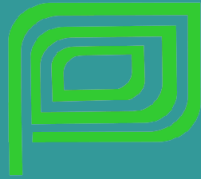




UNIVERSITY
OF MALAYA



Sustainability
Science

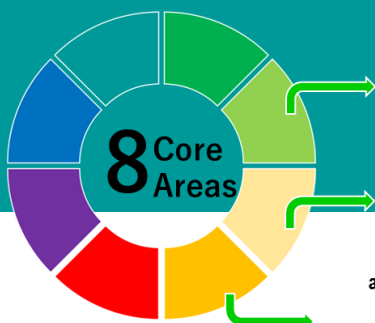


UNIVERSITY OF MALAYA
LIVING LABS

UM LIVING LAB ACHIEVEMENT REPORT (2017-2018)



Sustainability Science
Research Cluster, University
of Malaya



Landscape
management
and biodiversity



Waste
management



Water
governance



Energy
management



Transportation
system
management



Green
procurement



Educational
management –
Environment &
climate change



Change
Management,
participation, &
communication

UM LIVING LAB

ACHIEVEMENT REPORT

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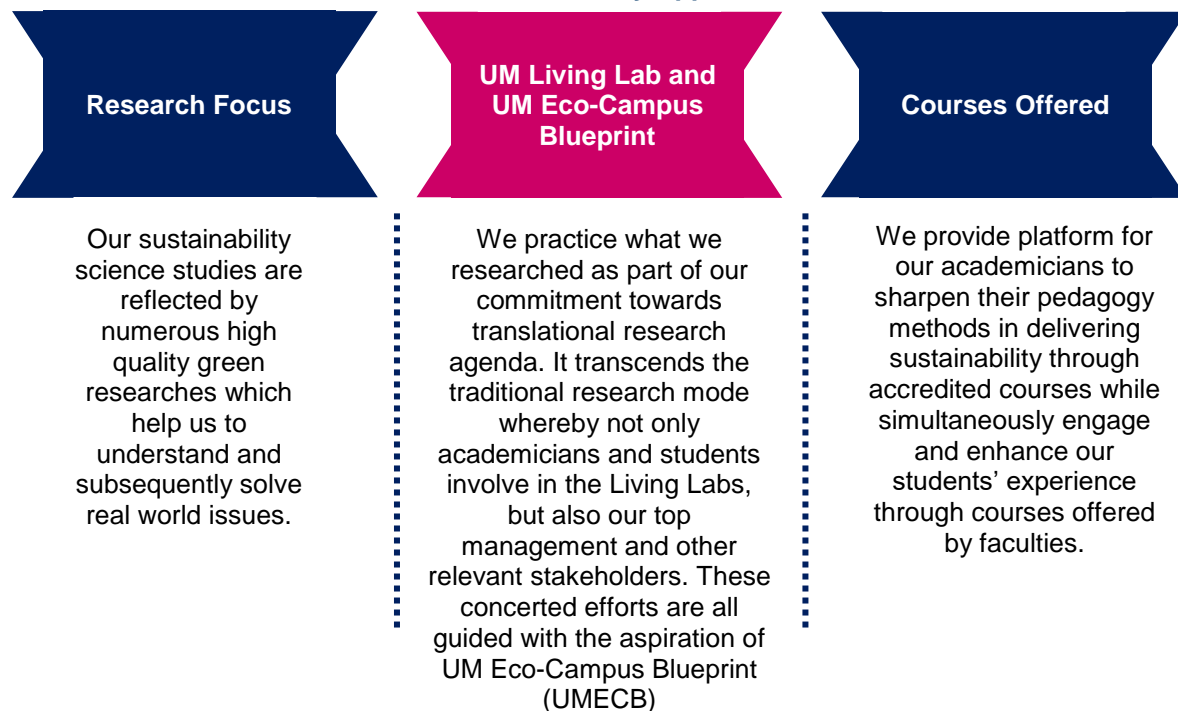
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UM LIVING LAB RESEARCH GRANT PROGRAMME

INTRODUCTION

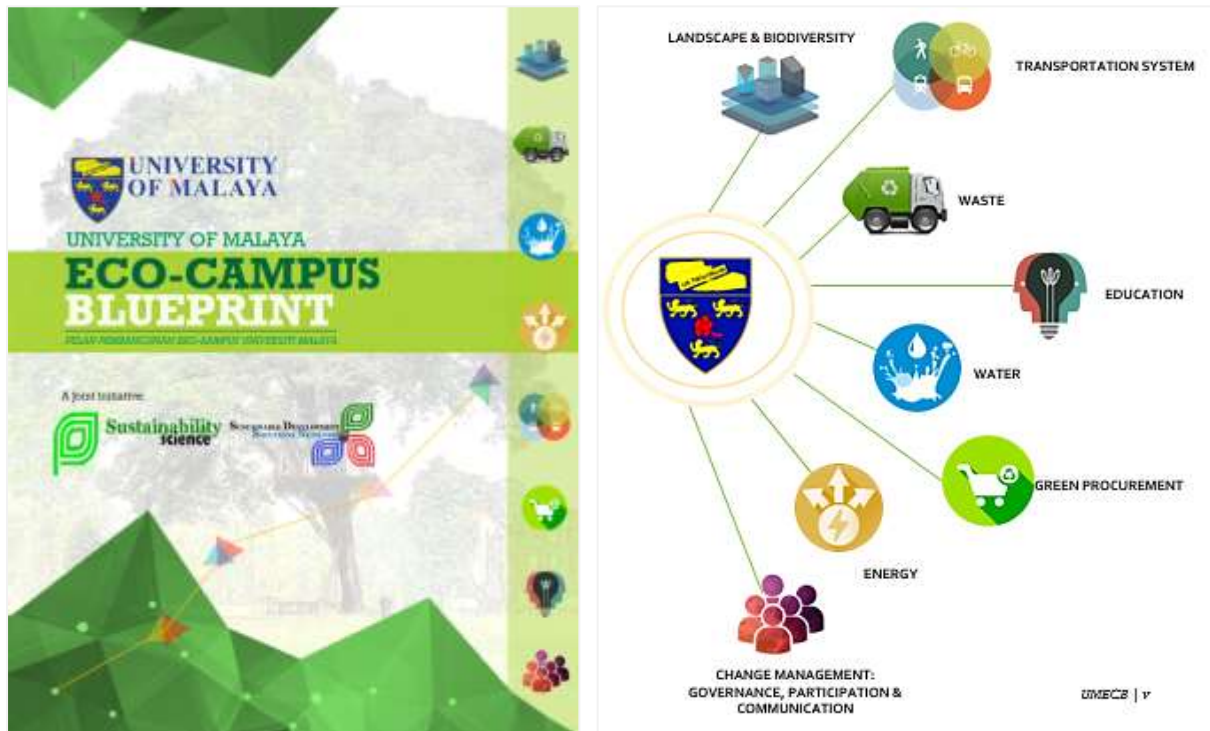
University of Malaya Living Lab Grant Programme (UMLL GP), which started in May 2015 is a strategic partnership between Deputy Vice-Chancellor (Research & Innovation) and Deputy Vice-Chancellor (Development) under the purview of Sustainability Science Research Cluster (SuSci). The philosophy behind the Living Lab idea is to convert university campuses to Living Labs i.e a combined lab/household system, analysing existing product-service-systems as well as technical and socioeconomic influences focused on the social needs of people, aiming at the development of integrated technical and social innovations and simultaneously promoting the conditions of sustainable development (highest resource efficiency, highest user orientation, etc.). Practically, UM LLGP serves as a knowledge/action research-platform for the Department of Development and Estate Maintenance (JPPHB) as the process owner (in waste management, water management and greening & biodiversity) to gradually improve the sustainability of their operations. In this approach, UM researchers will join hands with JPPHB staff and other relevant stakeholders in UM to systematically improve UM's performance in these areas, according to specific targets or Key Performance Indicators (KPIs). This approach is more focused, systematic collaborative, and trans-disciplinary in nature.

Different Sustainability Approach in UM



OVERVIEW IN 2017 - 2018

In UM, we harness our own academic staffs and students' capabilities to solve sustainability and social responsibility issues related to eight (8) thrust areas stipulated in the UM Eco-Campus Blueprint namely: 1) Landscape and biodiversity management, 2) Waste management, 3) Water governance, 4) Energy management, 5) Sustainable transportation system, 6) Green procurement, 7) Educational management, and 8) Change management: governance, participation and communication.



UM Living Lab Grant Programmes has been actively participated and assisted in the development and maintenance of several UM's sustainability initiatives



UM Eco-campus
Blueprint



UI GreenMetric World
University Rankings
(UIGM)



Low Carbon Cities
Framework (LCCF)

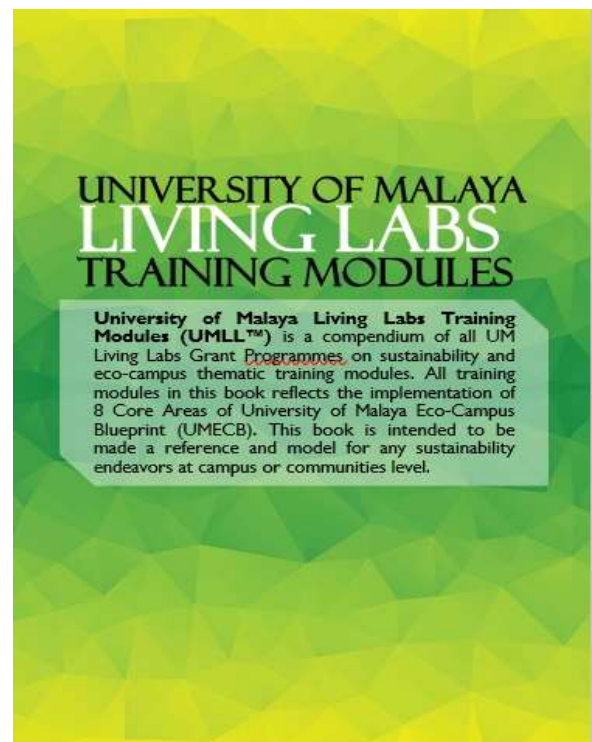


Green Campus
Audit

UM LIVING LAB HIGHLIGHTED PUBLICATION (2018):



UM Living Lab volume 1 consist of 11 paper projects while volume 2 consist of 10 paper projects collectively authored by all UM Living Lab Researchers. These books are example of UMLL's collective output published in April 2018. The books are part of the income generation mechanism to support UM Living Lab projects which can be bought at the price of RM50 each.



UM Living Labs Training Modules is another compilation of 10 ongoing UM Living Labs projects focusing on sustainability-based capacity building and trainings which has been launched by YB Dato' Seri Hamzah Zainuddin, the then Minister of Domestic Trade, Co-operatives & Consumerism (KPDNKK) at the Seminar on 'Sustainable Consumption, Our Responsibilities' (SCORE2018) in conjunction with the annual commemoration of World Earth Day. The book is currently in final editing stage and will soon be available to be sold.

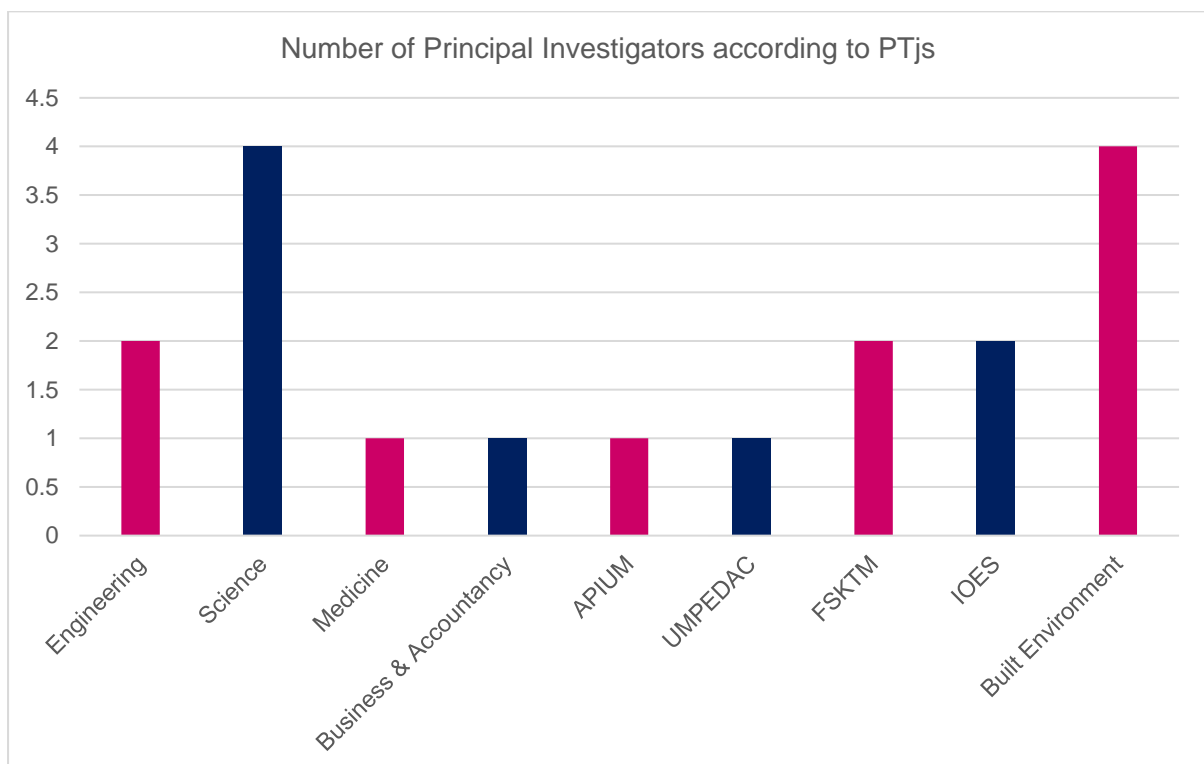
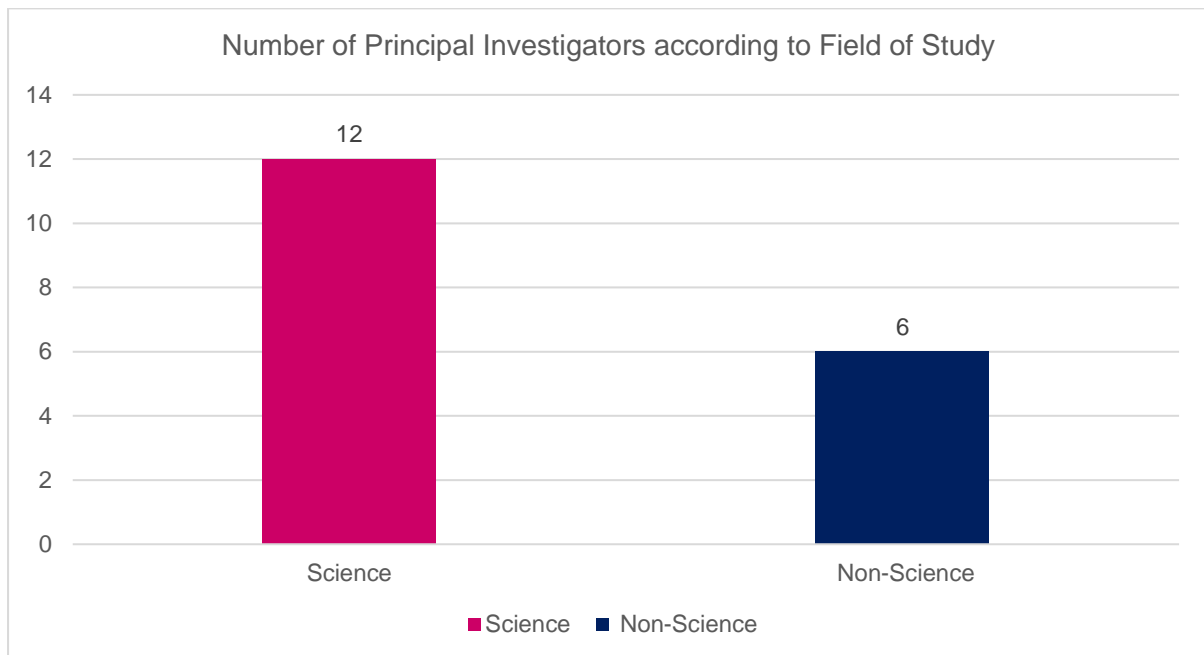
UM LIVING LAB RESEARCH GRANT PROGRAMME

By working with various faculties, departments, and personnel from around campus, we foster holistic integration throughout the university fabric, while simultaneously engage with the students to improve their learning experience in mitigating the university's environmental impact. This is in line with the university's aspiration to be a world class research university which not only strong in theoretical research, but also excellent in translating and applying it into the real world.

In 2017, a total of two (2) research programmes and 18 sub-programmes reflects the number of awarded grants under the UM Living Lab Grant Programmes (UMLL GP). The list of all UM Living Lab programmes and sub-programmes in 2017 are shown in the following table:

No.	Programme / Sub-programmes Title	Principal Investigators	Faculty
1.	UM Living Lab Administration (LL001-15SUS)	AP Dr Sumiani Yusoff	IOES
2.	Water Warriors (LL002-15SUS)	Dr Zeeda Fatimah Mohamad	Science
3.	UM Zero Waste Campaign (LL004-15SUS)	AP Dr Sumiani Yusoff	IOES
4.	The Rimba Project (LL005-15SUS)	AP Dr Sarinder Kaur	Science
5.	Developing A Strategic Facility Planning Framework for Eco-Resilience Homes (LL006-15SUS)	Prof Dr Sr Azlan Shah Ali	Built Environment
6.	Design of Homes for Active Ageing (LL007-15SUS)	Dr Muhammad Azzam Ismail	Built Environment
7.	Developing A Strategic Framework and Guideline for Eco-Resilience Neighbourhood for Active Ageing (LL008-15SUS)	Dr Nikmatul Adha Nordin	Built Environment
8.	Homes for Active Ageing: Market and Housing Aspect (LL009-15SUS)	AP Dr Noor Rosly Hanif	Built Environment
9.	Smart Energy Utilisation (LL010-15SUS)	Prof Dr Ir. Nasrudin Abd Rahim	UMPEDAC
10.	Building Energy Management System with Internet of Things and Evolution Computing (LL011-15SUS)	Dr Liew Chee Sun	Computer Science & Information Technology
11.	Analysis on Human Behaviour Pattern In An Office Building (LL012-15SUS)	Dr Unaizah Hanum Obaidallah	Computer Science & Information Technology
12.	Smart Modular Electrical Energy Monitoring and Management System (LL014-16SUS)	Dr Mohd Yazed Ahmad	Engineering
13.	Energy Conservation Culture in UM Campus (LL015-16SUS)	Dr Adi Ainurzaman Jamaludin	Science
14.	University of Malaya Ecological and Hydrological Data Warehouse Prototype System (LL023-15SUS)	Dr Sorayya Malek	Science
15.	Sustainable Transport System in University of Malaya Campus: Study on Improve the Feeder Bus Service and Promote Non-motorised Transport Mode in Campus (LL024-16SUS)	Dr Yuen Choon Wah	Engineering
16.	Safe Disposal of Unused Medications - Working towards A Green Pharmacy in the University of Malaya Medical Centre (LL030-16SUS)	Prof Dr Sim Si Mui	Medicine
17.	Transforming the Role of Surau APIUM for Campus Sustainability Through 'Imarah Green Project' (LL031-16SUS)	Dr Asmawati Muhamad	Academy of Islamic Studies
18.	Integrating Green into The University Malaya's Procurement Process: A Move Forward (LL033-17SUS)	Dr Suhana Mohezar Ali	Business & Accounting

Out of 18 recipients of UM Living Lab grants, majority are from science field in which researchers from the Faculty of Engineering leading the numbers with nine (9) accepted programmes.



UM LIVING LAB GRANT PROGRAMME

FINANCIAL STATUS

In 2017, a total of RM 967,536.80 research grants was entrusted to the Sustainability Science Research Cluster by the DVC (Research & Innovation)'s office as a form of annual appropriation to fund and support UM Living Lab programmes. Out of the total UMLL GP research grants, RM 688,500 was distributed to one programme (consists of 3 sub-programmes) and 11 projects (exceptional for "Homes for Active Ageing Programmes") which cater the multifaceted sustainability issues within the campus.



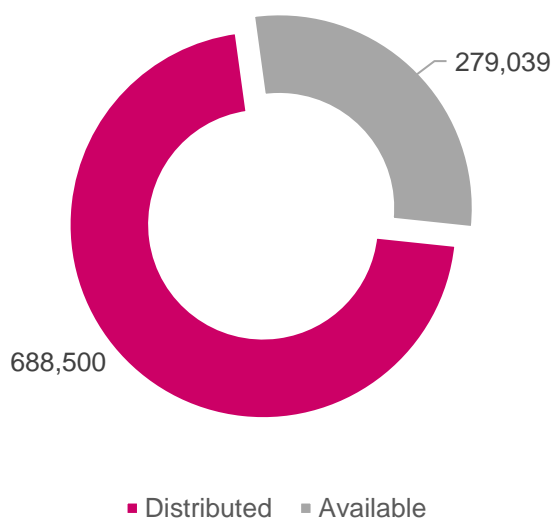
RM 688,500

Awarded to 1 programme (consist of 4 sub-programmes) and 11 projects

71.16%

Awarded to 1 ongoing programme which comprises 14 sub-programmes

UM Living Lab Grant Programme Fiscal Year 2017 (in RM)



UM LIVING LAB GRANT PROGRAMME

SUMMARY OF ACHIEVEMENTS

Research and innovation promotes inclusivity and opportunities that can be shared by all levels of society, promotes integration and increases productivity and wealth, and ultimately societal well-being. These are the gist principles embedded in Sustainable Development Goals (SDGs) launched in 2015 at the United Nations level with 17 multidimensional goals. Along the same line, UM Living Labs, through its translational and transformative approach, sought all stakeholders' commitment to work as one holistic community towards a more sustainable campus in the future.

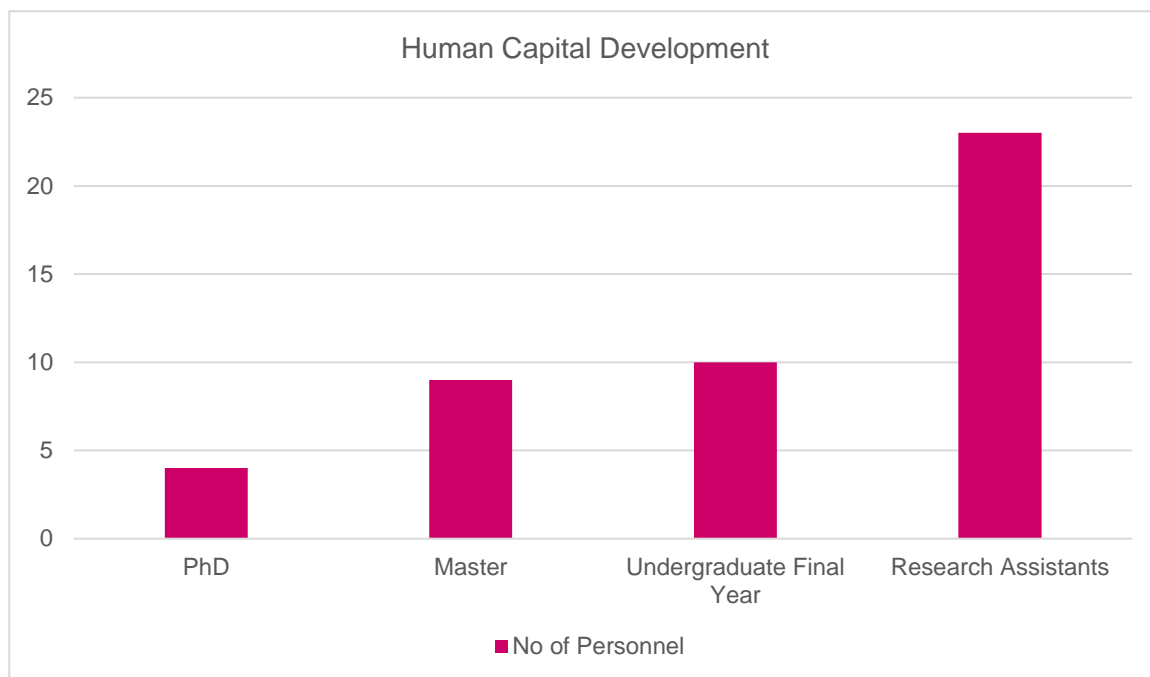
Summary of UM Living Lab Grant Programmes Achievements in 2017-2018

Capacity Building	<ul style="list-style-type: none">A) Human Capital Development	PhD	4
		Master	9
		Undergraduate	10
		Final Year	23
		Research Assistants	23
	Total		46
	<ul style="list-style-type: none">B) Seminar / Workshop / Demonstration		81
Total Capacity Building			127
Publications	<ul style="list-style-type: none">Journal papers	ISI	2
		Non-ISI	4
	<ul style="list-style-type: none">Book		5
	<ul style="list-style-type: none">Chapters in Book		33
	<ul style="list-style-type: none">Proceedings / Conference Paper		9
	<ul style="list-style-type: none">Presentations		20
	<ul style="list-style-type: none">Policy Paper / Guideline / Standards		14
	Total Publications		87
Networking	<ul style="list-style-type: none">Local		67
	<ul style="list-style-type: none">International		14
	Total Networking		81
Awards / Recognition			10
Media Appearances			20
GHG Assessment	<ul style="list-style-type: none">(kg CO₂ -eq)		4,750,000
Monetary Gain	<ul style="list-style-type: none">Direct income saving		RM 46,040
	<ul style="list-style-type: none">Indirect income saving		RM 429,172
	<ul style="list-style-type: none">Monetary Gain Calculated		RM 538,398.86

UM LIVING LAB GRANT PROGRAMME

A) HUMAN CAPITAL DEVELOPMENT

Human Capital Development is undeniably essential in every research programmes. Although manpower development is not listed as one the KPI for UM Living Labs, this programme boasts a number of human capital developed and trained by UM researchers.



B) SEMINAR/WORKSHOPS

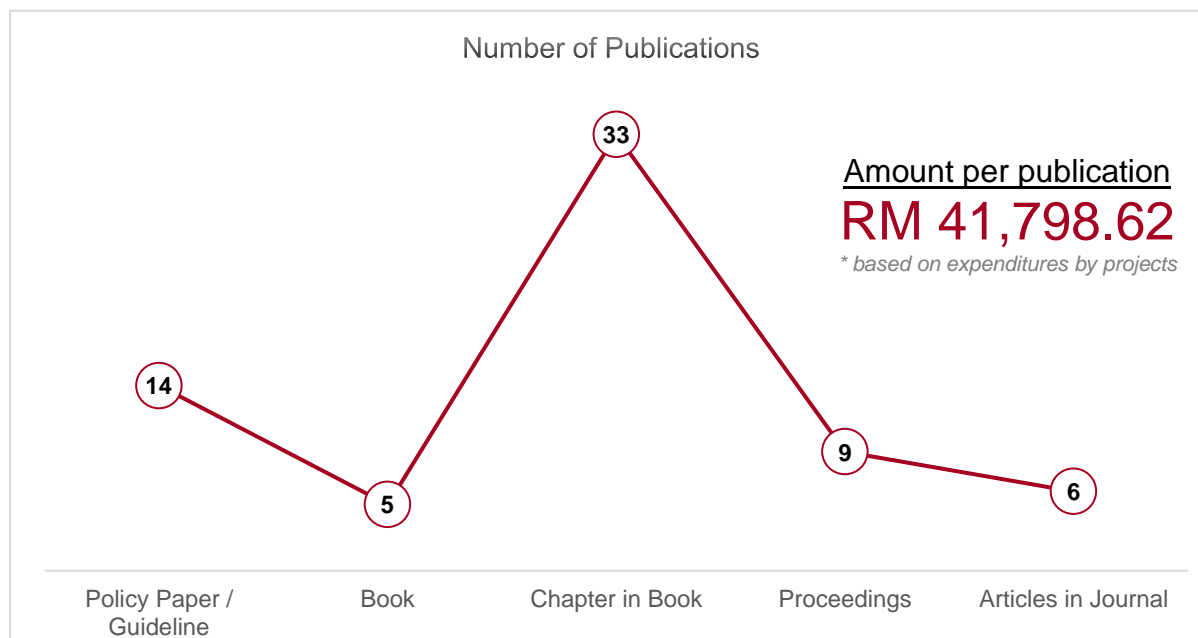
In addition, to encourage innovation, technology, and/or knowledge (ITK) transfers, a series of seminars, workshops, exhibitions, competitions, and demonstrations has been held or attended by UM Living Lab researchers or their team members / research assistants. Listed below are some of the highlighted activities conducted or participated by UM Living Lab teams.

Program/Event/Seminar/Workshops/Activties	Date
1. Green Talk by Professor Odeh Al-Jayoussi	10 August 2017
2. UM Sustainable Development Solutions Network Sustain-Talk on The Role of Universities in Promoting SDGs by Prof. Roderick J. Lawrence	9 October 2017
3. Ecological Footprint Workshop	22 October 2017
4. Environmental Protection Society Malaysia (EPSM) - Sustainable Living in Malaysia (SLiM) Conference	27 -28 October 2017
5. Talk on Low Carbon Cities Framework to UM Living Lab researchers	17 November 2017
6. IAIS's International Seminar on Islam and Green Technology	20 November 2017
7. ASEA-UNINET Indonesian Chapter Workshop on Sustainable Development at Universitas Indonesia (UI)	6 - 8 December 2017
8. Jeffrey Sachs Centre on Sustainable Development and the Special Unit TN50	3 January 2018
9. Workshop on Gap Analysis - UI Green Metric, Low Carbon Cities Framework Assessment (LCCFAS) and UM Eco-Campus Blueprint	24 January 2018
10. World Urban Forum at Kuala Lumpur Convention Centre	9 February 2018
11. IKIM's Seminar on Maqasid Al-Syari'ah & Climate Change	21 February 2018

12. Dialogue Session on <i>Transformasi Nasional 2050</i> (TN50) & Green Technology Master Plan (GTM) Malaysia (2017-2030)	23 February 2018
13. Workshop Forum on Responsible Food Waste Management – ‘Feed People Not Landfills’ Campaign	28 February 2018
14. Sustainable Mining Symposium 2018 at Faculty of Science UM	1 March 2018
15. Slot on Sustainability and UM Eco-Campus @ Faculty of Languages and Linguistics (FBL) UM	12 April 2018
16. Collaboration Appreciation Ceremony UM Living Labs (Homes for Active Ageing & <i>Pertubuhan Anak Yatim & Kebajikan Darul Izzah</i> (Baitul Maab) in Temerloh, Pahang	21 April 2018
17. International Seminar on Sustainable Consumption, Our Responsibilities (SCORE 2018)	26 April 2018
18. Karnival Imarah Eco-Mosque 2018 (KARIEM'18)	15 & 16 May 2018
19. ITRC's Forum on Engineering Contribution to SDG6: Clean Water	30 June 2018
20. ASLI's ASEAN Corporate Responsibility and Sustainability Summit 2018 in Sunway Hotel Resort and Spa	25 June 2018
21. SCHEMA Workshop on Campus Sustainability and Health	26 - 28 June 2018
22.	
23. UM Eco-Campus Slot at <i>Minggu Suai Kenal Pelajar PASUM</i> 2018/2019	27 June 2018

C) PUBLICATIONS

More than half of the publications generated from UM Living Lab Grant programmes are in the form of book chapters. This number is still growing considering that some of these projects are still on-going while output monitoring for completed programmes / projects are conducted for another 24 months after the programmes / projects concluded.



List of Publications

Articles in Journal	<ol style="list-style-type: none"> Sumiani Yusoff. (2017). "Towards a sustainable campus: UM Zero Waste Campaign at University of Malaya." Asia Research Network (ARN). (Non-ISI-Indexed) Sakai, N., Mohamad, Z. F., Nasaruddin, A., Kadir, S. N. A., Salleh, M. S. A. M., & Sulaiman, A. H. (2018). Eco-Heart Index as a tool for community-based water quality monitoring and assessment. <i>Ecological Indicators</i>, 91, 38-46. (ISI-Indexed)
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	<ol style="list-style-type: none"> 3. Mohamad, Z. F., Nasaruddin, A., Kadir, S. N. A., Sakai, Mohamed Zuki, F., Hussein, H, Mohamed Salleh, M. S. A. M., & Sulaiman, A. H. (2018). Heartware as a Driver for Campus Sustainability: Insights from an Action-oriented Exploratory Case Study. <i>Journal of Cleaner Production</i> [Accepted] (ISI-Indexed) 4. Chiong, K. S., Mohamad, Z. F., & Aziz, A. A. (2017). Factors encouraging sustainability integration into institutions of higher education. <i>International Journal of Environmental Science and Technology</i>, (14). (ISI-Indexed) 5. Nurul Emy Idayu Zulkifli, Adi Ainurzaman Jamaludin, Zul Ilham, Rohana Jani, & Mohd Istajib Mokhtar. (2018). The daily practice of UM students on electricity usage towards energy conservation. In Awangku Hassanah Bahar Pangiran Bagul, Jainurin Justine, Andy Lee Chen Hiung, Mohd Rizwan Abd Majid, Andi Tamsang Andi Kele, Datu Razali Datuk Eranza, Huikeng Lau, Mohd Alif Anwar Abu Bakar, Rostika Petrus Boroh, & Tini Maizura Mohtar (Eds.), <i>Climate Change and Campus Sustainability (Vol. II) - Proceedings of the 5th Regional Conference on Campus Sustainability 2018</i>, Universiti Malaysia Sabah (pp.133-146). Sabah, Malaysia: Universiti Malaysia Sabah. (Non-ISI-Indexed) 6. Ainurzaman Jamaludin, Hazreena Hussein & Ati Rosemary Mohd Ariffin. (2018, March). Performance of a residential college building with bioclimatic design strategies towards sustainable campus. Paper presented at the 5th Regional Conference on Campus Sustainability 2018 (5RCCS2018), Universiti Malaysia Sabah, Kota Kinabalu, Sabah, Malaysia. (Non-ISI-Indexed)
Book	<ol style="list-style-type: none"> 1. <i>Pelan Pembangunan Eko-kampus Universiti Malaya / UM Eco-Campus Blueprint (UMECB)</i> Publisher: Sustainability Science Research Cluster ISBN: 978-983-100-909-3 2. <i>The Backyard Before You</i>. 1st Edition. The Rimba Project Publisher: The Rimba Project ISBN: 978-967-0380-82-7 3. <i>UM Living Labs (Volume 1)</i> Publisher: Sustainability Science Research Cluster ISBN: 978-967-488-003-3 4. <i>UM Living Labs (Volume 2)</i> Publisher: Sustainability Science Research Cluster ISBN: 978-967-488-004-0 5. <i>UM Living Labs Training Module</i> Publisher: Sustainability Science Research Cluster ISBN: in progress (submitted)
Chapter in Book	<ol style="list-style-type: none"> 1. Sumiani Yusoff, Z. X. Keng, Nur Syuhada. (2017). <i>UM Zero Waste Campaign: Integrated and Sustainable Waste Management System Development in University of Malaya</i>. 2. Zeeda Fatimah Mohamad, Siti Norasiah Abd Kadir, Affan Nasaruddin, Nobumitsu Sakai, Fathiah Mohamed Zuki, Abdul Halim Sulaiman, Hazreena Hussein, Mohammad Shahrul Amin Mohd Salleh. (2017). <i>Water Warriors Living Lab: Towards an Integrated Heartware - Hardware – Software Approach to Water Management</i>. 3. Benjamin Ong Jia Ming, Nurul Fitrah Marican, Sugumaran Manickam, & Vanessa Ting Ching Ching. (2017). <i>Urban Biodiversity and The Rimba Project</i>. 4. Mohd Yazed Ahmad. (2017). <i>Smart Modular Electrical Energy Monitoring and Management System</i>. 5. Zul Ilham, Adi Ainurzaman Jamaludin, Nurul Emy Idayu Zulkifli, Muhammad Faizal Kamar, Fathiah Mohamed Zuki and Rohana Jani. (2017). <i>Issues and Challenges in Organizing an Effective Campus Energy Saving Culture</i>. 6. Ali Mohammed Alashwal, Muhammad Azzam Bin Ismail, Karam M. Al-Obaidi, Sharifah Noor Nazim Syed Yahya, Mohammed Hatim Al-Sabahi. (2017). <i>Zero Carbon Building Assessment for UM Chancellery Building and Other UM Office Buildings</i>. 7. Siew Yim, Loh. (2017). <i>Cancer-farm Lifestyle Lab - An Application of a Living Lab Methodology for an Innovative Community Care for Post Treatment Cancer Survivors</i>. 8. Chong Wen Tong, Izdihar Zahirah, Chu Yung Jeh, Wong Kok Hoe, Wang Xiao Hang, Masjuki Hassan, Sumiani Yusoff, and Wang Chin-Tsan. (2017). <i>The Design and Investigation of a Novel Ecological Air Cleaning and Cooling System Using the Concept of a Living Green Wall</i>.

	<ol style="list-style-type: none"> 9. Sarinder Kaur Dhillon, Sugumaran Manickam, Halijah Ibrahim, Melasutra Md Dali, Maszairizam Masri. (2017). A Virtual Reality Application on Plants in University of Malaya. 10. Suzaini Mohamed Zaid, Nurshuhada Zainon, Nik Elyna Myeda, Hazreena Hussein, and Eeswari Perisamy. (2017). Carbon Abatement Module for University of Malaya Eco-Campus: Addressing Urban Heat Island and Climatic Change Impact. 11. Norhaslina Hassan, Amirhosein Ghaffarianhoseini, Chew, P.C., and Faizul Azli bin Mohd Rahim. (2017). Essence of Green Roofs: UM Campus as an Experimental and Computational Living Lab towards Enhancing the Outdoor Thermal Comfort Conditions. 12. Sorayya Malek, Pozi Milow, Halim Sulaiman, and Hui Cham. (2017). University of Malaya Hydrological System (UMH20). 13. Yuen Choon Wah, Mohamed Rehan Karim, Aminah Wati Abdullah, Yong Adilah Shamsul Harumain and Mastura Adam. (2017). Sustainable Transport System in University of Malaya Campus: Study on Improving the Campus Shuttle Bus sService and Promote Non-Motorised Transport Mode. 14. Ahmad Saifizul Abdullah, Rahizar Ramli and Farah Fazlinda Mohamad. (2017). Real-time and Automated Traffic Data Inventory and Monitoring System (TDIM). 15. Onn Chiu Chuen, Mohamed Rehan Karim, Sumiani Yusoff, Ong Zhi Chao, Wan Asma Diana Wan Roselan and Lim Zhen Ji. (2017). Working Towards a Sustainable Means of Campus Transport. 16. Hussein Adebayo Ibrahim, Soon Poh Yap, Johnson Alengaram, and Kim Hung Mo. (2017). Construction Waste Recycling Center for Sustainable Drainage Construction. 17. Norbani Che-Ha and Saad Md Said. (2017). University of Malaya Zero Food Waste Campaign – A Head Start. 18. Muhamad Shakirin Mispan, Noor Zalina Mahmood, and Mohd Izaham Zainal Abidin. (2017). Agro-hero: Promoting Green Practices to Communities for Sustainable Agriculture. 19. Sim Si Mui, Lai Siew Mei Pauline, Tan Kit Mun, Lee Hong Gee, Che Zuraini Sulaiman and Wong Yin Yen. (2017). Safe Disposal of Unused Medications – Working toward a Green Pharmacy in the University of Malaya Medical Centre. 20. Asmawati Muhamad. (2017). Transforming The Role of Surau Apium for Campus Sustainability Through 'Imarah Green Project. 21. Zul Ilham, Mohd Idham Hakimi and Norzulaani Khalid. (2017). RCE Central Semenanjung: Local Community Sensitivity towards Climate Change Risk Events in Fraser's Hill. 22. Landscape and Biodiversity Training Module: The RIMBA Project (2018). Module 1: Forest-garden Guided Walk in RIMBA Ilmu. 23. Integrated Waste Management and UM Zero Waste Campaign (2018). 24. Module 1: Integrated Waste Management and UM Zero Waste Campaign Module 3: Wastes Collection, Sorting, Recycling & Treatment (Policy, Economy & Technology) 25. Medical Waste Management Training Module: Safe Disposal of Unused Medications Programme (Safe DUMP) Module 1: Impact of Unused Medications on Environment, People and Resources 26. Water Management Training Module: The Water Warrior Module 1: Water Quality Monitoring Module 2: Stream Sampling Module 3: Tasek Varsiti Nature Walk Module 4: Cleanup & Rubbish Assessment Module 5: Nature Craft 27. Energy Saving Management Training Module: Energy Saving Culture UM 28. Module 1: Energy Conservation and Efficiency 29. Energy Saving Management Training Module: Energy Saving Culture UM Module 1: The Importance of Energy Monitoring & Management Module 2: Implementation of a Simple Energy Monitoring System Module 3: Use of IOT in Energy Monitoring & Management system 30. Transportation System Management Training Module: Sustainable Transport System in University of Malaya Campus; Study to Improve the Campus Shuttle Bus Service and Promote Non-motorized Transport Mode in Campus Module 1: UMBike Cycling Tour Module 2: UMBike Exploration Tour 31. Green Procurement Training Module: University of Malaya Green Procurement Module 1: Introduction to Green Procurement Module
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	32. Education Management Training Module: Imarah Green Project Eco-Surau APIUM Module 1: Let's Go Green (Imarah Surau) Module 2: Be Green Be Exemplary 33. System Management Training Module: UM Living Lab System Module 1: Water Quality Management Module 2: Biodiversity Module 3: Waste Management Module 4: Electricity	
Proceedings	1. Towards a sustainable campus: "Zero Waste Campaign" at University of Malaya. Articles published on Asia Research Network (ARN) on 22nd June 2017. 2. Zero Waste Campaign: Integrated Waste Management Development in University of Malaya Campus." Presented at Sarawak Convention Bureau (SCB) ambassadors to the Land of the Thousand Handshakes on 12 th -15 th July 2017. 3. "Development and Validation of the Return and Disposal of Unused Medications (ReDIUM) questionnaire in Malaysia". Presented at 13 th National Geriatric Conference on 17 th & 18 th August 2017. 4. "The University as a Living Lab: Exploring Translational Education in Sustainability." Presented at The International Conference on Sustainable Cities, Communities and Partnership for SDGs (SCCP2017) on 6 th October 2017. 5. "Sustaining Human-Nature's Interaction for Shaping The Better World: Quran & Sunnah Perspective." Presented at UI Scholar Summit, Depok, Indonesia on 11 th October 2017. 6. "Enhancing the Urban Environment for Biodiversity.". Presented at The Sustainable Living in Malaysia (SLiM) Symposium 2017 on 27 th October 2017. 7. "The Practice of UM Students towards Energy Conservation". Presented at 5 th Regional Conference on Campus Sustainability (5RCCS) on 20 th & 21 st March 2018. 8. "Performance of a residential college building with bioclimatic design strategies towards sustainable campus". Presented at 5 th Regional Conference on Campus Sustainability (5RCCS) on 20 th & 21 st March 2018. 9. " <i>Isu- Isu Semasa Alam Sekitar dan Relevansi dengan Rumah Ibadah (Masjid).</i> " Presented at Karnival Imarah Eco-Mosque (KARIEM'18) on 16 th May 2018.	
Presentations	1. 1 June 2017 2. 12 - 15 July 2017 3. 17 & 18 August 2017 4. 24 August 2017 5. 6 September 2017 6. 7- 8 September 2017 7. 6 October 2017 8. 11 October 2017 9. 22 November 2017 10. 13 December 2017	"Importance of Food Waste Separation at Source", presented by Prof Madya Dr Sumiani Yusoff at Food Waste Separation Talk for cafeterias (Kolej 12, UM) "Zero Waste Campaign: Integrated Waste Management Development in UM Campus", presented by Prof Madya Dr Sumiani Yusoff at Sarawak Convention Bureau (SCB) Ambassadors to the Land of the Thousand Handshakes. "Development and Validation of the Return and Disposal of Unused Medications (ReDIUM) questionnaire in Malaysia", presented by Prof Dr Sim Si Mui at 13 th National Geriatric Conference Water warriors (Dr Zeeda Fatimah Mohamad) as invited speaker at 7 th International Conference on Sustainability Science hosted by Future Earth at Sweden. "Kursus pemahaman asas pengurusan sisa pepejal dan pembersihan awam, organized INTAN Kampus Wilayah Sabah, KPKT", presented by Prof Madya Dr Sumiani Yusoff at Kementerian P Kursus pemahaman asas pengurusan sisa pepejal dan pembersihan awam", presented by Prof Madya Dr Sumiani Yusoff at Bukit Tinggi i-KPKT The University as a Living Lab: Exploring Translational Education in Sustainability, presented by Benjamin Ong at The Sustainable Cities, Communities and Partnerships (SCCP) Conference "Sustaining Human-Nature's Interaction for Shaping The Better World: Quran & Sunnah Perspective.", presented at UI Scholar Summit, Depok, Indonesia "Introduction to UM Zero Waste Campaign - An Eco Campus initiative for sustainable waste management, presented by Prof Madya Dr Sumiani Yusoff at Civil Engineering Department. Braving the New World: 'Reservism,' rewilding and a new narrative for nature, presented by Benjamin Ong at UM Department of English Colloquium, Transgression, Tradition and Modernity.

	<p>11. 21 December 2017 Water warriors (Dr Zeeda Fatimah Mohamad as invited panellist during Design and Social Innovation in Asia-Pacific (DESIAP)</p> <p>12. 2 March 2018 The daily practice of UM students on electricity usage towards energy conservation, presented by Dr Adi Ainurzaman Jamaludin at 5th Regional Conference on Campus Sustainability 2018 (5RCCS2018), Universiti Malaysia Sabah, Kota Kinabalu, Sabah, Malaysia.</p> <p>13. 2 March 2018 Performance of a residential college building with bioclimatic design strategies towards sustainable campus, presented by Dr Adi Ainurzaman Jamaludin at 5th Regional Conference on Campus Sustainability 2018 (5RCCS2018), Universiti Malaysia Sabah, Kota Kinabalu, Sabah, Malaysia.</p> <p>14. 9 April 2018 4th International Workshop on UI GreenMetric World University Ranking (IWGM): "Universities, Impacts and SDGs", presented by Prof Madya Dr Sumiani Yusoff at Semarang.</p> <p>15. 12 April 2018 Sustainability Initiatives: UM Eco-Campus & UM Living Lab, presented by Prof Madya Dr Sumiani Yusoff at Faculti Bahasa & Linguistik, UM.</p> <p>16. 26 April 2018 Promoting Sustainable Consumption : Taking a Holistic Approach to Minimise Pollution and Implications of Waste, presented by Prof Madya Dr Sumiani Yusoff at Seminar on Sustainable Consumption Our Responsibility (SCORE2018)</p> <p>17. 12 May 2018 Talk on ntegrated waste management and biowaste composting by Prof Madya Dr Sumiani Yusoff at SMK Ketari</p> <p>18. 12 May 2018 Presentation on integrated waste management by Prof Madya Dr Sumiani Yusoff at IMPUMA, RMIC, UM.</p> <p>19. 16 May 2018 Isu- Isu Semasa Alam Sekitar dan Relevansi dengan Rumah Ibadah (Masjid), presented by Prof Madya Dr Sumiani Yusoff at Karnival Imarah Eco-Mosque (KARIEM'18)</p> <p>20. 27 June 2018 UM Eco Campus Green Initiative,presented by Prof Madya Dr Sumiani Yusoff at Minggu Suai Kenal PASUM 2018/2019</p>
Policy Paper / Guideline / Standard	<ol style="list-style-type: none"> Guideline on institutional green waste and wood waste separate collection and management UM Development Checklist (TNC (D) & JPPHB) Rimba Science Workshop Module GET Module: 'Nature Conservation and You!' Sytem User Manual for University of Malaya Ecological and Hydrological Data Warehouse Prototype System Transport Policy in UM Campus General public awareness pamphlet on medication wastage and safe disposal of unused prescribed medications. Garis Panduan Surau Lestari "Imarah Green Project Surau APIUM" University of Malaya Green Procurement Guideline Book "Homes for Active Ageing" Coffee Table Book User manual for "UM Living Lab System" Guideline on Energy Monitoring and Management for Energy Saving in University of Malaya Guideline on Energy Saving Culture Buku Panduan Aplikasi "UM Bus Tracking" bagi pemandu bas Universiti Malaya

D) NETWORKING & LINKAGES

INTERNATIONAL NETWORKINGS:

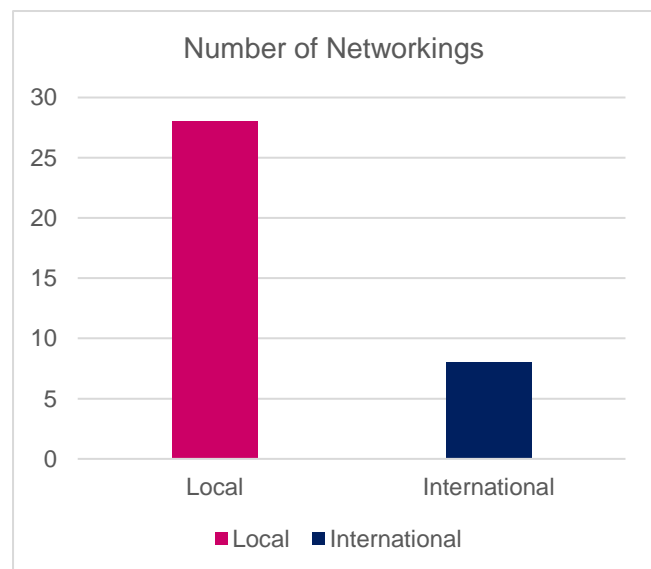
1. International Lake Environment Committee (ILEC)
2. Japan International Cooperation Agency (JICA)
3. Kyoto University Japan
4. Cardiff University, UK; SDG Lab, Future Earth
5. Sustainable Places Research Institute (PLACE), Cardiff University
6. United Nations University-International Institute of Global Health (UNU-IIGH)
7. Asia Research Network (ARN)
8. ASEAN Energy Management System (AEMAS)

SOME NOTABLE NATIONAL NETWORKINGS:

1. Malaysia Consumers Movement (MCM)
2. Kementerian Perdagangan Dalam Negeri Koperasi dan Kepenggunaan (KPDNKK)
3. TESCO Malaysia
4. CH Green
5. Majlis Perbandaran Petaling Jaya (MBPJ)
6. Mysavefood™ Network
7. Green Purchasing Network Malaysia
8. American Concrete Institute – Malaysia Chapter
9. Malaysian Agricultural Research and Development Institute (MARDI)
10. ARES Energy Sdn. Bhd
11. QASK Energy Sdn Bhd
12. SWCorp Malaysia
13. Indah Water Konsortium (IWK)
14. Majlis Agama Islam Wilayah Persekutuan
15. Jabatan Agama Islam Wilayah (JAWI)
16. Majlis Agama Islam Wilayah Persekutuan (MAIWP)
17. Environmental Protection Society Malaysia (EPSM)
18. Universiti Tunku Abdul Rahman (UTAR)
19. Kota Damansara Community Forest (KDCF)
20. Global Environment Center (GEC)
21. Badan Warisan Malaysia (BWM)
22. Selangor State Government
23. Universiti Malaysia Sabah (UMS)
24. Institut Kefahaman Islam Malaysia (IKIM)
25. GoGreen Malaysia
26. GRASS NGO
27. Ares Technology Sdn Bhd
28. Pertubuhan Anak Yatim & Kebajikan Darul Izzah (Baitul Maab) Temerloh, Pahang



Whether through solemn academic meetings or a much more laidback social events, extending networks is essential while doing research. Networking, linkages, partnerships, or collaboration often stimulate transfers of knowledge and exchange of ideas beyond university compound, allowing researchers to break their silos and gain insights from different perspectives.



E) AWARDS & RECOGNITIONS

Research, alongside education, can have a decisive impact on a university's contribution to society. Beyond its duty to impart knowledge, it is a university's commitment to research that allows it to conceive solutions to global challenges. In 2018, three (3) UM Living Lab programmes were awarded for their innovativeness in research.



Dr. Adi Ainurzaman Jamaludin
Faculty of Science, UM

Project Title

Energy Conservation Culture in UM Campus

Principal Investigator

Dr Adi Ainurzaman Jamaludin

Award

Certified Energy Manager under ASEAN Energy Management Scheme (AEMAS)



Dr. Zul Ilham Zulkiflee Lubes
Faculty of Science, UM

Project Title

Energy Conservation Culture in UM Campus

Co-Principal Investigator

Dr. Zul Ilham Zulkiflee Lubes

Award

Certified Energy Manager under ASEAN Energy Management Scheme (AEMAS)



Left: Energy Team won The Best Paper Award of the 5th Regional Conference on Campus Sustainability 2018 at Universiti Malaysia Sabah (UMS)



Dr. Asmawati Muhamad
Academy of Islamic Studies,
University of Malaya (APIUM)

Project Title	Transforming the Role of Surau APIUM for Campus Sustainability through 'Imarah Green Project
Principal Investigator	Dr. Asmawati Muhamad
Award	Won gold medal during Poster exhibition in conjunction with MiTA 2018



Left and top: Poster of *Imarah Green Project* and a certificate received by Eco-Mosque Team during Poster exhibition in conjunction with MiTA 2018

Left: Imarah Green Project Team received gold medal during Poster exhibition in conjunction with MiTA 2018



Dr. Zeeda Fatimah Mohamad
Faculty of Science, UM

Project Title	Integrated Water Management: UM as A Living Lab (Water Warriors)
Principal Investigator	Dr. Zeeda Fatimah Mohamad
Award	Water Warriors shortlisted in Top 20 Promising Living Labs by The Future Earth
Two international recognitions:	
<ol style="list-style-type: none"> 1. Endorsement of Water Warriors as one of global SDGs Labs by The Future Earth, a major international research platform to advance Global Sustainability Science. 2. Selected as Special Panel Exhibition at Lake Biwa Museum, Shiga Prefecture, Japan. 	



Left and bottom:

Dr. Zeeda Fatimah presenting Water Warriors initiative at the 7th International Conference on Sustainability Science (ICSS) hosted by Future Earth in partnership with Stockholm Resilience Centre in Sweden.



Project Title	Integrated Water Management: UM as A Living Lab (Water Warriors)
Principal Investigator	Dr. Zeeda Fatimah Mohamad
Awards	<p>University of Malaya Excellence Awards 2017 (Creativity and Innovativeness) – Innovation of 'Mr.Thimble'- a low water flow device (collective teamwork between JPPHB and UM Living Lab Water Warriors</p> <p>1st Place for UM Mini “Creative and Innovative” (KIK) Convention on 15 May 2018 & representing UM in the upcoming KIK (Public Universities) Convention in August 2018 - Construction of a Model Sustainable Drainage System (another strategic partnership between JPPHB and UM Living Lab Water Warriors</p>



F) MEDIA APPEARANCES

1) UM Zero Waste Campaign (UM ZWC)



Astro Awani Interview (6 January 2017)



Astro Awani Interview (26 January 2017)

2) The RIMBA Project

Uthmaniyah Popular Participation Alumni
Uthmaniyah Popular Participation Alumni



Tasek Varsity as the Heart of UM

By: 2011 Thiruvalluvar Street, A&L, B&L
Bachelor of Biomedical Engineering (Honours) 2012

Tasek Varsity is an urban lake park smack right in the middle of the campus and for all the city dwellers, it is the perfect spot for a short escape into nature. It was a man-made lake that has been around for a very long time, possibly even before University of Malaya's Kuala Lumpur branch began. Those who were around in the early days would remember a different look of the lake than what we can see today - the lake was bigger and wider, almost twice its current size, extending right to the green field in front of the library while there was no real barrier between the lake and river as both were a part of the same system (Chagat Puan). The river behind Tasek Varsity is an urban (semi)natural river (see below). In its heyday, students can be seen cheering for their fellow comrades in a 'Willy, that boy' duck-catching competition; freshies would make for the lake during orientation week to train for boat race competitions; a floating boat house was built at the lake during convocation week; 'baptism' ceremonies would surely attract convocation attendees; getting moving, activity to beautify the lake became a priority; lovers meet during sunset to profess their undying love and justice were written to captivate the beauty of lake.



18
19

However when development began at the surrounding areas, it is usually at the expense of its environment. During the construction of Dewan Tunku Chanselor and several residential colleges nearby, the excavation and deposition activities washed a great deal of sediment and rocks into the lake, creating a mud pond that eventually resulted in silting up a big part of the lake. Many other problems also occurred over these - algal blooms, improper drainage systems that polluted the water, lake drying up during dry season and the overflow of murky water from the river. Fortunately throughout the years, many actions have been taken to save the lake. For example, the former Vice Chancellor, Royal Professor Ungku Abdul Aziz Ungku Abdul Hamid initiated a research at the lake, while the late Tan Sri Dr. Ghaffar Hassan Ahmad contributed in beautifying the surrounding landscape by planting a large number of trees.

In 2012, Project Revitalise (Revive Varsity Lake) was initiated by Deputy Vice-Chancellor (Development), Professor Dr. Farid Naji Mohamed Alihan to revitalize the north-eastern part of the lake. The project centered in three phases: KUBSAR (Kuala Lumpur Sediment and River) (KUBSAR) (developing, rebranding, and restoring) of a new waterfront zone and the introduction of ground water as the new source of water (KUBSAR) (introduction of local fish species, ducks and geese and the construction of a new house and a new jetty) as Revitalize, as a mark of a commitment to the history of the lake where the community joins in as a swimming competition at the lake, an indication of good water quality.

Dr. Farid Alihan said that "It seems to me that the natural world is the greatest source of excitement, the greatest source of new beauty, the greatest source of intellectual interest. It is the greatest source of intellectual interest."



so much in life that makes life worth living". At present, there are more than 200 identified species, no identified birds and no identified fish (that calls the place home). Not forgetting the many other kinds of insects, mollusks, reptiles and amphibians that coexist and balance the ecosystem there. There are many ways that the lake is being enjoyed by the community: the century-old the perfect setting to hold gatherings, students have love to public kayak, joggers have a great time, and somewhere near their equipment while some enthusiast studies about the wildlife.

Water Warriors is a living lab project. We dream of turning Tasek Varsity into a sustainable lake with an open classroom research where the community can participate in citizen science and environmental education. Do you have any ideas, want, happy to hear your opinion at the lake? Share your ideas with us, we'll love to hear from you: waterwarriors@um.edu.my

JUL
12

TASIK VARSITY - THE HEART OF UM

Tasek Varsity is an urban lake in a park that is smack right in the middle of the campus and the perfect spot for a short escape into nature. It is a man-made lake that has been around for a very long time, possibly even before the campus in Kuala Lumpur was established. Those who were around in the early days would remember a different look of the lake than what we can see today - the lake was bigger and wider then and almost twice its current size, extending right to the green field in front of the library. During its heyday, the lake was the centre for a plethora of activities - students could be seen cheering for their fellow comrades in the silly, but fun duck-catching competition; freshies would make for the lake during orientation week to train for boat race competitions; a floating boat house would be constructed at the lake during convocation week; 'baptism' ceremonies were held for newly elected committee members; gotong-royong activities to beautify were a constant feature; and it was also the favoured venue for lovers to profess their undying love.



However when development in the surrounding areas around the lake began, for many, it sealed the fate of the lake. During the construction of Dewan Tunku Chanselor and several residential colleges nearby, the excavation and deposition activities washed a great deal of sediment and rocks into the lake. These activities created a mud pool that eventually resulted in silting up a big part of the lake. Other consequences soon followed - algal blooms, poor drainage which later polluted the water, drying up of the lake during the dry season and the overflow of murky water from the river. Fortunately throughout the years, many actions have been taken to save the lake. For example, the former Vice Chancellor, Royal Professor Ungku Abdul Aziz Ungku Abdul Hamid initiated a research at the lake, while the late Tan Sri Dr. Ghaffar Hassan Ahmad contributed in beautifying the surrounding landscape by planting a large number of trees.

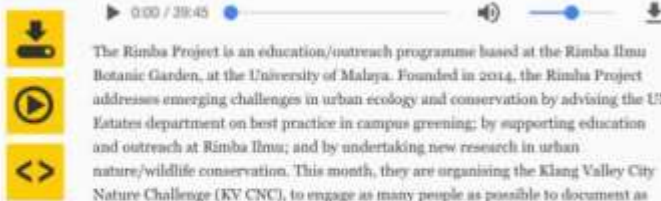


THE RIMBA PROJECT

Benjamin Ong, Founder & Project Officer and Research Assistant, The Rimba Project and Rimba Ilmu Botanic Garden respectively | Muhammad Najmi bin Mohd Ayub, Senior Volunteer, The Rimba Project
23-Apr-18 16:45



Interviewed by Juliet Jacobs for
The Bigger Picture: Earth Matters.



The Rimba Project is an education/outreach programme based at the Rimba Ilmu Botanic Garden, at the University of Malaya. Founded in 2014, the Rimba Project addresses emerging challenges in urban ecology and conservation by advising the UM Estates department on best practice in campus greening; by supporting education and outreach at Rimba Ilmu; and by undertaking new research in urban nature/wildlife conservation. This month, they are organising the Klang Valley City Nature Challenge (KV CNC), to engage as many people as possible to document as much urban wildlife as possible. We find out more from Benjamin Ong, the founder of the Rimba Project and Muhammad Najmi bin Mohd Ayub, a senior volunteer with The Rimba Project.

BFM 89.9
23 April 2018



Ecowatch
Help protect our urban biodiversity
Take part in the Klang Valley City Nature Challenge and play a role in conserving urban nature and wildlife.

The Klang Valley City Nature Challenge (KV CNC) is a citizen science project that aims to document and conserve urban biodiversity. It is part of the larger City Nature Challenge (CNC) which is a global initiative to engage citizens in documenting and conserving urban biodiversity.

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Star2
24 April 2018

Eye-opening talk on wildlife in the city

METRO NEWS

Tuesday, 1 May 2018



Ong says everyone has a duty to help conserve nature in the city.

PARTICIPANTS of a sustainability development talk discovered nature and wildlife in unlikely places in the city during a talk entitled "Making Peace with Urban Wildlife".

Star Metro
1 May 2018

1) UM Water Warriors

Water Warriors bergandengan bahu dengan penuntut KK12 bersihkan Sungai Pantai di UM



MISI SI PENCINTA SUNGAI



KOMUNITI BELIA
Reduan Muharam
ipm.yghmetro.com.my

SUKARELAWAN gigih mengutip sampah di Sungai Pantai.



Dalam usaha menggalakan kebersihannya, kumpulan sukarelawan Universiti Malaysia (UM) dikenali Water Warriors mengagunkan program pembersihan di Sungai Pantai, anak sungai yang bermula di kawasan berhikmah UM.

Pegawai Projek Water Warriors, Aiman Nazzaruddin berkata, program ini salah satu aktiviti mingguan yang dianjurkan keagumannya dan mendapat bantuan 20 penuntut UM dari Kolej Kediaman Raja Idris Nazrin Shah (KK12).

Program ini mendapat kerjasama

petabit Timbalan Naib Canselor (Pembangunan) UM dan sehingga kini, sukarelawan terbahar beraya mengumpul 77 kilogram sampah termasuklah lima kilogram barangan beracun plastik dan kertas yang boleh dikitar semula.

"Kebersihan itu berketi program ini mempunyai signifikansi dan perlu diteruskan dalam memulakan hasrat universiti untuk menjadikan persekitaran kampus lebih hijau dan melahirkan warga yang lebih cakaun dan tabu memulakan peranan masing-masing," katanya.

Sementara itu, Pengetua KK12 merangkap penasihat program, Prof Madya Dr Nafizul Adli Kadri berkata, inisiatif Water Warriors dan penuntut yang terbahar waja diberi pujian kerana membantu pihak universiti terutama dalam jangka panjang.

"Biar pun program ini berskala kecil, ia diharap memberi nilai muara kepada mahasiswa yang mengahat bahagian."

"Ia saba meraka juga diharap menjadi contoh dan membuka mata warga kampus untuk bersaba sama menjaga kebersihan sungai," katanya.

Pengetua Laban dua Fakulti Sains, Nur Ain Shohd Ariffin, 20, berkata, dia gembira kerana dapat menjadi salah seorang sukarelawan program berkebasan.

"Penyerahan dalam program ini memberi peluang kepada saya jadi lebih produktif pada hujung minggu. Kini saya sedar saliran besar yang meremasi kampus UM ini bukannya longkang tetapi sungai yang perlu dipelihara."

"Anas penting untuk memastikan keakal bersih dan tidak dicanhara sampah setiap yang boleh memulakan kesin hura kepada warga kampus," katanya.



SANTARA barangan yang diumpul sebagai program pembersihan



UM LIVING LAB GRANT PROGRAMME

UM LIVING LAB PERFORMANCES AND OUTPUTS

While UM Living Labs mode is slightly different from its counterpart such as UM Research Programme (UMRP) or Grand Challenge, they share the common principle and goals in providing working solutions to the community, which in UM Living Lab's case, the campus community as the main beneficiaries. As UM Living Labs are geared towards sustainable solutions for the campus, researchers are striving to gain excellence in their environmental, social and economic performances.

i) ENVIRONMENTAL PERFORMANCE

Theme	Example of Notable Achievements																						
Waste Management	<p>1) UM Zero Waste Campaign</p> <ul style="list-style-type: none"> Total waste diverted: 660,663 kg (June 2017-June 2018) <p>Waste Diverted from Landfills by UM ZWC (in tonnage)</p> <table border="1"> <thead> <tr> <th>Waste Type</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Biomass waste</td> <td>38%</td> </tr> <tr> <td>Garden Waste (Disposal)</td> <td>21%</td> </tr> <tr> <td>Food waste</td> <td>12%</td> </tr> <tr> <td>Hazardous waste</td> <td>6%</td> </tr> <tr> <td>Wood waste</td> <td>8%</td> </tr> <tr> <td>Recyclables</td> <td>9%</td> </tr> <tr> <td>Textiles</td> <td>2%</td> </tr> <tr> <td>Garden Waste (Composted)</td> <td>4%</td> </tr> <tr> <td>Unlabeled</td> <td>1%</td> </tr> <tr> <td>Unlabeled</td> <td>1%</td> </tr> </tbody> </table>	Waste Type	Percentage	Biomass waste	38%	Garden Waste (Disposal)	21%	Food waste	12%	Hazardous waste	6%	Wood waste	8%	Recyclables	9%	Textiles	2%	Garden Waste (Composted)	4%	Unlabeled	1%	Unlabeled	1%
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Unlabeled	1%																						
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As of June 2017 to June 2018 (latest data collected):

- Total Food Waste (open air): 79,766 kg
- Total Biomass Waste: 249,800 kg
- Total Recyclable Textile Waste: 15,564 kg
- Total Garden Waste (Composted): 23,822 kg
- Total Garden Waste (Disposal): 141,653 kg
- Total Hazardous Waste: 37,106 kg
- Total Recyclable Materials: 62,002 kg
- Total Wood Waste for Energy Generation: 50,950 kg

Total: **660,663 kg**

Total solid waste from landfills: 167,345 kg

- Wood waste (from green waste & wood furniture) are collected by JPPHB in UM campus and stored in open top Ro-Ro bin at UM central waste storage site
- Wood waste in open top bin is collected by TSP Waste Management for energy recovery in a paper mill in Selangor



- Current collection tonnage: 5-12 ton/month

- Waste Textile “Bring Collection” collected 1-2 month per ton



- Total Recyclable Textile Waste: **15,564 kg**

2) Safe Disposal of Unused Medications: Working towards Green Pharmacy in University of Malaya Medical Centre

- Total returned unused medicines (2018): **978 kg**
- Total amount of medicines discarded (2018): **272 kg**
- Total amount of medicines donated back to UMMC (2018): **706 kg**
- 28% of the unused medicines returned to UMMC Pharmacy was safely disposed.

Water Management

1) UM Water Warriors

- Development of Mr. Thimble which won UM Excellence Awards 2017 in “Creativity and Innovativeness” category
- Top 5 Observations in the World Klang Valley / Greater Kuala Lumpur
- No 1 most species observed (Klang Valley)

- Shortlisted as one of the top 20 promising Living Labs from over 400 submissions and awarded International recognition as an SDG Lab by Future Earth at Sweden on 24th August 2017.
- 1st Place for UM Mini “Creative and Innovative” (KIK) Convention on 15 May 2018 & representing UM in the upcoming KIK (Universiti Awam) Convention in August.

Construction of a Model Sustainable Drainage System (Phase 1) with JPPHB: Alur Mustafa



Eco-heart Index Water Quality Map Database for Lake and Rivers in UM



4 Monitoring Location:

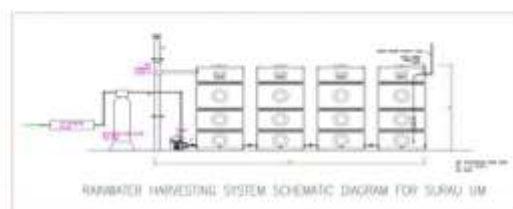
- 1) Tasek Varsiti
- 2) Sungai Pantai
- 3) Sungai Anak Air Batu
- 4) Sungai Mustafa

Analisa kualiti air Sungai Mustafa (April 2018):

PARAMETER	SEBELUM	SEKUTUNG
Oksigen terlarut (DO)	2.30 mg/l	4.46 mg/l
Pemalaran oksigen biologi (BOD)	0.00 mg/l	7.00 mg/l
Pemalaran oksigen kimia (COD)	20.00 mg/l	30.67 mg/l
Amoniakal nitrogen (NH3-N)	1.00 mg/l	0.07 mg/l
pH	6.30	6.15
Ecologi terlarut (TSS)	30.00 mg/l	11.67 mg/l
Isotoksikiti Air	31.40 (Reaksi IV)	71.36 (Reaksi IV)

Installation and Performance Monitoring of Specially Designed Rainwater Harvesting System at the Surau Akademi Pengajian Islam (for ablution)

The system

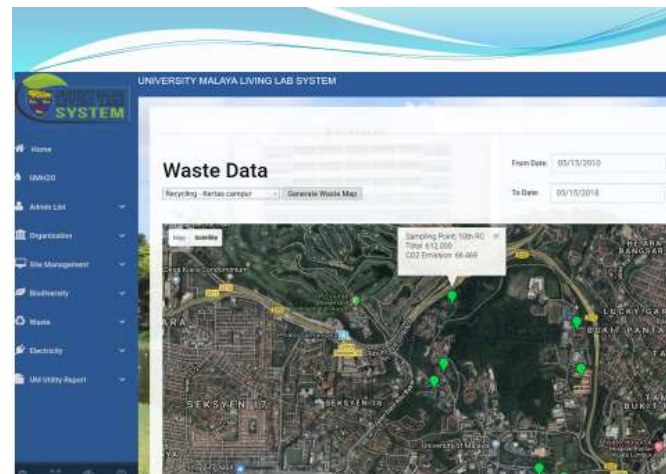
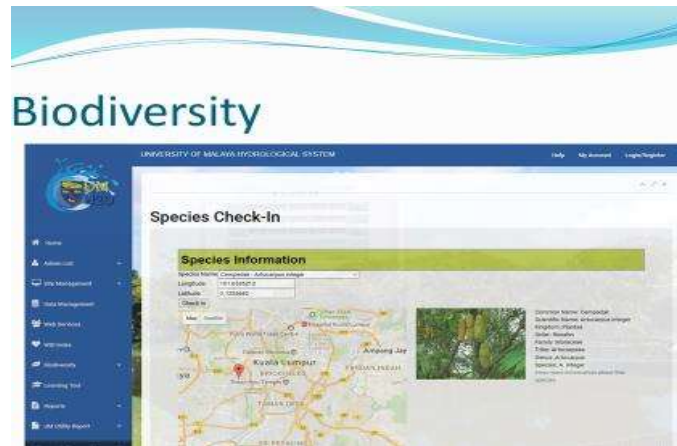


Demonstration



2) University of Malaya Ecological and Hydrological Data Warehouse

- Development of data warehouse to support green initiatives including UI GreenMetric, Low Carbon Cities Framework, and Green Campus Audit.



Energy Management

1) Smart Management of Electrical Appliances and Energy Saving using Internet of Things

- Reduction of 8.21% / 50,333kWh in monthly energy usage.
- Reduction of 8.21% / 2.76kWh/m²/year in Energy Efficiency Index

2) Smart Modular Electrical Energy Monitoring and Management System

- Under well controlled environment, the system has achieved:
 - 34% reduction of energy usage for lightings
 - 47.8% reduction of energy usage for air-conditioning

Transport

1) Sustainable Transport System in University of Malaya Campus: Study on Improve the Feeder Bus Service and Promote Non-motorised Transport Mode in Campus

- A new in campus shuttle bus schedule based on demand was introduced
- SMART Real Time Shuttle Bus Tracking System Apps and UM Bus Tracking Apps Handbook for UM Bus Drivers were developed.
- A new shared lane concept (Sharrow) for drivers and cyclist have been introduced.
- Installation of shared lane markings, or sharrows around Lingkungan Budi route.
- Two bicycle 'IN LANE' signage poles have been installed along with the sharrow markings.

Education

1) Transforming the Role of Surau APIUM for Campus Sustainability Through 'Imarah Green Project'

- Saved a total of 470 m³ water (RM 807.66) through the implementation of Rainwater Harvesting System (RWHS)



- Increase 10% of Surau areas with green vegetation



Hanging pots



Edible plants



Flowers @ planter box



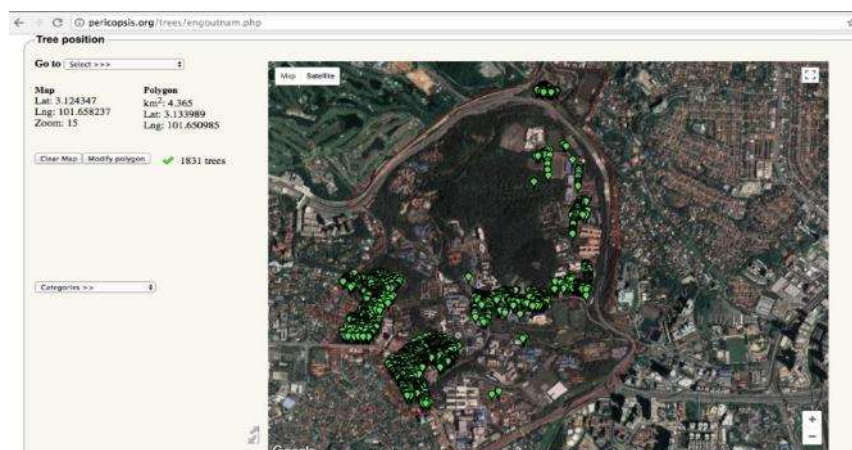
Vertical farming



Biodiversity

1) The RIMBA Project

- 90% survival of species in Rimba Ilmu conservation nursery
- Total of 109.90 t C ha⁻¹ carbon stock in trees ≥ 5 cm diameter at breast height (DBH) was recorded
- 100 trees have been planted at Samali Tree Area and Lingkungan Budi





ii) SOCIAL PERFORMANCE

Theme	Example of Notable Achievements
Waste Management	<p>1) UM Zero Waste Campaign</p> <div>  <p>Community engagement program on integrated waste management Aiesec UM international exchanges on 22nd Jan 2018</p> </div> <div>  <p>Community engagement program on integrated waste management to lecturers and staffs from Medan University on 21st Feb. 2018</p> </div>



Community engagement program on integrated waste management and municipal organic waste treatment to the councillors of City of Yangon on 28th Feb. 2018

2) Safe Disposal of Unused Medications: Working towards Green Pharmacy in University of Malaya Medical Centre



Completing **pre**-intervention questionnaire



Poster exhibition on World Pharmacists Day 2017

1) UM Water Warriors



Beach Clean-up at Pantai Remis with Idrissi International School





Stream Dipping with SK Assam Jawa, Kuala Selangor



Multi-use of Flood Detention Pond in Park and Open Space
(Kolam Takungan DBKL)

<p>Energy Management</p>	<p>1) Smart Management of Electrical Appliances and Energy Saving using Internet of Things</p>  <p>Best Paper Award of the 5th REGIONAL CONFERENCE ON CAMPUS SUSTAINABILITY 2018 at Universiti Malaysia Sabah (UMS).</p>
<p>Biodiversity</p>	<p>1) The RIMBA Project</p>   <p>Rimba Ilmu guided walks for young and old alike: FGA Seniors (24 Jan) and Global Indian International School (21 Feb).</p>   <p>Trees of Genetics-AAJ: The final step of tagging individually identified, mapped and <u>labelled</u> trees around the Genetics/AAJ complex.</p> 

iii) ECONOMIC PERFORMANCE

Theme	Example of Notable Achievements
Waste Management	<p>1) UM Zero Waste Campaign</p> <ul style="list-style-type: none"> Total money savings from operation of project: RM 194,064 Officially set up a fund (tabung) in year 2016 with UM Bursary for sale of UM ZWC baja organik @ RM5 /pack (Currently total sale: RM12,000)  <ul style="list-style-type: none"> UM Zero Waste Composting Site (UM ZWC Garden) 

	
Education	<p>1) Transforming the Role of Surau APIUM for Campus Sustainability Through 'Imarah Green Project'</p> <ul style="list-style-type: none"> Has collected RM 151.40 for selling 378kg recycle items to vendor Has collected RM 604.00 (222 items) from Lestari Shop <div data-bbox="416 902 1377 1910">  <div data-bbox="502 1137 667 1160">Weighing and record</div> <div data-bbox="853 1137 917 1160">Interior</div> <div data-bbox="1066 1137 1348 1160">Recycle Bins at the Recycling Centre</div> <div data-bbox="443 1391 738 1413">Banner to promote recycling activities</div> <div data-bbox="847 1391 997 1413">Exterior view of RC</div> <div data-bbox="1145 1391 1278 1413">Welcome to RC !</div> <div data-bbox="467 1655 699 1677">Women clothes at Lestari Shop</div> <div data-bbox="818 1655 986 1677">Front view of the shop</div> <div data-bbox="1153 1655 1316 1677">Lestari Shop is OPEN!</div> <div data-bbox="544 1890 667 1912">Children Clothes</div> <div data-bbox="818 1890 1026 1912">Men clothes at Lestari Shop</div> <div data-bbox="1214 1890 1273 1912">Necktie</div> </div>
Biodiversity	<p>1) The RIMBA Project</p> <ul style="list-style-type: none"> Has collected a total of RM 32339.76 from activities of project such as guided walks, book and merchandise sales and others.

UM LIVING LAB HIGHLIGHTED EVENT/PROGRAMME

National Seminar on Sustainable Consumption, Our Responsibility 2018 (SCORE2018)

Date: 26th April 2018

Venue: Research Management and Innovation Complex (RMIC UM)



Left: Official Group Photo of SCORE2018 with YB Dato' Seri Hamzah Zainudin, Minister of Domestic Trade, Co-operatives & Consumerism (KPDNKK)

Right: YB Dato' Seri Hamzah Zainudin, Minister of Domestic Trade, Co-operatives & Consumerism (KPDNKK) delivered his opening address



Left: YB Dato' Seri Hamzah accompanied by distinguished guests at the official launch of SuSci's UM Living Labs Books

Karnival Imarah Eco-Mosque (KARIEM'18)

Date: 15th and 16th May 2018

Venue: Akademi Pengajian Islam Universiti Malaya (APIUM)



Left: Dato' Seri Ir. Dr Zaini Ujang, Chief Secretary of Ministry of Energy, Green Technology and Water (KeTTHA) accompanied by distinguished guests at the official launch of KARIEM'18.

Right: Official group photo of VIPs of KARIEM'18 with Dato' Seri Ir. Dr Zaini Ujang, Chief Secretary of Ministry of Energy, Green Technology and Water (KeTTHA).



Top: Closing ceremony by Tuan Hj. Mohd Ajib Ismail, Director of Jabatan Agama Islam Wilayah Persekutuan (JAWI)

OPEN DAY APPRECIATION CEREMONY (HOMES FOR ACTIVE AGEING)

Date: 22nd April 2018

Venue: Pertubuhan Anak Yatim & Kebajikan Darul Izzah (Baitul Maab) Temerloh, Pahang



Left: Official group photo of Homes for Active Ageing Open Day with VIPs from University of Malaya

Right: Prof Dr. Yahaya Ahmad, Dean of Faculty of Built Environment accompanied by Prof Madya Dr. Sumiani Yusoff officiated the research prototype model (Refurbish Unit).



Left: Group photo of VIPs from UM and Homes for Active Ageing Researchers at research prototype model (Refurbish Unit).