UNIVERSITY OF MALAYA

Sustainability Science

2017

UNIVERSITY OF MALAYA LIVING LABS

ACHIEVEMENT REPORT

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UM LIVING LAB

GRANT PROGRAMME

UM Living Lab Grant Programme (UM LLGP), is a strategic partnership between DVC (Research & Innovation) and DVC (Development). 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 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. This approach is more focused, systematic collaborative, and trans-disciplinary in nature.

Different Sustainability Approach in UM

Research informed	UM Living Lab and UM Eco-Campus Blueprint	Courses
Our sustainability science studies are informed by numerous high quality green researches which help us to understand and subsequently solve real world problems.	We practice what we researched as part of our commitment towards translational research agenda. It transcends the traditional research mode whereby not only academicians and students involve in the Living Labs, but also our top management and other relevant stakeholders.	We provide platform for our academics to sharpen their pedagogy methods in sustainability through accredited courses while simultaneously engage and enhance our students' experience through courses offered by faculties.

UM LIVING LAB GRANT PROGRAMME

OVERVIEW IN 2016

In UM, we harness our own academic staffs and students' capabilities to solve sustainability and social responsibility issues related to eight 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, participation and communication.
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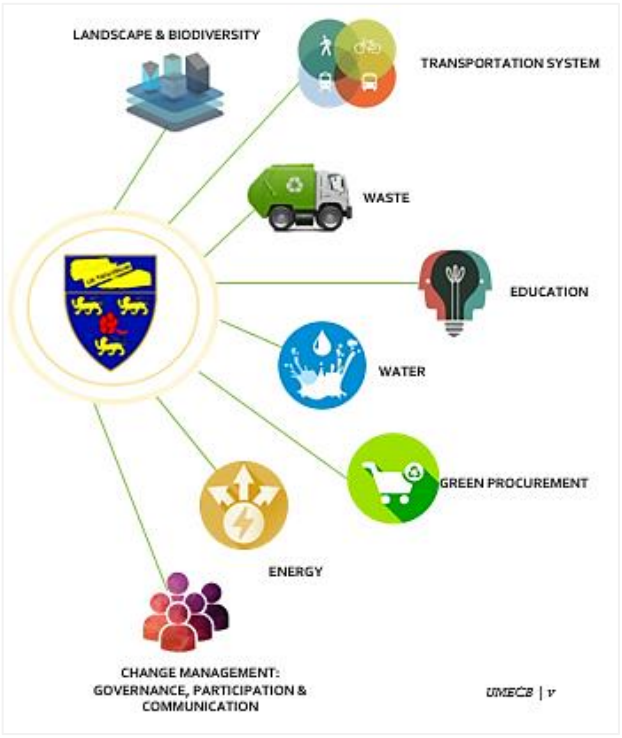
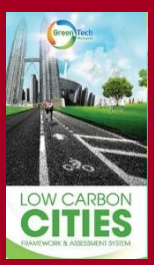


UM Living Lab Grant Programmes has been actively participated and assisted in the development and maintenance of several UM's sustainability initiatives

UM Eco-campus Blueprint

UI GreenMetric World University Ranking

UI GreenMetric Ranking



Low Carbon Cities Framework (LCCF)

SWCorp MALAYSIA

Green Campus Audit

Left: *UM Living Lab grant recipients with the Deputy Vice-Chancellor (Research & Innovation), Prof. Dr. Noorsaadah Abd Rahman and Associate Vice-Chancellor (Research & Innovation), Prof Dr. Shaliza Ibrahim, together with the Deans and Deputy Deans of Research Clusters*

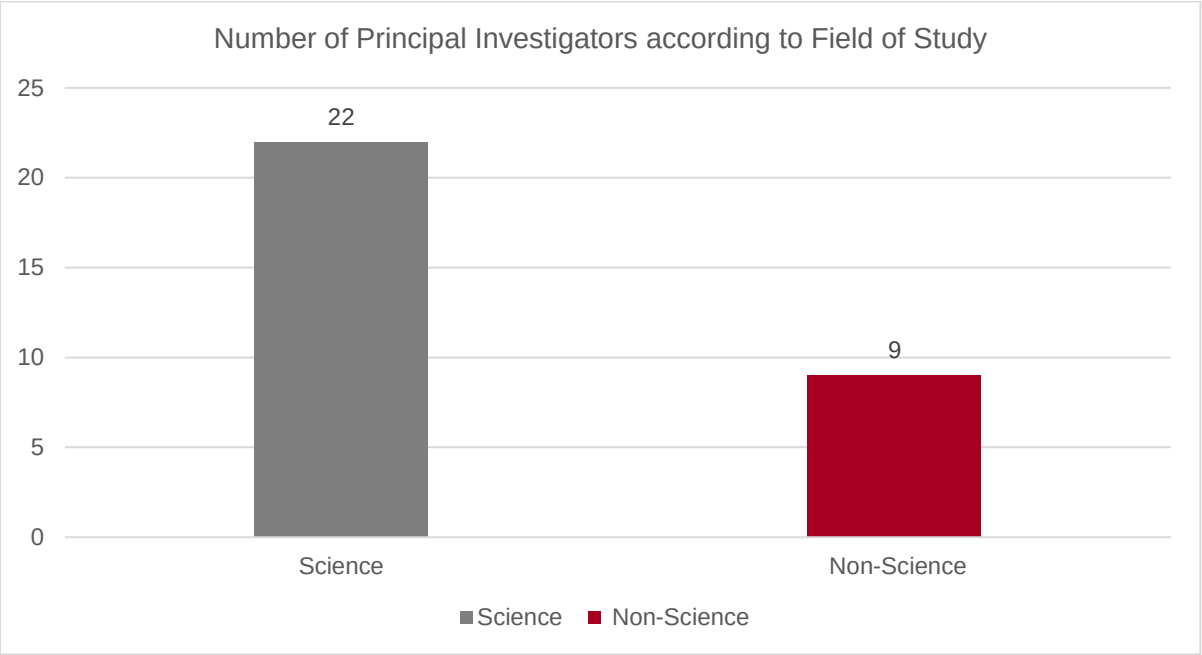
By working with various faculties, departments, and personnel from around campus, we foster holistic integration throughout the university fabric, while simultaneously engage with the students to improve their learning experience in mitigating the university's environmental impact. This is in line with 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.

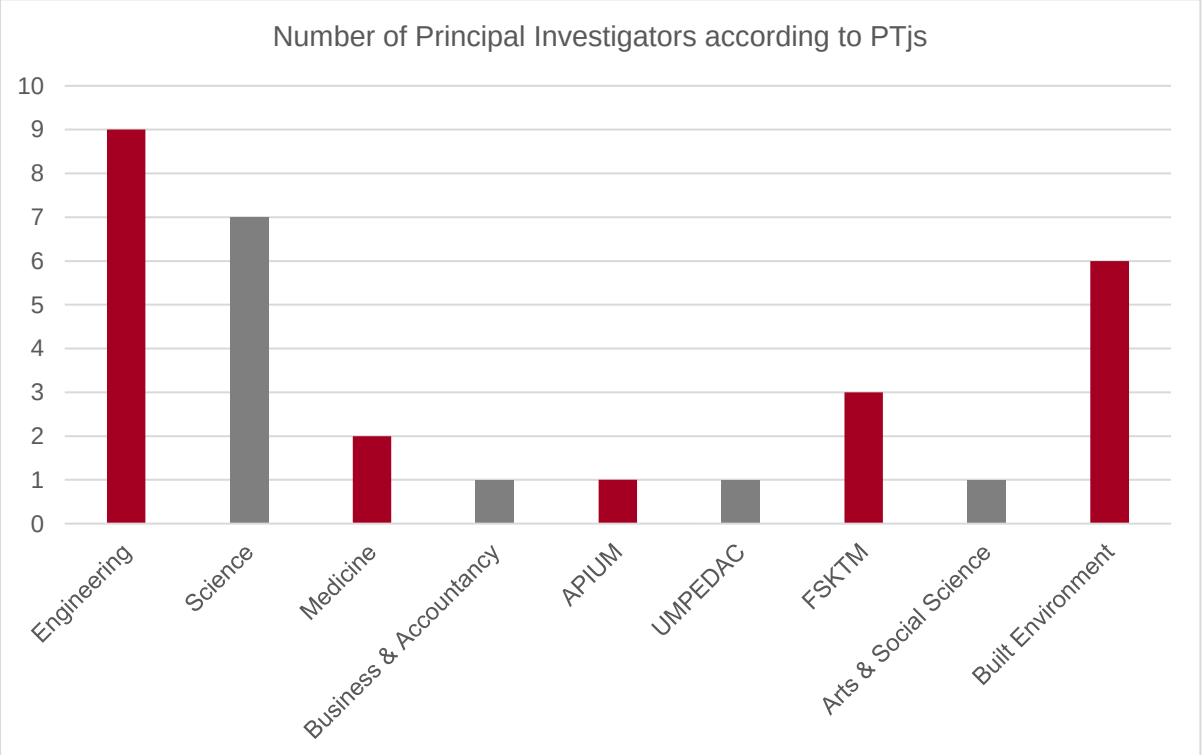
In 2016, a total of two research programmes and 31 sub-programmes was awarded grants under the UM Living Lab Grant Programmes. The list of all UM Living Lab programmes and sub-programmes for 2016 is shown in the following table.

No.	Programme / Sub-programmes Title	Principal Investigators	Faculty
1.	UM Living Lab Administration	AP Dr. Sumiani Yusoff	Engineering
2.	Water Warriors	Dr. Zeeda Fatimah Mohamad	Science
3.	UM Zero Waste Campaign	AP Dr. Sumiani Yusoff	Engineering
4.	The Rimba Project	Dr. Sugumaran a/l Manickam	Science
5.	Developing A Strategic Facility Planning Framework for Eco-Resilience Homes	Prof. Dr. Sr Azlan Shah Ali	Built Environment
6.	Design of Homes for Active Ageing	Dr. Muhammad Azzam Ismail	Built Environment
7.	Developing A Strategic Framework and Guideline for Eco-Resilience Neighbourhood for Active Ageing	Dr. Nikmatul Adha Nordin	Built Environment
8.	Homes for Active Ageing: Market and Housing Aspect	AP Dr. Noor Rosly Hanif	Built Environment
9.	Smart Energy Utilisation	Prof. Dr. Ir. Nasrudin Abd Rahim	UMPEDAC
10.	Building Energy Management System With Internet Of Things And Evolution Computing	Dr. Liew Chee Sun	Computer Science & Information Technology
11.	Analysis On Human Behavior Pattern In An Office Building	Dr. Unaizah Hanum Obaidellah	Computer Science & Information Technology
12.	Smart Management of Electrical Appliances and Energy Saving using Internet of Things	Dr. Mohammad Hossein Anisi	Computer Science & Information Technology
13.	Smart Modular Electrical Energy Monitoring and Management System	Dr. Mohd. Yazed Ahmad	Engineering

No.	Programme / Sub-programmes Title	Principal Investigators	Faculty
14.	Energy Conservation Culture in UM Campus	Dr. Adi Ainurzaman Jamaludin	Science
15.	Smart-E (Smart Energy Monitoring and Optimisation for Pre-existing Campus Buildings)	Dr. Noor Azizi Mardi	Engineering
16.	Zero Carbon Building Assessment for UM Chancellery Building and Other UM Office Buildings	Dr. Ali M. Alashwal	Built Environment
17.	The UM Cancer Farm Project: A Lifestyle Lab	AP Dr. Loh Siew Yim	Medicine
18.	The Design and Investigation of a Novel Ecological Air Cleaning and Cooling System using the Concept of a Living Green Wall	AP Dr. Chong Wen Tong	Engineering
19.	A Virtual Reality Application on Plants in University of Malaya	AP Dr. Sarinder Kaur	Science
20.	Carbon Abatement Module for UM Eco-campus: Addressing Urban Heat Island and Climate Change Impact	Dr. Noor Suzaini Mohamed Zaid	Built Environment
21.	Essence of Green Roofs/Walls: UM Campus As an Experimental and Computational Living Lab Towards Enhancing the Outdoor Thermal Comfort Conditions	AP Dr. Norhaslina Hassan	Arts & Social Science
22.	University of Malaya Ecological and Hydrological Data Warehouse Prototype System	Dr. Sorayya Malek	Science
23.	Sustainable Transport System in University of Malaya Campus: Study on Improve the Feeder Bus Service and Promote Non-motorised Transport Mode in Campus	Dr. Yuen Choon Wah	Engineering
24.	Real-time And Automated Traffic Data Inventory And Monitoring System (TDIM)	Dr. Ahmad Saifizul Abdullah	Engineering
25.	Working towards A Sustainable Means of Campus Transportation	Dr. Onn Chiu Chuen	Engineering
26.	Construction Waste Recycling Centre for Sustainable Drainage Construction	Dr. Yap Soon Poh	Engineering
27.	UM Zero Food Waste Campaign	AP Dr. Norbani Che Ha	Business & Accountancy
28.	Agro-hero: Promoting Green Practices to Communities for Sustainable Agriculture	Dr. Muhamad Shakirin Mispan	Science
29.	Safe Disposal of Unused Medications - Working towards A Green Pharmacy in the University of Malaya Medical Centre	Prof. Dr. Sim Si Mui	Medicine
30.	Transforming the Role of Surau APIUM for Campus Sustainability Through 'Imarah Green Project	Dr. Asmawati Muhamad	Academy of Islamic Studies
31.	Enhancing The Visibility of UM Regional Centre of Expertise (RCE) Central Semenanjung through Partnership with Bukit Fraser's Community and Authority	Prof. Dr. Norzulaani Khalid	Science

Out of 31 recipients of UM Living Lab grants, majority are from science field in which researchers from the Faculty of Engineering leading the numbers with nine accepted programmes.





UM LIVING LAB GRANT PROGRAMME

FINANCIAL STATUS

In 2016, a total of RM 2 million research grants was granted to the Sustainability Science Research Cluster specially to fund UM Living Lab programmes. Out of this, RM 1,805,095.00 was distributed to two programmes and 31 sub-programmes which cater the multifaceted sustainability issues within the campus.

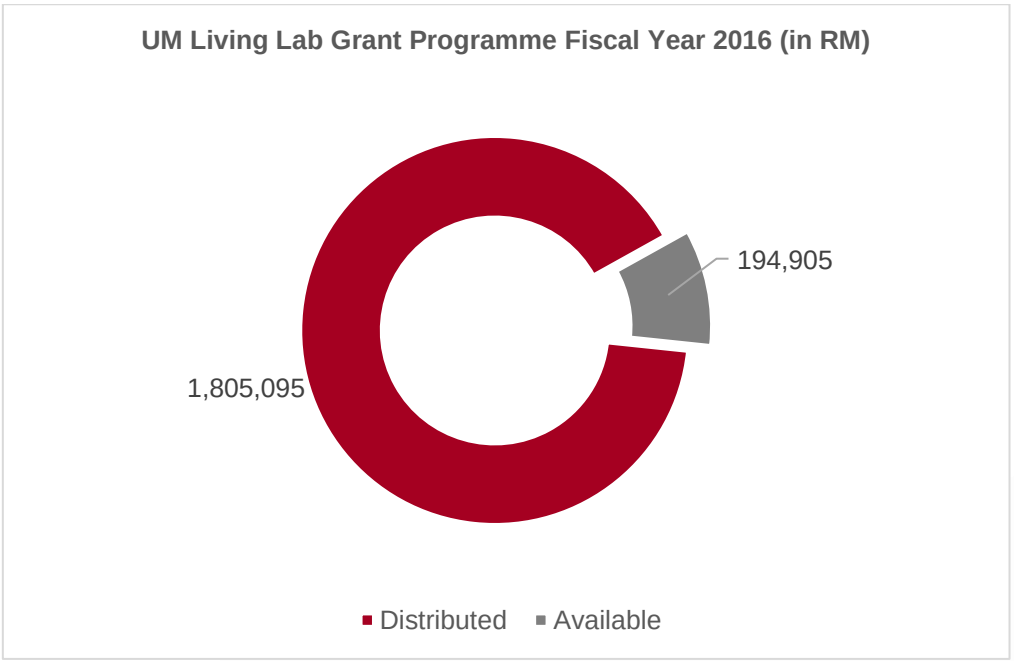
RM 1,805,095.00

Awarded to 2 ongoing programmes which comprises 31 sub-programmes

88.0%

Research funding spent (based on prorate)

RESEARCH



UM LIVING LAB GRANT PROGRAMME

ACHIEVEMENTS

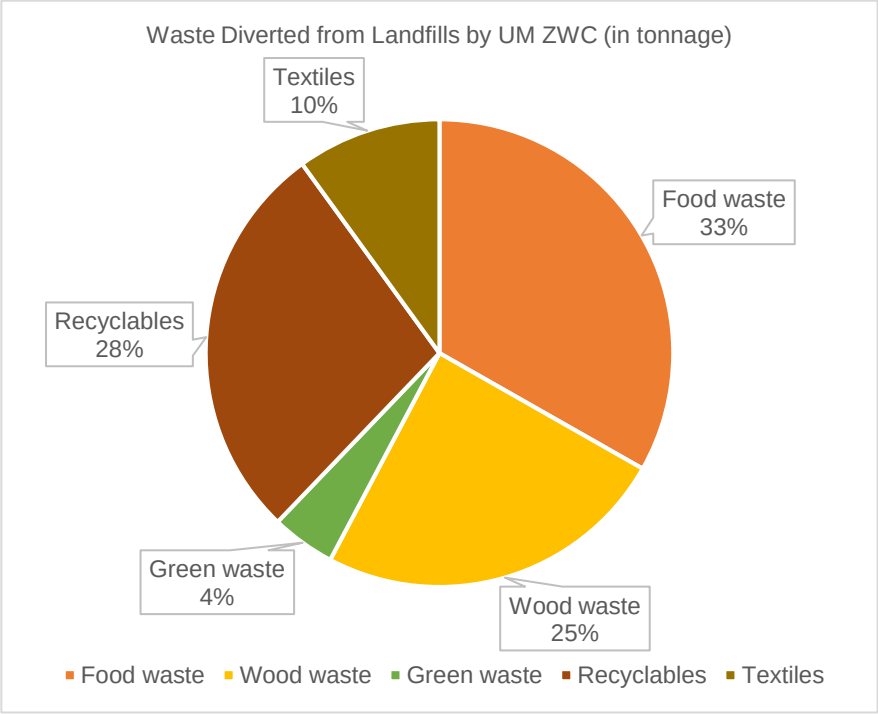
Research and innovation promotes inclusivity and opportunities that can be shared by all levels of society, promotes integration and increases productivity and wealth, and ultimately societal well-being. These are the gist principles embedded in Sustainable Development Goals (SDGs) launched in 2015 at 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.

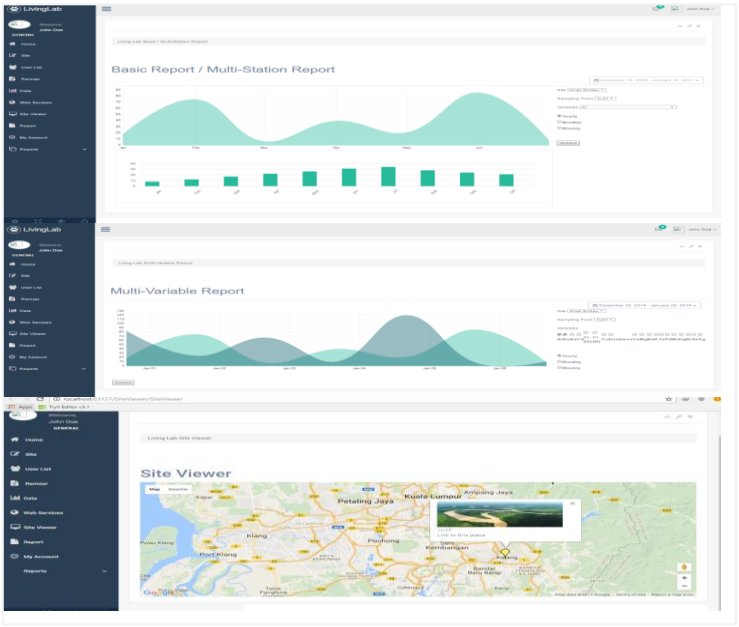
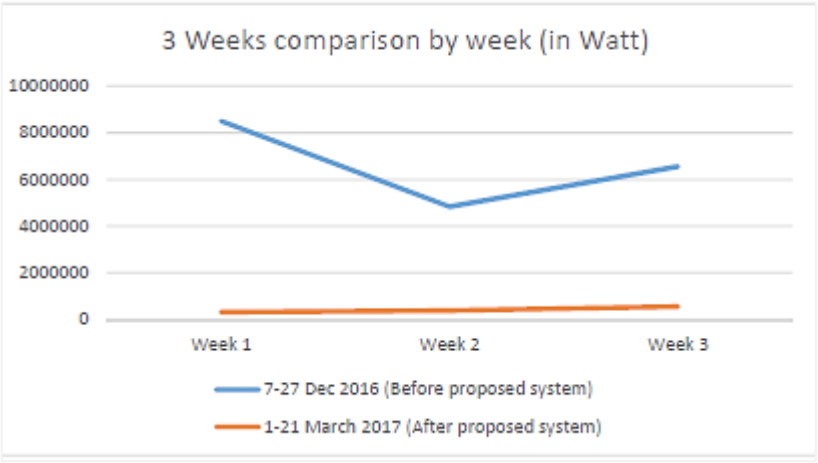
Summary of UM Living Lab Grant Programmes Achievements in 2016

Capacity Building	• Human Capital Development	PhD	6
		Master	5
		Undergraduate Final Year	14
		Research Assistants	27
	• Seminar / Workshop / Demonstration		80
Publications	• Journal papers	ISI	1
		Non-ISI	2
	• Book		2
	• Chapters in Book		25
	• Proceedings / Conference Paper		4
	• Policy Paper / Guideline / Standards		5
Networking	• Local		41
	• International		8
Awards / Recognition			4
Media Appearances			12
GHG Assessment	• (kg CO_2 -eq)		4,750,000
Indirect Monetary Gain			RM 461,611.95

ENVIRONMENTAL PERFORMANCE

While UM Living Labs mode is slightly different from its counterpart such as UM Research Programme (UMRP) or Grand Challenge, they share the same principle to provide working solutions to the community, which in UM Living Lab case, the campus community. As UM Living Labs are geared towards sustainable solutions for the campus, researchers are striving to gain excellence in their environmental performance.

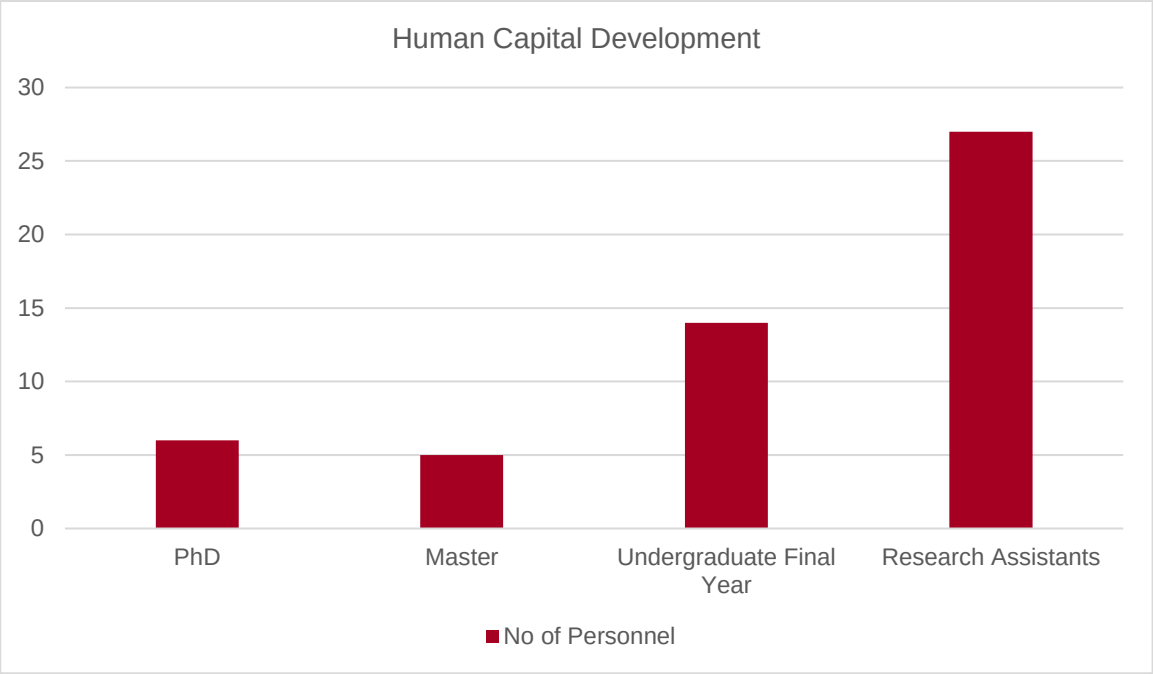
Theme	Example of Notable Achievements
Waste Management	**1) UM Zero Waste Campaign** • Total waste diverted: 218.93 tonnes (for 2016) • Total money savings: RM 97,758.00 (from January 2013)  **2) Safe Disposal of Unused Medications: Working towards Green Pharmacy in University of Malaya Medical Centre** • Total returned unused medicines: 1229 kg • Total recovered medicines: 1020.7 kg (83% by weight) • Average amount medicines donated back to UMMC: RM 19,377.00 per month **3) Construction of Waste Recycling Centre for Sustainable Drainage Construction** • Total concrete waste recycled: 6 tonnes • Total maintenance fee saved: RM 350 per tong

Theme	Example of Notable Achievements
Water Management	**1) Water Warriors** • Development of Mr. Thimble which won UM Excellence Awards 2017 in “Creativity and Innovativeness” category **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** • 3 weeks (21 days) of data are taken and put into comparison. Both before and after installing system data are taken with the same day (Wednesday to Tuesday). • Before installation of the system: 19,889,310 watt of energy usage • After installation: 1,252,135 watt of energy usage • Reduction in energy usage: 1588.43% 

Theme	Example of Notable Achievements
Energy Management	**2) Carbon Abatement Module for UM UM Eco-campus: Addressing Urban Heat Island and Climatic Change Impact** • Total expected yearly carbon emission abatement: 325.22 $kgCO_2e$ ➢ 234.72 $kgCO_2e$ through two PV panels ➢ 90.5 $kgCO_2e$ through vertical green system **3) 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
Biodiversity	**1) Agro-hero: Promoting Green Practices to Communities for Sustainable Agriculture** • Chemical fertiliser usage: 100% reduction • Herbicide usage: 100% reduction • Water savings: >80% • Petrol / diesel usage: 76% reduction **2) 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 **3) The Design and Investigation of a Novel Ecological Air Cleaning and Cooling System using the Concept of a Living Green Wall** • Reduction of air temperature: 2°C • Relative humidity: 10% increase • CO2 level: Reduction by average 140 ppm • Particulate matter PM 2.5: Reduction by 3 $\mu g/m^3$ • Particulate matter PM 10: Reduction by 4 $\mu g/m^3$

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 the researchers.



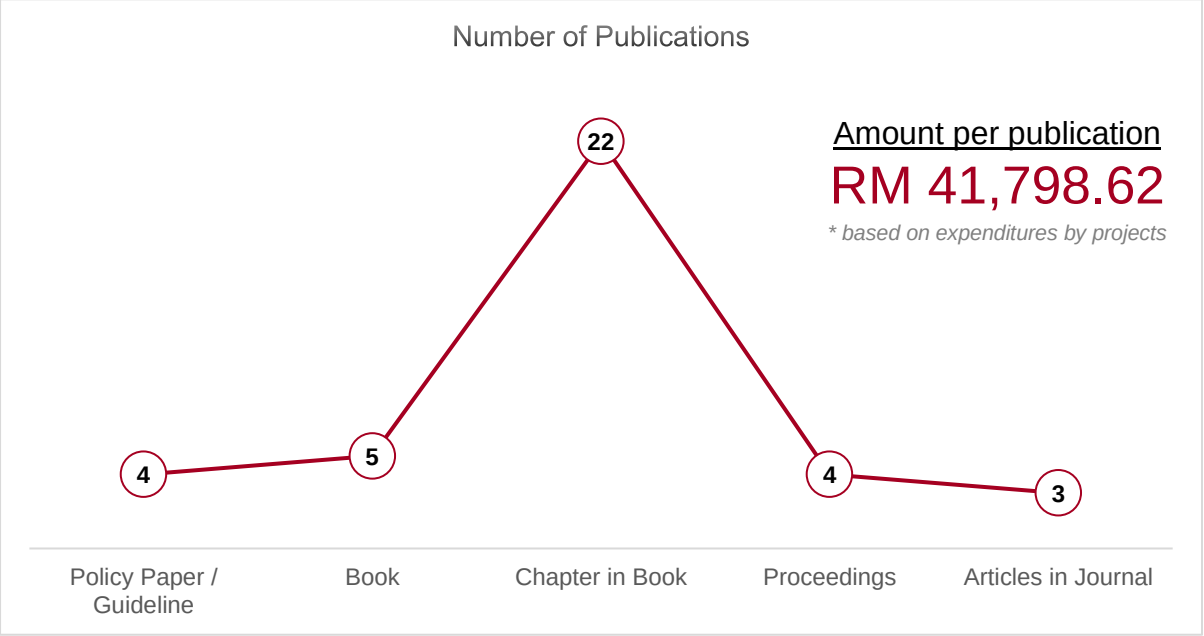
In addition, to encourage innovation, technology, and/or knowledge (ITK) transfers, a series of seminars, workshops, exhibitions, competition, and demonstration has been held or attended by UM Living Lab researchers or their team members/research assistants. Listed below are some of the highlighted activities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

1.	Symposium on Sustainable Development 2017 (SSD 2017)	21-22 April 2017
2.	KEEPABLE Cancer Walk	25 March 2017
3.	University of Malaya Edu-Carnival	17 - 28 March 2017
4.	International Seminar on Islam and Green Technology	16 November 2016
5.	Local Knowledge and Adaptation to Climate Change in RCE Central Semenanjung Area, Fraser's Hill	11 - 12 November 2016
6.	International Forum on Inclusive Wealth	8 October 2016
7.	Invention, Innovation and Design Exposition 2016	20 - 23 September 2016
8.	19th SME Annual Showcase (SMIDEX16)	17 - 19 May 2016
9.	UM Living Lab Open Day by Water Warriors, UM Zero Waste Campaign and The Rimba Project	23 April 2016

UM LIVING LAB GRANT PROGRAMME

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	
Policy Paper / Guideline / Standard	1. The Rimba Project Greening Roundtable 2. UM Development Checklist 3. UM Food Waste Management Policy and Guideline 4. An Introduction to Aquaponics
Book	1. UM Eco-Campus Blueprint Publisher: Sustainability Science Research Cluster ISBN: 978-983-100-910-9 2. *Pelan Pembangunan Eko-kampus Universiti Malaya* Publisher: Sustainability Science Research Cluster ISBN: 978-983-100-909-3 3. The Backyard Before You. 1st Edition. The Rimba Project Publisher: The Rimba Project ISBN: 978-967-0380-82-7 4. UM Living Labs (Volume 1) Publisher: Sustainability Science Research Cluster ISBN: in process 5. UM Living Labs (Volume 2) Publisher: Sustainability Science Research Cluster ISBN: in process

List of Publications	
Proceedings	1. 'Imarah Green Project: Surau APIUM as the Catalyst for Advocating Sustainability Practices in University of Malaya. 5-6 December 2016, International Conference on Islam and Contemporary Issues: The Way Forward. Kuala Lumpur, Malaysia. 2. Parametric Analysis of the Thermal Comfort Conditions of Unshaded Courtyards in the Tropical Context of Kuala Lumpur, 26 June 2016, International Conference on Architecture, Landscape and Built Environment (ICALBE 2016). Kuala Lumpur, Malaysia 3. Examining the Thermal Performance Characteristics of Outdoor Spaces in the Tropical Context of Kuala Lumpur, 25-26 June 2016, International Conference on Urban Design and Cities Planning (ICUDCP 2016). Kuala Lumpur, Malaysia. 4. The Rimba Project: Integrating Urban Biodiversity Conservation, Education, and Outreach into the Campus Sustainability Movement. 7-9 April 2016, 3rd Regional Conference on Campus Sustainability 2016. Manila, Philippines.
Articles in Journal	1. Aliyu Aliyu Babayo, Mohammad Hossein Anisi, Ihsan Ali. A Review on Energy Management Schemes in Energy Harvesting Wireless Sensor Networks. (2016). Renewable and Sustainable Energy Reviews. (IF=6.79, Q1) *ISI* 2. Alam, Md. S., Jassim, W. A., Ahmad, M. Y., Zilany, M.S.A. (2016). Phoneme classification Using the Auditory Neurogram. IEEE Access. (IF=3.244) Non-*ISI* 3. Loh SY, Jonsson H (2016) Cancer Survivorship Care: A perspective from an Occupational-Participation Approach. J Cancer Sci Ther 8:179-184. doi:10.4172/1948-5956.1000411 Non-*ISI*
Chapter in Book	1. Nik Meriam Sulaiman, Azizan Baharuddin, Noor Zalina Mahmood, Zeeda Fatimah Mohamad, the Swe Jean & Azizi Abu Bakar. (2016). Intercultural Dialogues on Integrated Watershed Management: A Case of JSPS Asian Core Programme. In Munir Shuib & Lie, K. Y. (Eds.), The Role of the University with a Focus on University-Community Engagement. Pulau Pinang, Penerbit Universiti Sains Malaysia. 2. Sumiani Yusoff, Z. X. Keng, Nur Syuhada. (2017). UM Zero Waste Campaign: Integrated and Sustainable Waste Management System Development in University of Malaya. 3. 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). Water Warriors Living Lab: Towards an Integrated Heartware - Hardware – Software Approach to Water Management. 4. Benjamin Ong Jia Ming, Nurul Fitrah Marican, Sugumaran Manickam, & Vanessa Ting Ching Ching. (2017). Urban Biodiversity and The Rimba Project. 5. Mohd Yazed Ahmad. (2017). Smart Modular Electrical Energy Monitoring and Management System. 6. Zul Ilham, Adi Ainurzaman Jamaludin, Nurul Emy Idayu Zulkifli, Muhammad Faizal Kamar, Fathiah Mohamed Zuki and Rohana Jani. (2017). Issues and Challenges in Organizing an Effective Campus Energy Saving Culture. 7. Ali Mohammed Alashwal, Muhammad Azzam Bin Ismail, Karam M. Al-Obaidi, Sharifah Noor Nazim Syed Yahya, Mohammed Hatim Al-Sabahi. (2017). Zero Carbon Building Assessment for UM Chancellery Building and Other UM Office Buildings. 8. Siew Yim, Loh. (2017). Cancer-farm Lifestyle Lab - An Application of a Living Lab Methodology for an Innovative Community Care for Post Treatment Cancer Survivors.

List of Publications	
Chapter in Book	9. Chong Wen Tong, Izdihar Zahirah, Chu Yung Jeh, Wong Kok Hoe, Wang Xiao Hang, Masjuki Hassan, Sumiani Yusoff, and Wang Chin-Tsan. (2017). The Design and Investigation of a Novel Ecological Air Cleaning and Cooling System Using the Concept of a Living Green Wall. 10. Sarinder Kaur Dhillon, Sugumaran Manickam, Halijah Ibrahim, Melasutra Md Dali, Maszairizam Masri. (2017). A Virtual Reality Application on Plants in University of Malaya. 11. 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. 12. 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. 13. Sorayya Malek, Pozi Milow, Halim Sulaiman, and Hui Cham. (2017). University of Malaya Hydrological System (UMH20). 14. 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. 15. Ahmad Saifizul Abdullah, Rahizar Ramli and Farah Fazlinda Mohamad. (2017). Real-time and Automated Traffic Data Inventory and Monitoring System (TDIM). 16. 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. 17. Hussein Adebayo Ibrahim, Soon Poh Yap, Johnson Alengaram, and Kim Hung Mo. (2017). Construction Waste Recycling Center for Sustainable Drainage Construction. 18. Norbani Che-Ha and Saad Md Said. (2017). University of Malaya Zero Food Waste Campaign – A Head Start. 19. Muhamad Shakirin Mispan, Noor Zalina Mahmood, and Mohd Izaham Zainal Abidin. (2017). Agro-hero: Promoting Green Practices to Communities for Sustainable Agriculture. 20. 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. 21. Asmawati Muhamad. (2017). Transforming The Role of Surau Apium for Campus Sustainability Through 'Imarah Green Project. 22. Zul Ilham, Mohd Idham Hakimi and Norzulaani Khalid. (2017). RCE Central Semenanjung: Local Community Sensitivity towards Climate Change Risk Events in Fraser's Hill.

List of Presentations			
Presentations	1.	18 March 2016	Capacity building program to UIA (International Islamic University Malaysia) on composting
	2.	19 March 2016	“Let’s Be A Water Warrior” with Kolej Kediaman Ibnu Sina (KK6) UMCares club (28 participants)
	3.	20 March 2016	Invited speaker at UIA: Talk on Project ReviVaL and Water Conservation (100 participants)
	4.	23 March 2016	Training and demonstration on communal composting at UM ZWC center to SWCorp and several local authorities
	5.	3 April 2016	Seminar and demonstration to University of Nottingham Malaysia on composting
	6.	8 - 10 April 2016	UMCares Tropical Eco Camp – Training of Trainers (40 participants)
	7.	14 April 2016	Capacity building program on composting project at UM ZWC to Politeknik Shah Alam
	8.	23 April 2016	Rimba Ilmu Open Day (100 participants)
	9.	23 April 2016	Talk on Tasek Varsiti during Sustainability Month (60 participants)
	10.	15 May 2016	Seminar and demonstration of composting project at UM ZWC to MUST (Malaysia University of Science & Technology)
	11.	23 May 2016	Presentation to Sudan Delegates (30 participants)
	12.	31 May 201	Global International Indian School Field Trip (120 participants)
	13.	1 June 2016	Environmental education: MRSM Taiping
	14.	14 June 2016	Seminar and demonstration on composting project at UM ZWC center to RCOMM and DBKL LA21
	15.	30 July 2016	Training and capacity building program on Takakura composting to community at Sunway SPK Damansara
	16.	3 August 2016	Environmental education: Faculty of Civil Engineering (23 participants)
	17.	9 August 2016	Presentation to HELP University Environmental Science Club (9 participants)
	18.	13 August 2016	Carolina Community Science Resource Centre (13 participants)
	19.	15 August 2016	Training and capacity building program on Takakura composting to community at Sunway SPK Damansara
	20.	20 August 2016	Guest presentation and awareness talk on sustainable and integrated waste management to all staffs at Maybank CR Day, Maybank Headquartes
	21.	14 September 2016	Philosophy of Sustainability Class (13 participants)
	22.	22 September 2016	Training and capacity building program on Takakura composting to community at Eco Melawati
	23.	26 September 2016	Development of Scientist-Teacher-Student Partnership (STSP) Model to Enhance Secondary Science Learning (30 participants)
	24.	5 October 2016	Environmental education: Faculty of Built Environment (30 participants)

List of Presentations			
Presentations	25.	14 October 2016	Shibata Senior High School Visiting University of Malaya (40 participants)
	26.	21 October 2016	Training and capacity building program on Takakura composting to community at Sunway SPK Damansara
	27.	2 November 2016	Training and capacity building on composting and waste management to students from Faculty Engineering
	28.	11 November 2016	Training and capacity building on integrated waste management to students from Faculty Science
	29.	14 November 2016	Training and capacity building on composting to students from Faculty Built Environment
	30.	19 November 2016	Pharma Co' Recreational Club (25 participants)
	31.	23 November 2016	Training and capacity building on composting and waste management to students from Faculty Engineering
	32.	26 November 2016	Training and capacity building program on waste management and composting to Keepable Cancer Club
	33.	26 November 2016	Briefing and capacity building on composting project to students from Heriot-Watt university
	34.	14 December 2016	Training program (taklimat) on food waste segregation at source to IPS, UM
	35.	4 January 2017	Tokuyama High School (30 participants)
	36.	24 January 2017	Training and capacity building on integrated waste management to AIESEC international exchange students

UM LIVING LAB GRANT PROGRAMME

NETWORKINGS & LINKAGES

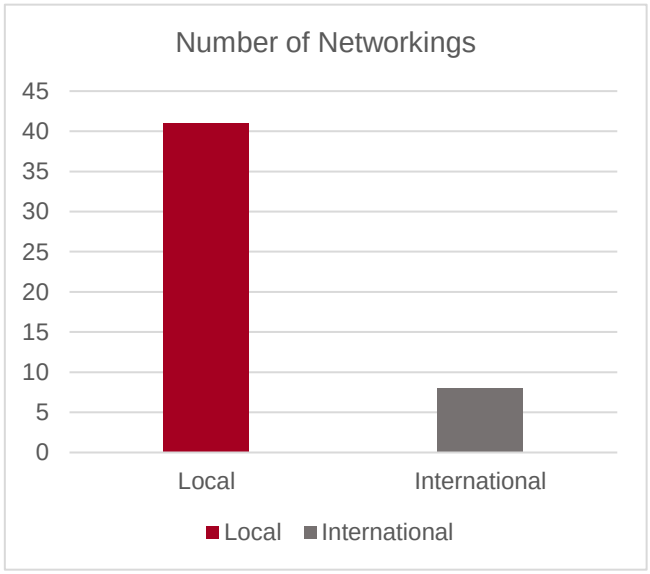
INTERNATIONAL NETWORKINGS:

1. International Lake Environment Committee (ILEC)
2. Japan International Cooperation Agency (JICA)
3. China Machinery Engineering Corporation
4. Dr. Ruth Wood, Manchester University
5. Shiibata High School, Japan
6. RCE Yogyakarta
7. UBUS Technology
8. IEN Consultants

SOME NOTABLE NATIONAL NETWORKINGS:

1. National Hydraulic Research Institute of Malaysia (NAHRIM)
2. Putrajaya Corporation
3. SWCorp Malaysia
4. Pejabat Pertanian Jelebu
5. Majlis Agama Islam Wilayah Persekutuan
6. Global Environmental Centre
7. Centre of Excellent for Waste Management (EPIC)
8. Malaysian Green Building Confederation
9. Maybank
10. Ares Technology Sdn Bhd
11. Gigatech Sdn Bhd
12. Global Insignia Sdn Bhd
13. Nadi Putra
14. Malton Sdn Bhd
15. Central Geo Sdn Bhd
16. RCE Iskandar
17. RCE Penang
18. World Wildlife Fund (WWF)
19. Food Aid Foundation

Whether through solemn academic meetings or a much more laidback social events, extending networks is essential while doing research. Networking, linkages, 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.



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 2016, three UM Living Lab programmes were awarded for their innovativeness in research.

Associate Professor Dr. Chong Wen Tong
Faculty of Engineering

Project Title	The Design and Investigation of a Novel Ecological Air Cleaning and Cooling System using the Concept of a Living Green Wall
Principal Investigator	Assoc. Prof. Dr. Chong Wen Tong
Award	Gold Award at Invention, Innovation & Design Exposition 2016 for "Living Green Wall - Ecological Air Cleaning and Cooling System"

Dr. Mohammad Hossein Anisi
Faculty of Computer Science and Information Technology

Project Title	Smart Management of Electrical Appliances and Energy Saving using Internet of Things
Principal Investigator	Dr. Mohammad Hossein Anisi
Award	Bronze Award at Invention, Innovation & Design Exposition 2016 for "Lightweight Localized Energy Management Using Internet of Things"

Dr. Zeeda Fatimah Mohamad
Faculty of Science

Two international recognitions:

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.*

IN MEDIA

// sekitar Pejabat Pentadbiran Alumni

Tasek Varsiti as the Heart of UM

By: Siti Norasiah binti Abd. Kadir
Bachelor of Biomedical Engineering (Alumna 2012)

Tasek Varsiti 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, possible even before University of Malaya's Kuala Lumpur branch began. Those who were around in the earlier days would remember a different lake than what we can see today: the lake was bigger and wider, almost twice its current size, extending until 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 (Sungai Pantai, the river behind Tasek Varsiti is an urban channelized river seen today). In its heyday, students can be seen cheering for their fellow comrades in a 'silly, but fun' duck-catching competition; freshies trains for boat race competitions during orientation week; a floating boat house were built at the lake during convocation week; 'baptism' ceremony awaits newly elected committee members; gotong-royong activity to beautify the lake became norm; lovers meet during sunset to profess their undying love and poems were written to captivate the beauty of lake.

18 titar alumni

// sekitar Pejabat Pentadbiran Alumni

1. Duck versus human in a 'swimming competition'
2. Vice Chancellor Prof. Dato' Dr. Mohd Amin Jalaludin and Mr Sanori Hj Mohd Senang from Sport Centre enjoying a Kayak session
3. Deputy Vice Chancellor, Prof. Dr. Faisal Rafiq was the first person to jump into the lake after the success of Project Revival
4. A paddling ducks
5. A cute duckling swinging life to the lake

However when developments begins at the surrounding areas, it is usually at the expense of its environment. During the construction of Dewan Tunku Chancelor and several residential colleges nearby, the excavation and deposition activities washed a great deal of sediment and rocks into the lake; creating a mud pool that eventually resulted in silting up a big part of the lake. Many other problems also occurred since then: algal blooms, improper drainage system 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 were taken to save the lake. Former Vice Chancellor, Royal Professor Ungku Abdul Aziz Ungku Abdul Hamid initiated a limnology research at the lake, while the late Tan Sri Dr. Abdullah Sanusi Ahmad contributed in beautifying the surrounding landscape by planting a large number of trees.

In 2013, Project ReviVaL (Revive Varsity Lake) was initiated by Deputy Vice Chancellor (Development), Professor Dr. Faisal Rafiq Mahamd Adikan to reinstate the nostalgic beauty of the lake. The project occurred in three phases, RESEARCH (water quality, point and non-point source pollution and documentation) FIXING (dredging, rechannelling of drainage, construction of a new wetlands system and the introduction of ground water as the new source of water intake) and LIFE (introduction of local fish species, ducks and geese and the construction of a tree house and a mini jetty). 20 November 2014 was a momentous day to remember in the history of the lake where the community joins in on a swimming competition at the lake, an indication of good water quality.

Sir David Attenborough was quoted saying that "It seems to me that the natural world is the greatest source of excitement; the greatest source of visual beauty; the greatest source of intellectual interest. It is the greatest source of

so much in life that makes life worth living". At present, there are more than 40 identified plants, 20 identified birds and 26 identified fish that calls the place home. Not forgetting the many other kinds of insects, rodents, reptiles and amphibians that completes and balance the ecosystem there. There are many ways that the lake is being enjoyed by the community: the scenery sets the perfect setting to hold gatherings, students learn how to paddle kayak, joggers break a sweat here, and researchers tests their equipment while nature enthusiast studies about the wildlife.

Water Warriors is a living lab project. We dream of turning Tasek Varsiti into a sustainable lake with an open classroom concept where the community can participate in citizen science and environmental education. Do you have any funny, weird, happy or tear-jerking memories at the lake? Share your stories with us; we'd love to hear from you: umwaterwarriors@gmail.com

titar alumni 19

JUL
12

TASIK VARSITY - THE HEART OF UM

Tasik Varsiti is an urban lake in a park that is smacked 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 Canselor 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

Kutip 600kg sampah dalam tempoh dua jam

ARZIANA MOHM AD AZAMAN
29 SEPTEMBER 2016

Lambakan sampah memenuhi Sungai Selangor sekali gus menjejaskan kawasan tumpuan pelancong di Kampung Kuantan.

KUALA SELANGOR – Penguatkuasaan undang-undang terhadap individu yang membuang sampah ke dalam sungai perlu diperketat bagi menyelesaikan isu pencemaran sungai yang tiada kesudahan di Sungai Selangor.

Kuala Lumpur: Tidak sampai 10 peratus tapak pelupusan sanitari mesra alam yang selamat terdapat di negara ini yang mana memerlukan pemantauan ketat dilakukan sepanjang masa.

Pakar Pengurusan Sisa Pepejal Universiti Malaya (UM) Dr Sumiani Yusoff berkata, pemantauan dan penguatkuasaan perlu diadakan secara teratur bagi mengelakkan kewujudan tapak pelupusan sampah haram.

"Tindakan ini perlu bagi jangka masa panjang untuk mengelakkan impak negatif seperti pencemaran sumber air oleh leachate (resapan air tercemar) yang hanya akan dirasai penduduk sekitar untuk tempoh berpuluh-puluh tahun selepas itu.

"Begitu juga risiko penyakit dan bau. Keadaan ini diburukkan lagi dengan kurang 10 peratus tapak pelupusan sanitari mesra alam yang selamat," katanya.

Beliau berkata, tapak pelupusan sampah yang sanitari mempunyai pengurusan pencemaran, gas dan radiasi yang terancang.

"Sebab itu, masyarakat perlu mengubah sikap untuk mengelakkan pembuangan sampah dalam kuantiti banyak.

"Jumlah sampah seperti makanan dan organik yang dibuang setiap hari sangat membimbangkan.

"Jika tidak dikumpulkan dengan baik, ia akan terlerai dengan alam sekitar seterusnya melepaskan gas rumah hijau.

"Keadaan ini sebenarnya serius kerana risiko pembebasan gas metana secara pasif melalui proses pereputan sampah di tapak pelupusan dalam tempoh tertentu.

"Gas metana menyebabkan 25 kali risiko pemanasan global berbanding karbon dioksida (CO_2)," katanya.

Tinjauan Harian Metro ke Tapak Pelupusan Sanitari Bukit Tagar mendapati tapak pelupusan itu antara lain, mempunyai tapak lapisan dasar daripada plastik berkualiti tinggi yang menghalang leachate daripada meresap ke sumber air bawah tanah.

Artikel ini disiarkan pada : Sabtu, 5 November 2016 @ 10:03 AM

Star Metro CENTRAL
WEDNESDAY 26 APRIL 2017

Piling it on: A Universiti Malaya worker tossing a compost heap. As part of its Zero Waste Campaign, UM gathers food waste together with garden waste to create high quality composts. — Photos: ART CHEN/The Star

Don't let it go to waste

Experts are urging the authorities to stop sending food waste to the country's landfills and convert it to compost, enzymes and biogas instead. >2&3

Recycle food waste for environment's sake

Experts say it is not degradable and produces harmful greenhouse gases as well as polluting leachate

Kong (left) and Dr Sumiani inspecting compost made at the university which are sold for RM5 per bag.

ing food waste in the country was extremely low.

"There is a lack of household composting.

"The slightly larger scale of food composting would be the ones done at industrial or commercial areas.

"Bear in mind, there is also the sensitive issue of halal when food type is concerned if it is to be done in a large scale.

"The final outcome of the composting will be questionable. It is important to control waste from source," he said.

"Some households stop composting food waste when they are faced with problems such as bad smell, maggots or lack of space," he said.

Dr Theng said many councils' community-based food composting failed due to problems with logistics, the technology used, waste input, the source, and importantly failure to identify the final buyer of the compost.

"Numerous community food composting centres were launched in the country but failed soon after.

"It requires commitment from many sectors especially the council for it to be successful," he said.

Dr Theng estimated about 5% of players from the food and beverage industry carried out their own food waste recycling.

Intelligent recycling centre among UM's initiatives for Earth Day

By SHEILA SRI PRIYA
sheilasripriya@thestar.com.my

UNIVERSITI Malaya launched its first Intelligent Recycle Centre, which dispenses coupons that can be redeemed for rewards.

Green Carpark and Community Green Roof Garden were among the other green initiatives launched by the Universiti Malaya (UM) Sustainability Science Research Cluster in conjunction with International Earth Day.

Universiti Malaya Sustainability Science Research Cluster dean Assoc Prof Dr Sumiani Yusoff said it was important to integrate innovation of technology and green initiatives, as well as execute actual problem-solving plans.

"Recycling has to be appealing and infrastructure development is a crucial aspect," she said.

Dr Sumiani said UM was able to recycle 20% of the waste generated on campus and this was encouraging.

"The national recycling rate is about 11% and we have surpassed the national average within the campus. Our target is for UM to reach a 60% recycling rate, which is the recycling rate in developed countries," she said at the launch of the UM Intelligent Recycle Centre.

Universiti Malaya Development Deputy Vice-Chancellor Prof Dr Faisal Rafiq Mahamd Adika (left) and Dr Noorsaadah launching the UM Intelligent Recycle Centre at Pusat Asasi Sains.

At the Intelligent Recycle Centre, students and university visitors are able to discard newspapers, aluminium cans and plastic bottles and receive reward points.

The centre is located at UM's Pusat Asasi Sains.

The points vary based on the type of recyclable item. Once a certain number of points are accumulated, they can be redeemed for items such as compost, food discounts at selected canteens on campus and T-shirts.

Meanwhile, the Green Carpark project relies on sunlight coming through the carpark's covered rooftop which generates energy to water plants.

Built Environment Faculty lecturer Dr Noor Suzaini Mohd Zaid said the project aimed to reduce impact of urban heat island in UM by generating clean renewable energy via the solar system and increase the capacity of campus carbon sequestration through the vertical greenery system.

The Community Green Roof project consists of 70 edible plant species grown on seven different planter boxes.

The idea behind the rooftop garden is to introduce community gardening, including a good design that will benefit from proper use of water and soil.

Besides creating a beautiful atmosphere with healthy plants, the garden will encourage participants to recycle food and garden waste into compost.

There are seven beds consisting of plants with different water level needs.

Among them is the medicine bed, which consists of plants with medicinal properties such as *orthosiphon aristatus*, which is better known locally as *misai kucing*.

The event was launched by the Universiti Malaya Research and Innovation deputy vice-chancellor Prof Dr Noorsaadah Abd Rahman, who called for more research on the benefits of Community Green Roof.

KUALA LUMPUR

By SHEILA SRI PRIYA
sheilasripriya@thestar.com.my

Recycle food waste for environment's sake

Experts say it is not degradable and produces harmful greenhouse gases as well as polluting leachate

IT'S A shame that food is the largest segment of waste discarded in landfills, comprising more than 30% of the total waste.

Food waste has great potential to be turned into compost, enzyme and biogas, but it is not popular in Malaysia.

Among the deterrent factors for food composting are operational costs, the absence of a government policy on food waste separation for composting or biogas, and cheap landfill tipping fees.

Universiti Malaya Civil Engineering Department Associate Professor Dr Sumiani Yusoff said disposal of food waste in landfills causes pollution such as the release of greenhouse gases and leachate that seeps into the ground.

"The public should be worried as greenhouse gases lead to climate change.

"The increase or decrease in temperature can temper growth of crops, sea life and the food chain.

"People have this false perception that food waste is degradable and continue discarding it.

"However, when food is trapped in the landfill it produces gases such as methane that are harmful to the environment.

"Most of our landfills are unsanitary and leachate from the food will seep into the ground and contaminate our rivers and groundwater," said Sumiani.

She added that it is not true that it is cheaper to dump waste at landfills compared to composting.

"It costs hundreds of millions of ringgit to treat the landfill as it emits greenhouse gases.

"The land cannot be used for many years for any purpose," she said, adding the land will minimally useful even after it is treated.

The country will be able to solve 50% of its waste problem if food waste is taken as seriously as plastic waste, said Sumiani.

Waste management specialist Dr Theng Lee Chong said food waste can be categorised into food residue, kitchen waste from meal preparation, as well as unconsumed and expired food.

Workers at Universiti Malaya piling up food and garden waste on top of a compost heap.

A close-up of food waste mixed with garden waste which will be turned into compost.

He said the practice of composting food waste in the country is extremely low.

"There is a lack of household composting.

"The slightly larger scale of food composting would be the ones done in industrial or commercial areas.

"Bear in mind, there is also the sensitive issue of halal when food type is concerned if it is to be done on a large scale.

"The final outcome of the compost will be questionable. It is important to control waste from the source," he said.

"Some households stop composting food waste when they are faced with problems such as bad smells, maggots or lack of space," he said.

Theng said many community-based food composting initiatives organised by local councils fail due to problems with logistics, the technology used, waste input, and failure to identify the final buyer of the compost.

"Numerous community food composting centres were launched in the country but failed soon after.

"It requires commitment from many sectors especially the council for it to be successful," Theng said.

He estimates about 5% of organisations from the food and beverage industry carry out their own food waste recycling.

However, food waste comprises 70% of the waste that is eventually buried in landfills as the rest is removed for recycling.

"There may be a economic returns from recycling certain items but it is important to recycle food waste for the sake of the environment," he said.

Food composting in Universiti Malaya

In 2009, a group of final year undergraduates from Universiti Malaya's Environment Engineering started a food waste composting project called the UM Zero Waste Campaign.

Since its inception, about 400kg of compost has been produced every month with more than 230 tonnes of organic food waste compost produced since 2012.

> TURN TO PAGE 1

Towards zero food waste in Rawang

Pilot project using 'phoenix worms' kicks off in Bandar Country Homes

story by
STUART MICHAEL
stuart@thestar.com.my

A young boy (centre) appears fascinated as he watches black soldier fly larvae known as 'phoenix worms' devour chicken carcass placed in a tray during the launch of the Zero Waste project at the Bandar Country Homes wet market.

IN AN effort to reduce food waste thrown at dumpsites in Selangor, Selayang Municipal Council (MPS) together with local community leaders and Universiti Malaya have embarked on a pilot project to encourage traders to separate food waste.

The Zero Waste project, which is part of the Clean and Green campaign in Bandar Country Homes Rawang, was launched by Rawang assemblyman Gan Pei Nei, who presented 50 garbage bins to food stall operators in Bandar Country Homes wet market as well as restaurant operators.

The project was initiated by MPS councillor Gunarajah R. George and supervised by Zero Waste project manager Keng Zi Xiang, who is from Universiti Malaya, and Persatuan Alam Sekitar Akar Harapan pro-tem chairman Tet Wong.

Under the project, traders have to place food waste in the garbage bins provided by MPS and the waste would be broken down naturally by the larvae of black soldier flies.

During the launch, attendees were shown what the larvae – called "phoenix worms" – looked like and that they were different from the ordinary house fly.

Tet Wong said his team would collect the food waste either daily or every two days from the market or restaurants, and place it at an open area at the former illegal dumping ground near Bandar Country Homes.

"We leave it there in the open. Surprisingly, it will not smell as the maggots will do their job.

"These maggots can devour any carcass within 24 hours. The maggots can then be collected and fed to fish and chicken or to supplement animal feed.

"The food waste can also be turned into compost and fertiliser to be used for plants," he said.

Keng, who is monitoring the project, said the country produced 33,000 tonnes of waste daily and 90% of this went to the landfill.

"About half of this are food waste that can be turned into fertiliser and animal feed.

"In numerous other countries, food waste is banned from being dumped into the landfills as it can cause environmental damage especially if it pollutes rivers," he said.

MPS Waste Management and Health Department director Hairudin Daud hoped that once the pilot project was successful, it could be introduced throughout the entire Selayang constituency.

Gunarajah said this new initiative took a lot of manpower and coordination, and thankfully residents and charity organisations were committed in looking at ways to preserve nature and not damage the environment.

"As a resident in Bandar Country Homes, I am doing my part and encouraging people to save the environment and recycle in any way they can.

"I hope this project can also be done in households throughout the municipality," he said.

Gan said about 40% of the MPS budget was used for garbage disposal in the constituency where every RM1 that MPS collects, 40sen was for waste disposal.

"This is a very high percentage and something like this project should be done to ensure our landfills in Bukit Tagar will not be filled up too soon.

"And the way to start this is by separating our rubbish," she said.

Restaurant and food stall operators queuing up to register before receiving the food waste disposal bins.

UM manages its waste so that less is sent to landfills.

Aiming for zero waste

By TAN CHENG LI
star2green@thestar.com.my

WITH populations that run into the thousands, each university campus is a community in itself, generating as much trash as say, a village.

Their discards can be anything from five to eight tonnes a day, according to Dr Sumiani Yusoff, a solid waste management scientist at Universiti Malaya.

With there being 20 public universities and 200 private ones in the country, she estimates that the trash from these academic institutions amount to some 1,500 tonnes a day.

"They generate between 5% and 10% of the country's total waste. And almost all are dumped into landfills," says the associate professor in the department of civil engineering.

"The country now produces 33,000 tonnes of waste each day. It's a pertinent issue that needs to be settled. We cannot rely on the Government ... we should also take stock and do something about it."

And that is the push behind UM's Zero Waste Campaign. The scheme started out as a final year project on recycling by students in the environmental engineering department in 2009 and expanded to include segregation of food and garden wastes for composting.

In late 2010, it grew into the ambitious Zero Waste Campaign (ZWC) with funding from CIMB Foundation. Today, aside from recycling the usual paper, plastics and metals, wastes such as food scraps, garden trimmings, textiles, electronics and wood are also diverted from landfills.

"Waste management is not just waste treatment. It is complex as it is about managing waste," says Sumiani, principal co-ordinator of the project.

"It entails various aspects such as generation, collection, reuse, recycling and disposal. Waste, if recovered, can be a resource. We should re-look our waste disposal hierarchy. We should first reduce, reuse, recycle, process and finally only landfill if we cannot do anything with it."

Guided by that philosophy, the ZWC team adopted a multi-pronged strategy as the various waste-types have to be dealt with differently. It also collaborates with various private companies to ensure proper handling of the waste after collection from campus grounds. As a start, the placement of recycling bins all over the campus encourages waste separation. The recyclables are collected by janitors and sold to recyclers.

To ensure proper disposal of electronic waste, there is a drop-off bin at the ZWC project site located at the university's waste storage area. Occasionally, special collections and pick-ups are organised for e-waste, which is then recycled by the company T-Pot E & E. The project, however, does not handle hazardous waste such light bulbs and laboratory waste; that is the domain of the UM occupational health unit.

Reusing waste

A key focus of the campaign is organic waste since that forms between 50% to 60% of our total discards. "If we ignore organic waste, we're ignoring the bulk of our waste problem," explains Sumiani.

"Landfills are the biggest source of man-made methane (released when organic waste decomposes). Methane is a potent greenhouse gas. Although its concentration (in the atmosphere) is 200 times lower than that of carbon dioxide, it accounts for 20% of the current warming capacity. If we tackle organic waste, half of our waste problem is already solved. Another 20% to 30% of waste can be recycled. That leaves a small amount which cannot be recycled. Then only can you talk about incineration of the remaining waste."

The 20 food outlets in the UM campus generate some 400kg of food waste daily. To deal with that, in September 2011 the ZWC team started a composting scheme to turn the waste into compost. Cafe operators have to separate their waste; food scraps go into white plastic bags so as to distinguish them from the recyclables and general waste which are put into black bags.

Minimising trash: Garden waste is shredded before being composted together with food waste under Universiti Malaya's Zero Waste Campaign. Photos: AZHAR MAHFOF/The Star

The food waste, together with garden trimmings, are sent to the waste storage area. The waste is piled into heaps and stirred daily to encourage aerobic decomposition by microbes. After four to five weeks, it would have broken down and mature into fertile compost, which is used to enrich the soil. The compost is distributed free to UM communities.

At the site, some organic waste is treated in an anaerobic digester. The UM team is researching the performance of the machine, provided by the company CH Green. This method produces liquid compost and methane.

The volume of the gas, however, is too small for conversion into energy. So, it is merely flared or used as cooking gas by the workers.

Currently, the composting effort can only handle four out of the 10 tonnes of organic waste thrown out each month. The remaining waste still has to go to landfills.

"Nevertheless, through the composting scheme, some four to five Ro-Ro bins (dumpsters) of organic waste are diverted from landfills each month and turned into a resource," says ZWC manager, Jaron Keng. "It also leads to savings in transport costs, fuel and tipping fees as well as non-tangible benefits such as emission reductions and environmental protection."

Until December 2014, over 145,300kg of organic waste has been treated, producing 4,700kg of compost and curbing the emission of 70 tonnes of carbon dioxide equivalent.

Challenges remain, however. The need to purchase the white plastic bags – some 80 bags are given free initially – might deter cafe operators from using them. To counter that, the team plans to seek the help of the university administration to subsidise the bags.

"Continuous campaigning is needed to educate food outlet operators as they change when contracts expire. The waste separation is now voluntary ... some couldn't care less and are not helpful. We hope to get the university to make waste separation a policy," says Sumiani.

The team also tied up with Kris Biofuel to turn used cooking oil into biodiesel, but faces difficulties in collecting the waste. "Cafe operators prefer to sell to recyclers who pay a higher price. We cannot offer a high price as diesel price is low," explains Sumiani.

Saving old clothes

To handle textile waste, the team collaborates with a recycler, Life Line Clothing. The collaboration started a year ago with only two drop-off bins. Now, there are 10 bins all over the campus for people to dispose of their old clothes and household textiles such as curtains and bedsheets.

Old toys, bags and shoes are also accepted. Life Line donates a certain sum (undisclosed) for every kilogramme of waste dropped into the bin, to three charities – the Malaysian

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Mahasiswa dituntut bantu

pulihara alam sekitar

Prof Dr Sumiani Yusoff

Perhebat kesedaran kitar semula

» *PPSPPA, UM usaha beri pengetahuan pengurusan sisa pepejal*

Oleh Wan Nur Faliqha Wan Hazani
Kuala Lumpur

Perbadanan Pengurusan Sisa Pepejal dan Pengurusan Awam (PPSPPA) akan bekerjasama dengan Universiti Malaya (UM) dalam usaha meningkatkan kesedaran dalam kalangan pelajarnya dan masyarakat negara ini terhadap usaha kitar semula.

Menerusi memorandum persefahaman (MoU) yang dimeterai kedua-dua pihak semalam, ia diharap dapat membawa perubahan besar dalam bidang pendidikan dan minda masyarakat terhadap usaha mewujudkan persekitaran yang lestari.

Ketua Pegawai Eksekutif PPSPPA, Datuk Ab Rahim Mohd Nor, berkata usaha kitar semula yang dilaksanakan oleh UM selama ini, berpotensi memberi pengetahuan menyeluruh mengenai pengurusan sisa pepejal.

"Menerusi usaha yang dilakukan oleh UM, pelajar dan masyarakat dapat melihat sendiri bagaimana sisa makanan sebenarnya boleh dikitar semula menjadi bahan yang berguna seperti baja kompos.

"Kerjasama ini juga dapat memberi kesedaran kepada pelajar dan masyarakat mengenai isu pencemaran," katanya selepas merasmikan tapak pengurusan sisa pepejal bersepadu UM, di sini, semalam.

Perluas kerjasama

Yang turut hadir, Naib Canselor UM, Datuk Dr Mohd Amin Jalaludin dan Ketua Setiausaha Kementerian Kesejahteraan Bandar, Perumahan dan Kerajaan Tempatan (KPKT), Datuk Mohammad Mentek

Ab Rahim berkata, selain UM, PPSPPA juga mengadakan MoU sama dengan tujuh lagi universiti awam tempatan bagi tujuan dan dalam perancangan memperluaskan kerjasama itu kepada institusi pengajian tinggi lain.

Sementara itu, penyelidik dari Jabatan Kejuruteraan Sivil UM, Prof Madya Dr Sumiani Yusoff, berkata program kitar semula menerusi Projek VeeCycle di universiti itu bermula sejak 2009.

"Kami bermula dengan dana RM100,000 menerusi program kebajikan Yayasan CIMB. Sebuah kabin disediakan di sini sebagai pusat sumber rujukan dan pameran untuk memberi pendedahan serta kesedaran kepada orang ramai," katanya.

Beliau berkata, melalui projek kitar semula yang dilaksanakan di situ dapat membantu dalam aspek ekonomi menerusi pengurangan kos pengurusan sisa pepejal.

HEALTH

Community awareness and support makes something like cancer a lot less intimidating. Photo: 123rf.com

Home / Health

Community support for cancer patients

MARCH 14, 2016 HEALTH, LIVING, VIEWPOINTS, WELLNESS

BY ASSOC PROF DR LOH SIEW YIM

RELATED ARTICLES

WE Can, I Can is the campaign theme for this year's World Cancer Day (Feb 4), which calls for a more focused community agenda in the fight against cancer.

The month of March is also dedicated to increasing awareness of colorectal