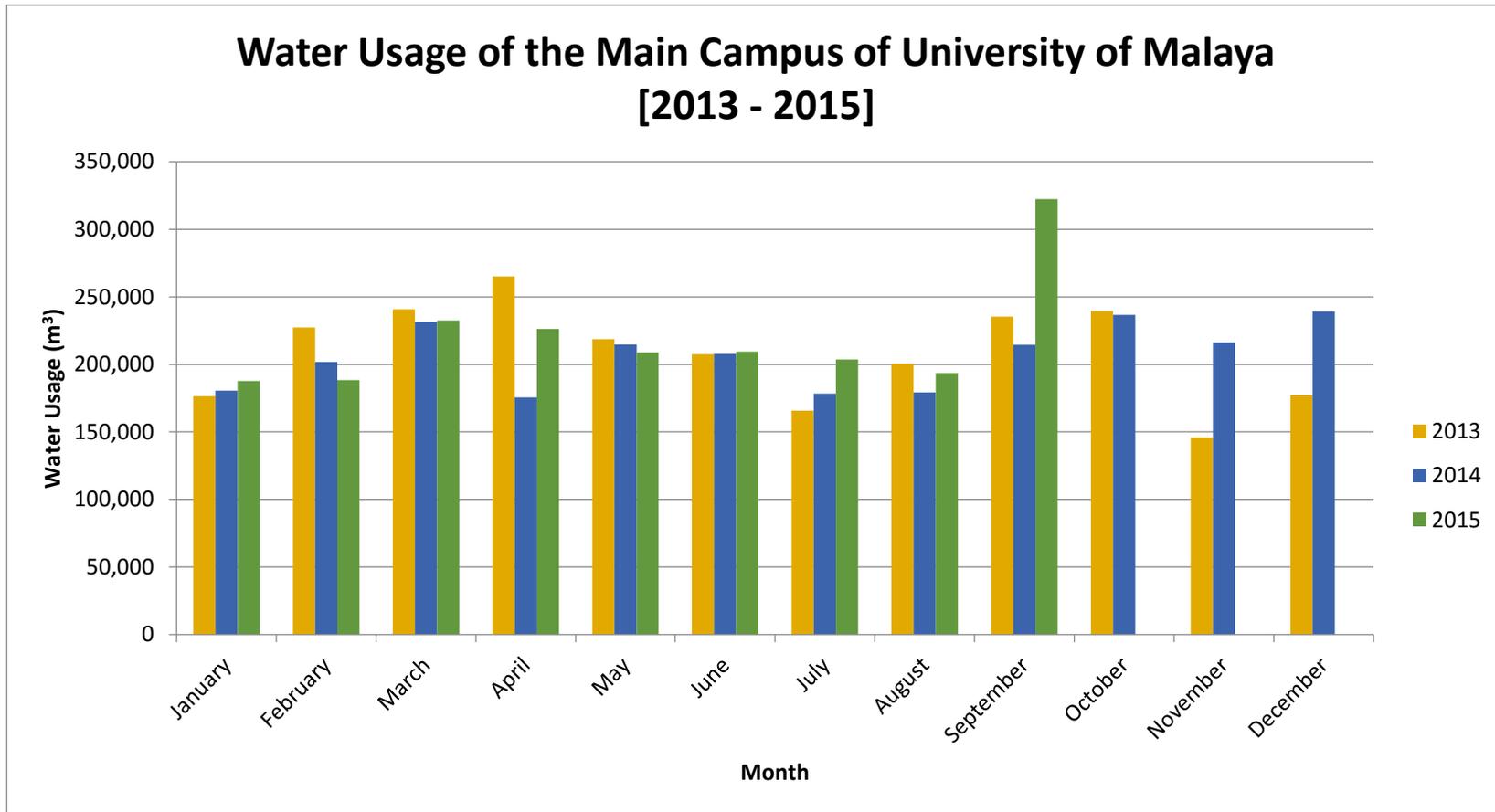


Figure 4.0: University of Malaya Water Usage in cubic metre from 2013 - 2015
[Source: UM Living Lab: JPPHB UM & Water Warriors]



Figure 4.1: University of Malaya Average Water Usage in cubic metre and Ringgit Malaysia from 2013 – 2015 on monthly basis
[Source: UM Living Lab: JPPHB UM & Water Warriors]

GROUNDWATER IN THE CAMPUS

Water conservation program

[Source: JPPHB UM]

The Revival Project of Varsity Lake is currently a work-in-progress. By having the expert team lead by Dr. Abdul Halim of the Water Warriors with close collaboration with JPPHB team, the team have identified that groundwater is part of the alternative solutions as a water source for Varsity Lake.

Depth of well : 100 metres

Depth of pump : 60 metres

Pumping rate : 12.5 cubic metres (m³) per hour



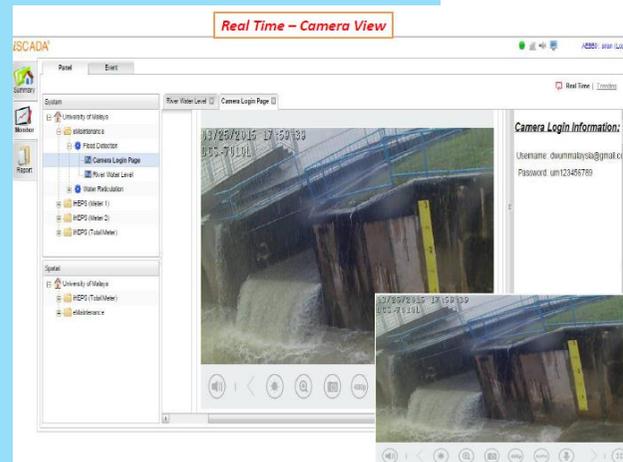
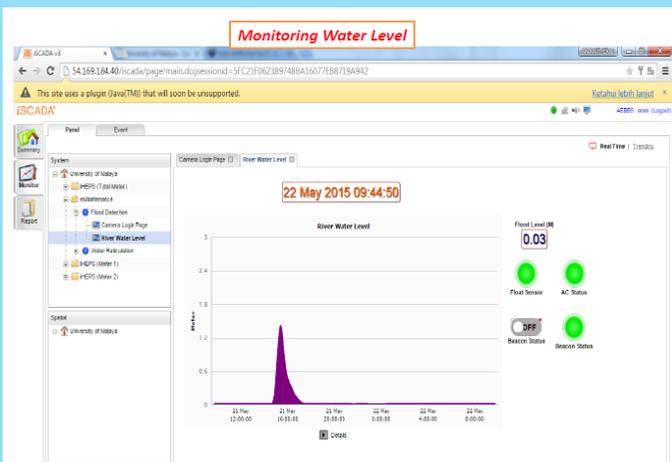
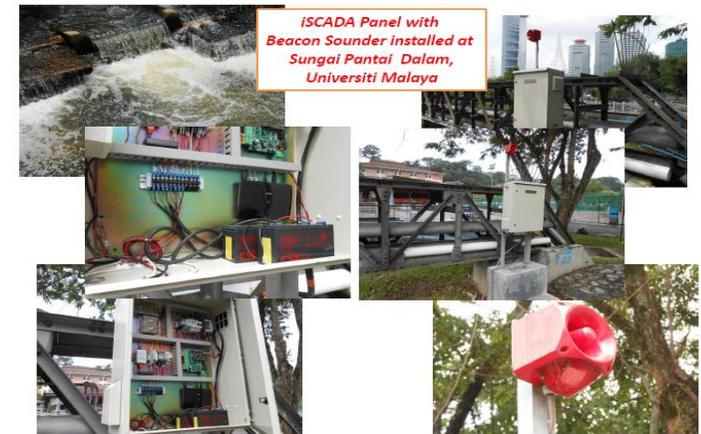
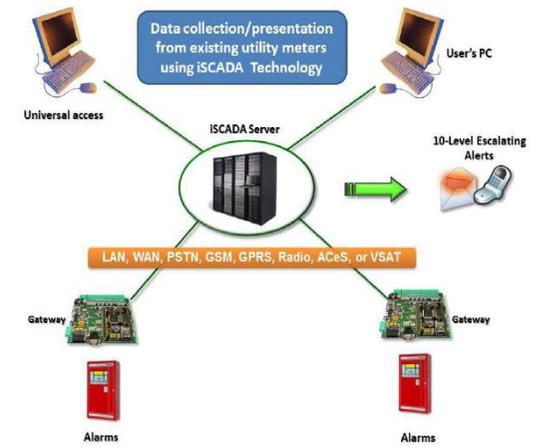
University of Malaya Flood Early Warning System

[Source: JPPHB UM]

This system deploys the iSCADA Technology to provide continuous water level monitoring and deliver early warning audio visual alerts including mobile automatic alerts when floods occur.

The iSCADA Panel was installed pillar-mounted on an outdoor concrete plinth within the designated location of water level monitoring. The installation includes Alert Alarm Sounder and Rotating Halogen Beacon for outdoor early warning when floods occur. The system is configured to also deliver automatic mobile SMS alerts.

A Submersible Pressure Transmitter was installed complete with housing and submerged in the water to continuously monitor the water level. This includes an outdoor IP Surveillance camera to provide remote visual access.



WATER CONSERVATION PROGRAMME IN UM



No.	Project	Short description	Date and location	Estimated participants	Organized by
1	Tasek Varsiti Clean Up (<i>Harvesting Najas spp.</i>)	This activity involves the collaboration of UM community to collect weed species (<i>Najas</i> sp.) that spread quickly in the lake. UM community residing in campus during Chinese New Year participated to help collect this species using the kayak provided by the Sports Centre.	19/2/2015 (Tasek Varsiti)	50	Water Warriors
2	Evening Session with Vice-Chancellor of UM	Vice-Chancellor Professor Dato' Dr. Mohd. Amin Jalaluddin visited the lake at 6pm to witness the latest development of Varsity Lake. The activities also carried out in the evening is kayaking, visit to a duck barn and feed-the-fish at the jetty.	03/3/2015 (Tasek Varsiti)	25	Water Warriors
3	UM World Wetlands Day	<ul style="list-style-type: none"> - This program involves UM community and neighbouring community and some residents 'home-school' kids to celebrate the World Wetlands Day. - Activities: <ul style="list-style-type: none"> • Basic introduction of Wetland Plant by Prof. Abdul Halim Sulaiman • <i>Make a 'Floating Wetland'</i> • Kayaking • <i>'Badge Making'</i> 	07/3/2015 (Tasek Varsiti)	80	Water Warriors
4	Knowledge Sharing Session and Site visit from:	<ul style="list-style-type: none"> - Prof. Masahisa Nakamura (International Lake Environment Committee Foundation, ILEC) - Mr. Akashah Majizat (Former Head, Lake Management Division Perbadanan Putrajaya) - Assoc. Prof. Hiroshi Yamamoto (University of Tokushima) 	12/3/2015 (Tasek Varsiti)	10	Water Warriors & Asian Core Programme (ACP)
5	Knowledge Exchange Visit with Young Scientists from Tsukuba University, Japan	<ul style="list-style-type: none"> - Knowledge exchange between UM and Tsukuba University - Educational Tour to Tasek Varsiti - Visiting Putrajaya Wetland & Botanical Garden Putrajaya 	19/3/2015 (Tasek Varsiti & Putrajaya)	12	Water Warriors & Asian Core Programme (ACP)

6	Water Quality Monitoring & Talk (12 th Residential College)	- An Environmental Program initiated by the 12 th Residential College related to water conservation. Water Warrior Team has been appointed to give an educational workshop on water monitoring and water conservation.	28/3/2015 (12 th Residential College, UM)	45	
7	Responsible Lakers	- An ongoing program held every two weeks to provide opportunities for the community to enjoy kayaking in UM which has not yet officially re-opened to the public. UM students or the community will not be charged any fees for using the kayak, but they are required to collect trash or weeds in Tasek Varsiti. This could indirectly promote awareness to the community about protecting the environment.	02/4/2015 (Tasek Varsiti)	17	Water Warriors & UM Sports Centre
8	Responsible Lakers	- An ongoing program held every two weeks to provide opportunities for the community to enjoy kayaking in UM which has not yet officially re-opened to the public. UM students or the community will not be charged any fees for using the kayak, but they are required to collect trash or weeds in Tasek Varsiti. This could indirectly promote awareness to the community about protecting the environment.	16/4/2015 (Tasek Varsiti)	23	Water Warriors & UM Sports Centre
9	Water Malaysia Conference 2015	- Dr Nobumitsu Sakai is a researcher in Water Warriors. Dr Sakai has been invited to give a talk about Project ReViVal (Revive Varsity Lake): Development of Living Lab in University of Malaya Campus in the conference	22/4/2015 (KL Convention Centre)	1 representative from Water Warriors	
10	Wetland Planting (12 th Residential College)	- Aimed to purify the water in college's lake before discharge to the drain and to ensure the safe environment for the lake which is free of chemical substance for aquatic organisms to live. Wetland plant have the same function which can replace lotus plant	25/4/2015 (12 th Residential College, UM)	20	12 th Residential College & Water Warriors

		and yet have more function that lotus plant could not have such as to reduce the surrounding temperature.			
11	Earth Day 2015 with Chow Kit Kids Project	- Some children of Chow Kit Kids Project has visited UM to learn about the environment. The session began by testing the water quality of Lake Varsity lead by Water Warriors, then a visit to Zero Waste Campaign and the last one is to learn about the flora and fauna by The RIMBA team.	26/4/2015 (Tasek Varsiti)	25	Chow Kit Kids Project, Water Warriors, The RIMBA team, Zero Waste Campaign
12	Educational Booth PJ Environmental Expo 2015	- A booth that consist of 3 main project of Living Lab, aim to spread awareness among the Petaling Jaya community on environmental conservation initiatives.	28/4/2015 (Banquet Hall MBPJ)	100	MBPJ
13	Responsible Lakers	- An ongoing program held every two weeks to provide opportunities for the community to enjoy kayaking in UM which has not yet officially re-opened to the public. UM students or the community will not be charged any fees for using the kayak, but they are required to collect trash or weeds in Tasek Varsiti. This could indirectly promote awareness to the community about protecting the environment.	07/5/2015 (Tasek Varsiti)	20	Water Warriors & UM Sports Centre
14	University Malaya Fishing Competition	- A program to reduce the population of fish in Tasek Varsiti. Fish inventory also been held by fish expert Dr. Azham from UiTM - An education booth also been opened for kids to learn about fishes.	09/5/2015 (Tasek Varsiti)	55	JPPHB, UM Sports Centre, Water Warriors
15	Responsible Lakers	- An ongoing program held every two weeks to provide opportunities for the community to enjoy kayaking in UM which has not yet officially re-opened to the public. UM students or the community will not be charged any fees for using the kayak, but they are required to collect trash or weeds in Tasek Varsiti. This could indirectly promote	21/5/2015 (Tasek Varsiti)	23	Water Warriors & UM Sports Centre

		awareness to the community about protecting the environment.			
16	Responsible Lakers	- An ongoing program held every two weeks to provide opportunities for the community to enjoy kayaking in UM which has not yet officially re-opened to the public. UM students or the community will not be charged any fees for using the kayak, but they are required to collect trash or weeds in Tasek Varsiti. This could indirectly promote awareness to the community about protecting the environment.	02/6/2015	5	Water Warriors & UM Sports Centre
17	Lake Management Briefing	- A briefing session conducted by Water Warriors to all stakeholders that are related to Tasek Varsiti. Prof Halim and Dr Zeeda are the panel for that day. Aim for this briefing is to show what is the best practices to manage the lake in more eco-friendly way.	10/6/2015 (Auditorium of JPPHB)	21	Water Warriors
18	'Bio-Monitoring' at Gombak River in Collaboration with WWF and HSBC	- Bio-Monitoring in Gombak river. Water Warriors has been invited by WWF to become a facilitator to HSBC group.	13/6/2015 (Gombak River, Selangor)	50	WWF, HSBC, University of Malaya & Water Warriors
19	Visit from Okayama Joto High School Japan	- A visit from high school in Japan to the Varsity Lake, Water Warriors lead the educational visit by explaining about the history of Tasek Varsiti (Varsity Lake), conduct a monitoring test, and explaining the function of wetland plants.	26/6/2015 (Tasek Varsiti)	42	Water Warriors & ACP
20	Nursery Wetland Plant	- This program is to make a nursery for wetland plants. This is important to ensure the wetland plants can be planted sustainably to another place in the future.	30/6/2015 (Tasek Varsiti)	3	Water Warriors
21	Responsible Lakers	- An ongoing program held every two weeks to provide opportunities for the community to enjoy kayaking in UM which has not yet officially re-opened to the public. UM students or the community will not be charged any fees for using the kayak, but they are required to collect trash	6/8/2015 (Tasek Varsiti)	11	Water Warriors & UM Sports Centre

		or weeds in Tasek Varsiti. This could indirectly promote awareness to the community about protecting the environment.			
22	Responsible Lakers	- An ongoing program held every two weeks to provide opportunities for the community to enjoy kayaking in UM which has not yet officially re-opened to the public. UM students or the community will not be charged any fees for using the kayak, but they are required to collect trash or weeds in Tasek Varsiti. This could indirectly promote awareness to the community about protecting the environment.	27/8/2015 (Tasek Varsiti)	20	Water Warriors & UM Sports Centre
23	My Beautiful UM	- Lake Clean-up - Volunteer works done by the new intake students (fresh year during their Orientation Week)	4/9/2015 (Tasek Varsiti)	100	Water Warriors & University of Malaya
24	Responsible Lakers	- An ongoing program held every two weeks to provide opportunities for the community to enjoy kayaking in UM which has not yet officially re-opened to the public. UM students or the community will not be charged any fees for using the kayak, but they are required to collect trash or weeds in Tasek Varsiti. This could indirectly promote awareness to the community about protecting the environment.	17/9/2015 (Tasek Varsiti)	20	Water Warriors & UM Sports Centre
25	Environmental Education for Kids	- An educational program targeted for the school kids during their holiday. Some of the activities are Tree Walk and Water Monitoring Test	22/9/2015 (Tasek Varsiti)	4	Water Warriors
26	Lestari Public Lecture	- Title: "Global Water Management for Water Security with Korean Integrated River Management (IRBM) Experiences" - Lecturer : Prof. Dr. Soontak Lee (Yeungnam University)	05/10/2015 (UKM, National University of Malaysia)	1 representative from Water Warriors	UKM, National University of Malaysia

27	Visit from Shibata & Hita High School Japan	- A visit from high school in Japan to the Varsity Lake, Water Warriors lead the educational visit by explaining about the history of Tasek Varsiti (Varsity Lake), conduct a monitoring test, and explaining the function of wetland plants.	07/10/2015 (Tasek Varsiti)	60	Water Warriors & ACP
28	UMRC Carnival	- An educational booth consist of 3 main project of Living Lab, aim to spread awareness among the community during the Research Carnival	08/10/2015 - 09/10/2015 (Tasek Varsiti)	100	Water Warriors, The RIMBA Team, UM SDSN, ZWC, UMRC
29	Responsible Lakers	- An ongoing program held every two weeks to provide opportunities for the community to enjoy kayaking in UM which has not yet officially re-opened to the public. UM students or the community will not be charged any fees for using the kayak, but they are required to collect trash or weeds in Tasek Varsiti. This could indirectly promote awareness to the community about protecting the environment.	08/10/2015 (Tasek Varsiti)	11	Water Warriors & UM Sports Centre
30	Bestari Community Forest (By 4 th College)	- Aimed to investigate the sources of water and its quality located at the Bestari Community Forest	8/3/2015 (Kolej Kediaman Keempat)	8	Bestari UMCares Club
31	Water Saviours (By 4 th College)	- Aimed to study the quality of water of the lake located at Fourth Residential College, University of Malaya and also to educate students on the nutrients contained in water and the importance of clean water	28/2/2015 (Kolej Kediaman Keempat)	3	Bestari UMCares Club
32	Pond Cleaning (By 8 th College)	- An effort aimed to make the college environment better	22/3/ 2015 (8 th College)	15	Sprouts8
33	Toilet flush tank water reduction (By 8 th College)	- Aimed to reduce water wastage by reducing the water level in the flush tank so that only necessary amount of water is used.	13/5/ 2015 (8 th College)	12	Sprouts8

34	Rain is Love, Rain is Life (By 8 th College)	- The rain water is collected in a cistern and we plan to put a filter in the rain water that's flowing in	16/12/ 2015 (8 th College)	6	Sprouts8
35	Lake Water Monitoring (By 12 th College)	- Aimed to increase awareness of residents about the importances of conserving and preserving environment, especially water resources, by carrying out a series of water monitoring process to maintain the quality of lake water.	28/3/2015 (Tasik Kolej Kediaman Dr. Raja Nazrin Shah, KK 12)	30	Kelab UMCares Royal Kolej Kediaman Raja Dr. Nazrin Shah in collaboration with UM Water Warriors Team
36	Transform Lotus Pond to Wetland	- Aimed to purify the water in college's lake before discharge to the drain and to ensure the safe environment for the lake which is free of chemical substance for aquatic organisms to live. Wetland plant have the same function which can replace lotus plant and yet have more function that lotus plant could not have such as to reduce the surrounding temperature.	25/4/2015 (Tasik Kolej Kediaman Dr. Raja Nazrin Shah, KK 12)	20	Kelab UMCares Royal Kolej Kediaman Raja Dr. Nazrin Shah, in collaboration with UM Water Warriors Team
37	Water Saving Campaign	- A campaign that promotes UM community to reduce the usage of water - A poster/sign have been posted in some places like ablution places, canteen and several others.	3/1/2015 UM Campus	UM Community	JPPHB

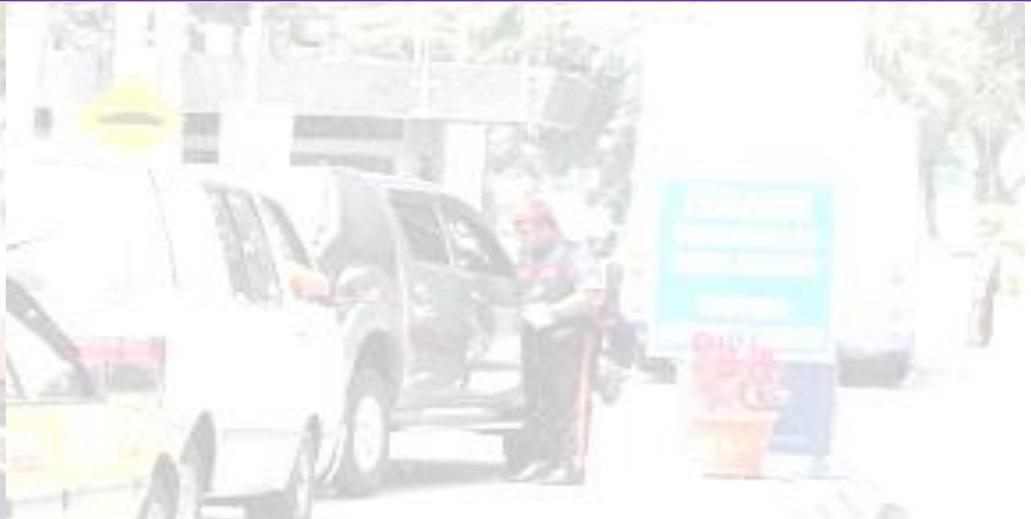
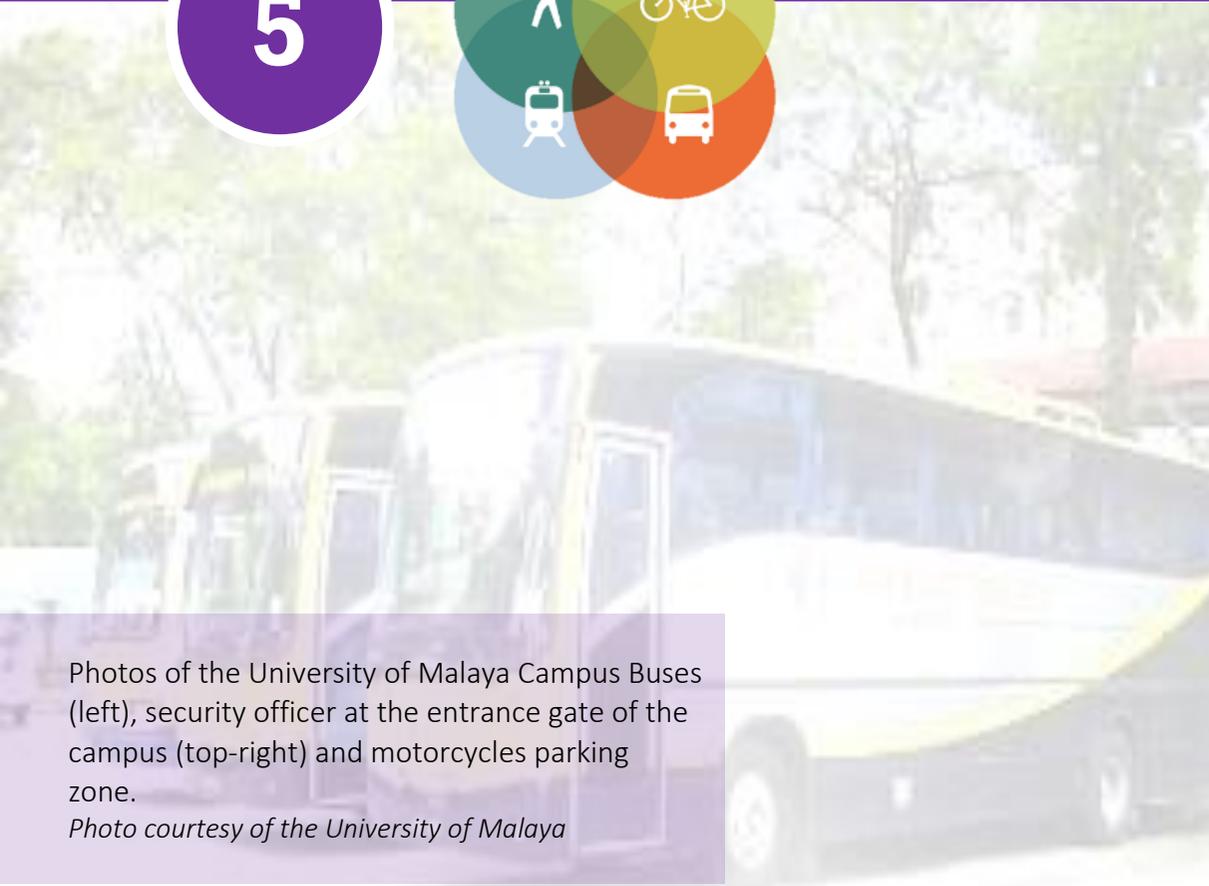
Figure 4.2: University of Malaya Water Conservation and Awareness Program by UM Living Lab: Water Warriors for 2015
[Source: UM Living Lab: Water Warriors]

RAINWATER HARVESTING IN UM

No.	Project	Location	Number of tanks (unit)	Volume per tank (gallons)	By
1	Rainwater harvesting	First Residential College	3	Tank A: 400 gallons Tank B: 400 gallons Tank C: 400 gallons	JPPHB
2	Rainwater harvesting	Second Residential College	3	Tank A: 400 gallons Tank B: 400 gallons Tank C: 400 gallons	
3	Rainwater harvesting	Third Residential College	3	Tank A: 400 gallons Tank B: 400 gallons Tank C: 400 gallons	
4	Rainwater harvesting	Fourth Residential College	3	Tank A: 400 gallons Tank B: 400 gallons Tank C: 400 gallons	
5	Rainwater harvesting	Fifth Residential College	3	Tank A: 400 gallons Tank B: 400 gallons Tank C: 400 gallons	
6	Rainwater harvesting	Sixth Residential College	3	Tank A: 400 gallons Tank B: 400 gallons Tank C: 400 gallons	
7	Rainwater harvesting	Seventh Residential College	3	Tank A: 400 gallons Tank B: 400 gallons Tank C: 400 gallons	
8	Rainwater harvesting	Eighth Residential College	3	Tank A: 400 gallons Tank B: 400 gallons Tank C: 400 gallons	
9	Rainwater harvesting	Ninth Residential College	3	Tank A: 400 gallons Tank B: 400 gallons Tank C: 400 gallons	
10	Rainwater harvesting	Tenth Residential College	3	Tank A: 400 gallons Tank B: 400 gallons Tank C: 400 gallons	
11	Rainwater harvesting	Eleventh Residential College	3	Tank A: 400 gallons Tank B: 400 gallons Tank C: 400 gallons	
12	Rainwater harvesting	Twelfth Residential College	3	Tank A: 400 gallons Tank B: 400 gallons Tank C: 400 gallons	
13	Rainwater harvesting	International house	3	Tank A: 400 gallons Tank B: 400 gallons Tank C: 400 gallons	
14	Rainwater harvesting	Bus depot	3	Tank A: 400 gallons Tank B: 400 gallons Tank C: 400 gallons	
15	Rainwater harvesting	Landscaping nursery	2	Tank A: 400 gallons Tank B: 400 gallons	
16	Rainwater harvesting	TADIKUM	1	Tank A: 200 gallons	
17	Rainwater harvesting	TASKUM	1	Tank A: 200 gallons	
18	Rainwater harvesting	Perdana Siswa Complex (KPS)	1	Tank A: 93 gallons	
TOTAL				18, 093 gallons	

Figure 4.2: University of Malaya Rainwater Harvesting (RWH) Program in 2015
 [Source: JPPHB UM]

5



Photos of the University of Malaya Campus Buses (left), security officer at the entrance gate of the campus (top-right) and motorcycles parking zone.

Photo courtesy of the University of Malaya

TRANSPORTATION

HEP UM

JPPHB UM



MOBILITY OF THE CAMPUS: CAMPUS BUS



18
campus bus operated in University of Malaya Main Campus



52 pax
Average passengers of each campus bus



146
Total trips for campus bus service each day



Free Service
Available throughout the campus as free service for the students

Number of Campus Bus based on Routes*		Number of bus	Total of bus
<i>Note: Given the good condition of all campus buses of Student Affairs at one time</i>			
1	Route A	4	18 Buses
2	Route B	4	
3	Route C	3	
4	Route D	3	
5	Route E	4	

Average Passengers (Minimum & Maximum) for a campus bus in one trip*		Average Minimum / Maximum	Total Number of Passengers for all campus buses in one complete trip
<i>Note: Minimum average number of passengers are due to some trip with zero passenger.</i>			
1	Route A	0 / 50	260 pax
2	Route B	0 / 90	
3	Route C	0 / 35	
4	Route D	0 / 45	
5	Route E	0 / 40	

Figure 5.0: University of Malaya Campus Bus Information in 2015
[Source: Students Affairs Division (HEP)]

Total set of a complete trips for a campus bus based on each route in one day		Number of trips	Total of Complete Trips in One Day
<i>Note: For Route A, B & E, trips at peak hours are not the same depending on total of buses and passengers. Data stated here is average</i>			
1	Route A	32	146 trips
2	Route B	32	
3	Route C	25	
4	Route D	25	
5	Route E	32	



AVERAGE NUMBER OF PASSENGER PER BUS:

260 / 5 =

52 PAX

Figure 5.1: University of Malaya Campus Bus Information in 2015
 [Source: Students Affairs Division (HEP)]

MOBILITY OF THE CAMPUS: CARS & MOTORCYCLES



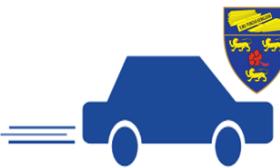
387

Transport units especially cars owned by university



4,255

Number of motorcycles entering the university daily



8,135

Number of cars entering the university daily



115

Number of bicycles that are found on campus on an average day



VEHICLES ENTERING UM CAMPUS ON DAILY BASIS

CARS & MOTORCYCLES



Number of Registered Vehicle Sticker Owners		Number	Total Number of Registered Vehicle Sticker Owners	
1	Staff	6,755	8,832	
2	Students	1,510		
3	Others (example: café operator)	567		
Based on Population Group		Number	Based on Vehicle Categories	Overall Total
5	Number of staff	7,394	Cars 80 % 5,915	7,394
			Motorcycles 20 % 1,479	
6	Number of students	17,092 A. Residential College: 11,541 B. Outside of Campus : 5,551	Cars 30 % 1,665	5,551
			Motorcycles 60% 3,331	
			Other mode of transportation 10% 555	

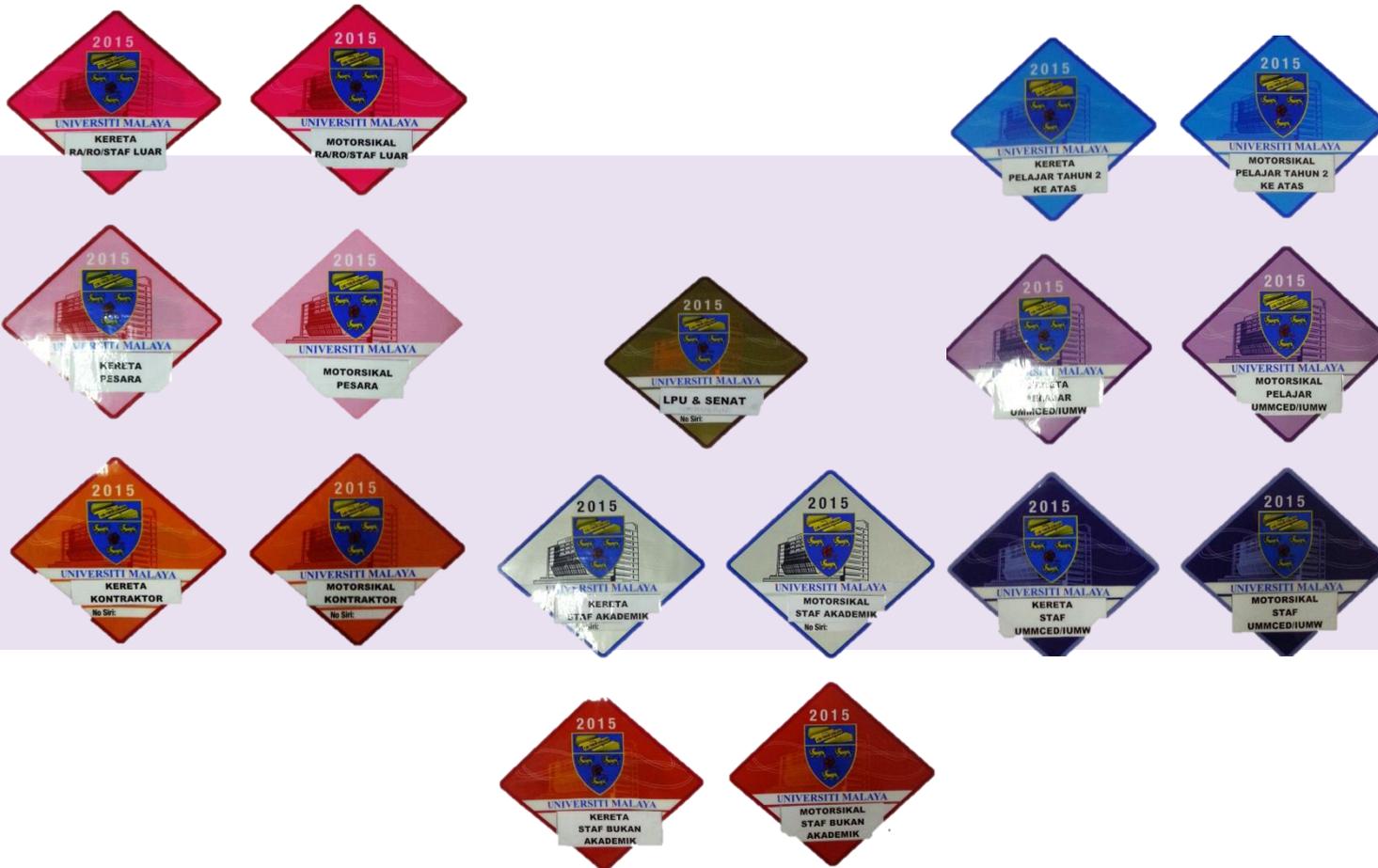
**TOTAL VEHICLES
ENTERING UM**

Number of cars
entering UM
campus daily:
8,135

Number of
motorcycles
entering UM
campus daily:
4,255

OFFICIAL STICKERS FOR THE CARS & MOTORCYCLES IN THE CAMPUS

[Source: Transportation & Traffic Unit, Security Office of University of Malaya]



Syarat-syarat Pengeluaran



PERMOHONAN PELEKAT KENDERAAN
APPLICATION FOR CAR STICKER
UNIVERSITI MALAYA

SYARAT-SYARAT PENGELUARAN PELEKAT KENDERAAN DAN PERATURAN UNIVERSITI
Terms and conditions for the Issuing of Car Sticker & University's Rules and Regulations

- Kebenaran masuk ke Universiti Malaya hanya diberi kepada Kakitangan dan Pelajar Universiti Malaya, Pelawat dan Pedagang yang berurusan di Universiti Malaya. Semua pemandu dan kenderaan yang masuk ke Kampus hendaklah mempunyai Kad Kampus, Kad Matrikulasi, Pelekat Kenderaan dan Pas Kampus.
Approval for entry to the University of Malaya is only applicable to the University Staff and Students, Visitor and Businessmen who are dealing with the University. The drivers and vehicles entering the Campus have to possess Campus Card, Matriculation Card, Car Sticker and Campus Pass.
- Permohonan Pelekat Kenderaan hendaklah dibuat atas borang yang sah dan boleh didapati dari Pejabat Keselamatan. Pelekat Kenderaan yang telah tamat tempoh sahnya hendaklah diperbaharui.
Application for Car Sticker has to be made on a valid form and can be obtained from the Security Office. Car Sticker which have expired validity period are to be renewed.
- Pelekat Kenderaan tidak boleh berpindah milik.
Car Stickers cannot be transferred in term of ownership.
- Pengarah Keselamatan berhak menolak mana-mana permohonan tanpa memberi penjelasan dan meminda mana-mana peraturan dan syarat-syarat diatas pada bila-bila masa tanpa sebarang notis.
The Head of Security reserves the right to reject any application without giving any explanation and can amend any of the above terms and conditions without prior notis.

PERATURAN-PERATURAN LALULINTAS
TRAFFIC RULES AND REGULATIONS

- Mereka yang dibenarkan membawa kenderaan masuk ke Kampus, mestilah patuh kepada peraturan lalulintas dan arahan dari Pengawal Keselamatan bertugas. Mereka yang engkar boleh dikenakan tindakan kompaun.
Those who are allowed to bring vehicles to enter the Campus must abide to the traffic rules and regulations and any orders from Security Officers. Those who fail to comply can be fined and charged with compound.
- Kenderaan yang tidak mempunyai Pelekat Kenderaan dan Pemandu yang tidak mempunyai Pas Kampus dilarang masuk ke Kampus. Kenderaan dan pemandu yang mempunyai pas boleh ditahan untuk diperiksa.
Vehicle that does not possess a legal Car Sticker and driver that does not own a Campus Pass might be prohibited to enter the Campus. Vehicle and driver that own passes can be apprehended and checked.
- Sekiranya berlaku kemalangan didalam kampus, kemalangan tersebutlah dilaporkan ke Pejabat Keselamatan dan kemudian ke Balai Polis sebagaimana yang dikehendaki oleh Undang-Undang.
If any accidents occur in the Campus, it has to be reported to the Security Office and to the Police Station as provided for under the law.

OFFICIAL MAP

University of Malaya Main Campus

[Source: Office of the Deputy Vice-Chancellor of Development & JPPHB Team]



TRANSPORTATION POLICY ON CAMPUS: BUSES, CARS & MOTORCYCLES

The Students Affairs Division (HEP) manages campus buses and 25 drivers provide shuttle services for students travelling in and outside of campus. All buses are used for students to attend classes across campus. Among service route for shuttle bus services are as follows:

Route A: UM Main Library → 3rd, 4th & 7th Residential College → Academy of Malay Studies (APM) → 8th & 10th Residential College → Academy of Islamic Studies (API) Checkpoint

Route B: UM Main Library → Centre for Foundation Studies in Science (PASUM) → 12th Residential College & Institute of Graduate Studies (IPS) → 5th Residential College → 11th Residential College & Sports Centre → Academy of Islamic Studies (API)

Route C: Bukit Angkasa and Vista Angkasa & Kerinchi area / Wisma R&D

Route D: International House & Section 17, Petaling Jaya, Selangor

Route E: 9th Residential College

Transportation policy designed to limit the number of motor vehicles used on campus & to limit or decrease the parking area on campus

In University of Malaya, the rightful authority for the transportation management for any vehicles in and out of the campus belong to the Transportation and Traffic Unit Division of the Security Office, headquartered at the Old Chancellory Building as well as the office at the 12th Residential College.

However, the current status of the transportation policy to limit the number of motor vehicles used on campus as well as policy to limit the parking area on campus have been implemented but with some degree of problems and challenges.

University of Malaya Main Campus is located at the heart of the Klang Valley which become one of the potential and relative 'shortcut' by non-campus transport users to get to Petaling Jaya, Damansara as well as Kuala Lumpur. Other possible challenge is the difficulty to ensure all campus community be it students or staff adhere to the application for official transport stickers registration in order for them to bring their transport to the campus.

All Students/Staff
University of Malaya

Sir/Madam/Brother/Sister,

Please be informed that shuttle bus service that were previously managed by Nadicorp SDN BHD (Red Bus) has ended their service on August 2015. For your information, Transportation Matters SAAD are in the process of selecting a new operator for the shuttle bus service. Accordingly, UM Bus will take over the service (session 2015/2016) starting today (7th September 2015) and the operation time as on attachment.

**For UMCCed student that staying at 5th RC and 12th RC you are advised to wait at PASUM pitstop (near at DTC) to take the bus for route C1 or C2 to go to Wisma R&D.*

Regarding on this matter, we hope that all staff and students to plan your schedule early (30/45 minutes) before classes begin. Any inquires please contact En. Hairil Zainal at 03-7967 3548 or via email hep_pengangkutan@um.edu.my.

--
"Nurturing Future Leaders"

MOHD HAIRIL ZAINAL ABIDIN

Bicycle and pedestrian policy on campus:

- ✓ No policy on bicycle but use are not discouraged,
- ✓ bicycles provided by university, and
- ✓ pedestrian way provided by university

The approximate travel distance of a vehicle each day inside campus only (in kilometres):

10 km*

Note:

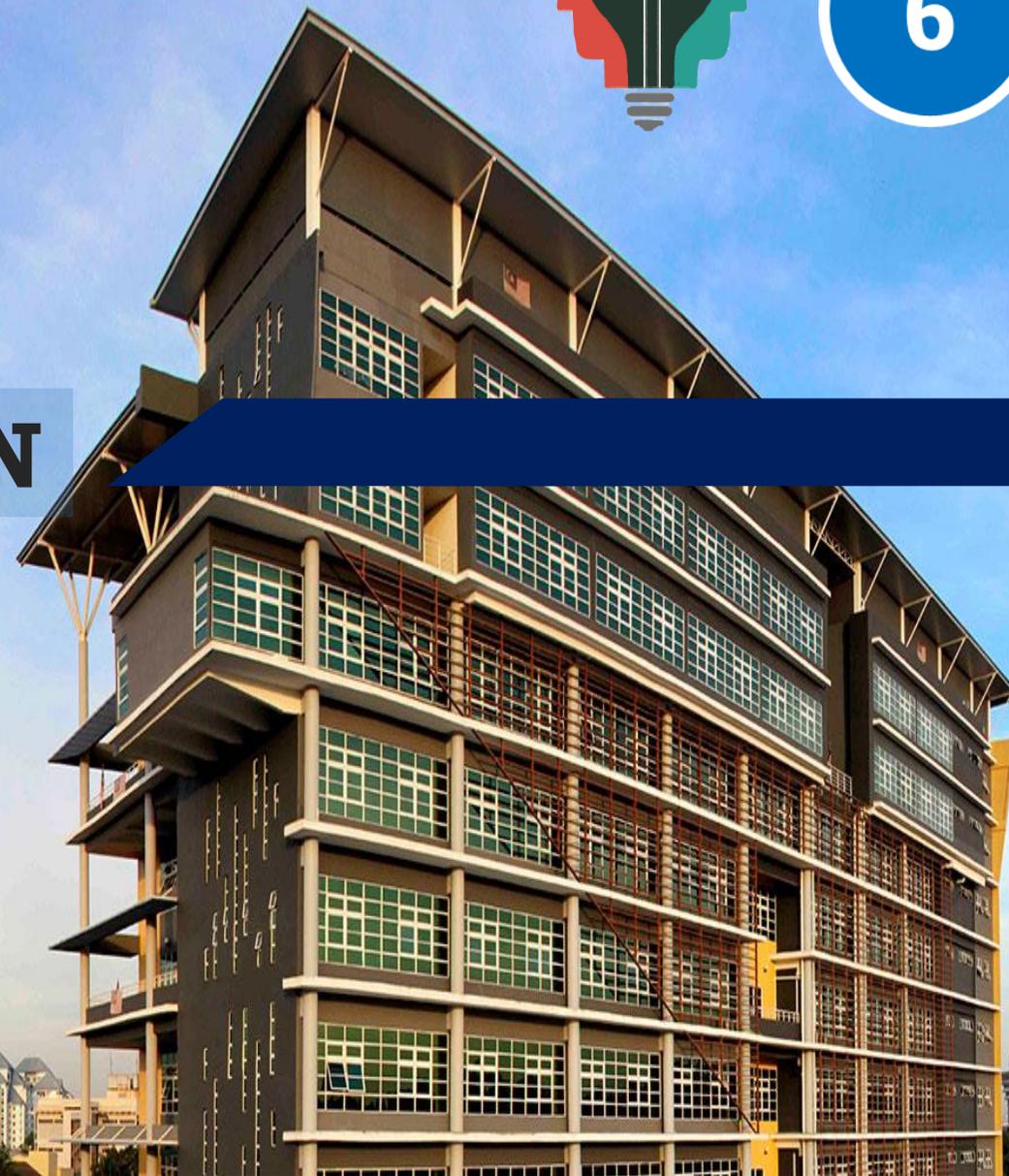
10 km =
From Kuala Lumpur Main Gate →
UM Main Library → Dewan Tunku
Canselor (DTC) → Kuala Lumpur
Main Gate



EDUCATION

Photo of the Faculty of Built Environment University of Malaya (right) with the UM Medical Centre (UMMC) & Faculty of Medical on the background (left).

Photo courtesy of the University of Malaya



EDUCATION IN UNIVERSITY OF MALAYA:

Sustainability-and-Environmental Related Courses offered in campus

In University of Malaya, the Deputy Vice-Chancellor of Academic & International oversees all educational affairs as well as internationalization of University of Malaya. A responsible division on the management of the educational courses offered in UM is known as Academic Division which consist of the following sections / units:

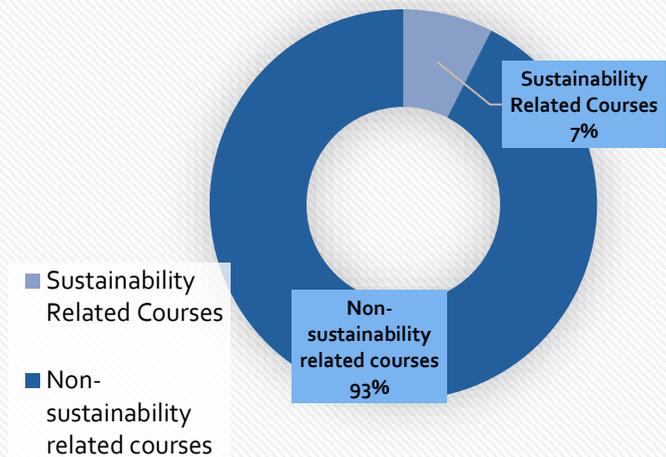
- Admissions and Records Section (SKR): responsible for the enrolment of Undergraduate / First Degree Candidates.
- Examination Section
- Policy Management and Senate Management Unit: Coordinating the Course and Teaching Evaluation (CTES) exercise for undergraduate programmes
- Academic Programme Marketing Unit: the central unit that handles all the activities related to marketing, promotion and students recruitment.

Courses offered in UM for 2015

Based on the Official University of Malaya Convocation Book 2015 and the data provided by the Academic Division team, the following explain the overall courses offered based on each level of education offered in UM:

Level of Education	Number of Courses
PhD	2
Masters	145
Bachelors	133
Total	280

Sustainability-Related vs. Non-Sustainability Related Courses offered in UM for 2015



List of Sustainability or Environmental Related Courses offered in UM in 2015



- International University of Malaya-Wales (IUMW)
- International Institute of Public Policy and Management (INPUMA)
- Faculty of Medicine
- Department of Geology
- Faculty of Arts and Social Sciences (FSSS)
- Department of Science & Technology Studies (STS)
- Faculty of Engineering
- Academy of Islamic Studies (API)
- Institute of Biological Sciences (ISB)



RESEARCH IN UNIVERSITY OF MALAYA:

Sustainability-and-Environmental Related Research Projects funded in campus

In University of Malaya, the Deputy Vice-Chancellor of Research and Innovation oversees the research affairs as well as the commercialization and innovation of research outputs of University of Malaya. A responsible division on the management of the research management inclusive of several responsibility entities and its' core support system as follows:

- Institute of Research Management and Monitoring (IPPP): Governing Institute of Research affairs in UM
- 5+1 Higher Institution of Centre of Excellence (HICoE): University of Malaya Power Energy Dedicated Advance Centre (UMPEDAC), Institute of Ocean and Earth Sciences (IOES), Photonics Research Centre (PRC), Tropical Infectious Diseases Research & Education Centre (TIDREC), Centre for Research in Biotechnology for Agriculture (CEBAR), and Nanotechnology & Catalysis Research Centre (NANOCAT)
- 6 Research Clusters: Sustainability Science, Humanities, Innovative Technology, Equitable Society, Wellness, and Frontier Science.
- Research Core Support System: Centre for Research Services (PPP), Centre for Research Grant Management (PPGP), University of Malaya Centre of Innovation and Commercialization (UMCIC) and University of Malaya Consultancy Unit (UPUM)
- Centres and Institute: UMCares - The Community & Sustainability Centre, Centre for Creative Content & Digital Innovation (3CDI), Institute of China Studies, and High Impact Research (HIR)

Pertaining to research funds for sustainability-and-environmental related research projects in University of Malaya, the following entities are among the responsible entities in managing / distributing / monitoring / conducting the research: Sustainability Science Research Cluster, Humanities Research Cluster, Equitable Society Research Cluster, Innovative Technology Research Cluster, GCOE-Asian Core Programme, High Impact Research (HIR), Institute of Ocean and Earth Sciences (IOES), UM Grand Challenges and UMCares.



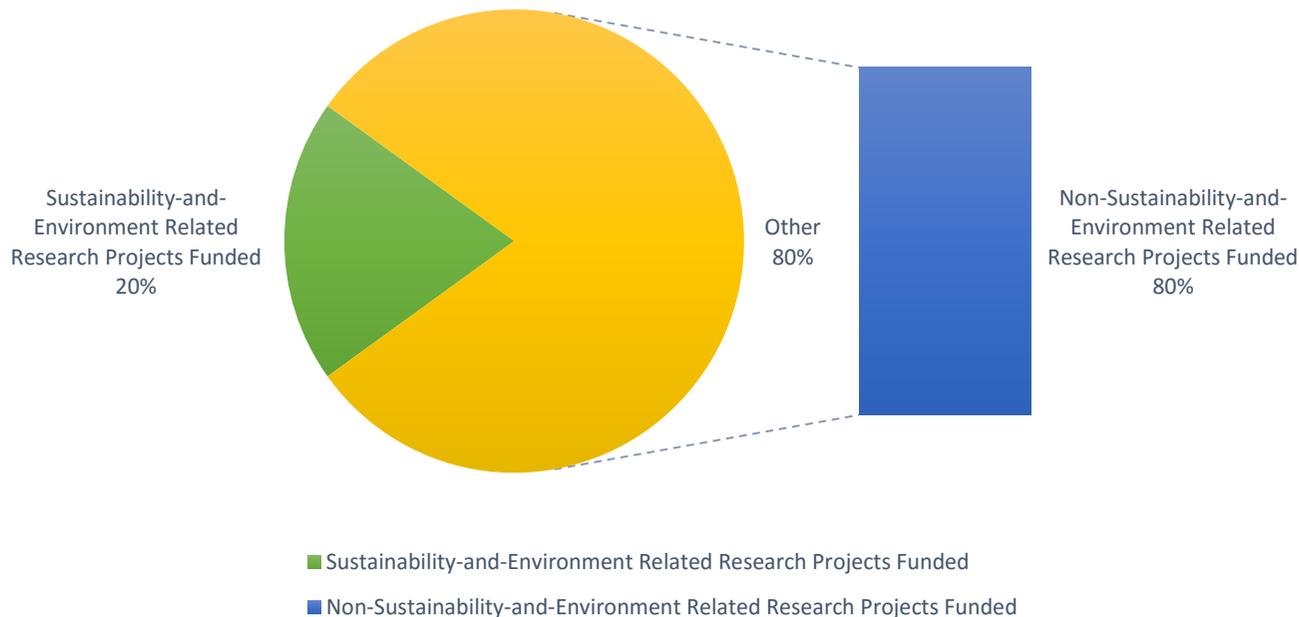
Photo of the Research Management & Innovation Complex (RMIC) University of Malaya.
Photo courtesy of the University of Malaya



'MONEY TALKS' RESEARCH FUNDS IN UNIVERSITY OF MALAYA:

Dedicated to Sustainability-and-Environmental Related Research Projects in campus across faculties and centers

Average Research Funds in University of Malaya over the Last 3 Years [2013-2015]



Sustainability-and-Environmental Related Research Projects Funded (Average over the last 3 years):

USD 5,211,565.58

TOTAL RESEARCH FUNDS (AVERAGE OVER THE LAST 3 YEARS):

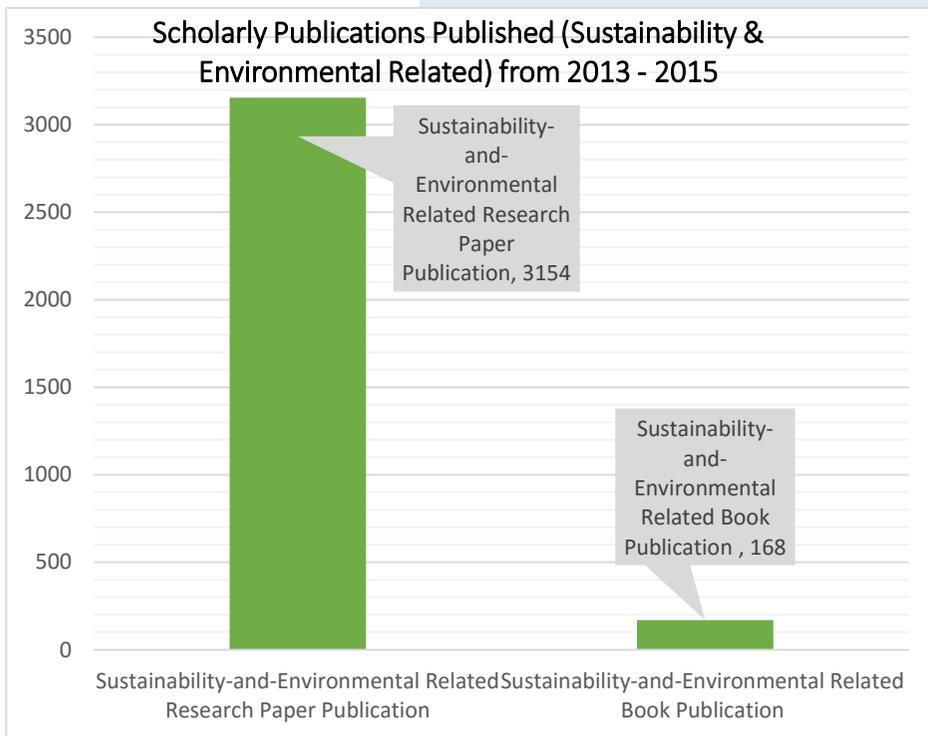
Inclusive of;
Internal grants (UMRG/ GC/ Flagship/ BKP/ Living Lab/ ROGS/ RU);
External Grants (KTP/ RACE/ ERGS/ FRGS/LRGS/TRGS/ PRGS/ Others MOHE/ Sciencefund);
Private & International Funding:

USD 26,249,716.90

[Source: Institute of Research Management & Monitoring (IPPP), 4 Research Clusters & UMCares]

UNIVERSITY OF MALAYA SCHOLARLY PUBLICATIONS PUBLISHED

Dedicated to Sustainability-and-Environmental Fields over the last 3 years (2013-2015)



Average Paper Publication

12,616 / 4 years
=
3,154 per year

Average Book Publication

475 / 3 years =
158 per year

Scival UM 2012 - 2015 (Average 3 recent years)

Research Area	No. of publications
Environmental Science	894
Agricultural and Biological Sciences	1,097
Anthropology	32
Architecture	24
Biochemistry	347
Biochemistry, Genetics and Molecular Biology (miscellaneous)	8
Biomedical Engineering	234
Biotechnology	196
Building and Construction	136
Chemical Engineering	1,046
Civil and Structural Engineering	194
Demography	2
Development	56
Earth and Planetary Sciences	281
Electrical and Electronic Engineering	1,087
Energy	882
Gender Studies	5
General Biochemistry, Genetics and Molecular Biology	673
General Engineering	660
General Health Professions	5
Geography, Planning and Development	105
Health (social science)	82
Health Information Management	22
Health Policy	41
Health Professions (miscellaneous)	6
Industrial and Manufacturing Engineering	351
Life-span and Life-course Studies	3
Materials Science	2,187
Mechanical Engineering	581
Media Technology	16
Molecular Biology	245
Multidisciplinary	398
Ocean Engineering	69
Public Health, Environmental and Occupational Health	402
Safety Research	13
Safety, Risk, Reliability and Quality	77
Sociology and Political Science	116
Transportation	19
Urban Studies	24
TOTAL PUBLICATION UM E&S RELATED	12,616

[Source: SciVal for Paper Publication and UM Pendeta for Book Publication]



SCHOLARLY EVENTS RELATED TO SUSTAINABILITY & ENVIRONMENTAL INITIATIVES OR DISCOURSE

IN UNIVERSITY OF MALAYA OVER THE LAST 3 YEARS (2013-2015):

[Source: PTM UM – UM Conference Management System, SuSci, UM Living Lab & UM SDSN]

Events listed here is only examples and a part of the full list of the academic discourse took place in UM. Programs held at department or centre level were not listed here as the data would be a long list of activities inclusive of all faculties and responsibility centers (PTjs)

- University of Malaya Researchers Conference

November 2013

- International Conference on Integrated Urban Planning

November 2013

- 2nd International Conference on Solar Energy Materials, Solar Cells & Solar Energy Application

August 2013

- Asia Pacific Network for Housing Research Conference: Global Housing Dilemmas: The Ways Forward

August 2013

- International Seminar on Daawah and Human Development

May 2013

Average scholarly events of 3 recent years

24 / 3 years = 8 per year

- The 6th AUN/SEED-Net Regional Conference on Electrical Engineering

March 2014

- The 4th International Symposium on Asian Vertebrate Species Diversity

December 2014

- 2nd International Conference on Social Security

December 2014

- 3rd IET International Conference on Clean Energy and Technology 2014

November 2014

- International Conference on Integrated Urban Planning 2014: Integrated Urban Conservation - Global Vision, National Mission and Local Outlook

October 2014

- Intellectual Discourse on Islam and Science

November 2015

- International Conference on the Science and Engineering Materials (ICoSEM)

November 2015

- University of Malaya Research Carnival (UMRC2015)

October 2015

- Youth Forum 2015: Youth for Education on Sustainability and Peace by YESPeace Network Malaysia Chapter (UM SDSN & SuSci Research Cluster)

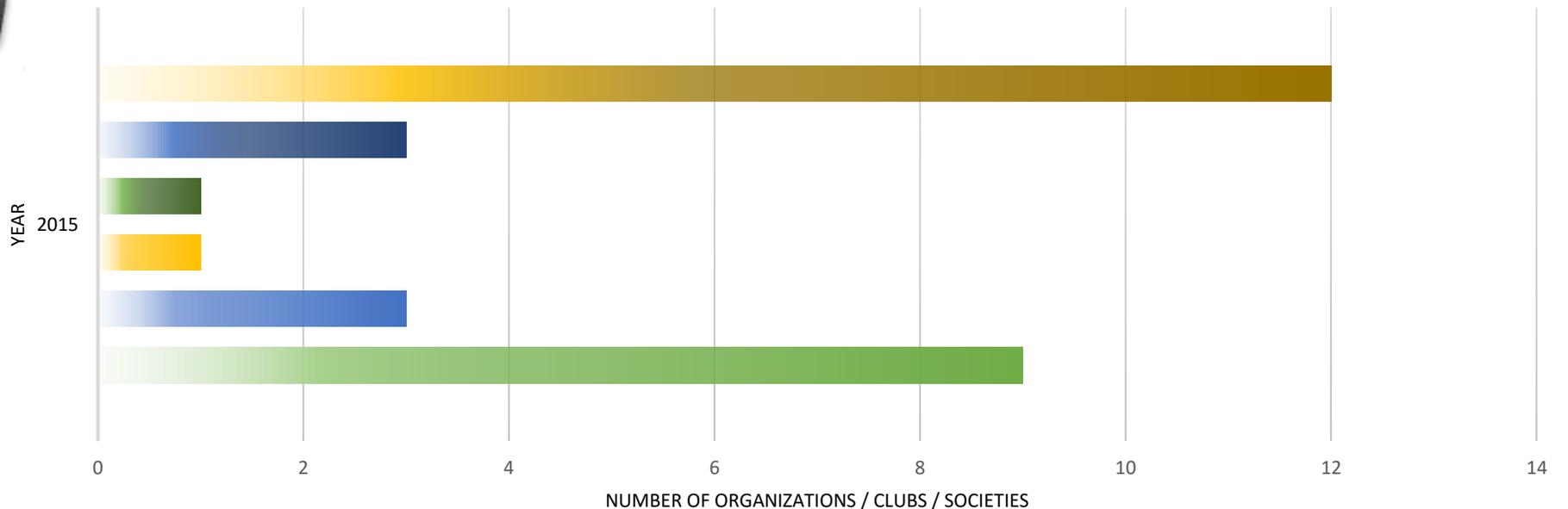
May 2015

STUDENTS ORGANIZATIONS RELATED TO SUSTAINABILITY & ENVIRONMENTAL INITIATIVES

IN UNIVERSITY OF MALAYA:



NUMBER OF STUDENT ORGANIZATIONS RELATED TO SUSTAINABILITY & ENVIRONMENTAL INITIATIVES IN UM 2015



- UM Cares' Residential Colleges Squads
- UM Living Lab Programs: RIMBA, Zero Waste Campaign & Water Warriors
- UM SDSN (YESPeace Malaysia)
- Centre for Civilisational Dialogue (University of Malaya UNESCO Club)
- Faculties & Department: SPAS, ECOB, STS

WEBSITE & SOCIAL MEDIA PAGE RELATED TO SUSTAINABILITY & ENVIRONMENTAL INITIATIVES

IN UNIVERSITY OF MALAYA:

[Source: All respective stakeholders mentioned on this section]



RESEARCH CLUSTER

Sustainability Science Research Cluster (SuSci RC):
<http://susci.um.edu.my>



CENTRE: COMMUNITY & SUSTAINABILITY

UMCares – UM The Community & Sustainability Center
 1) Website:
<http://umcares.um.edu.my>
 2) Facebook Page:
<http://www.facebook.com/umcares>



NETWORKS

UM Sustainable Development Solutions Network (UM SDSN)

- UM SDSN Website:
<http://umsdsn.strikingly.com>
- UM SDSN Facebook Page:
<http://www.facebook.com/umsdsn>
- Youth on Education for Sustainability and Peace Network Malaysia Chapter:
<http://yespeacemalaysia.strikingly.com>



UM LIVING LAB



The RIMBA Project: www.umrimba.com
UM Big Year: umbigyear.weebly.com
Trees of UM: umtrees.wordpress.com
The RIMBA Project (Facebook): www.facebook.com/umrimba
UM Big Year (Facebook): www.facebook.com/UMBigYear



Water Warriors UM:
<https://www.facebook.com/umwaterwarriors>



Zero Waste Campaign UM:
<https://www.facebook.com/zerowastecampaignum>

RESEARCH NETWORKS



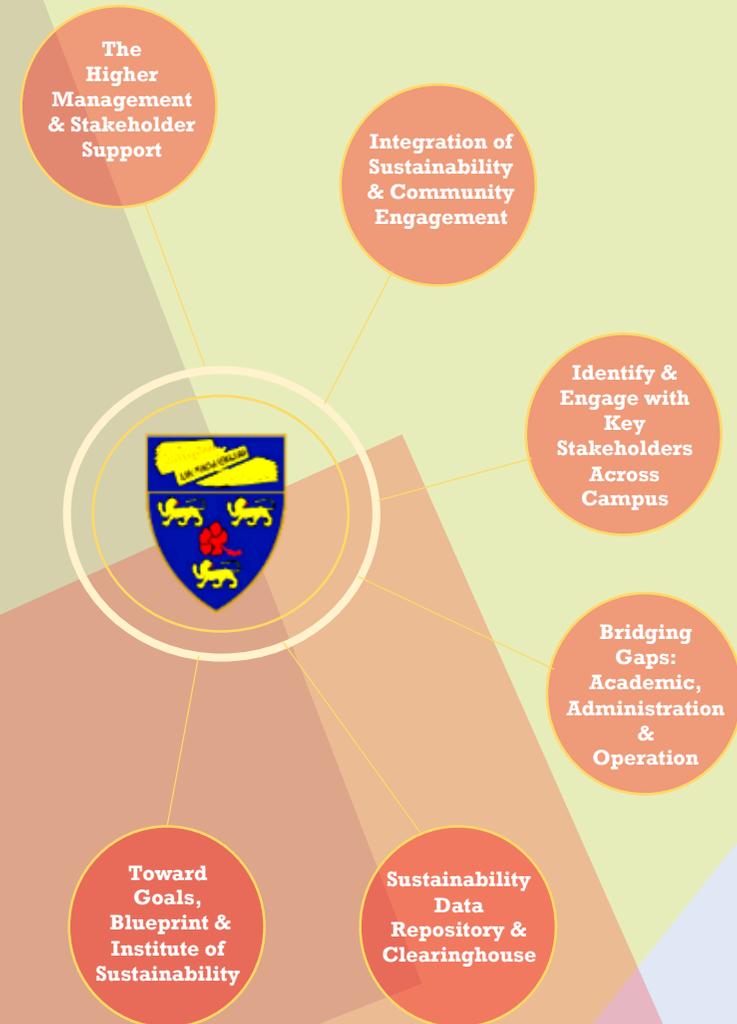
University of Malaya-Kyoto University Program:
GCOE and JSPS Asian Core
<http://gcoe-acp.um.edu.my/>



WHAT WILL UM DO NEXT?

NEXT.STEP →

- Keep the campus community informed on progress made and opportunities for involvement and contribution
- Promote and strengthen smart partnerships and increase participation from staff and students, on and off campus
- Long Term Projection: considering the plan in formulating University of Malaya Campus Sustainability Blueprint, University of Malaya Sustainability Council (UMSC), and the University of Malaya Institute for Sustainability (UMIS).
- Build on strategic sustainability-related local and international networks in enhancing UM's visibility to be aligned with global agenda such as The Sustainable Development Goals (SDGs)



ACKNOWLEDGEMENT

- 1) Professor Dr. Mohd Amin Jalaludin & Office of Vice-Chancellor, University of Malaya
- 2) Professor Dr. Faisal Rafiq Mahamd Adikan & Office of Deputy Vice-Chancellor of Development: JPPHB – Property Management Division, Civil Engineering Division, Administrative Division, Financial Division, Electrical & Electronic Engineering Division (Mr. Husnil Abdullah, Mr. Mohd Fais Bin Ismail, Pn. Huwaida Borhan, Pn. Nor Suzila Mohamad, Mr. Kalaivhaanan Chokka Lingam SK, Mr. Maszairizam Masri, Mr. Muhammad Faris Ali, Pn. Siti Hamizah, Pn. Ana Maizura, Pn. Nor Fazilla Salleh, Pn. Norzilah Mohamad]
- 3) Professor Dr. Noorsaadah Abd. Rahman & Office of Deputy Vice-Chancellor of Research & Innovation: IPPP UM, PPGP, Research Clusters - Sustainability Science RC (Puan Norazlin Mat Radi), Innovative Technology RC, Humanities RC (Puan Melati Kassim), Equitable Society RC (Puan Nor Hidayah Ismail & Ms. Faridah Azwah Kamaruddin)
- 4) Professor Dr. Awg Bulgiba Awg Mahmud & Office of Deputy Vice-Chancellor of Academic & International: Academic Division, Institute of Biological Sciences Faculty of Science (Mr. Mohd Rafizudin Rafiz – Academic Division, Assoc. Prof. Dr. Noor Zalina Mahmood – ISB)
- 5) Professor Datuk Dr. Rohana Yusof & Office of Deputy Vice-Chancellor Student Affairs and Alumni: Registered Student Bodies Division & HEP Shuttle Bus Services (Mr. Mohd Hairil Zainal Abidin, Mr. Mohd Khaidir Zulkepli)
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- 8) **UM Living Lab: Ms. Lili Fariza Ariffin (Program Officer)**
 - Water Warriors: Mr. Affan Nasaruddin, Ms. Siti Norasiah Abd, Kadir, Mr. Mohammad Shahrul Amin
 - RIMBA: Mr. Benjaming Ong, Ms. Vanessa Ting, Ms. Nurul Fitrah Marican
 - Zero Waste Campaign: Mr. Jaron Keng, Mr. Ng CheeGuan, Ms. Nurfatina Baharuddin
- 9) UM Library: Interactive Portal – Web of Science UM, SciVal & UM Repository
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- 11) UMCares – The Community and Sustainability Center: Professor Dr. Norzulaani Khalid (Director), Ms. Nur Fatehah Raudhah Ariffin (CSR Officer)
- 12) Information Technology Centre (PTM): UM Conference Management System
- 13) **UM SDSN Advisor, Coordinator, & Sustainability Associate Members:**
 - Senior Advisor: Prof. Dr. Nik Meriam Nik Sulaiman (Dekan, Kluster Penyelidikan SuSci)
 - Coordinator: Dr. Zul Ilham Zulkiflee Lubes (ISB)
 - Associate Member (Academician): Assoc. Prof. Dr. Noor Zalina Mahmood (ISB)
 - Associate Members (Core Volunteer): Ms. Lili Fariza Ariffin & Ms. Norshahzila Idris
- 14) **UM SDSN UI GreenMetric Team (Student Assistants):** Mr. Nor Khairul Iman Noor Khairudin Ismadi (FSSS) & Mr. Muhd Razani Azmi (Faculty of Medicine)

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(ilham@um.edu.my)
Dr Zeeda Fatimah Mohamad
(zeeda21@um.edu.my)

Concept, Layout & Reports

Mr. Mohd Fadhli Rahmat Fakri, UM Sustainable Development Solutions Network (UM SDSN) Unit
(fadhli@um.edu.my / umsdsn@gmail.com)

Format & Technical

Ms. Lili Fariza Ariffin, UM Living Lab Program / UM SDSN Core-Volunteer
(lilifariza@um.edu.my)
Ms. Norshahzila Idris, UM SDSN Core-Volunteer
(shahzaris@gmail.com)

Main Contributors

Department of Development & Estate Maintenance (JPPHB)
(jpphb@um.edu.my)

UM Living Lab Programs:
The RIMBA Team
Water Warriors
Zero Waste Campaign

Student Registered Bodies Division & Shuttle Bus Service Division,
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Team Assistants

Mr. Nor Khairul Iman Noor Khairudin Ismadi (Faculty of Arts & Social Sciences, UM)
Mr. Muhd Razani Azmi (Faculty of Medicine, UM)



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