UITM GREEN CENTRE (UGC)

ENVIRONMENTAL SUSTAINABILITY REPORT (ESR)

2021 - 2022

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UiTM Environmental Sustainability Report 2021/2022

The Universiti Teknologi MARA Environmental Sustainability Report (ESR) 2021/2022 is part of the UiTM Green Centre (UGC) deliverables from the ideation of UiTM Greenation Strategic Plan. With the theme “Greening UiTM”; the UiTM ESR 2021 summarizes the overall progress in university and campus sustainability initiatives which aim to be associated with the UGC Core Area – Ui Green Metric (UiGM) and Low Carbon Challenge (LCC) through the year of 2021. This report presents information on sustainable initiatives undertaken by UiTM in its main as well as branch campuses throughout the country. The UiTM community comprehensively visualizes UiTM sustainability endeavors in times of the COVID-19 pandemic crisis and continuously manages it well during the post pandemic. More importantly, the UiTM community has created value through the sustainability perspectives as envisioned via the 17 Sustainable Development Goals (SDGs) and UiTM Strategic Planning 2025. UiTM has sustained and accelerated various initiatives to adapt to these changes. This progress is an opportunity for UiTM to seek thoughtful partners which supportively strategize to learn and co-create innovative planning to solve sustainability challenges in the campus, nation, and global scale.

Message: Vice-Chancellor

Bismillahirrahmanirrahim.

My sincerest congratulations to UiTM Green Centre on the completion of Environmental Sustainability Report (ESR) 2021/2022. The reporting is imperative in showcasing UiTM's commitments to ensuring and promoting eco-friendly practices on campus.

The green initiatives at Universiti Teknologi MARA (UiTM) are continuously implemented at all UiTM campuses. With the goal of becoming a Smart Sustainable Green Campus, UiTM's initiatives are not only focused on the planet and profit but also on creating awareness among individuals ranging from the staff, students, alumni, strategic partners, suppliers, and the community.

The UiTM 2025 Strategic Plan which gears towards becoming a Globally Renowned University will warrant cooperativeness in unleashing full potentials to shape the future. With heightened awareness on environmental issues, higher education is reformed through providing quality education which cultivates skilled and competent manpower whilst reducing inequalities and wastefulness. Such efforts will allow individuals from all walks of life to contribute towards the nation's progress and economic prosperity as outlined in the 17 Sustainable Development Goals (SDGs).

Episode 4 of Coffee Talk with Rozie (CTWR) focused on the topic Global Goals: UiTM at the forefront in Green Initiatives validated the University's concerns and addressed the plan, strategies, and formula in educating Warga UiTM on the importance of green sustainable efforts. Clearly, awareness and cooperation of all UiTM stakeholders are much needed to undertake green initiatives and to ensure its success for the benefit of our future generation. Initiatives and activities conducted now may look like a simple act, but the results will speak for themselves.

Congratulations to all for the noble acts undertaken in making UiTM green campus. Together let us green UiTM!

PROFESSOR DATUK Ts. DR HAJAH ROZIAH MOHD JANOR
Vice-Chancellor, UiTM

Note: Deputy Vice-Chancellor (Development)

Bismillahirrahmanirrahim.

Sustainable and green initiatives have always been at the forefront of Universiti Teknologi MARA's (UiTM) plans in pursuit of delivering continuous value to its stakeholders. The 8th Strategic Theme (Smart Campus) under UiTM 2025 Strategic Plan upholds the sustainability agenda of the university headed by the Development Office. Initiative on 'Smart Campus' is aimed at preserving UiTM visible and sustainable eco-system for the benefit for the entire University community including staff, students, alumni, strategic partners, suppliers, and the surrounding community.

A conducive environment is crucial for successful teaching and learning, working and research activities. As such, the Development Office has laid out six (6) main initiatives in line with the university overall mission. The initiatives are empowering the existing facility management system, strengthening staff capacity, improving PFI management, earning and spending, preserving campus visibility and sustainability and digitizing campus.

Greenation is a theme set by the Development Office as sustainable initiatives are an on-going process and require effort and university's resources. Part of the initiatives undertaken by the Development Office include creating awareness on the energy saving, water consumption, carbon footprint (carpool, paperless, etc.) and not forgetting developing and enhancing special need facilities for the OKU. All these aim at cost reduction and saving of approximately 15% of the university expenditure which can be translated into rewarding the other segment of life or community.

Let continue the momentum – alert, aware and involved towards creating a green, conducive, and sustainable university.

PROFESSOR DATO' Ts. DR HJ. MOHD FOZI ALI
Deputy Vice-Chancellor (Development)

Note: Director UiTM Green Centre

Bismillahirrahmanirrahim.

The establishment of UiTM Green Centre (UGC) or Pusat Hijau UiTM was approved by the MEU meeting in October 2020, under the portfolio of Deputy Vice Chancellor of Development, Universiti Teknologi MARA (UiTM). This initiative is in line with the UiTM 2025 Strategic Plan under the Strategic Theme 8 (Smart Campus) and to uphold the sustainability agenda of the university, community, and the world. UGC operationalization commenced fully in March 2021.

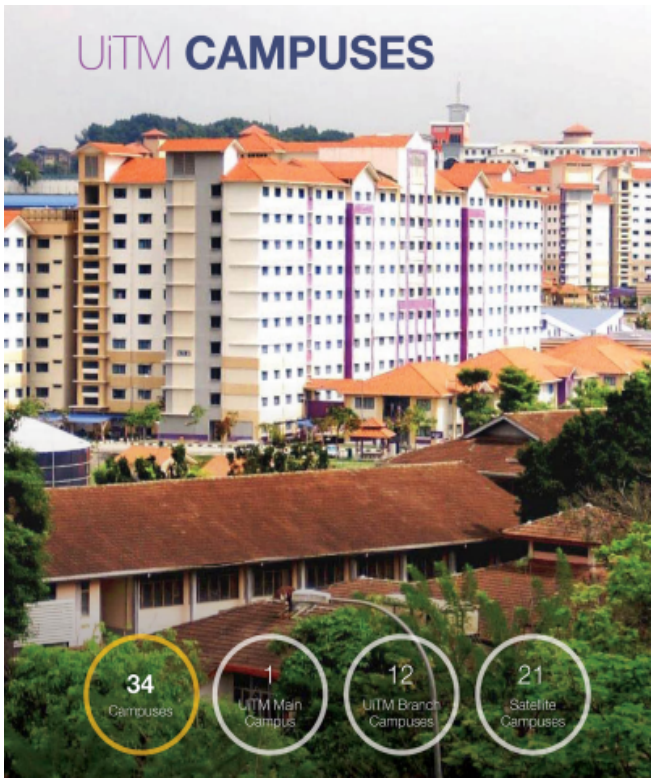
UGC promotes dynamic and diversity in its operations where the key members are appointed among the UiTM community; assisted by Expert Task Force (ETF) across faculties and with multidisciplinary experts who have a strong passion and interest to advocate the sustainable agenda of the university. UGC main function is on spreading awareness and transforming the University system towards Sustainable Green Campus by initiating and coordinating sustainability-related programs/activities. UGC also acts as the data hub, collecting information on any green initiatives/activities among the UiTM community. This year UGC emphasis on three main agenda - Ui Green Metric (UiGM), Low Carbon City Challenge (LCC) 2030 and Green Sustainability Campus Festival which ultimately focus on UiTM efforts on sustainability locally and globally.

The key success factor in greening the university is through optimum cooperation with the university's strategic partners both internally (within faculty, campus, students) and externally (local agencies, alumni, and local community). Both inner drive and smart cooperation will result in a systematic, comprehensive, and impactful program/activity towards greening the university. Such formulas aim towards a greener and healthier lifestyle for human well-being.

ASSOCIATE PROFESSOR DATIN Ts. Gs. DR. ARNIS ASMAT
Director, UiTM Green Centre (UGC)

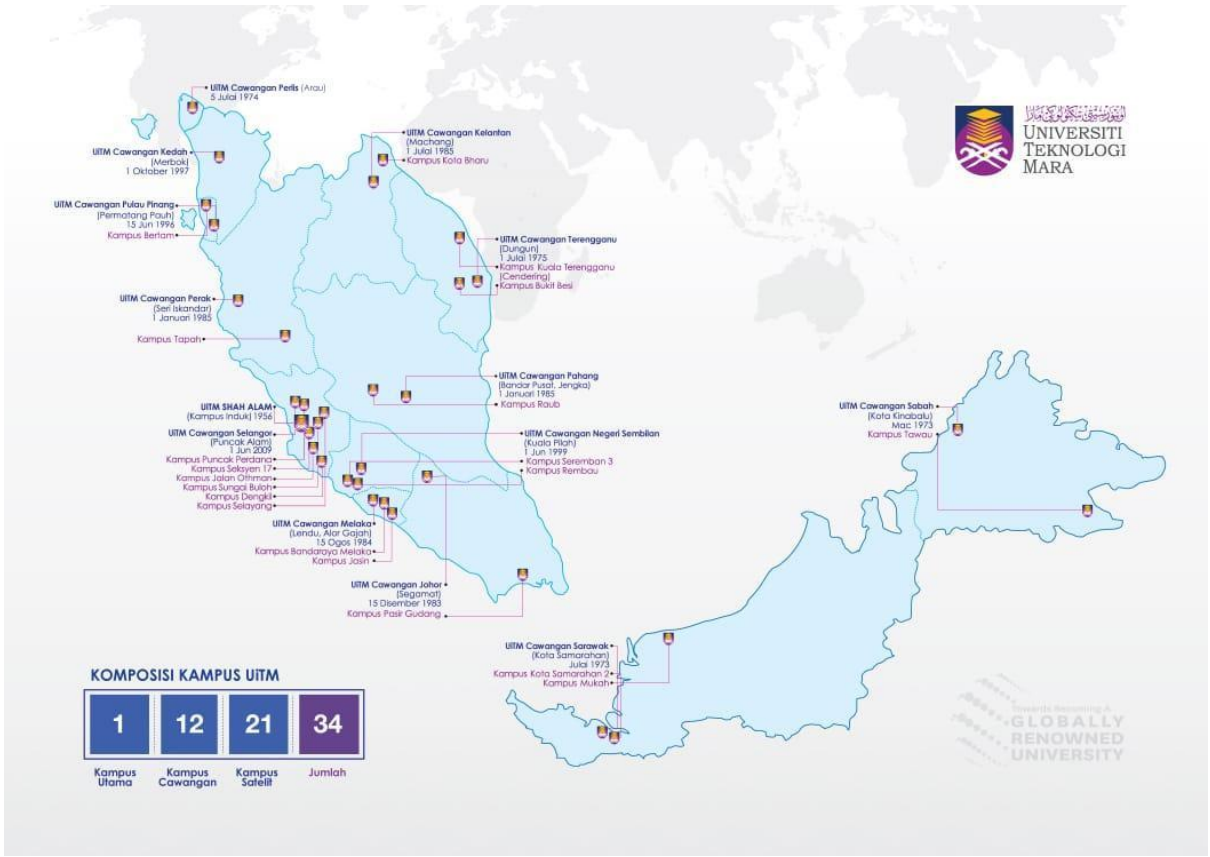
A. Snapshot of UiTM

Universiti Teknologi MARA (UiTM) is the largest comprehensive university in Malaysia that provides innovative education with the latest infrastructure and technology that includes 34 campuses (1 main campus, 12 branch campuses and 21 satellite campuses), 17 faculties, 7 academic centers and 2 study colleges in the whole country.

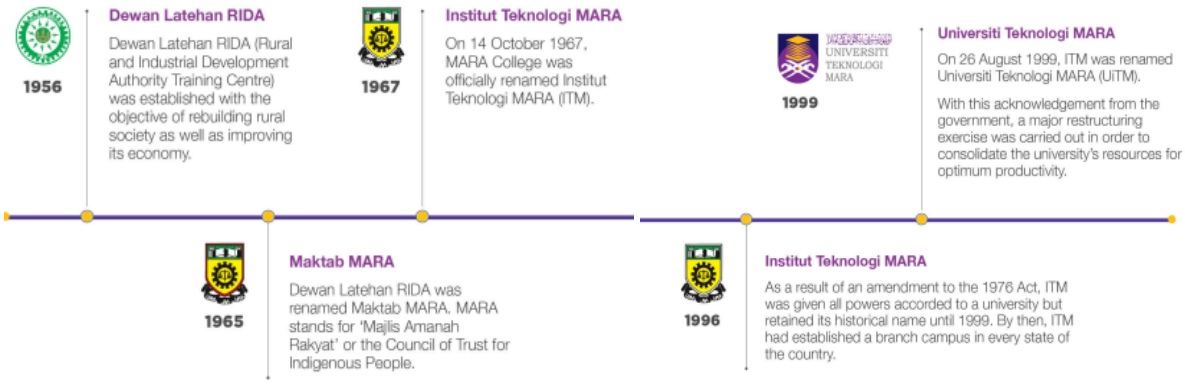


UiTM offers more than 500 academic programs at Foundation, Pre-diploma, Diploma, Bachelor, Master, and PhD levels, as well as Professional Programs. UiTM always expands access to higher education and plays its role in nation building by highlighting potential, shaping the future.

With more than 900,000 alumni in the fields of science, technology, humanities, and entrepreneurship, UiTM offers opportunities in forming leaders at the national, industrial, and global levels in achieving the aspiration of becoming a world-leading university by the year 2025.



UiTM Journey



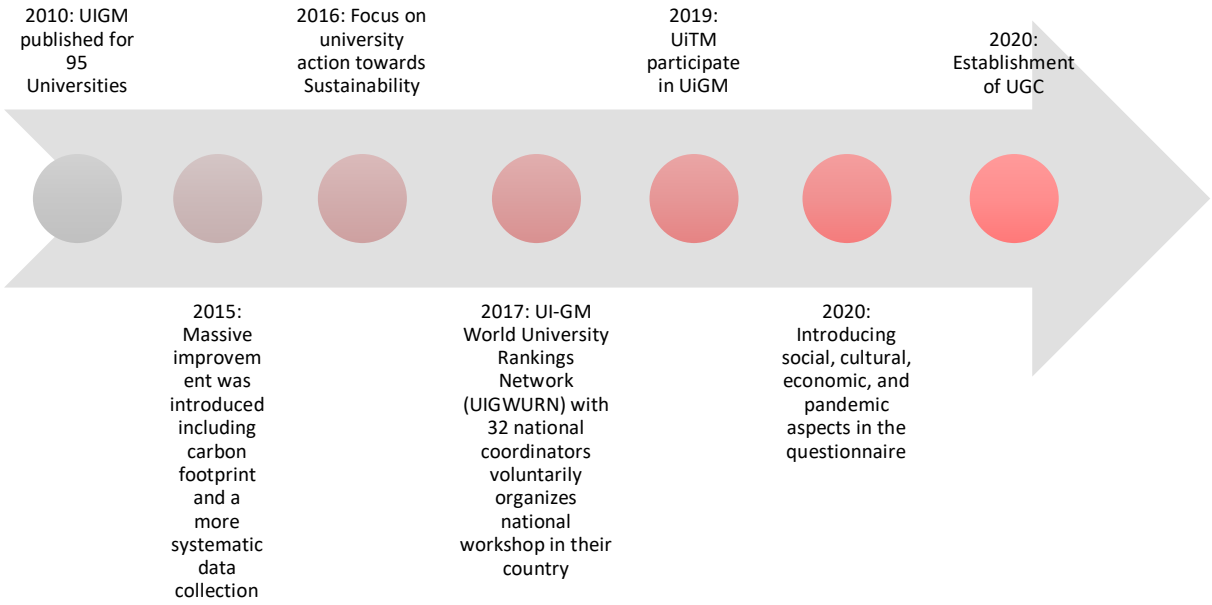
UiTM Fast Fact

UiTM2025
STRATEGIC PLAN

To remain relevant, UiTM needs to be proactive in its response to an ever-changing, evolving national and global landscape.

The strategic plan is based on three (3) strategic thrusts:

UiTM Road to Campus Sustainability



B. Infrastructure & Infostructure Development Office

In line with the University Transformation program, the Development Office, and the Information Technology Office (InfoTech) were merged with the name of the Infrastructure & Infostructure Development Office (*Pejabat Pembangunan Infrastruktur & Infostruktur* in short PPII) in 2016. The Office is headed by Deputy Vice-Chancellor (Development) who reports directly to the Vice Chancellor.

Development Office Governance and Organization Chart

The development office consists of six divisions as shown in Figure B-1 below and the full organization chart is presented in Figure 0-B.

Figure B-1: The six division under the Development Office

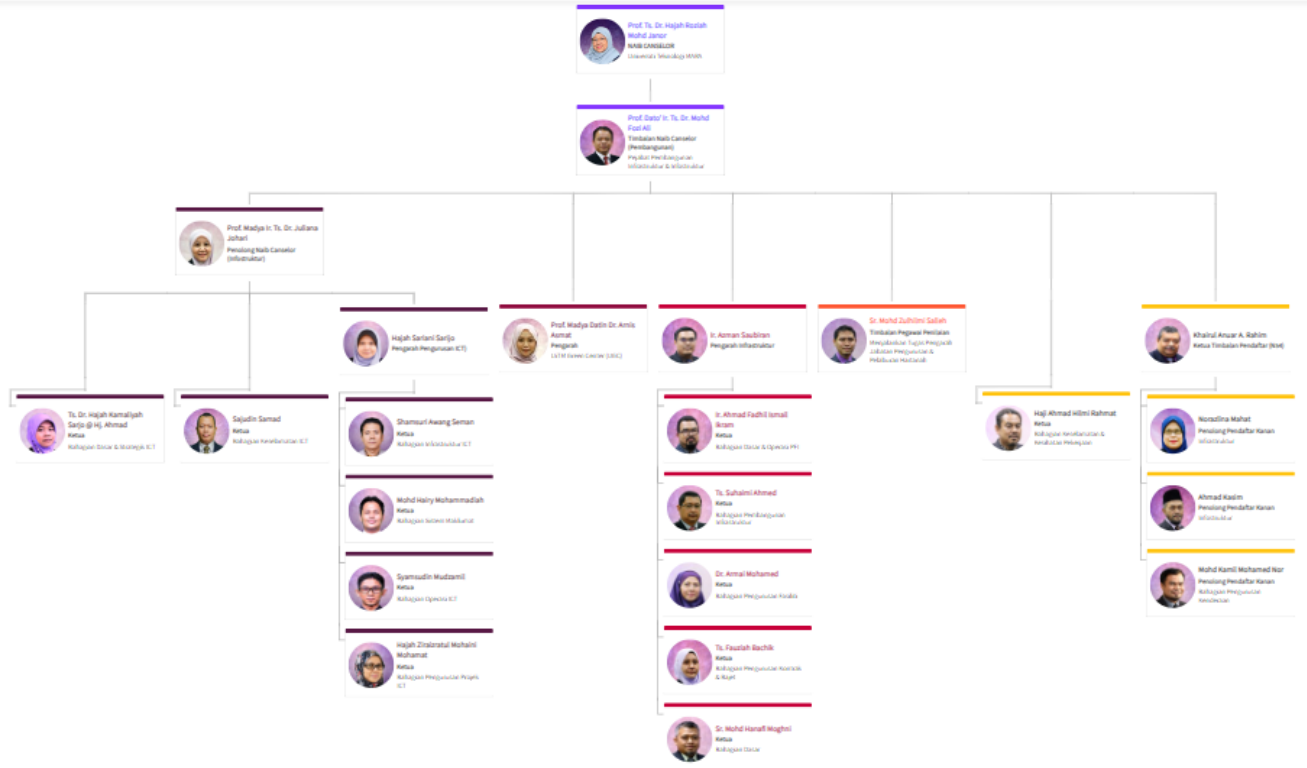


Figure B-2: The organization chart of the Development Office

Development Office at a Glance

The vision, function and initiatives outline by the PPII office are as follows:

VISION

To support the realization of UiTM's vision to make UiTM a world-leading university in the fields of Science, Technology, Humanities and Entrepreneurship.

FUNCTION

Planning and coordinating facility development and management policies
Manage projects carried out through private funding initiatives
Standardization of concession performance monitoring controls in line with the concession agreement
Plan and manage the implementation of building upgrades and facility service management
Plan, manage and maintain the University's Data Center and Disaster Recovery Center

INITIATIVES

empowering the existing facility management system
strengthening staff capacity
improving PFI management
earn and spend
campus visibility and sustainability
digitalizing campus

C. UiTM Green Centre (UGC)

UiTM Green Center (UGC) is parked under the Infrastructure & Infostructure Development Office. The UGC establishment is in line with UiTM's 2020-2025 strategic planning under Strategic Theme 8 (Smart Campus) to support the sustainability agenda at the university, community, and global levels.

UGC Strategic Areas and Focus

UiTM Green Centre (UGC) pledges to promote green initiatives to transform the university into a sustainable green campus through its nine (9) strategic areas and five (5) focus as outlined in Figure C-1 below.

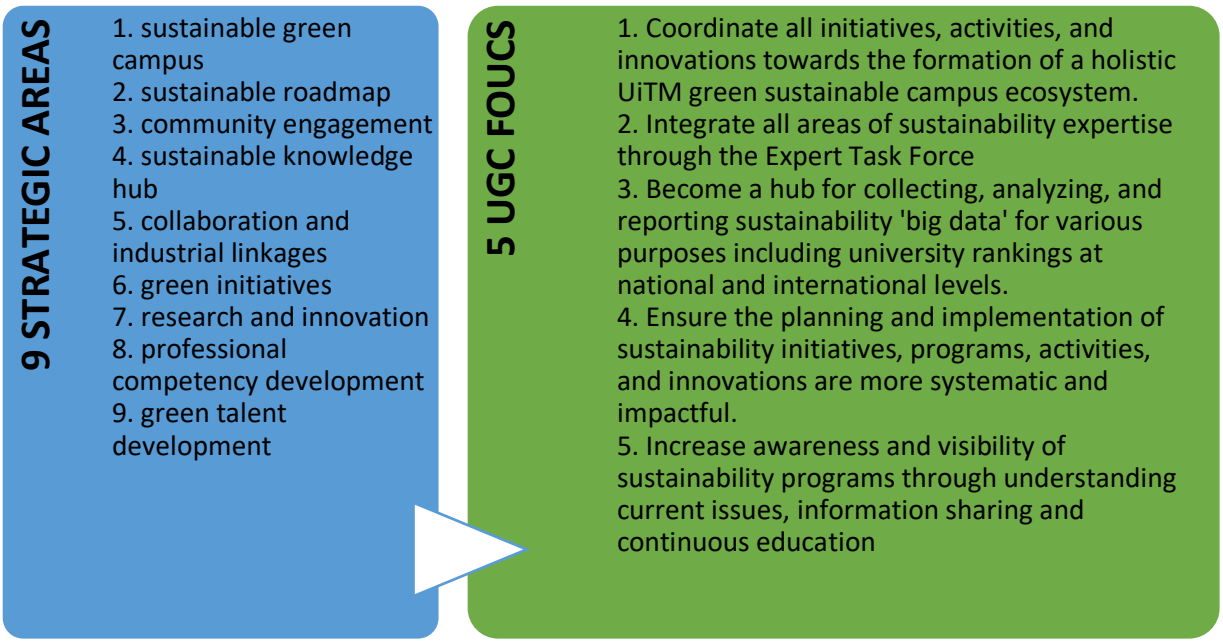


Figure C-1: UGC Strategic Areas and Focus

UGC Team

UGC is led by Associate Professor Datin Ts. Gs. Dr. Arnis Asmat as a Director and Associate Professor Ts. Dr. Khairi Khalid as Deputy Director and assisted by four coordinators, eight fellows and an Executive Officer. UGC also has an Expert Task Force (ETF) to support their project-based programme with the help of Green Marvels which are amongst UiTM students.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UGC Initiatives

UiTM Green Centre (UGC) has implemented and planned many initiatives to be embarked in supporting UiTM to transform into as a sustainable green campus. These projects build upon the work UGC is doing on localizing the Sustainable Development Goals (SDGs) and making the SDGs real to the campus community. Listed below were some initiatives undertaken by UGC so far.


Sustainable Green Campus & Roadmap
Capacity building for low carbon campus
Sustainable waste management in campus
Energy in buildings
Passive and low carbon transportation
Enhance water conservation and practice low-water landscape strategies in campus
Green lifestyle awareness
Community Engagement
Sahabat Sungai Program Pengurusan to clean Sungai Langat, Kg. Kuala Pangson
Sustainable Knowledge Hub
program UGC4Life
#GreenStartsWithYou
Collaboration & Industrial linkages
Kloth Malaysia Sdn Bhd
Aset Air Berhad (PAAB)
Malaysian sustainability network (MySun)
Green talent & Competency
people management policies and activities

GREENING UiTM INITIATIVES

D. Low Carbon City 2030 Challenge (LCC2030C)

The Low Carbon City 2030 Challenge (LCC2030C) main objective is towards reduction of carbon emissions in cities. The LCC 2030 challenges were organized by the Ministry of Environment and Water (KASA) with the theme of creating low carbon zones around Malaysia's major cities. The programme, which has been mandated by the Malaysian Green Technology and Climate Change Center (MGTC), has become the second phase of the Low Carbon City Framework (LCCF) implementation beginning 2019 to 2030. Aspired to implement green and low carbon city practices, UiTM has taken up the LCC2030C to transform the university into a low carbon campus which addresses carbon emissions on energy, waste, water, and greenery with strategic partnership with Majlis Bandaraya Shah Alam (MBSA). Carbon reduction in UiTM is managed by measuring energy, reducing residual and adding green area by planting trees to offset or mitigate carbon emission (also termed net zero emission).

D.1 UiTM Participation

A carbon management plan is underway to enable UiTM to be Malaysia's best Low Carbon Public University Model by 2030, while also striving for carbon-neutrality. It is basically a shift toward maximizing efficiency in energy, water, and waste, generating electricity from renewable sources, reducing wastage and shifting towards protecting existing greenery and planting more trees. With the rapid increase in urbanization, UiTM has the collective responsibility to ensure sustainability for all. Going low carbon now, as many cities have started, will set UiTM on a path towards a more sustainable and prosperous future which is in line with the SDGs agenda. A city-based approach is chosen for the entire campus in UiTM with special projects of performance-based approach for selected buildings. In 2021, the focus was on energy consumption which UiTM zones/buildings have successfully won Diamond Awards in LCC 2030 Challenge. This shows that UiTM has proven its low carbon commitment to reduce 45% emission by 2030 from the baseline in 2015.

Figure E-1: UiTM participation in LCC 2030

D.2 UiTM Achievements 2019 - 2022

The LCC 2030 challenge has changed the UiTM approach to reducing carbon emissions from daily energy consumption, while creating sustainable and better environmental quality, particularly in city areas. In this year's challenge assessment period of 2021, UiTM was able to achieve carbon emissions on energy savings of 13,423.10 CO^2 equivalent to a reduction of 32.85% from the baseline. The initiatives in transforming the University into a Low Carbon Green City are implemented through an energy reduction plan. Leading by example by installing solar PVs, UiTM actively encourages the use of renewable energy and energy efficient lighting fixtures for offices and public facilities and has led by example by installing solar PVs.

Table 1 below indicates the performance of UiTM in LCC 2030C in 2019-2021, showing improvement on the performance and reduction of carbon emission. In realizing UiTM aims, values should be created through the sustainability perspectives as envisioned via the 17 Sustainable Development Goals (SDGs) and UiTM Strategic Planning 2025.

Table E-1: UiTM performance in LCC 2030 Challenge from 2019 to 2021

	2019		2020		2021	
	Carbon Emission	% Reduction	Carbon Emission	% Reduction	Carbon Emission	% Reduction
Seksyen 1/UiTM Shah Alam				38.77		27.31
Chancellery Building	1,109.90	16.97%	791.62	41.75%	735.59	45.87%
Kompleks Kejuruteraan	9,717.40	-37.32%	2,044.29	64.10%	3,376.15	40.71%
Fakulti Sains Komputer & Matematik (FSKM)	1,417.93	23.04%	700.57	62.57%	555.67	70.31%
Fakulti Senibina Perancangan & Ukur (FSPU)	1,167.45	-1.79%	518.79	48.37%	807.34	19.65%
UiTM Health Centre	317.00	-2.48%	264.08	13.97%	254.78	17.00%

This year UiTM continues to record its own history when four (4) of UiTM zones/buildings which is the Bangunan Canseleri Syed Sirajuddin, Fakulti Sains Komputer & Matematik (FSKM), Fakulti Senibina Perancangan & Ukur (FSPU) and Pusat Kesihatan UiTM have successfully won Diamond Awards during the LCC 2030 Challenge. This clearly shows the University's full commitment to continue to strengthen the sustainability agenda in achieving the aspirations of the Sustainable Development Goals (SDG). UiTM transition to support this sustainability agenda can be seen through various green initiatives that have been implemented within the University to help reduce the rate of carbon emissions to the environment and leading towards a Low Carbon Campus. Table E-2 and Figure E-2 below shows the awards presented to UiTM.

Table E-2: List of Awards Presented to UiTM

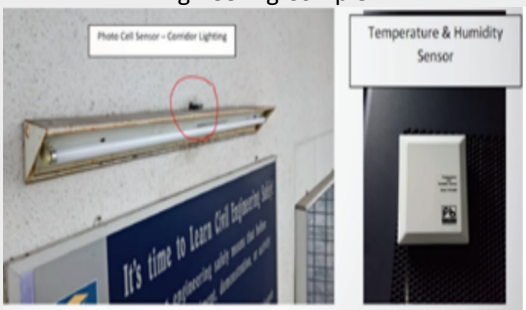
4 Diamond Award	Chancellery Building FSPU Building FSKM Building
3 Diamond Award	UiTM Health Centre

Figure E-2: Award winning ceremony of the LCC 2030 challenge

Strategic planning and action taken by UiTM towards achievement of goals has contributed to the achievement of the awards towards a reduction in carbon emissions for several buildings in UiTM. These include establishing green building designs through a Building Sector Energy Use & Carbon Reporting programme (BECO2R). Specifically, UiTM has designed its strategy by switching to energy efficient appliances, for example, using LED lighting and precision air-conditioner with inverter. Otherwise, renewable energy initiatives such as solar PV and smart building implementation, such as photocell sensors are aimed to be installed in UiTM campuses in Malaysia to support the low carbon cities framework program.

Energy Efficient Appliances being installed in most of buildings in UiTM

Smart building installation of photocell sensor at Engineering Complex



Photovoltaic roof solar panel (20kW) at selected buildings

Figure E-3: Initiatives taken by UiTM to save energy consumption

UiTM always encourages their staff to become certified energy managers so that it can support their aims of having an energy management system. To support all these initiatives and strategies, the Energy Policy is a guideline to ensure all UiTM campuses is following the aims of the University in efficiently managing and measuring the amount of low carbon energy used toward the aspiration to reduce the carbon emission to 45% in 2030.

Figure E-4: Energy Management policy and Energy Management system introduced at UiTM

E. UiTM Green Sustainability Campus

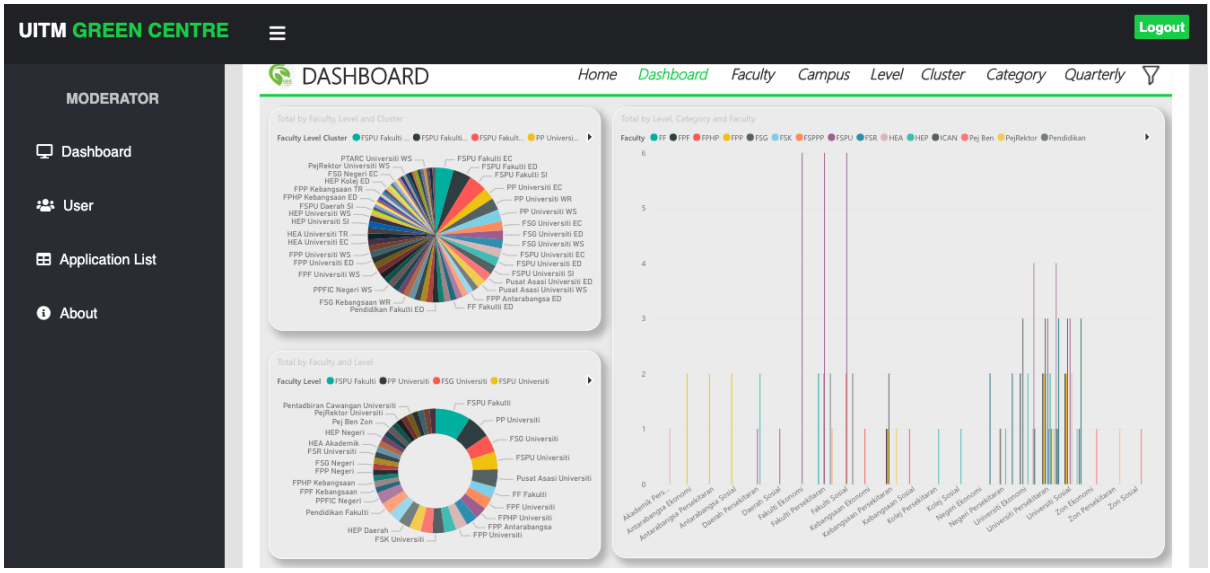
A "green campus" is a place where environmentally friendly and sustainable activities are coupled with education to encourage green living practices on site. The status of green campus is obtained by significantly improving cross-campus community collaboration in one or more of the following areas: settings and infrastructure, energy and climate change, waste, water, transportation, and education. IN 2021, UiTM also participated in Green Campus initiatives through THE establishment of Integrated Sustainable Campus Report “IS-CARE system” and “Festival Kelestarian Kampus Hijau” to support low carbon green city initiatives which are in line with the Sustainable Development Goals (SDGs) – 11 of Sustainable Cities and Communities to create cities and settlements that are inclusive, safe, resilient, and sustainable. These initiatives not only create awareness, but also involve participation from all UiTM communities to reach its mission.

Figure F-1: UiTM Green Sustainability mission for all campuses and PTJ

E.1 ‘IS-CARE’ System

Integrated Sustainable Campus Report UiTM Green Centre (UGC) known as “IS-CARE” is a system developed to report on the activities and performance of UiTM Green Campus initiatives so that it can be measured for a sustainable impact in line with the Sustainable Development Goals (SDGs) and University’s aims toward low carbon cities by 2030. Using the "IS-CARE" platform, the report will then communicate disclosures on an organization's most significant impact, whether positive or negative, and on activities toward a sustainable environment, society, and economy. It is critical for UiTM to recognize the impact of green efforts to measure the strategic plan prior to 2030 with the goals of supporting low carbon emission and the green agenda toward sustainability. The dashboard of the "IS-CARE" system will illustrate visualization tools through descriptive analysis and provide a summary of the project performance carried out by the faculties and branch campuses of UiTM in Malaysia. A comparison of their performance is necessary so that top management can strategize their plan to ensure the performance and aspirations of campuses in UiTM are aligned with the headquarters (HQ), in Shah Alam, Malaysia.

Figure F-2: Dashboard of the 'IS-CARE' System



E.2 Festival Kelestarian Kampus Hijau UiTM 2021

The *Festival Kelestarian Kampus Hijau* UiTM 2021, with the theme "Greener and Healthier Lifestyle," was held with the aim of educating UiTM residents about sustainable and healthy lifestyles. Ultimately, it would cultivate culture and awareness among the community in emphasizing their roles and contribution on the global Sustainable Development Goals (SDG). Several initiatives were launched during the event and are scheduled to support UiTM to become such a sustainable, green campus.

Figure F-3: Festival Kelestarian Kampus Hijau UiTM 2021 with the theme "Greener & Healthier Lifestyle"

The initiatives cover the following themes:

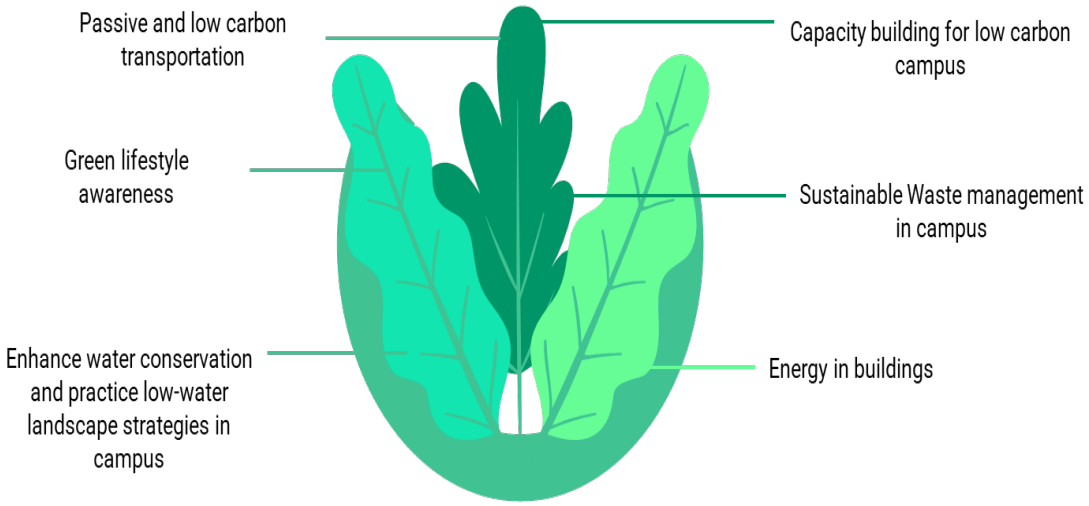


Figure F-4: Initiatives coverage under the theme "Greener & Healthier Lifestyle"

The goal of this year's Festival which took place from 1 November to 24 December 2021, was to raise awareness of UiTM's aim to soon meet the rating requirements for the "Ui-Green Metric World University Ranking" on its 34 campuses throughout the nation. During the festival, the best campus for green implementation was awarded based on the impact measurement of their year-round initiatives. This UI-Green Metric rating is crucial to strengthening UiTM's international brand and becoming a Global Renowned University by 2025. This campus greening programme involved not only UiTM citizens, but also the community surrounding the campus. Starting with “Ikrar Lestari Maya”, several activities were held, including webinars, campaigns, competitions, and exhibitions, among others.

Figure F-5: Ikrar Lestari Maya *2021 event*

Considering that the country was still in the pre-endemic phase in 2021, festival activities were not an impediment to UiTM carrying out the sustainability agenda. Many online activities have been organized, such as webinars, virtual exhibitions, sustainability campaigns, and virtual competitions. These activities involving all citizens in the 36 UiTM campuses aimed to achieve UiTM's goal of bringing the sustainable agenda from the main campus to all UiTM campuses in Malaysia.

Figure F-6: Participation call out to join the festival

Figure F-7: Announcement of the winner of Festival Kelestarian Kampus Hijau 2021

UiTM also took on the challenge of physically organizing activities to ensure the sustainability agenda incude the local community, while adhering to the Ministry of Health's standard operating procedure (SOP).

Figure F-8: Physical activities conducted to increase community awareness on the festival

Activities such as "Sahabat Sungai'' and the recycle, reuse, and reduce programs were organized to make the local community aware of UiTM's commitment on the sustainability agenda and to encourage their participation. It also demonstrated UiTM's visibility in the SDGs 2030 agenda. A total of 40 volunteers from UiTM and the PAAB agency participated in the "Sahabat Sungai'' programme organized by UiTM Green Center (UGC) and Pengurusan Aset Air Berhad (PAAB) in cleaning Sungai Langat, Kg. Kuala Pangsun. The contributions from Sahabat Sungai can come in many forms, including manpower, building materials, mutual aid equipment, or others that can help with related projects. Simultaneously, Sahabat Sungai participants were encouraged to organize a diverse range of activities that will help to enhance the surroundings of the river trail while also promoting its beauty to the local community.

F. UI-Green Metrics (UIGM)

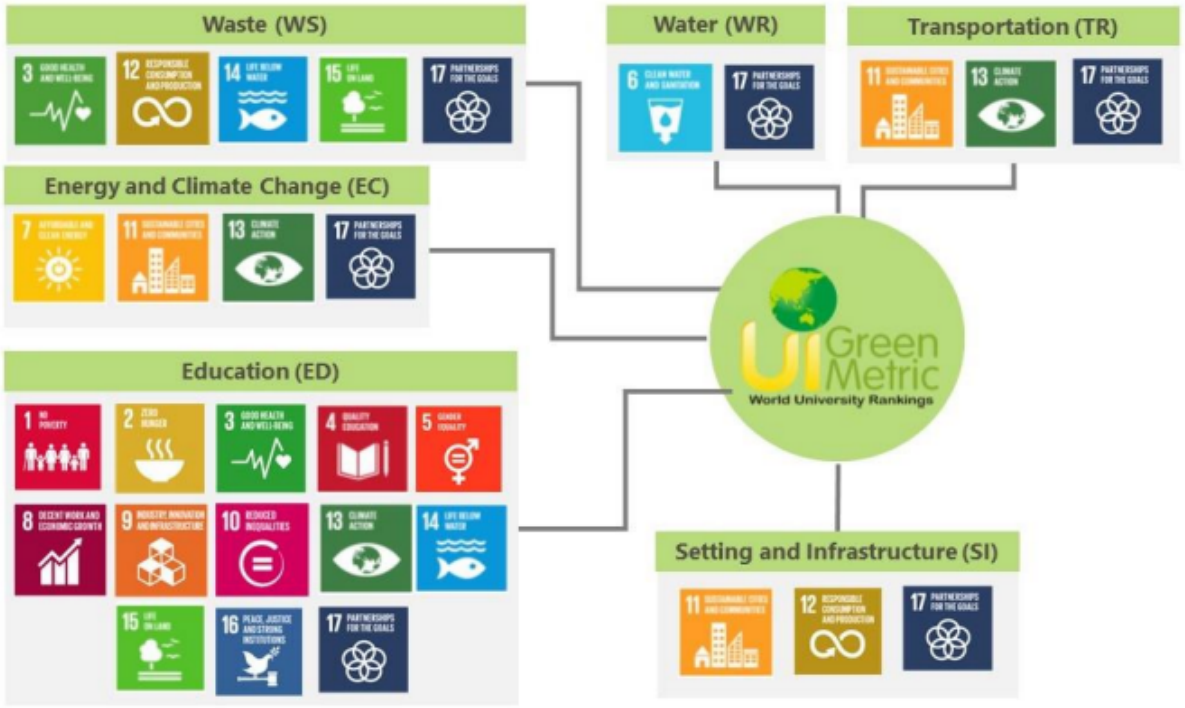
UiTM Green Centre (UGC) has been established to transform UiTM into a sustainable green campus by focusing on six (6) key clusters of Ui-Green Metric (UIGM) University Ranking. They include Setting and Infrastructure (SI), Waste (WS), Water (WR), Energy and Climate Change (EC), Education and Research (ED) and Transportation (TR). The category of UIGM provides the basic guideline on UiTM's commitment towards green and environmental sustainability as each cluster will outline its own specific aim to support the environmental sustainability agenda of UiTM.

UIGM is the measurement of UiTM's efforts towards campus sustainability at the global level. The effort is currently focused on UiTM main campus in Shah Alam. To ensure the effort and idea are accepted, UGC has initiated Festival 'Kelestarian Kampus Hijau' in all branch campuses and faculties with a pledge aspiration towards sustainability headed by UiTM Vice Chancellor.

The UIGM Guideline every year will be announced yearly based on the current setting affecting the higher education landscape as shown below.

UiTM's vision is to be Malaysia's best Low Carbon Public University Model by 2030 and pledges to have a 45% reduction in carbon intensity by 2030 from baseline year 2015. UiTM's mission in this initiative is to incorporate sustainable practices through teaching, learning and research towards development of green talent. UiTM intends to implement green governance that advocates sustainability in managing goal setting, execution, and performance management of UiTM. UiTM is

committed to protecting and enhancing the green campus ecosystem through carbon management. UiTM plans to increase university community linkages and partnerships in achieving the United Nations (UN) 17 Sustainable Development Goals (SDGs).



Source: UiGM

F.1 Overall Achievements

On 6 April 2021, UiTM embarked on its initial participation in the UI-GreenMetric ranking that was introduced in 2010 which specifically measures the campus sustainability and effective environmental management.

UiTM was ranked the 9th Most Sustainable University among 20 other Malaysian IHL listed in UI-Green Metric World University 2020 and listed at 184th from 780 participating universities all over the world. The UIGM World University Ranking is an initiative of Universitas Indonesia which was launched in 2010. As part of its strategy to raise its international standing, the University hosted an International Conference on World University Rankings on 16 April 2009. The aim of this ranking was to provide the result of an online survey pertaining to the current conditions and policies related to the Green Campus and Sustainability among the universities all over the world. It is envisaged that by drawing the attention of university leaders and stakeholders, more attention will be given to combating global climate change, energy and water conservation, waste recycling, and green transportation.

Category	Allocated mark	2019	2020	2021
Setting & Infrastructure	1500	700	750	950
Energy & Climate change	2100	875	875	1000
Waste	1800	1500	1500	1650
Water	1000	1000	1000	1000
Transportation	1800	75	1075	1175
Education & Research	1800	1350	1725	1800
Total score	10000	6175	6925	7575
Ranking in Malaysia		10	9	9
Ranking in World		183	184	150

F.2 Cluster Descriptions

Each cluster is guided by its carter as described below:

Setting and Infrastructure (SI)
To provide the basic information of the university commitment towards green environment through sustainability efforts by providing more space, safeguarding environment, and developing sustainable energy.

Energy & Climate Change (EC)
To synergise efforts in energy efficiency initiatives, energy reduction and low carbon emissions programs as well as providing solutions for climate change issues and develop effective policies to meet the energy standards in protecting nature and energy resources

Water Management (WT)
To promote awareness, water conservation programs, water recycling program, usage of effcient water appliances and the consumption of treated water systems are crucial to alleviate water issues in terms of supply, quality, and sustainability.

Waste Management (WS)
In creating a green campus and sustainable environment, the initiatives include reduction of plastic/paper, processing and recycling of waste, handling of toxic wastes, treatment of organic and inorganic waste, sewage treatment and formulation of waste disposal policy.

Transportation
Transportation provides assistance to economic growth by making accessibility to resources and markets which improves quality of life linking persons to employment, health, education, recreation and other amenities.

Education & Research (ED)
University roles in fostering sustainable development through education, research and practices learning and teaching, organisational governance, culture and operations and leadership

CLUSTER 1.0: Setting and Infrastructure

1.1 Introduction

The primary aim of SI cluster in UGC is to drive UiTM's commitment to a green environment through sustainability efforts to provide more space for greenery in safeguarding the environment. The SI category of UIGM provides the basic information on UiTM's commitment towards green and environmental sustainability. The 11 key indicators of SI category will determine whether UiTM Shah Alam deserves to be called a Green Campus. Thus, through UCG the SI cluster has taken proactive actions and initiatives to increase UiTM's commitment to environmental sustainability by offering additional area for vegetation and environmental protection.

Through its main initiative, SI cluster's Go-Green Landscape strategy aims to increase planted vegetation in UiTM Shah Alam campus to more than 40% by the year 2025 (which is currently at 20 - 30% in 2022). Specific projects include:

Forest Gazette and Green Space Preservation	Conservation and Preservation (Replanting Trees)	Greening and Shading Approach (Horizontal and Vertical)
Smart Tree Planting	River Trail Program	Program Penanaman Sejuta Pokok@UiTM

In addition to meeting the requirements of a Green Campus, UiTM also realized the importance of aligning the aim of SI cluster to the three SDGs shown below.

1.2 Cluster Aim, Functions, Focus Areas, and Indicators

The guidance for the cluster is as per Figure B-1 below.

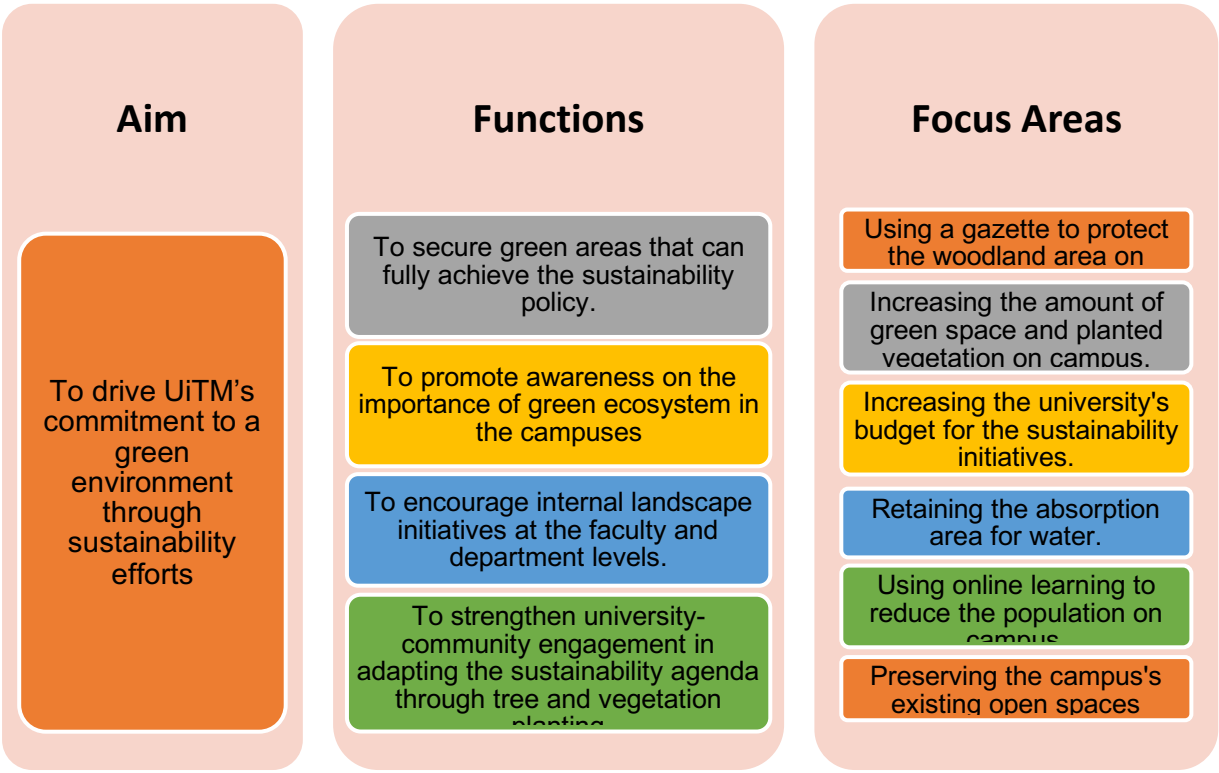


Figure 0-1: The SI Cluster aim, functions, and focus areas

The achievements of SI cluster aim were measured using the specific indicators set by UIGM for SI. For the year 2022, a total of 11 indicators as outlined in Figure 0-2 have been used by UiTM Shah Alam to provide information relating to the setting and infrastructure in being called a Green Campus.

SI1 The ratio of open space area to the total area
SI2 Total area on campus covered in forest vegetation
SI3 Total area on campus covered in planted vegetation
SI4 Total area on campus for water absorption besides the forest and planted vegetation
SI5 The total open space area divided by the total campus population
SI6 Percentage of university budget for sustainability efforts
SI7 Percentage of operation and maintenance activities of building in one year period
SI8 Campus facilities for disabled, special needs, and/or maternity care
SI9 Security and safety facilities
SI10 Health infrastructure facilities for students, academics, and administrative staff's wellbeing
SI11 Conservation: plant (flora), animal (fauna), and wildlife, genetic resources for food and agriculture secured in either medium or long-term conservation facilities

Figure 0-2: The 11 indicators for SI Cluster

1.3 Cluster Projects and Achievements

The following section outlines the projects undertaken by the cluster and its achievement.

1.3.1 Campus Setting

UiTM is a comprehensive public university based primarily in Shah Alam, Malaysia, a country located in a tropical wet climate region. Established in 1956 as RIDA (Rural & Industrial Development Authority) Training Centre (Malay: Dewan Latihan RIDA), it opened to some 50 students with a focus to help the rural Malays. Since that time, it has grown into the largest higher education institution in Malaysia, by physical infrastructure, staff organization (academic and non-academic), and student enrolment.

The university comprises one main campus and 33 campuses over the nation. With 18,347 academic and non-academic staff, UiTM offers over 504 programmes ranging from foundation to postgraduate level. It is home to some 172,659 Bumiputera and international students, in full-time and part-time modes. Teaching is fully conducted in English.

Figure 0-3: UiTM Shah Alam Main Entrance

Figure 0-4: Overall Layout of UiTM Shah Alam

The main campus of UiTM is in Shah Alam. The map depicted in Figure 0-4 clearly shows that Shah Alam is a major developed area in Selangor. This can be attributed to the rapid development and significance of Shah Alam, which was designated as the state capital and thus granted City Status on

October 10, 2000. Shah Alam, with a total area of 290.3 km2, is in the district of Petaling and a portion of the district of Klang in the state of Selangor.

It is bounded in the east by the cities of Subang Jaya and Petaling Jaya, in the west by the district of Klang, in the north by the districts of Kuala Selangor and Selayang, and in the south by the district of Kuala Langat. Due to the Klang River flowing through it on its way westward to the Strait of Malacca, Shah Alam is also one of the major cities within Malaysia's Klang Valley, which includes Kuala Lumpur and its suburbs, as well as adjoining cities and towns in the state of Selangor. Shah Alam's topography is mostly flat, except for a prominent rolling hill in the city's northern part, which is in Klang Valley.

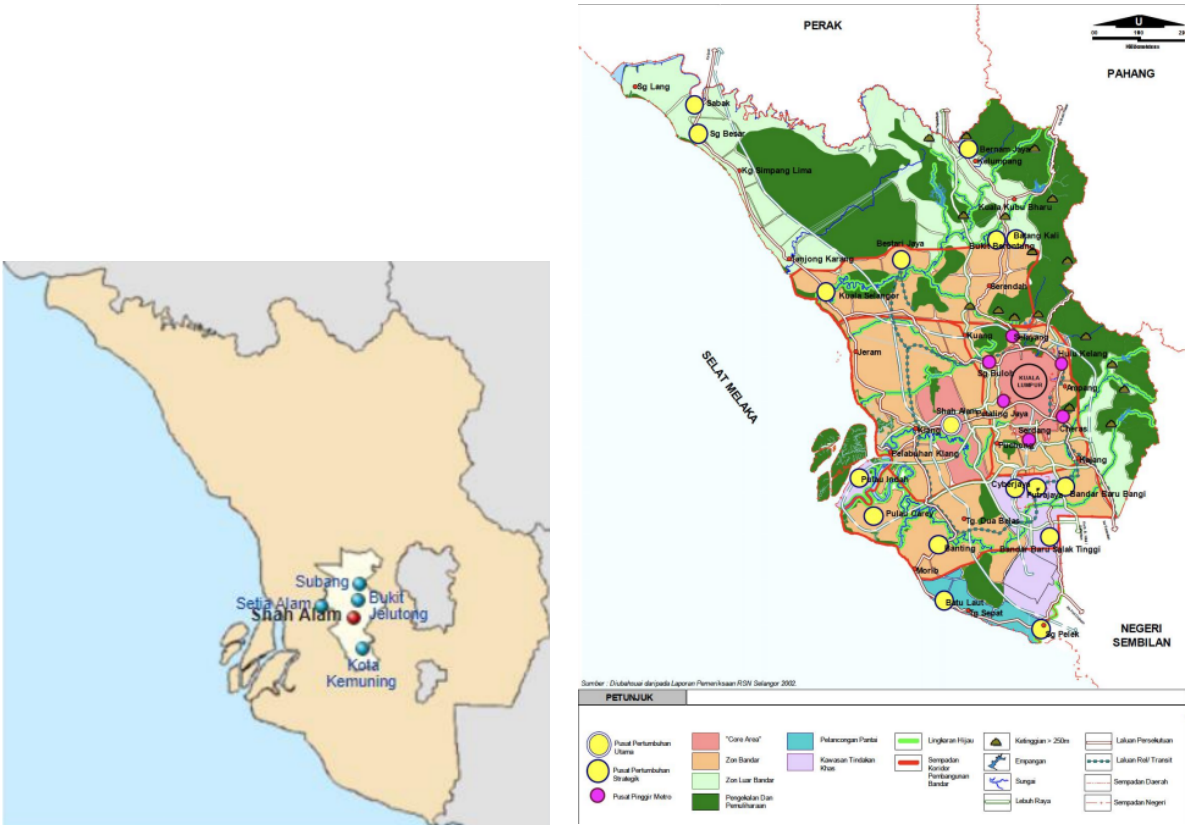
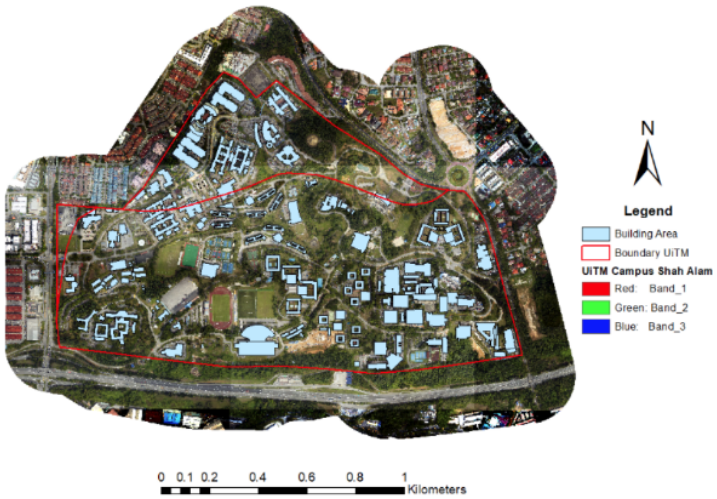


Figure 0-5: Location of Shah Alam in the state of Selangor and Topography of Shah Alam

1.3.2 Campus Area and Buildings Space



UiTM Shah Alam, being the oldest and main campus for the university, is surrounded by greenery and a tranquil environment. This setting offers advantage for UiTM Shah Alam in its aim to be designated as a Green Campus. UiTM Shah Alam campus area covers Lot 51, Lot 52 and Lot 53 with a total of 1,587,464 square meters [m^2].

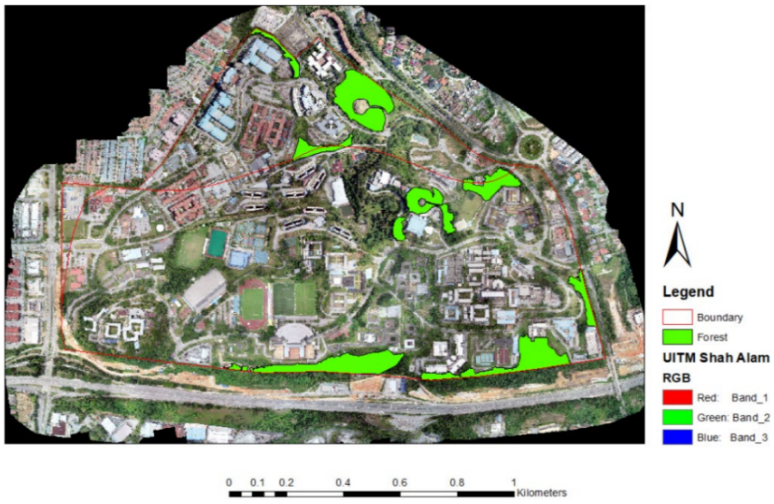
Figure 0-6: Total built up ground floor area in UiTM Shah Alam

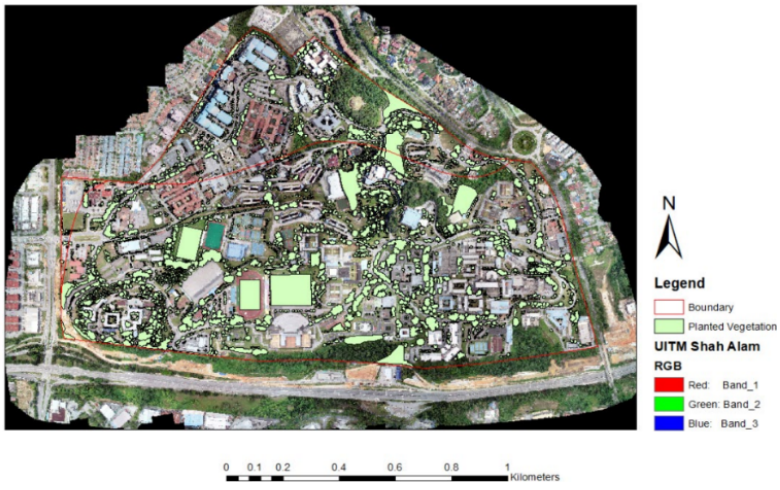
The buildings on UiTM Shah Alam campus are mainly used for providing academic services to the students as well as accommodation. In addition, the buildings are also used for administrative offices, health care, community halls and sports centers. These buildings occupy a total ground floor area of 170,331.07 square meters, and a total buildings area of about 729,683.72 square meters.

The SI 1 indicator of the ratio of open space area to a total campus area is high at 89%, which indicates positive efforts of the university's open space management towards promoting environmental sustainability. This high ratio also serves as an important direction to UiTM to continuously improve its efforts in promoting UiTM Shah Alam as a Green Campus.

1.3.3 Campus Forest, Vegetation and Water Absorption area

The UiTM Shah Alam campus is surrounded by green, especially near parking lots and gathering areas, which creates a pleasant atmosphere and provides natural shade for pedestrians. Water movement is slowed by vegetation, which reduces soil erosion and the number of contaminants entering waterways. Plant roots help to stabilize or lock the ground. The total forest area in UiTM Shah Alam campus is 112, 855.317 square meters. This represents 7.11% of campus area covered by vegetation in the form of forest for 2022. This percentage is like 2021. Thus, indicated that the forest area in the campus which includes natural and planted trees and its biodiversity are continuously given a priority in the context of space management to promote environmental sustainability through forest vegetation.





In addition, UiTM Shah Alam campus area is also covered in planted vegetation in the form of lawns, gardens, green roofs and internal planting. The total area of planted vegetation is 374,712.865 square meters, including a total of 5,134.006 square meters of internal planting. The percentage of the area on campus covered in planted vegetation to the total campus area for 2022 is like 2021 at 23.61%. This indicates more opportunity for UiTM Shah Alam to improve its planted vegetation area

especially with internal planting within the campus buildings and premises. Consequently, help in developing green space on campus that serves both ecological and environmental needs

Figure 0-7: Samples of internal planting in UiTM Shah Alam

There is a total of 934,539.777 square meters of water absorption area in UiTM Shah Alam, which represents 59% of the total campus area. This indicates a large and desirable percentage of water absorption area besides the forest and planted vegetation on the campus area, which are important to sustain green space in the campus area.

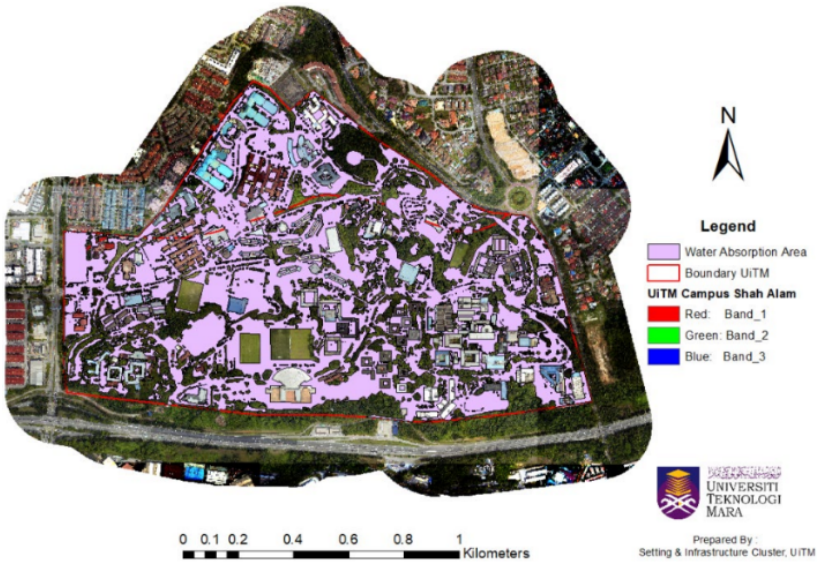


Figure 0-8: Water absorption area in UiTM Shah Alam

1.3.4 Campus open space area to population

The total number of regular students including online-only registered students attended both the undergraduate and postgraduate programmes offered in UiTM Shah Alam campus in the academic year 2021 – 2022 is 44091 students. The total number of full-time academic and administrative staff working at UiTM Shah Alam campus in the academic year 2021 - 2022 is 4714 staffs.

The restrictions and regulations pertaining to Covid 19 pandemic were still applicable and compiled until Dec 2021. Thus, until December 2021, the maximum capacity of on campus population is still restricted at 50% as full capacity. Even though the university has moved into an endemic situation in January 2022, all classes are still conducted online and there is still restriction in place on the campus population i.e., with 70% capacity.

The estimated annual total population who participated in academic activities on campus for the one-year period from May 2021 to Apr is 48805.

The ratio of the open space area to the total campus population = xxxx square meters/person

1.3.5 University budget for sustainability efforts

Previous trend shows increased budget being allocated by the university in relation to sustainability efforts since 2018. This verifies the commitment given by the top management in pursuing the environmental sustainability agenda in UiTM, specifically UiTM Shah Alam campus.

The allocated budget for sustainability efforts were based on the six major categories i.e., Green Area, Waste Management, Water, Electricity, Research and Education and Transportation. There was a significant increase in the allocated budget given to Research and Education efforts from 2018 to 2020. Only 4% of the total sustainability budget was allocated for Research and Education in 2018 but the allocation was increased to 59% in 2020. Thus, indicating the need to provide centralized knowledge enhancement to all UiTM stakeholders in materializing our journey to Green Campus.

Table 0-1: University budget for Sustainability effort from 2019 - 2020

	2019	2020	2021
Green Area	213,728	403,820	268,590
Waste Management	373,985	297,949	359,888
Water	1,201,340	697,376	506,875
Electricity	6,909,697	4,107,023	3,250,622
Research And Education	6,955,845	9,423,054	4,337,527
Transport	612,619	1,036,530	1,307
Total	16,267,214	15,965,751	8,724,808
	Average Budget for Sustainability (USD)		**13,652,591**

The average university budget per annum over the last 3 years

Year	2019	2020	2021
Budget (USD)	184,531,119	167,230,242	183,013,540
Average	178,258,300		

1.3.6 Campus operation and maintenance of buildings

The operation and maintenance activities in UiTM Shah Alam campus covers a total area of operation activities of buildings = 332, 759.71 square meters. It Includes administrative offices, students' accommodations, general amenities buildings such as community halls, central mosque, and health centre.

Administrative offices	108,342.12	32.5%
Students' accommodation	196,065.21	58.9%
General amenities	28,352.38	8.6%

Total operation activities of buildings 332,759.71

Area for maintenance activities of buildings for 2020 (30%) = 99827.91 m2

Operation and maintenance activities of Building during Covid 19 = 432,587.62 m2
Total campus buildings area = 729,683.72 m2
Percentage of operation and maintenance activities of building during Covid-19 pandemic
= ((Total area for operated and maintenance activities of Building during Covid 19 /Total campus buildings area) *100)
= ((432,587.62/729,683.72) *100)
= 59%

1.3.7 Campus facilities and Infrastructure

A. Special needs

The university has well-established and friendly facilities for disabled, special needs and maternity care. Guided by Akta Universiti Teknologi MARA 1976, the university has been well governed by the establishment of a wide range of administrative units taking care of holistic university's ecosystems including staffs' wellbeing. As such, the group of disabled, special needs and maternity people as part of the university ecosystem had been well attended.

Unit Perkhidmatan OKU UiTM (People with Disabilities (PWD) Service Unit) was officially established on 1 November 2019 in UiTM. The initiative to establish this unit is in line with the Implementation Guidelines for the Inclusive Policy of Persons with Disabilities in Higher Education Institutions [i.e., Dasar Inklusif Orang Kurang Upaya, Kementerian Pendidikan Malaysia] which was launched on 5 September 2019 by the Malaysian Ministry of Higher Education.

UiTM is the first public university in Malaysia to place a Disability Services Unit under the Vice Chancellor's Office. The vision of this disabled services unit is to be a leading center for the development and empowerment of people with disabilities among higher education institutions in Malaysia.

Disability Services Unit Objectives

Coordinating the management of disabled people at all administrative levels in UiTM.
Fulfilling and safeguarding the rights of people with disabilities to obtain full access to the Teaching and Learning (PdPc) and life at UiTM.
Empowering the competitiveness of people with disabilities holistically at UiTM.
Increase awareness of the rights and issues related to the disabled and to all UiTM citizens

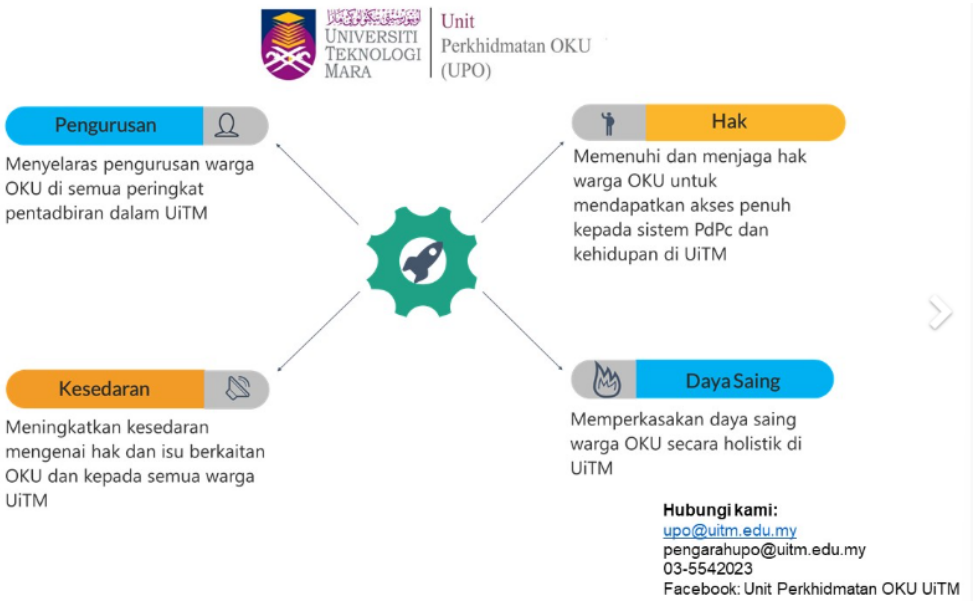
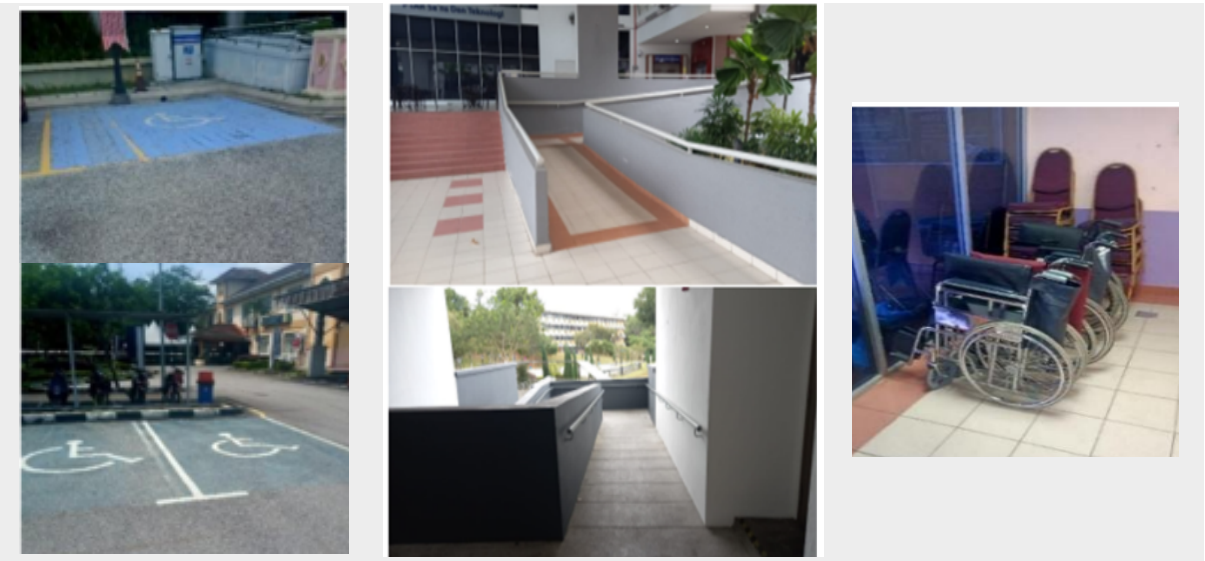


Figure 0-9: The four objectives of Unit Perkhidmatan OKU UiTM [UPO UiTM] published on UiTM corporate website

The UiTM's PWD unit functions as a one stop center that administers matters related to staff and students with special needs such as Disability Liaison Officer program, outreach, courses and workshops and financial supports such as zakat giveaway. Thus, providing delivery of information through implementation of empowerment and self-improvement programs will consequently result in efficient management of the individuals with special needs in the university. The services offered by PWD unit has also been extended to other UiTM campuses across Malaysia. Until April 2022, there are a total of 342 students, 81 academic/administrative staff and 364 staff with disabled dependents that are benefiting from the various services offered by this unit.

Figure 0-10: Infographic for information dissemination on special needs at UiTM

The services and initiatives offered by UiTM PWD are indeed aligned with SDG11 in promoting inclusivity and access for UiTM residents including the staff and students with special needs to all facilities and buildings in UiTM Shah Alam campus. For instance, the university had provided adequate facilities and equipment for the special needs such as designated parking areas, special designated toilets, wheelchairs, and ramps for wheelchairs. These amenities are found in all administrative units, faculties and centres within the university.



Parking lots for disabled | Ramp for wheelchair users | Wheelchairs for mobility of physical disabled person

Figure 0-11: Facilities prepared for the OKU around UiTM Campus

The university staff and students with disability and special needs are assisted with wheelchairs and ramps. These facilities make their mobility and movement in confined areas and buildings in the university become more convenient and the provision of these facilities indicates the university's concern for this group of disabled people.

Toilets are one of the basic human needs at home or the workplace. As for the disabled group of people, the specially designed toilets at the workplace are critical to facilitate basic needs for them. As such, the special designated toilets that are user-friendly are also provided and available at all the premises within the university.

Figure 0-12: Designated toilet for disabled and special needs at Dewan Agong Tuanku Canselor, UiTM Shah Alam

B. Security and Safety

The security and safety of students, academic and non-academic staff and community members is the primary concern of the university. As such, the university's office of safety and security i.e., UiTM Auxiliary Police Office is always on the job. With the mission to ensure safety and security of the campus community in a harmonious working environment, the following objectives have been established:

- Committed to making the Auxiliary Police Office as an organization that can ensure the campus and the campus is in a safe state of peace. And ensure the safety of UiTM property through the execution of tasks with full trust, dedication, discipline, and quality.
- Creating a conducive environment for the convenience of students to produce outstanding graduates besides having commendable character and personality to enhance the image and reputation of UiTM.
- Creating Auxiliary Police personnel who are capable, ethical, efficient, committed, and professional in carrying out their duties and responsibilities and to support and uphold the rules set by the Security Unit for the welfare of UiTM campus.

In achieving the objectives, the Auxiliary Police Office offers the following services:

- Provide security services to the public, citizens, and property of the University campus
- Enforce the laws and regulations of the university toward the citizens in a prudent and proactive manner.
- Implement security controls systematically and continuously.
- Ensure member safety precautions and competent
- Ensure traffic flow systems running smoothly.

Auxiliary Police Officers conduct regular patrols of all campus buildings, grounds, and parking areas. Students' accommodation buildings are patrolled and monitored around the clock by the police officers. They provide campus-wide service which operates 24 hours a day, seven days a week.

Figure 1.16: UiTM Auxiliary Police Officers

Aspects of security are also being extended to personal safety, fire safety and building security on campus. The Closed-Circuit Television (CCTV), Fire Hose Reel and Fire Extinguisher, Emergency Break Glass Panel, Fire Hydrant and Security Gate Barrier are located strategically within the university's compound for an immediate response towards unfavorable incidents. All premises are equipped with these security and safety equipment that provide immediate assistance for emergency cases.

Figure 1.17: Closed circuit television (CCTV)

The CCTV, as modern surveillance tools, are placed in all strategic premises for safeguarding the university from unexpected threats. There are about 344 units of CCTV that operate 24/7 and are linked to UiTM's Control Centre. The table below shows the list of the premises and the number of CCTV units built in various locations.

NO.	LOCATION	QUANTITY
1	Bangunan Canseleri	21
2	Pintu 1	5
3	Pintu 2	5
4	Pintu 3	2
5	Pintu 4	0
6	ARI	4
7	DATC	24
8	Pej. Bendahari Bahagian Gaji	7
9	Fakulti Kejuruteraan Awam	18
10	Fakulti Kejuruteraan Elektrik	29
11	Fakulti Seni Lukis & Senireka	13
12	Fakulti Undang-Undang	20
13	Galeri	10
14	MTC	8
15	Bangunan Pusat Inovasi	4
16	Makmal Tisu Kultur -FSG	4
17	Bangunan Akademik III	7
18	Foyer Menara SAAS	6
19	Bangunan Parkir Bertingkat	10
20	Parkir Motorsikal FKM	3
21	Parkir Motorsikal Pusat Data	2
22	Pencawang 33 KV	9
23	Bangunan Bendahari Perolehan	10
24	Pusat Islam	19
25	Pusat Sukan	2
26	Stadium	6
27	Sistem Parkiran Berpalang	22
28	Bahagian Peperiksaan	10
29	Bangunan Sarjana	17
30	Pejabat Infostruktur	13
31	Kolej Melati	11
32	PPII	11
33	FKK	2
34	Depoh Senjata	1
35	APB	2
36	STEL	1
37	Lain-lain (PTZ)	6
	TOTAL	**344**

Table 1.1: List of CCTV and its locations in UiTM Shah Alam campus

In combating emergency fires, the fire hose reel and fire extinguishers are placed and available in all buildings within the university. With regular inspections and maintenance, these fire combating tools function well in providing safety assistance to the university community.

Figure 0-13: Fire hose reel, fire extinguisher and Emergency break glass panel

In case of emergencies including fire, the emergency break glass panel is provided as a safety tool. This tool is installed at all office emergency exits and used to set off the alarm in emergencies and provide immediate safety action mainly for UiTM staff and students.

The fire hydrants provide the essential water supply points where firefighters can utilize them in case of fires. As a component of active fire protection and safety, the university has installed several fire hydrants in many strategic locations throughout its sprawling premises.

Figure 1.20: Fire hydrant

The security gate barriers play an important role in safeguarding the UiTM premises from unauthorized access. While staff are granted access to the premises and offices with their authorized access card, the visitors and contractors are granted access with temporary access cards prior to entering the premises and offices in the university.

Figure 1. 21: Security gate barrier

In addition, access to the administrative, academic and accommodation buildings is controlled either by locked entrance doors or a card-access system. All other campus facilities such as the library and health center are locked and unlocked daily according to established schedules.

In the university, the safety and security measures are also prepared in the form of Emergency Action Plan and Emergency Assembly Area. For all these security measures, regular workshops and training are conducted to let all staff and students in the university be alert to potential threats to the campus security.

C. *Health Care*

UiTM are committed to provide infrastructure that support students, academics, and staff's well-being on campus particularly for health services. UiTM Health Centre was established in 1974 to provide primary medical and health services to all UiTM staff and students. This Health Centre is located at Lot 1, Jalan Bijak 1/22, Seksyen 1, UiTM Shah Alam. There are also Health units in all branch campuses of the university.

The mission of UiTM Health Centre is to provide primary health and medical services to UiTM staff and students in efforts of helping them to focus on learning, teaching, and conducting research activities in UiTM. This mission is supported by its client's charter, in which the centre pledged to put in best effort in ensuring:

a) Quality and Professional Health Services
b) Friendly, Fast and Responsible Services
c) Clean, Safe and Conducive Environment
d) Continuous Upgrading and Improving of Services

Figure 0-14: Health Center in UiTM Shah Alam Campus

The health center is managed by Medical Officers, Dental Officers, and other support staff. In total Table 1.2 shows the distribution of personnel involved in running this health center.

Personnel	**Number**
Medical	38
Dental	15
Support	34
Total	87

Services provided at UiTM Health Centre can be classified into 5 main units, which are the Medical Unit, Public Health Unit, Oral Health Unit, Medical Diagnostic & Development Unit and Pharmacy Unit. These main units are supported by 2 other units namely the Administration Unit and the ICT Unit. The services offered are shown in Table 1.2.

Table 0-2: Health services offered by UiTM Health Centre

Health Services	Other health-related services
1. Medical Treatment 2. Accident & Emergency 3. Minor Surgery & Other Procedures 4. Day Care 5. Medical Check-Up	Laboratory ▪ Sample Collection - blood, urine, body fluid swab ▪ Sample Test – hematology, biochemistry, immunology, urine microscopic

6. Health Screening 7. Vaccination 8. Guarantee Letter [for hospital admission] 9. Diabetic Clinic 10. Hypertension Clinic 11. Asthma Clinic 12. Get Slim Clinic 13. Stop Smoking	▪ Urine Drugs Screening ▪ Sample delivery to hospital ▪ Machine and laboratory equipment calibration ▪ Sample processing from state campus ▪ Instrument placement and reagent rental X-ray ▪ For diagnosis – Chest, Scull, Abdominal / KUB (kidney, ureter, bladder), Extremities, Pelvis ▪ For medical check up

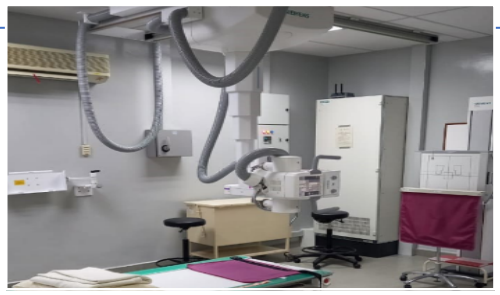
In providing the best services to the communities in the university, the UiTM Health Centre operates with full capacity of medical personnel on specified working days. The details of medical personnel at the UiTM Health Centre during the operating hours from 8.00am to 10.00pm (Mondays to Fridays) are available for the visitors. Both Medical and Dental clinics operate all year round, 5 days a week including semester break with variation in operating hours. In addition, 24-hour ambulance services are available after clinic operating hours throughout the semester

All health facilities in Figure 1.23 are available at the UiTM Health Centre in providing quality and professional health services to all students and staff.

Emergency room

Ward Room

Medical laboratory



X-ray room

Figure 1.23: Infrastructure and facilities available at UiTM Health Centre

In addition to physical health care services provided by UiTM Health Center, UiTM has been the first public university to provide mobile clinics that provide health services on campuses. This service is named as the UiTM Emergency Mobile Rescue (UEMR), the university's mobile clinic operated from a specially fitted bus equipped with emergency facilities built upon the Emergency and Ambulance Service Guidelines set by the Primary Health Facilities. The UEMR provides initial treatment and patient transfer services. In addition, this bus is also friendly for people with disabilities to access.

Figure 1.24: Mobile clinic - UiTM Emergency Mobile Rescue

The UiTM Health Center has taken proactive action in promoting the wellbeing of staff through both virtual and face-to-face events. Figure 1.24 provides examples of webinars and exhibitions conducted by UiTM Health Centre. The targeted issues were mainly related to public health including mental health.

Figure 1.25: UiTM Health Center Activities in Promoting Well-beings of Staff and Students

More information on health-related activities [with recorded videos] are made available by UiTM Health Centre on its social media which is accessible via https://www.facebook.com/pkuitmsa/. Additionally, health information is also shared on its website. For example, health tips are accessible via https://pusatkesihatan.uitm.edu.my/index.php/download/health-tips. A screenshot is shown in Figure 1.26.

Hits: 947

Health Tips

NO	ARTICLE TITLE	HITS
1	Panduan Penjagaan Kesihatan Mulut	285
2	Amalan Penjagaan Kesihatan Mulut	
3	Rawatan Kanal Akar	258
4	Rawatan Alternatif Bagi Menggantikan Gigi Yang Tiada	183
5	Penyakit Periodontal	191
6	Geraham Bongsu	191
7	Korona Pergigian	184
8	5 Komponen Kecergasan	1498
9	Panduan Penyediaan Menu Sihat Di Pejabat	4226
10	8 Tips Of Eating	
11	Fake Braces	
12	Ubat vs Makanan	
13	Tips Penggunaan Bekas Plastik	
14	Cara Penggunaan Flos Pergigian	

Figure 1.26: Extract from UiTM Health Center website on health tips

Apart from health services provided by the university, UiTM also provides sport and recreational infrastructure and facilities to promote healthy well-being and lifestyle amongst the university students, academic and non-academic staff. The availability of recreational rooms, swimming pool and sports complex encourage UiTM Shah Alam students and staff utilize them to stay fit and maintain a healthy lifestyle.

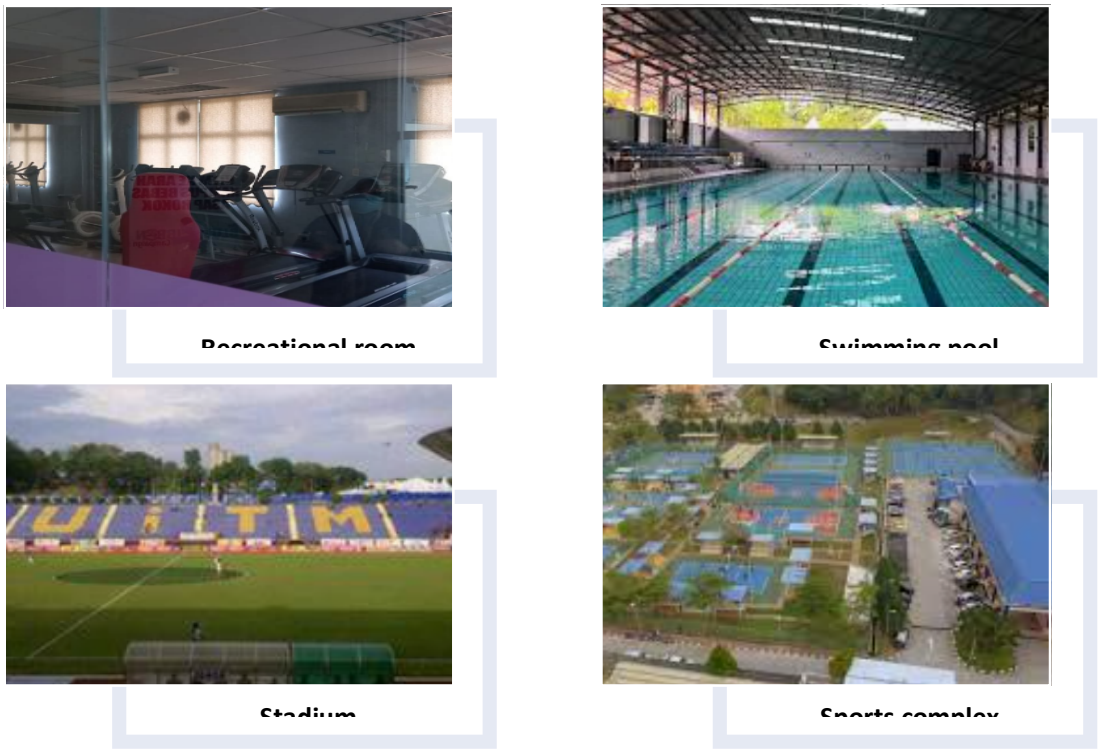


Figure 1.29: Facilities available at UiTM Shah Alam campus

The support provided by the Counseling Unit is accessible to all students and staff. The service is significant to assist students and staff in need to deal with their issues and to improve their personal well-being. A special Mental Health Programme – Let's Talk "We care for you" was developed with the aim to raise awareness for students. The program mainly emphasized the importance of acquiring knowledge and information on mental health issues as well as the role they can play in supporting and assisting in mitigating risks associated with mental health.

Figure 1.30: Let's Talk Webinar on Mental Health

1.3.8 Conservation Initiatives

The university is also actively involved in conservation activities or programs in UiTM Shah Alam campus. There are 15 related programs for conservation of plant, animal and wildlife that have been initiated for the year 2021 – 2022. A total of 11 out of 15 or 73% of the programs have been successfully implemented by UiTM and 4 programs are still in planning status. This status indicates a 15% increase from 2019 to 2020.

No.	Program	Status
1	Tag Trees, Stay Green	Implemented
2	SDG Triangle@UiTM	Implemented
3	UiTM-Perhilitan Taman Negara Research Projects	Implemented
4	Rainwater Harvesting System for Watering Plants in UiTM	Implemented
5	International Camp of Food Rescue	Implemented
6	Garden Waste Generation as Soil Conditioner in UiTM Shah Alam	Implemented
7	Low Carbon City Framework	Implemented

8	Tree for Future	Implemented
9	Hiking Trails Exploration	Implemented
10	UGC Fun Plogging	Implemented
11	My Green Space Challenge	Implemented
12	Master Plan for Central Forest Spine (CFS) Ecological Linkages	In-Preparation
13	Greening My Campus @ UiTM	In-Preparation
14	Development of Spatial Database for Individual Planted Tree using Geospatial Technology in UiTM, Shah Alam	In-Preparation
15	Botanical Garden	In-Preparation

Table 1.4: Conservation Activities and status in UiTM

Figure 1.31 shows three examples of activities relating to conservation by UiTM Shah Alam. Participation was open to students and staff of UiTM with the objective to create awareness on the importance of preserving and conserving nature for the future. In addition, the activity Tree for the Future is a collaborative program with Shah Alam City Council, indicating initiative related to the attainment of SDG 17.

Exploring new green areas @campus

Greening the workplace	Tree for the future

Figure 1.31: Conservation activities at UiTM Shah Alam Campus

Another conservation activity that promotes SDG17 for the year 2020-2021 is a river cleaning program. UiTM Green Center (UGC), Infrastructure & Infrastructure Development Office, Universiti Teknologi MARA (UiTM) together with Pengurusan Aset Air Berhad (PAAB) has conducted the Sahabat Sungai Program to clean Sungai Langat, Kg. Kuala Pangsun in the state of Selangor. This program was conducted in conjunction with the celebration of World Water Day 2021 and was implemented simultaneously throughout the country under the National River Trail (DSK) mega program, Ministry of Environment & Water (KASA). A total of 40 volunteers from UiTM and PAAB agencies have participated in this program. This program is one of the programs conducted by UGC to strengthen the knowledge and experience of nature more closely, as well as to realize UiTM as an eco-friendly campus and support the sustainability agenda at UiTM. In this collaboration, UiTM has become Sahabat Sungai in Sungai Langat, Kg. Kuala Pangsun.

CLUSTER 2.0: Energy and Climate Change

2.1 Introduction

Climate change is primarily caused by how humans conduct and manage their business activities. This will directly affect energy consumption and, in turn, organizational direct and indirect carbon emissions. UiTM is committed to providing solutions for climate change issues and developing effective policies to meet the energy standards in protecting nature and energy resources.

2.2 Cluster Objective, Functions, and Indicators

Sustainability initiatives at UiTM have highlighted the importance of the Energy and Climate Change (EC) cluster towards targeting the "Low Carbon Campus". It is expected to improve energy efficiency and optimize campus renewable energy for carbon emission reduction in its Shah Alam main campus and the other 13 state and 22 satellite campuses all over Malaysia. The EC cluster aim, objective and functions are illustrated in Figure 0-1 below.

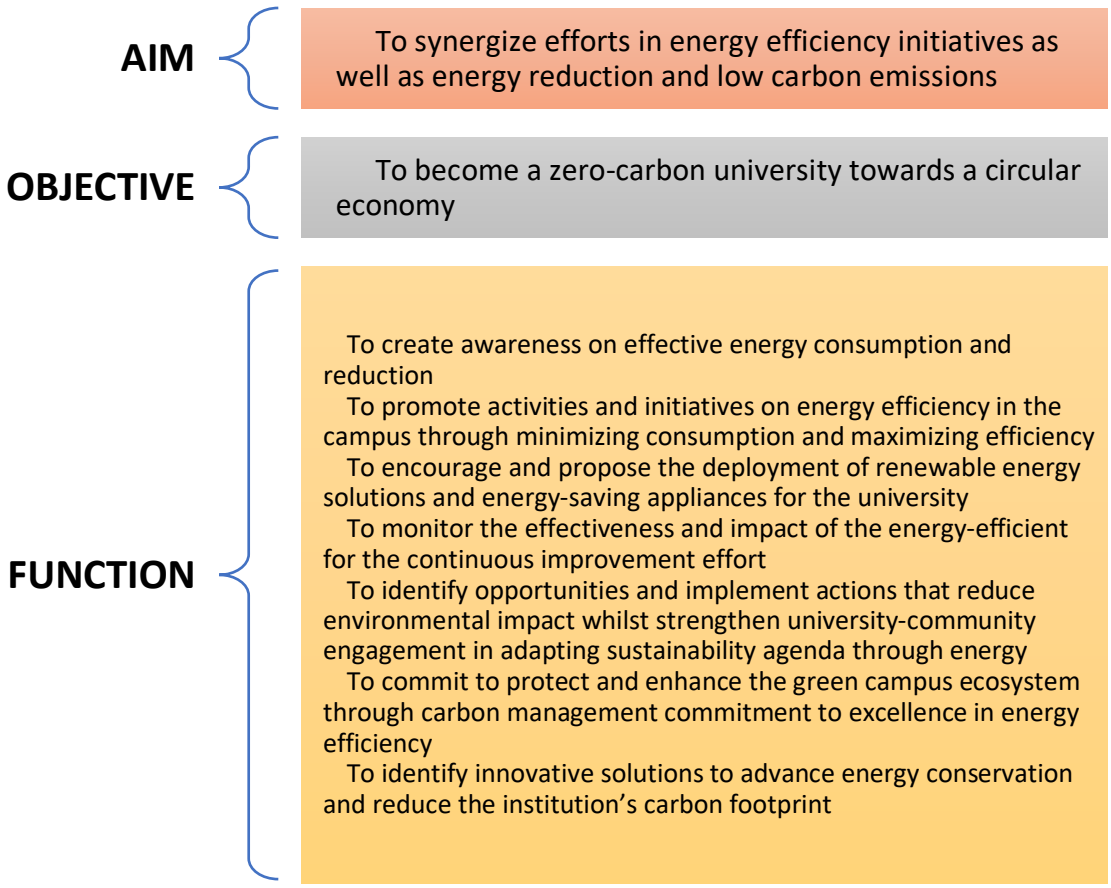


Figure 0-1: EC Cluster aim, objective, and functions

There were ten (10) performance indicators for the EC cluster, as shown in Figure 0-2 below. It is equally important to include the social, cultural, and economic aspects of sustainability in the indicators to ensure UiTM and EC clusters continue towards achieving their goal.

The area of concern of EC is on energy-efficient appliances, the implementation of smart buildings, total electricity usage, energy conservation programs, elements of green buildings, climate change adaptation and mitigation programs, greenhouse gas emission reductions policy, and carbon footprint. With these indicators, UiTM will continue its efforts in energy efficiency, focusing on building management and caring more about nature and energy resources.

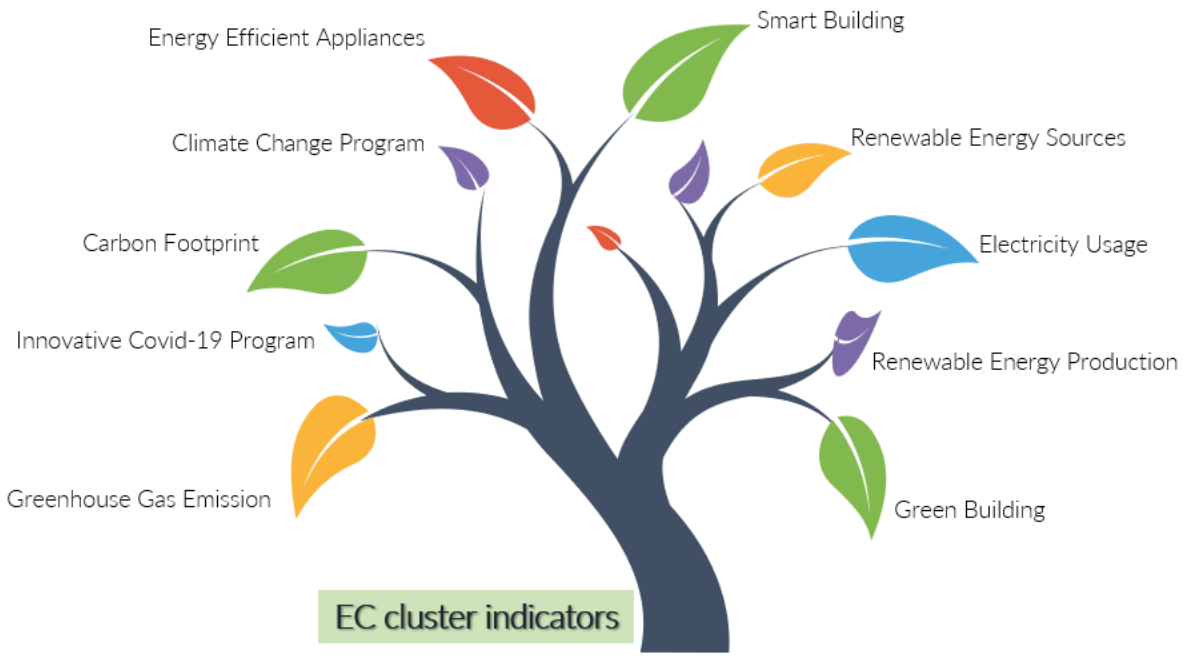


Figure 0-2: The ten performance indicators for Energy & Climate Change

2.3 Cluster Indicators and Strategy

In supporting the university's initiative towards sustainability, the EC cluster has committed to both short-term and long-term planning. Table 0-1 shows the strategies that need to be continuously monitored to achieve the sustainability goal of the cluster in specific and UiTM vision to be Malaysia's best Low Carbon Public University Model by 2030.

Table 0-1: The five main strategies of the EC cluster

Strategies	Action	Target year	Status
S1: Switch to energy-efficient appliances	a) Replace fluorescent bulb to LED for all building and street b) Replace split unit air conditioner to inverter c) Replace existing chiller to variable speed drive (SVD) system	2025	On-going
S2: Usage of energy policy	To ensure UiTM and its campuses adopt the guideline of energy policy	2025	On-going
S3: Installing renewable energy	To install more renewable energy sources – solar photovoltaic (PV)	2025	On-going
S4: Building management – smart and green	1. To install sensors such as photocell sensors	2025	On-going

	2. To educate Warga UiTM on smart and green building implementation		
S5: Energy management system	To increase the number of certified energy manager	2025	On-going

2.4 Cluster Projects and Achievements

2.4.1 Energy Efficient Appliances Usage

UiTM intends to realize further energy savings by paying close attention to energy management. All parts of the organization can assess their own energy consumption and realize their own energy-saving potential by means of various initiatives the installation of more efficient engineering system such as new efficient chillers for the cooling system and energy saving appliances such as split unit air-conditioning units with inverter, energy saving computers in the laboratories and offices, LED screen and AV systems in classrooms, LED lighting and the deployment of sustainable technology.

More smart classrooms are also constructed to accommodate teaching and learning techniques based on Digital Learning Tools and Technologies. With the aim to fulfill the UiTM's Agenda 2025 (Smart Campus & Education 5.0@ UiTM), Smart Classroom offers greater security, increased access to students, more interactivity, and better learning. Smart Classrooms will provide an expansion of unique and creative learning through the provision of learning spaces and adaptive immersive technology.

For buildings with a central cooling system, chillers and AHU consume between 50-60% of the total buildings energy consumption. Old chillers were replaced with newer more efficient chillers in stages. List of energy efficient appliances are as follows.

	Appliances	Number	Efficient Units	Ratio of efficient appliances %
1	Desktop Computer Units	7,540	7,540	100%
2	Notebook	2,100	2,100	100%
3	Split AC Unit	7,572	1,208 (inverter)	16%
4	Large AC Chillers*	17	12 (New)	67%
5	Light bulbs	91,770	30,000 (LED est)	33%
6	Screen display (LED)	600 (est)	600	100%

Based on this data, the overall ratio of efficient appliances in UiTM is more than 75%. This percentage indicates the significant efficiency level in energy saving initiatives. The images below exemplify the energy efficient appliances in UiTM.

Figure 0-3: Highly Efficient Hybrid Modular Chillers were installed for independent operation time of the cooling system in two Libraries: PTAR 3(80 RT) and PTAR 4 (120RT).

Figure 0-4: Two (2) new chillers were installed with the same capacity. Only one operating at a time, another on standby mode

Figure 0-5: Replacement of four (4) RT water-cooled chillers is the major project for energy saving at the Engineering Complex

Smart Classroom (SC) is one of the latest teaching and learning (T&L) facilities adopted in the university. In UiTM, the SC were and are to be equipped with energy efficient features. Common Features in SC are:

1. Touch Screen PC
2. Interactive TV Systems
3. 5-Star Energy Efficient LED Screen
4. Mirror Op Presenter
5. Audio Visual (AV)
6. Smart Glass Board
7. Smart Glass Table

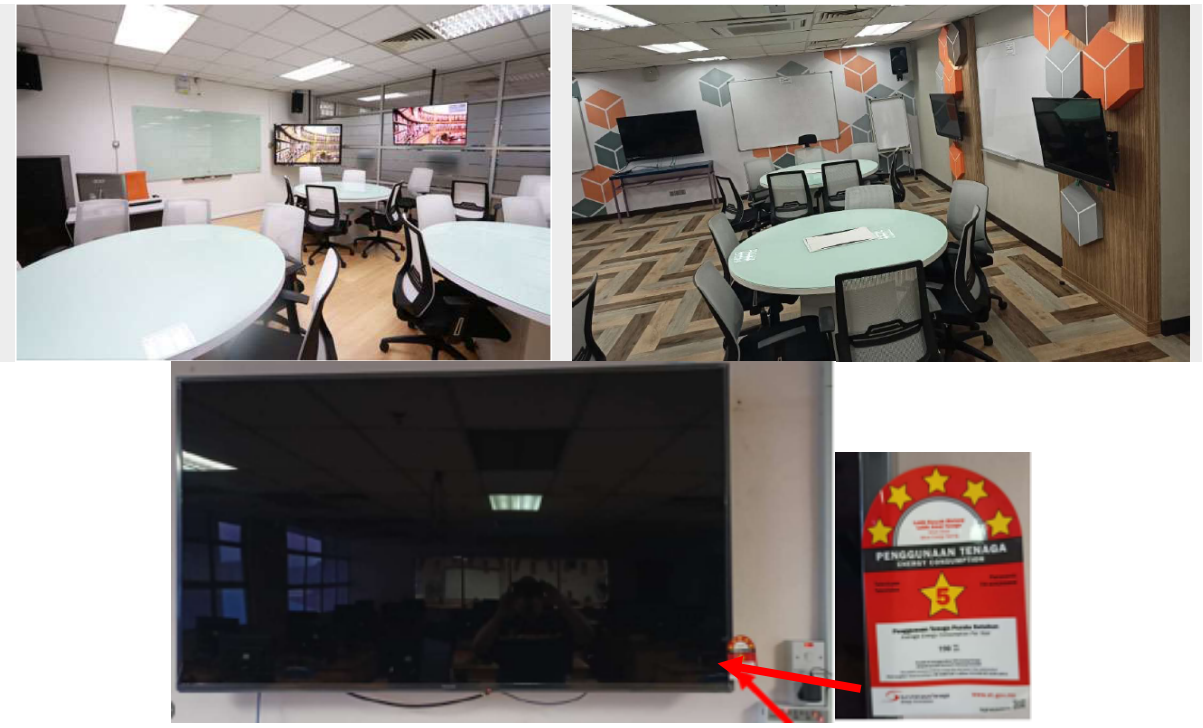


Figure 0-6: All Computer Units Provided in the Campus are of Energy Efficient Types with various Energy Saving Features

Computer Facilities in Libraries

Computer Laboratories in Engineering Faculties.

Figure 0-7: Replacement of integrated high-energy efficient communication devices for staff

SDG Area:

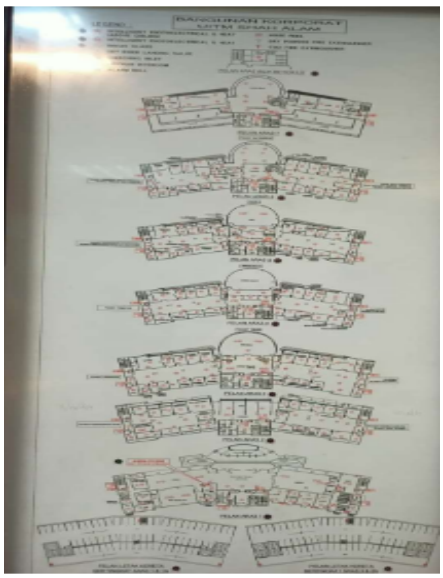
2.4.2 Smart Building Implementation

UiTM main campus in Shah Alam, Selangor comprises Gross Building Area. Smart Building elements such as Fire Fighting Facilities and Monitoring Systems, Centralized Security Monitoring Cameras, Energy Saving Devices & Energy Monitoring Systems, Smart Meters Data Loggers; and Data Recording for Energy Monitoring Systems were implemented at various buildings. These smart

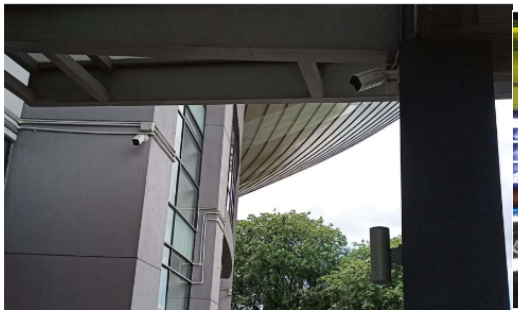
building elements covers the total area of at least 190,723 square meter and compromise the major important/critical buildings as indicated in the table below.

	Buildings	Net Floor Area (m^2)
	All Buildings (SI7)	710, 187
1	Science & Technology Complex	121,235
2	Canseleri Tuanku Syed Sirajuddin	7,827
3	DATC Dewan Agung Tuanku Canselor	17,970
4	UiTM-MTDC Malaysian Technology Development Corporation	12,187
5	Health Centre	3,689
6	Data Recovery Centre (INFOTECH)	1.365
7	Menara SAS	26,450
	TOTAL	**190,723**
	Ratio (2.2 /1.7) x 100%	26.86 %

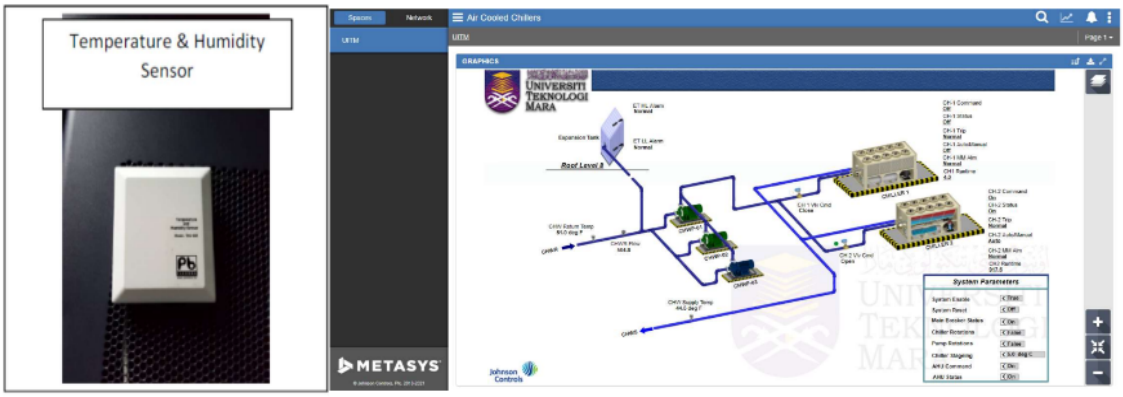
1. Fire Fighting Facilities and Monitoring Systems at various Buildings



2. Centralized Security Monitoring Cameras at various locations outside and inside the buildings



3. Energy Saving Devices & Energy Monitoring Systems



Building Automation System (BAS) - Chiller Monitoring Systems (Canseleri)

4. Smart Meters Data Loggers and Data Recording for Energy Monitoring Systems.

2.4.3 Number of Renewable Energy Sources in Campus

As of this date, UiTM has established one (1) renewable energy project in its campus. This project is known as Solar PV system (GERC) located in *Kolej Teratai* and is operated under *Pusat Penyelidikan Tenaga Hijau.*

Figure 0-8: 19 kWp Solar PV System (GERC) – Kolej Teratai

2.4.4 The Total Electricity Usage Divided by Total Campus Population *(KWH Per Person)*

The electricity usage in UiTM is at 1104.63kWh/person. This usage level is considerably low/moderate/high compared to national/international rates. The table below shows the electricity usage for 2021 where it provides the basis for energy usage by kWh/person.

YEAR	2021	ELECTRICITY CONSUMPTION	
	MONTHS	kWh	RM
FACILITY DEPARTMENT	JANUARY	2485480	999627.60
SHAH ALAM CAMPUS	FEBRUARY	2663249	1086319.25
SECTION 1	MARCH	2663249	1343492.10
	APRIL	3417759	1392468.50
	MAY	2719475	745400.20
	JUNE	2286480	857986.42
	JULY	2248231	828462.49
	AUGUST	2459753	918897.65
	SEPTEMBER	2672134	944469.50
	OCTOBER	3365237	1309634.45
	NOVEMBER	3516158	1376504.40
	DECEMBER	3718679	1425024.30
	TOTAL	**34215884**	**13228286.86**

	POPULATION 2020			
CAMPUS	Regular Student	Academic Staff	Administrative Staff	Total
SHAH ALAM	44091	2036	2678	**48805**
			63.5 % Population	**30975**

Energy Consumption per Population kWh/Year	Annual Energy Consumption/population = 34215844/48805 **= 701.07 kWh/person**	Full population
	Annual Energy Consumptio/population = 34215844/30975 **= 1104.63 kWh/person**	63.5% population

SDG Area:

2.4.5. The Ratio of Renewable Energy Production Divided by Total Energy Usage Per Year

The renewable energy project in UiTM is in the form of a solar system and there were two solar system projects namely “Roof Top” and “Walkway”. The ratio of renewable energy production by these two projects divided by total energy usage per year is at 0.079 in total as calculated from the following table. The “Roof Top” and “Walkway” provide a ratio at 0.067 and 0.012.

Shah Alam Campus Solar System	Solar Energy Capacity	Solar Radiation Index (hrs)	Month	Day	Solar Generation kWh/ Year	Energy Consumption kWh/ Year	Ratio of RE (solar) generation over Total Energy Consumption (%)
Roof Top	16	4	12	30	23040	34215884	0.067
Walkway	3	4	12	30	4320	39536562	0.012
						Total	**0.079**

SDG Area:

2.4.6 Elements of Green Building Implementation as Reflected in All Construction and Renovation Policies

This initiative is a main concern in UiTM. In supporting the green building implementation through construction of new building and renovation works, some specific initiatives have been established. The UiTM has been acknowledged by Suruhanjaya Tenaga as a "Pengurus Tenaga Elektrik'' that grants UiTM to instantiate the green building policies in its own campus. Consequently, the Polisi Pengurusan Tenaga UiTM was made available. Following these policies, the construction and renovation projects such as Retrofitted Chancellery Building Tuanku Syed Sirajuddin, was administered under this policy.

01808

Suruhanjaya Tenaga
Energy Commission

AKTA BEKALAN ELEKTRIK 1990

PERATURAN-PERATURAN PENGURUSAN TENAGA ELEKTRIK DENGAN CEKAP 2008

PERAKUAN PENDAFTARAN SEBAGAI PENGURUS TENAGA ELEKTRIK

RAMLAN BIN ZAILANI

Suruhanjaya Tenaga
Energy Commission

PPTEC 08-PTE 0066 2013

RAZALI BIN ABD HADI
NO 32, JALAN KRISTAL 7/65,
SEKSYEN 7,
40000 SHAH ALAM
SELANGOR

Tuan,

PEMBAHARUAN PENDAFTARAN SEBAGAI PENGURUS TENAGA ELEKTRIK

Bil	Nama Pengurus Tenaga Elektrik	No. Kad Pengenalan	No Perakuan	Tamat Tempoh
1	RAZALI BIN ABD HADI	641010055101	PTE-0021-2013	08/08/2023

2. Bersama-sama ini dilampirkan resit bagi pembayaran fi pembaharuan pendaftaran pengurus tenaga elektrik yang telah diluluskan untuk rujukan dan simpanan tuan.

[X] Dilampirkan bersama surat ini.
[ ] Telah diberikan melalui surat pejabat ini.
[ ] Telah diambil sendiri pada :

Sekian, Terima kasih.

Yang Benar,

ZULKIFLEE BIN UMAR

Figure 0-9: Polisi Pengurusan Tenaga Universiti Teknologi Mara (UiTM)

GARIS PANDUAN POLISI PENGURUSAN TENAGA
UNIVERSITI TEKNOLOGI MARA

1.0 TUJUAN

Garis panduan ini adalah bagi membantu warga universiti dalam mewujudkan dan melaksanakan sistem pengurusan tenaga yang sistematik dan berkesan. Berikut adalah polisi yang menunjukkan UiTM komited untuk:

1) Menggunakan tenaga dengan cekap dan pembaziran tenaga sifar secara berterusan dan menyeluruh

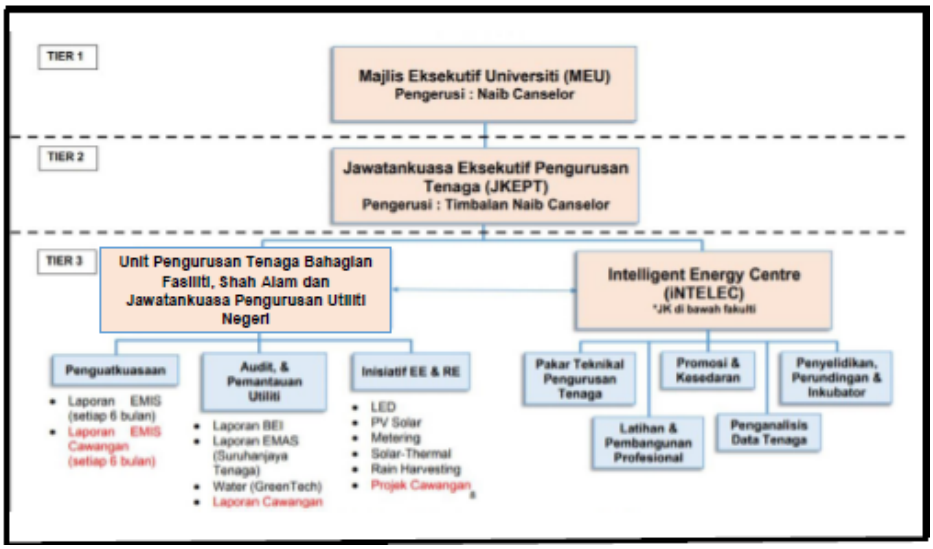
Kaedah adalah melalui kawalan, sistem, pengauditan tenaga dan memantau secara berterusan, menganalisa penggunaan tenaga serta menggalakkan warga universiti disemua peringkat untuk terlibat menyertai pengurusan kecekapan tenaga.

Selain itu, latihan dan maklumat berkaitan pengurusan tenaga akan disediakan untuk warga universiti bagi membolehkan penyertaan dan dan sumbangan mereka secara efektif terhadap usaha UiTM dalam pengurusan kecekapan tenaga.

Pendekatan adalah;

a) Waktu dan lokasi kuliah serta aktiviti-aktiviti lain akan dikaji semula dengan lebih kerap bagi memastikan penggunaan tenaga yang paling cekap. Aktiviti yang memerlukan pelanjutan tempoh operasi perlu digabungkan sebanyak mungkin
b) Menutup suis penyaman udara jika tidak menggunakan ruang berkenaan, mengurangkan penggunaan sistem hawa dingin dan menetapkan suhu tidak kurang dari 24°C
c) Menutup suis lampu apabila tidak menggunakan ruang berkenaan, membuka lampu yang perlu sahaja dan menggunakan lampu jenis cekap tenaga
d) Tutup dan tanggalkan plag komputer, monitor, dan peralatan elektrik yang lain, penghujung setiap hari dan cuti hujung minggu untuk menghapuskan potensi keupayaan 'kehilangan tenaga walaupun dalam keadaan dimatikan'
e) Menggunakan peralatan yang cekap tenaga (Energy Star) dengan melihat kepada label dan spesifikasinya
f) Menggalakkan aktiviti-aktiviti penjimatan tenaga seperti 'Earth Hour' di peringkat Pusat Tanggungjawab (PTJ) dan Universiti
g) Sistem pencahayaan lampu jalan yang mematuhi piawaian MS825 dan CIE115
h) Melaksanakan audit tenaga dan peralatan secara berkala.

JAWATANKUASA PENGURUSAN TENAGA UNIVERSITI TEKLNOLOGI MARA



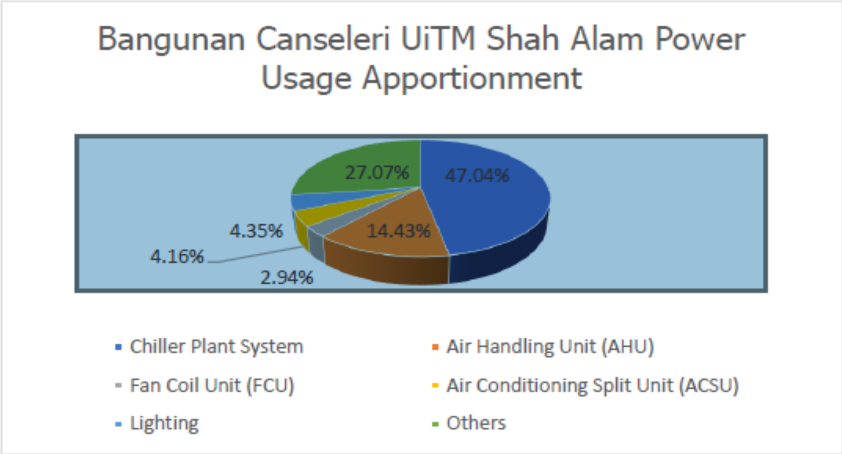
Project Name: Retrofitted Chancellery Building Tuanku Syed Sirajuddin

The Tuanku Syed Sirajuddin Chancellery Building in UiTM Shah Alam serves as the main administrative building for high executive offices of the university. It provides administrative services to the Vice Chancellor Office, Deputy Vice Chancellors, Bursary Office, University's Board Meeting Room, Senate Meeting Hall, and most high-execute offices of the university in carrying out their daily task. This seven-story building was completed in 2005 with a total net building floor area (NFA) of 8,004.12 m2, and the air conditioning area of 6,740.07m2. However, the energy efficiency of the building facilities, particularly air conditioning and lighting was found to substantially degrade after its long operation for more than ten years. Therefore, a major retrofit of Chancellery building was undertaken to improve the building efficiency in 2013. The project included the upgrade of lighting and air conditioning

systems as well as chiller optimization. In August 2019 the implementation of chiller replacement has taken place and completed at the end of 2019. Some other initiative has been taken in the installation of air conditioner split unit (ACSU) for energy conservation measures. In addition, some research work and alternative energy developed at NECTEC were applied for energy conservation. For example, de-lamping projects and chiller operation optimization is designated only during office hours. With these measures, the building reduced the electricity consumption by 29.19% in 2018 compared with that in the prior year (2013), in accordance with the university sustainable energy conservation policies and plans.

Source of Energy	TNB Sdn. Bhd
Age of Project/Commercial Operating Date (COD)	6-years (2013-2019)

Applicant General Information	
Name of Company	Universiti Teknologi MARA (UiTM)
Primary Contact Person	Assoc. Prof Datin Dr Arnis Asmat
Designation	Director
Business Address	UiTM Green Centre (UGC) Office of Development Infrastructure & Infostructure (PPII) Universiti Teknologi MARA (UiTM) 40450 Shah Alam, Selangor
Project Site Address	Chancellory Building, Tuanku Syed Sirajuddin, UiTM Shah Alam
Telephone	03-5544 2801
Mobile Phone	019 2244222
Fax	+603 5521 1122
Email	rnis_annis@uitm.edu.my
Website	www.uitm.edu.my



SDG Area:

2.4.7 Greenhouse Gas Emission Reduction Program

UiTM is committed to implement the low carbon cities framework program focusing on four Greenhouse Gas (GHG) reduction elements: energy, waste, water and greenery and water bodies. The UiTM's carbon commitment is to reduce 45% emission by 2030 from the baseline year 2015. A city-based approach is chosen for the whole campus with special projects of performance-based approach for selected buildings. Various initiatives are outlined in achieving the Sustainable Development Goals (SDG) through sustainable campus practices, green governance, and ecosystem; and university-community linkages and partnerships for the goals. A carbon management plan is underway to enable UiTM to be Malaysia's best Low Carbon Public University Model by 2030, while also striving for carbon neutrality. Table below describes the UiTM's GHG elements-target.

Area	Elements	Target
Emission Reduction	Energy	30% reduction in building energy use by 2030 from baseline year 2015
		7.5% increase in renewable energy by 2030 from baseline year 2015
		ASEAN Energy Management Scheme (AEMAS) certification
	Waste	30% reduction in municipal solid waste to landfill by 2030 from baseline year 2015
	Water	30% reduction in water usage by 2030 from baseline year 2015
		7.5% increase in rainwater harvesting by 2030 from baseline year 2015
Carbon Sequestration	Greenery	3% increase in green space by 2030 from baseline 2015
	Forest and Water Bodies	Preserve existing forested and water bodies areas

SDG Area:

2.4.8 Total carbon footprint divided by total campus' population *(metric tons per person)*

The carbon footprint produced from electricity and transportation (shuttle, car and motorcycle) by metric ton per/person in UiTM premise is vary in values at 0.7368 (electricity), 37.27 (shuttle), 1023.47 (car) and 255.54 (motorcycle). The details of total carbon footprint are shown in the table below.

Electricity Usage per year (kWh) (EC 2.7)	**34215884**
Emission Index for Peninsular Malaysia kg/kWh(MGTC 2017)	0.667
Carbon Emission from Electricity Usage (kg)	22821995
Carbon Emission from Electricity Usage (Ton)	22821.995
Total Population (2021)	30975
Carbon Emission per population (Ton/person)	0.7368

Transportation per year (shuttle) TR5.6	
Number of Shuttle Bus (TR5.6)	17
Number of Trip	20
Number of Service days	242
Average distance in campus	4.53
Emission Index	0.01
Carbon Emission (Ton)	37.27

Transportation per year (Car) TR5.2	
Number of Car (TR5.2)	4668
Number of Service days	242
Average distance in campus	4.53
Emission Index	0.02
Carbon Emission (Ton)	1023.47

Transportation per year (Motorcycle) TR5.3	
Number of Motorcycle (TR5.3)	2331
Number of Service days	242
Average distance in campus	4.53
Emission Index	0.01
Carbon Emission (Ton)	255.54

Total Emission per year	
Total Emission from electricity usage + Transportation (Ton)	**24138.274**
Total Population (2021)	**30975**
Carbon Emission per population (Ton/person)	**0.7793**

SDG Area:

2.4.9 Number of the innovative program(s) in energy and climate change

For the year 2021, there were eight (8) programs considered as innovative programs by UiTM established on energy and climate change. The themes of those programs are centralized to awareness, role, and responsibility among UiTM's ecosystem on energy and climate change.

Innovative Program	Date	Program Banner

Festival Kelestarian Kampus Hijau UiTM 2021	1 November – 24 December 2021	
The 2021 IEEE International Conference in Power Engineering Application (ICPEA 2021)	8-9 March 2021	 https://icpea2021.uitm.edu.my/home
International Webinar Towards Greener Earth: Precision Farming: From Garden to Table	9t September 2021	 https://meet.google.com/cig-euzr-chc
The 1st International Conference on Biodiversity and Sustainable Development 2021	23-24 November 2021	
Webinar on Solar PV Roof Top Home Installations	29 September 2021	
SRI-RVSCET Inbound-Outbound Programme	2-3 December 2021	
International Research Grant Collaboration	27 September 2021	This project is under Asia EDGE Resource Centers under the Asia EDGE initiative organized by the National Bureau of Asian Research (NBR), Washington DC to support community understanding and capacity building efforts to tackle energy security, market reform and enhance

		knowledge on solar energy and climate actions.
Webinar: Green Initiatives for Sustainable City	21 July 2021	

2.4.10 Impactful university program(s) on climate change

On top of innovation, there were impactful programs held by UiTM on energy and climate change. One of these programs i.e., SRI-RVSCET Inbound-Outbound Programme fits the innovative program described above. The descriptions of the impactful programs held by UiTM in 2021 are as follows.

Impactful Program	Date	Program Banner	Description
9th Malaysian International Seminar on Antarctica (MISA9)	25-27th October 2021	 https://news.uitm.edu.my/invitation-on-9th-malaysian-international-seminar-on-antarctica-misa9/	The 9th Malaysian International Seminar on Antarctica (MISA9) is a biennial event which brings together researchers from various polar and non-polar nations to share their research findings as well as to generate interest on Antarctica or polar in general. The theme of MISA9 is 'Polar Regions Matter in Our Climate Crisis'. This conference is jointly organized by

			Ministry of Environment and Water (KASA), Universiti Teknologi MARA (UiTM), Yayasan Penyelidikan Antartika Sultan Mizan (YPASM) and National Antarctic Research Centre (NARC), Malaysia. The key aim of MISA9 is to provide a platform to share and discuss polar climate variability, atmospheric dynamics, polar oceanography, climate, and sea ice modeling, as well as biological response and adaptation.
Regional Climate Change and Disaster Resilience	25th February 2021	 https://qs-gen.com/uitm-and-eccri-co-host-csdra-2020-to-discuss-regional-climate-change-and-disasterresilience/	UiTM Solar Research Institute (SRI) and Environmental and Climate Change Research Institute (ECCRI), Philippines, Ministry of Science, Technology, and Innovation (MOSTI) Malaysia, ASEAN Secretariat, ASEAN Foundation, and the United States Agency for International Development (USAID). This one-day international conference was determined to uphold the resolution for discussing an urgent, powerful, high-impact commentary on the environmental issue among the ASEAN countries.

SRI-RVSCET Inbound-Outbound Programme	2-3 December 2021	 https://qs-gen.com/uitms-solar-research-institute-collaborates-with-rvs-college-of-engineering-technology-for-inbound-outbound-programme/	The Solar Research Institute (SRI), Universiti Teknologi MARA (UiTM) Malaysia, Shah Alam, in partnership with RVS College of Engineering & Technology (RVSCET) organized the SRI-RVSCET Inbound-Outbound. The programme was conducted on 2nd – 3rd December 2021. The virtual event, which was hosted on Cisco Webex®, was intended to promote the advancement of solar energy specifically in the aspects of analysis, tools, and applications.

2.5 Moving Forward

In achieving its mission, the university is recently promoting their staff to become a Certified Energy Manager (CEM). The Certified Energy Manager is responsible for optimizing the energy performance of a unit, facility, building or business area. The CEM will be the systems integrator for electrical, mechanical, process and building infrastructure, analyzing the optimum solutions to reduce energy consumption in a cost-effective manner.

CLUSTER 3.0: Waste Management

3.1 Introduction

UiTM is the largest public university in Malaysia with 35 branches across 13 different states which is designed to be a smart and green campus in line with the university's strategic plan. More than thousand acres of land and millions worth (RM) of equipment and facilities are placed in these branches for the purpose of waste management within the campuses.

Currently, waste management is under the responsibility of the Faculty Unit, Office of Infrastructure, and Infrastructure Development (PPII). All the activities related to generation, collection and disposal will be recorded and monitored by PPII. Nevertheless, to encourage the faculty members to be well informed and aware about waste management, UiTM is committed to the practice of managing and conserving resources through the establishment of a Waste Expert Task Force Team. This team is composed of experts from different branches and units. In conjunction with the UiTM's strategic plan, focus is given to sustainable approaches to ensure the objective, mission, and vision as a smart and green campus is achievable. Methods of waste generation, collection and treatment have been introduced based on scientific data collection on campus.

In line with the UiTM's strategic plan, the university is focusing on sustainable approaches to ensure the objective, mission, and vision as a smart and green campus is achievable. Methods of waste generation, collection and treatment have been introduced based on scientific data collection on campus.
The transition of Covid-19 pandemic has resulted in tremendous change in how the University operated. As the university has limited access to only essential activities whenever possible, many of the sustainability activities shifted accordingly. Some changes were positive from an environmental perspective, this included decreasing waste diversion rates. More importantly, the scale of the positive impacts has improved, albeit small to the major reduction of activity on campus.

3.2 Cluster Objective

By 2025, the university aims to become a zero-waste campus. Therefore, the objective of having sustainable waste management in UiTM campus is to avoid final disposal to the landfill. To fulfill this objective for the waste management cluster, UiTM campuses have implemented ongoing initiatives for sustainable waste management. In this context, the initiatives and effort carried out by the university is in support of Sustainable Development Goals (SDGs) 12, 13, and 14.

UiTM is committed to the practice of managing and conserving resources for the best of the following matters:

- To promote awareness on the importance of waste management.

- To nurture and educate campus UiTM's community in managing waste.
- To assess the waste generated in the campus and provide best practice through the waste hierarchy of avoidance, minimization, and recycling.
- To collaborate with government and non-governmental agencies in empowering the agenda of waste management.
- To strengthen university-community engagement in adapting sustainability agenda through efficient waste management practices.

For the waste management cluster, the performance indicators are divided into six (6) indicators (as in Figure 1.

Figure 1: Six (6) waste indicators

For 2021, the transition phenomenon of Covid 19 pandemic has resulted in an overwhelming situation to reduce carbon footprint. Waste generated on campus has decreased and shows an increasing score of 1725 compared to 2020 which is at 1650. This indicates that the university has achieved a significant improvement in waste management by 4.5% since the university has gradually been occupied by its academic staff.

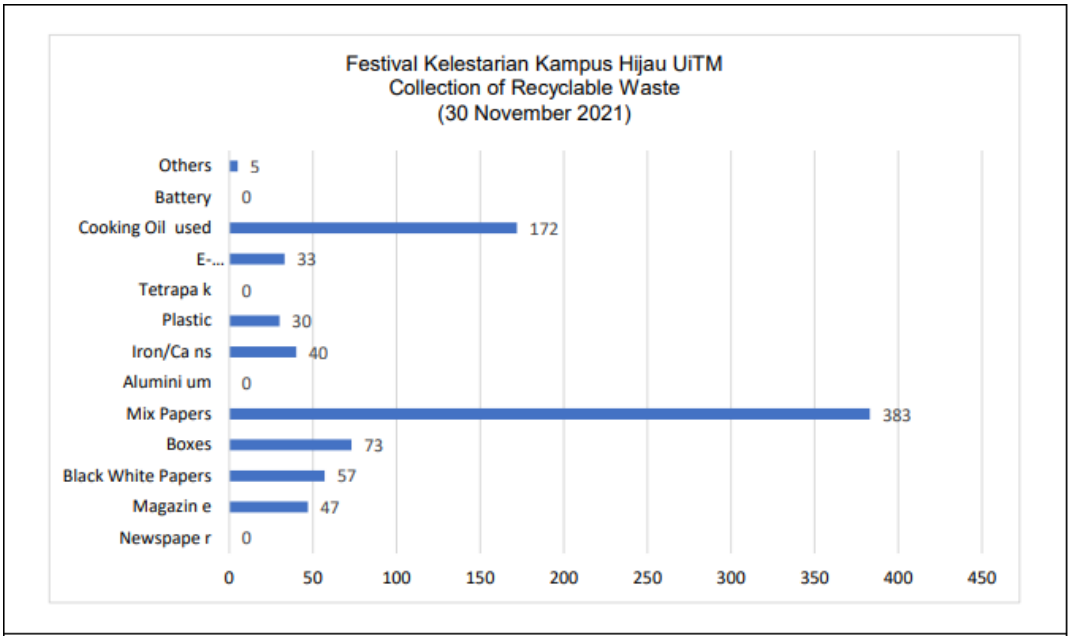
3.3 Cluster Projects and Achievements

3.3.1 Recycling programs conducted in UiTM (SDG 12 and 13)

In the academic sphere, the need to ensure SDG is successfully delivered, knowledge transfer programs and activities have been strongly carried out to enhance the awareness among the faculty

members and students of UITM. During the year, several programs were held in conjunction with the need to ensure the society to have the knowledge and awareness in keeping the university clean. Further, these programs were able to elevate the potential knowledge about the waste and materials recycling process in providing better and conducive study and living environments. Among the programs successfully carried out by the university are: (a) Go Green: Let's Recycle & Environmental Knowledge Transfer (Program: Festival Kelestarian Kampus Hijau UiTM 2021), which was held on 27 and 30 November 2021. This program was in collaboration with Alam Flora with the aim to encourage the faculty members, students, and society to understand the components of waste that can be recycled in reducing carbon footprint.

The program had introduced a 'drive thru, drop off' concept in collecting the waste material. Among the waste that successfully collected from this program are as follow:



Program: 3R on Wheels Bersama Alam Flora

Based on the figure mix papers and cooking oil are the highest waste that have been collected through 38 participations.

(c) Refuse disposable plastic (12 - 25 September 2021, and (d) Zero waste Lifestyle with 5 R (5-18 December 2021). The objective of these programs is to educate the faculty members to reduce plastic usage within the university. Social media platforms were used to disseminate the awareness and knowledge about plastic waste among the university community, this includes the use of plastic utensils and food packaging in the university cafeteria. These programs also provide various cause and effect knowledge to explain the consequences of the plastic waste towards the environment.

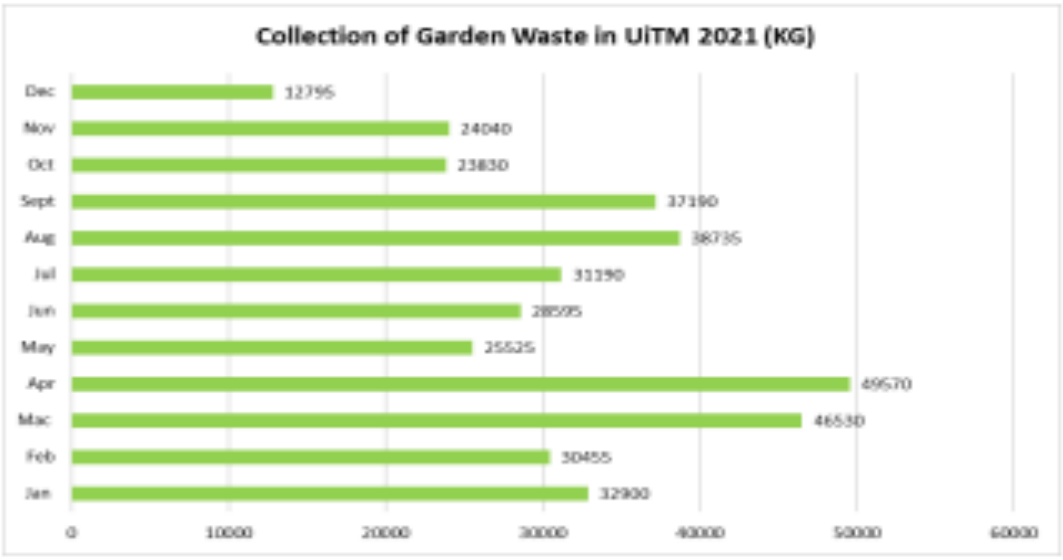
3.3.2 Waste management activities

In line with this effort, a webinar program entitled 'Managing My Waste' was conducted on 13 December 2021. This program was in collaboration with external corporations i.e., Mensilin Energy Sdn Bhd and KDEB Waste Management. This program was held with the aim to expose the faculty members and society around the household plastic consumption to better improve waste management.

Refuse disposable plastic (12 - 25 September 2021) and Zero waste Lifestyle with 5R (5-18 December 2021) were conducted to educate the faculty members to reduce plastic usage within the university. Social media platforms were used to disseminate the awareness and knowledge about plastic waste among the university community, this includes the use of plastic utensils and food packaging in the university cafeteria. These programs also provide various cause and effect knowledge to explain the consequences of the plastic waste towards the environment.

3.3.3 Organic Waste Treatment

More than 50% of UiTM's area is covered with green landscaping. To maintain and preserve the landfill, it is significant to the university to ensure generation of garden waste management is handled carefully. Among the main projects carried out were garden waste generation and composting. Management of garden waste in UiTM is handled by the UiTM Facility Unit under the administration of the Infrastructure and Infrastructure Development Office. Generation of UiTM's garden waste in 2021 was in the range of 12,795 – 49,570 kg. Composting is the main treatment method for the garden waste and the compost produced was applied as soil conditioner.



3.3.4 Inorganic waste treatment

Inorganic waste management - the aim of this program is to educate the university staff and students to dispose of used face masks in an appropriate way to reduce environmental pollution. In addition to this program, a webinar session has been organized by UiTM Green in collaboration with UBE-ICEA Japan in discussing the importance of Sustainability in Solid Waste Management.

3.4.5 Toxic Waste Treatment

3.4.6 Sewage Treatment

In UiTM, our waste management cluster is committed in addressing SDG 3, 7, 11, 12 and 13 (Figures 3-20), of which in summary is to ensure the consumption and production that includes targets focused on environmentally sound management and communities of all waste will be addressed through prevention, reduction, recycling and reuse, and reduction of waste. Waste management has since been contributing to each of these goals since. In 2020, UGC refined the approach by aligning to 2025 UiTM Sustainable Campus, which is best to have said as waste-wise campus to rethink, reduce, recycle, refuse, and reuse waste.

CLUSTER 4.0: Water Management

4.1 Introduction

UiTM is committed to promote sustainable and efficient water management practices. This is in line with SDG 6 – Clean water and sanitation; and SDG 17 – Partnerships for the Goals. The SDG 6 goal is to ensure availability and sustainable management of water and sanitation for all. The SDG17 goal is to strengthen the means of implementation and revitalize Global Partnership for Sustainable Development.

The main approach is to provide solutions in the water management crisis and develop policies to provide solutions in the water management crisis. It is also to develop effective policies towards water consumption.

The roles of this cluster are as follows:

a) To create awareness on the importance of water education and management
b) To encourage the campus community to reduce water usage and increase water conservation
c) To assess the water consumption, water treatment and water recycling in the campus.
d) To develop green integrated water management system for UiTM

Five main initiatives are formulated, which are Water conservation program & implementation, Water recycling program implementation, Water-efficient appliances usage, Consumption of treated water and Water pollution control in the campus area. With life beyond the Covid-19 pandemic, there has been a change in the last criteria, from percentage of additional handwashing and sanitation facilities during Covid-19 pandemic, to the water pollution control in the campus area.

Each of these initiatives are assigned indicators for the purpose of performance monitoring. The targeted indicators, WR1, WR2, WR3, WR4 and WR5 have been achieved for the year 2021.

4.2 Cluster Objective

The cluster goal is to develop comprehensive strategies and initiatives to reduce pressure on the existing water resources. With this, the five indicators; WR1, WR2, WR3, WR4 and WR5 are assigned. Each indicator is worth 200 points, giving a total of 1000 points and a weightage of 10%.

No	Criteria		Achievement
	Water (WR)	Point	2020
WR1	Water conservation program & implementation	200	200
WR2	Water recycling program implementation	200	200
WR3	Water-efficient appliances usage	200	200
WR4	Consumption of treated water	200	200
WR5	Water pollution control in the campus area	200	200
	Total	1000	1000

4.3 Cluster Projects and Achievements

4.3.1 Water Conservation Program & Implementation

The aim of the water conservation program is to encourage and educate Warga UiTM on wise water management resources. The continuation of the conservation programs may keep the environment healthy, for example by diverting less water from the river or bays as well as cost savings to the UiTM.

For 2021, the focus of the programs are (i) awareness and educational activities, and (ii) water harvesting system. Success of the programs are measured based on scales none, program in preparation, 1-25% implemented at early stage, > 25-50% water conserved and >50% water conserved. Each of these scales are given a weight (as shown in the table below).

Water conservation program and implementation (WR.1)

[1] None. Please select this option if the conservation program is needed, but nothing has been done.	
[2] Program in preparation (i.e., feasibility study and promotion)	
[3] 1 - 25% implemented at an early stage (i.e., measurement of potential surface runoff volume)	
[4] > 25 - 50% water conserved	
[5] > 50% water conserved	/

In 2021, UiTM has achieved more than 50% water conservation which shows that our commitment to water conservation programs have yielded successful results. Water conservation initiatives must also include students. Educational and awareness programs are important and crucial. Scarcity of water and sustainability for the future generations must be put forward. One of the activities which had continued in 2021 was our students were exposed to the field work on water conservation sites, i.e., the UiTM pilot plant laboratory.

Field sampling on water quality monitoring exposes the students on the importance of water conservation. Here the students are exposed to the method of sampling and in calculating the water quality based on the biological organisms found in the river.

Field Exposure to Students on the Water Quality Monitoring

UiTM Pilot Plant Laboratory enables students to have hands-on experience on how the industrial wastewater is being produced and treated before disposal into the environment. This enhances the water conservation understanding through understanding of the treatment used and its relation towards the Malaysian Environmental Regulations.

Student academic activities at the UiTM Pilot Plan Laboratory (IETS)

The next focus is the rainwater harvesting system. In pursuing the goal of managing water effectively, a rainwater harvesting system has also been implemented since 2010. This system will collect and store rainwater for the Landscape Department in UiTM. This technology is used for the purpose of watering plants and landscaping. The goal is to provide an alternative source of water for landscaping activities. This is an environmentally responsible practice and promotes self-sufficiency among Warga UiTM. UiTM has a plan to expand its rainwater harvesting system in other catchment areas (eg. Faculties, colleges, and administration building) for the purpose of cleaning and landscaping activities.

Rain Harvesting System in UiTM

4.3.2 Water Recycling Program Implementation

The achievement of initiative WR2: Water Recycling Program Implementation is measured based on five scales, which are: (1) None with 0 % achievement score, (2) Program in preparation with 25% achievement score, (3) 1-25% early-stage implementation with 50% achievement score, (4) >25-50% water recycled, with 75% achievement score and (5), >50% water recycled with 100% achievement score.

For WR2: Water Recycling Program Implementation it is reported that UiTM is currently within the scale no. 5, i.e., has achieved its target of more than 50% water being recycled. The following are the UiTM initiatives under WR2.

A. Grant for Recycled Water

To support projects, a research grant amounting to RM25,000 has been approved and awarded by UiTM from 2020 to 2022, to support a study related to Rainwater Harvesting and Recycle water from Chiller.

Pejabat
Timbalan Naib Canselor
(Penyelidikan dan Inovasi)

Rujukan Kami : 600-RMC/DANA 5/3/BESTARI (TD) (005/2019)
Tarikh : 1 Februari 2020

Dr. Suzana ramli
Fakulti Kejuruteraan Awam
Universiti Teknologi MARA
40450 Shah Alam
SELANGOR

Puan,

KELULUSAN GERAN PENYELIDIKAN BESTARI (TD)

Tajuk Projek	:	*Combination System of Rainwater Harvesting and Recycled Water from Chiller in S&T Building UiTM Shah Alam*
Kod Projek	:	600-RMC/DANA 5/3/BESTARI (TD) (005/2019)
Tempoh	:	2 Tahun
Jumlah Peruntukan	:	RM 25,000.00
Perkhidmatan Penyelidikan	:	RM 1,250.00
Jumlah Pengoperasian	:	RM 23,750.00
Ketua Projek	:	Dr. Suzana ramli

Dengan segala hormatnya perkara di atas adalah dirujuk.

2. Sukacita dimaklumkan, pihak Pejabat Timbalan Naib Canselor (Penyelidikan & Inovasi) telah mendaftarkan geran penyelidikan puan di bawah Geran Penyelidikan BESTARI (TD) bermula pada 1 Februari 2020.

3. Bagi pihak Universiti, Pejabat Timbalan Naib Canselor (Penyelidikan & Inovasi) mengucapkan tahniah kerana memperolehi geran ini dan berharap pihak puan berjaya menamatkan projek ini dengan cemerlang. Penggunaan peruntukan adalah tertakluk kepada Garis Panduan Geran Penyelidikan BESTARI yang terkini yang boleh dimuat turun dari laman sesawang RMC.

Sekian, harap maklum.

"SELAMAT MENJALANKAN PENYELIDIKAN DENGAN JAYANYA"

Yang benar

PROF. MADYA DR. ROHANA HASSAN
Pengarah
Pusat Pengurusan Penyelidikan (RMC)

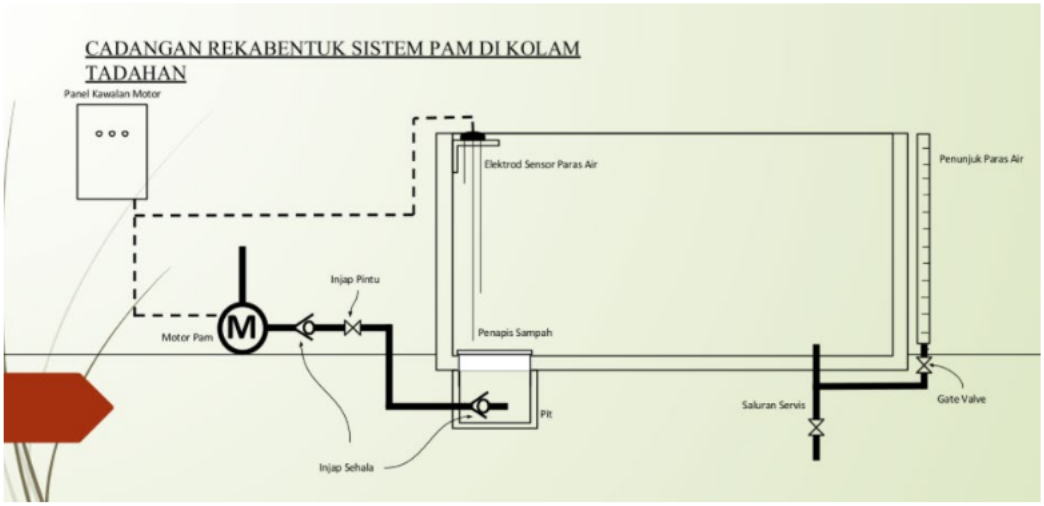
: Disertakan

Grant for Rainwater Harvesting and Recycle water from Chiller

B. Educational program - UiTM Rainwater Harvesting Project

Water Rainwater Harvesting Project is a process of collect and storage of rainwater for non-potable usages such as building cleaning, general household cleaning, cooling towers, fire suppression as well as landscape irrigation. In UiTM, the rainwater harvesting project is mainly used by the UiTM

Landscape Department. The proposed water pump system in the water retention pond and its ponds are shown below.



Schematic diagram for the rainwater harvester in Unit Landskap UiTM

Rainwater being collected in the detention pond before being used for irrigation purposes

C. Education program on water courses

To promote awareness and active research related to water recycling among warga UiTM including the students, three (3) faculties have embedded related programs into some of their courses as shown in the Table below.

Faculty	Subject	Source Data
School of Civil Engineering	Environmental Engineering and Sustainability (ECW445) Water and Wastewater Engineering (ECW567) Environmental Engineering Laboratory (ECW568) Groundwater Engineering (ECW581)	UHEK
School of Chemical Engineering	Wastewater Engineering (CPE675) Environmental Engineering (CPE649)	UHEK
Faculty of Applied Sciences	Water Resource Technology (EVT525) Wastewater Technology (EVT577) Water and Wastewater Technology (CMT635) Water Pollution Control Technology (EVT712)	UHEK

Education on Water Related courses at UiTM

D. Student Projects Related to Water Recycling

Further, the Faculty of Applied Sciences have introduced the “Water Treatment” as the final year project theme in 2020/2021. The list of final year projects for 2021 is shown in the table below.

No	Final Year Project Title	Theme	Year	Faculty
1	Removal of Malachite Green by using Chitosan-Alginate-Coffee Husk	Water Treatment	2021	Faculty of Applied Sciences
2	Microplastics on marine system: Corroboration of microplastics on macroalgae	Water Treatment	2021	Faculty of Applied Sciences
3	USAGE OF BANANA AS PLANT BASED NATURAL COAGULANT IN TREATING WASTEWATER	Water Treatment	2021	Faculty of Applied Sciences
4	Removal of Methylene Blue using Dragon Fruits (Hylocereusundatus) Peels as Bio-sorbent.	Water Treatment	2021	Faculty of Applied Sciences
5	NUTRIENT REMOVAL EFFICIENCY USING *Lolla Bionda*	Water Treatment	2021	Faculty of Applied Sciences
6	Radioactivity level and risk assesment of metals and radionuclides in fish from ex mining lake	Water Treatment	2021	Faculty of Applied Sciences
7	Radioactivity Assessment of Soil Sample in Ex-Mining Area	Water Treatment	2021	Faculty of Applied Sciences
8	Evaluation of water quality and eutrophication levels of lake in Shah Alam	Water Treatment	2021	Faculty of Applied Sciences
9	REMOVAL OF AMMONIUM BY USING CHITOSAN-ALGINATE-COFFEE HUSK BEAD	Water Treatment	2021	Faculty of Applied Sciences
10	Treatment of Laundry Wastewater by Using Corncob Based Activated Carbon.	Water Treatment	2021	Faculty of Applied Sciences
11	Treatment of laundry wastewater by using microalgae, *Chlorella vulgaris* .	Water Treatment	2021	Faculty of Applied Sciences
12	*Moringa Oleifera* Seed Extract to Reduce COD & Turbidity in Textile Wastewater	Water Treatment	2021	Faculty of Applied Sciences
13	Seasonal WQI Identification at Taman Tasik Seksyen 7, Shah Alam, Selangor	Water Treatment	2021	Faculty of Applied Sciences
14	Removal of Copper in Wastewater using Eggshell Waste as an Adsorbent.	Water Treatment	2021	Faculty of Applied Sciences
15	Use of Palnt-based Coagulant in the Tretament of Laundry Wastewater.	Water Treatment	2021	Faculty of Applied Sciences
16	Treatment of Laundry Wastewater by using Activated Carbon Made from Agriculture Residue.	Water Treatment	2021	Faculty of Applied Sciences
17	Reuse of grey water for non-potable use : A Review	Water Treatment	2021	Faculty of Applied Sciences
18	Comparative Review Using Modified Eggshell Waste on The Efficiency of Phosphate Removal	Water Treatment	2021	Faculty of Applied Sciences
19	A Review on Heavy Metal Concentration in Aquatic Eccsystems.	Water Treatment	2021	Faculty of Applied Sciences
20	A Review: Adsorption of Dyes from Wastewater by Agricultural Wastes	Water Treatment	2021	Faculty of Applied Sciences
21	Adsorption of Methylene Blue by Ficus carica Leaf as a Natural Adsorbent	Water Treatment	2021	Faculty of Applied Sciences
22	Methylene Blue Dye Removal Efficiency Using Activated Corn Cob	Water Treatment	2021	Faculty of Applied Sciences
23	A Review of Microplastic Pollution in Wastewater Treatment Plant.	Water Treatment	2021	Faculty of Applied Sciences
24	A Review on Dye Adsorption from Wastewater by Agricultural Peels	Water Treatment	2021	Faculty of Applied Sciences
25	Nutrient Removal Efficiency using Edible Plants in Closed Loop Aquaponic System.	Water Treatment	2021	Faculty of Applied Sciences
26	Removal of Phosphorus In Wastewater Using Magnesium-Modified Lightweight Expanded Clay Aggregate	Water Treatment	2021	Faculty of Applied Sciences
27	Adsorption of Malachite Green Dye using Modified Chitosan-Alginate-Oil Palm Empty Fruit Bunch Bead: Case Study	Water Treatment	2021	Faculty of Applied Sciences
28	Efficiency of Lead Removal Using Activated Rice Husk	Water Treatment	2021	Faculty of Applied Sciences
29	Phytoremediation of Heavy Metal in Laundry Wastewater using Water Hyacinth.	Water Treatment	2021	Faculty of Applied Sciences
30	Removal of Dyes by Adsorption of Modified Clay	Water Treatment	2021	Faculty of Applied Sciences
31	Removal of Heavy Metals From Industrial Wastewater using Lemna minor.	Water Treatment	2021	Faculty of Applied Sciences
32	Wastewater Industry at Telok Panglima Garang.	Water Treatment	2021	Faculty of Applied Sciences
33	Improvement on Water Quality In Recreational Lakes Using Phycoremediation & Bioremediation.	Water Treatment	2021	Faculty of Applied Sciences
34	Removal of Malachite Green using Chitosan-Alginate Spent Mushroom Compost Beads: Case study	Water Treatment	2021	Faculty of Applied Sciences
35	Harvesting Rain water in Johor Area.	Water Treatment	2021	Faculty of Applied Sciences
36	Filtration of Grey Water by Using Oil Palm Waste Based Filter System: A Review.	Water Treatment	2021	Faculty of Applied Sciences
37	A Review: Biosorptive Removal of Methylene Blue from Wastewater using Natural Biomass Waste.	Water Treatment	2021	Faculty of Applied Sciences
38	Titanium (IV) Isopropoxide modified Expanded Perlite for The Removal of Herbicide Diuron from Water.	Water Treatment	2021	Faculty of Applied Sciences
39	A Review: Removal of dyes using clay	Water Treatment	2021	Faculty of Applied Sciences
40	Review: The Effectiveness of Immobilization Environment Friendly Biocarriers in Bioremediation Of Oil Contaminated Water	Water Treatment	2021	Faculty of Applied Sciences
41	Removal of Phosphorus In Wastewater Using Magnesium Peroxide-Modified Lightweight Expanded Clay Aggregate	Water Treatment	2021	Faculty of Applied Sciences
42	A Review: Adsorption of Methylene Blue using Biomass-based Activated Carbon.	Water Treatment	2021	Faculty of Applied Sciences
43	Removal of Heavy Metal from Wastewater using Ipomoea aquatica and Xentelle asiatica	Water Treatment	2021	Faculty of Applied Sciences

Students FYP regarding water recycling for Faculty of Applied Science

E. Educational program - Water recycling Strategy

The development of new water recycling strategies to treat wastewater from six (6) Sewerage Treatment Plants (STPs) in UiTM Shah Alam by Facility UiTM. The strategies are still under proposal stage and confidential. Since 2020, a treatment system for the water treatment effluent from Kolej Mawar STP has been proposed by the appointed consultant. In their proposal, membrane treatment has been proposed and cost benefit analysis (CBA) also has been conducted**.**

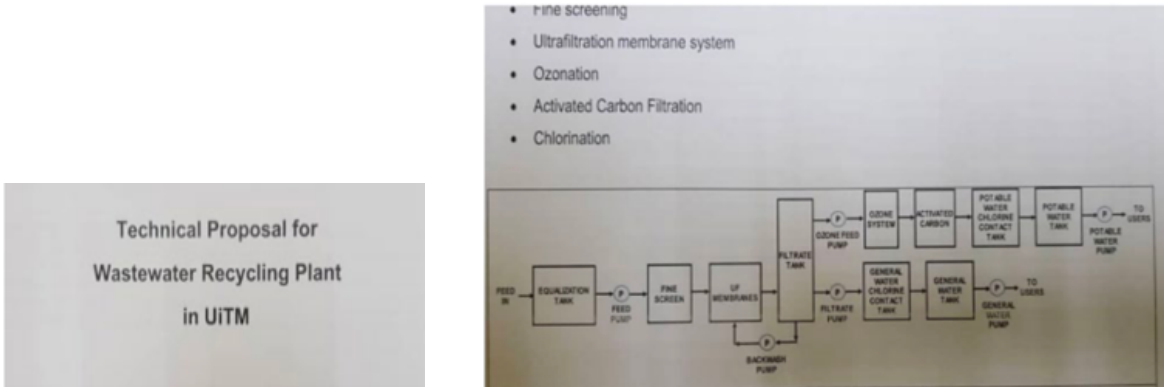


Figure 0-1: Cover and Proposal of the WRP process flow

F. Educational program - Aquaponic Water Research

The project recycles the water from the fish tank to irrigate the plants on top of the system and back to the fish tank.

Figure 0-2: Aquaponic water research in Faculty of Applied Science

4.3.3 Water-efficient appliances usage

Using water-efficient appliances is another method of ensuring water savings at the university. The KPI which aimed to install more than 50% of water-efficient appliances installed had already achieved in previous years.

UiTM uses highly efficient appliances, which are: (i) auto sensor and, (ii) dual-flush toilets. The auto sensor is a device used in the chiller and air conditioning systems to control the volume and flow of water. Its significant function is to control the temperature of the building. At UiTM, this sensor is used in Dewan Agong Tuanku Canselor (DATC).

Auto Sensor

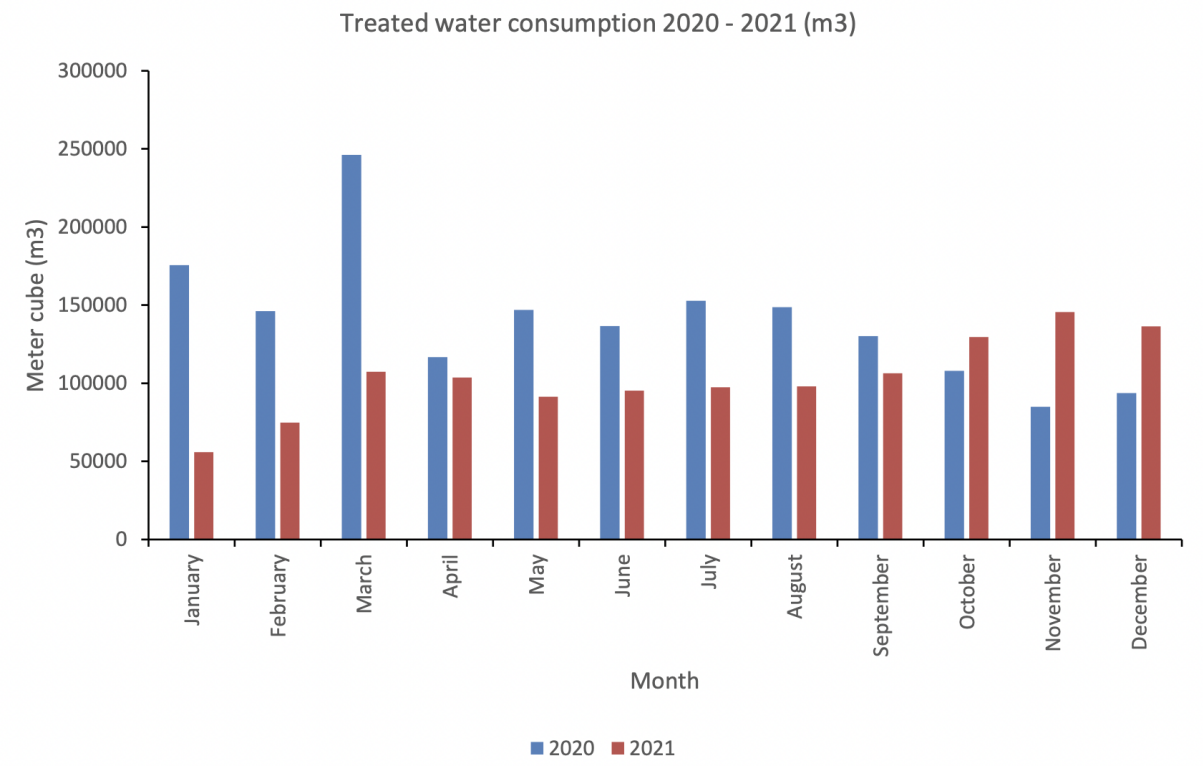
A dual-flush toilet is a variation of the flush toilet which uses two buttons or a handle mechanism to flush different amounts of water. A lesser amount of water is designed to flush liquid waste and the larger quantity of water designed to flush solid waste. This modern dual-flush system will save more water. Most restrooms in UiTM are equipped with dual flush toilets.

These appliances not only conserve water, but also energy. This in turn will reduce greenhouse gas pollutants which may lessen the risk of climate change/or carbon footprint in the future. We also view this as to support our UiTM's commitment to improve their performance in all issues related to energy and climate change.

Dual-flush toilet

4.3.4 Consumption of treated water

Similar to the other initiatives, our treated water consumed has also achieved the target, i.e. more than 75% of treated water consumed as shown in the table below:



Consumption of treated water (WR.4)

[1] None	
[2] 1 - 25% treated water consumed	
[3] > 25 - 50% treated water consumed	
[4] > 50 - 75% treated water consumed	
[5] > 75% treated water consumed	/

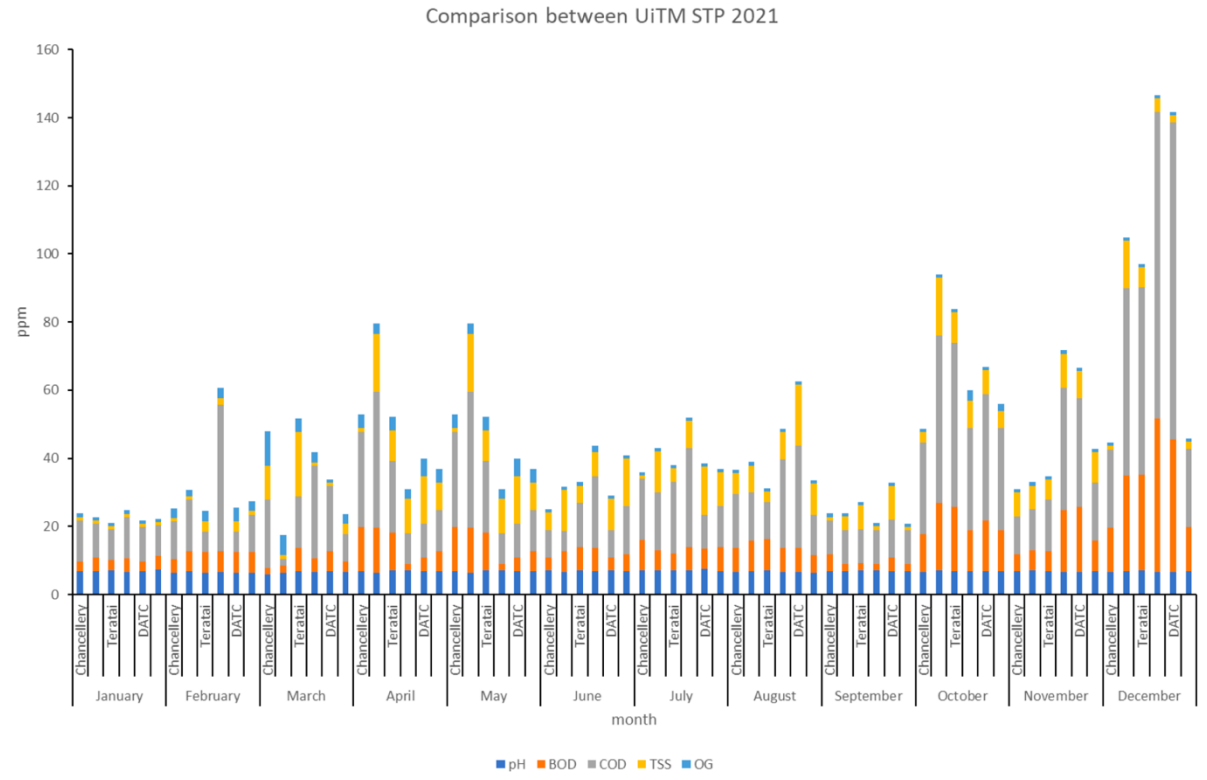
In terms of consumption of treated water, the decline in April 2020 was due to the Movement Control Order (MCO) in Malaysia. In 2021, the consumption is still significantly lower compared to the pre-pandemic days, as most staff and students were not on campus, due to the extension of Movement Control Order, as well as the Work-from-Home (WFH) policy. The trend, in meter cube of the treated water usage in 2021 compared to 2020 is shown in the table. (Source: PPII UiTM)

4.3.5 Water pollution control in the campus area

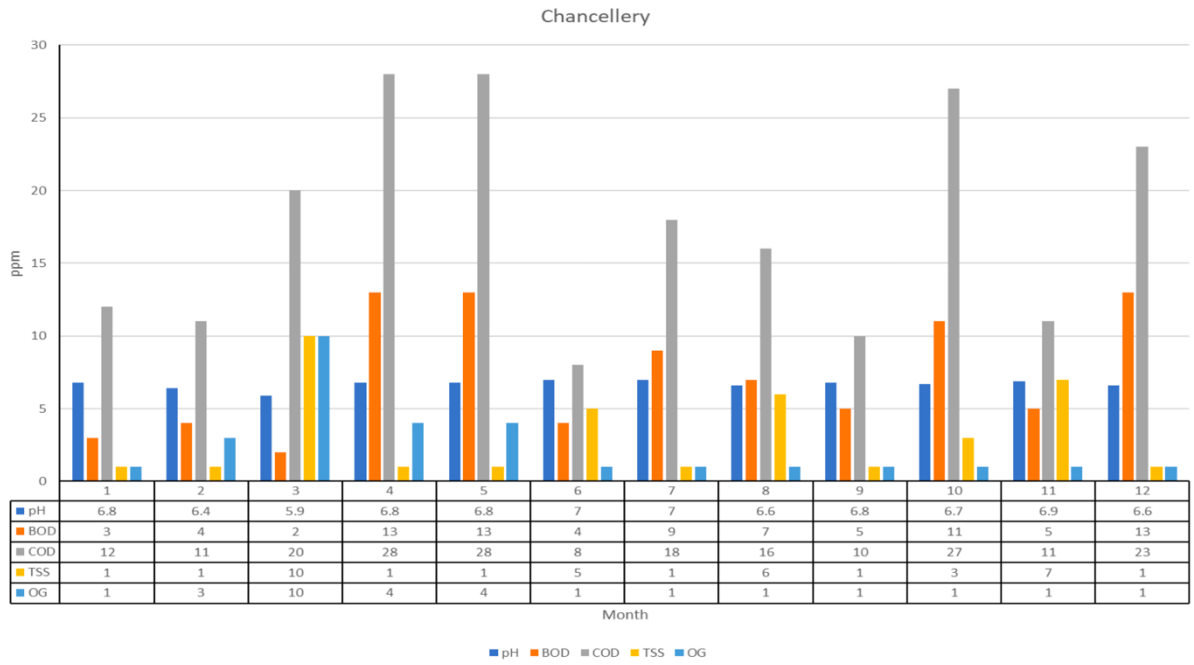
There are policies and programs in place for water pollution control at the university. UiTM is proactive in monitoring the Sewage Treatment Plant (STP). The figures below show the effluence analysis results for 6 STPs in UiTM, which are at the Chancellery, Mawar, Teratai, Reserve Officer Training Unit, DATC and Pusat Islam. The STP monitoring is done monthly whereby the pH, BOD, COD, TSS and OG levels are observed at these locations.

Water pollution control in campus area (WR.5)

[1] Policy and programs for water pollution control are in the designing stage	
[2] Policy and programs for water pollution control are in the construction stage	
[3] Policy and programs for water pollution control are in the early implementation stage	
[4] Policy and programs for water pollution control are fully implemented and monitored occasionally	
[5] Policy and programs for water pollution control are fully implemented and monitored regularly	/

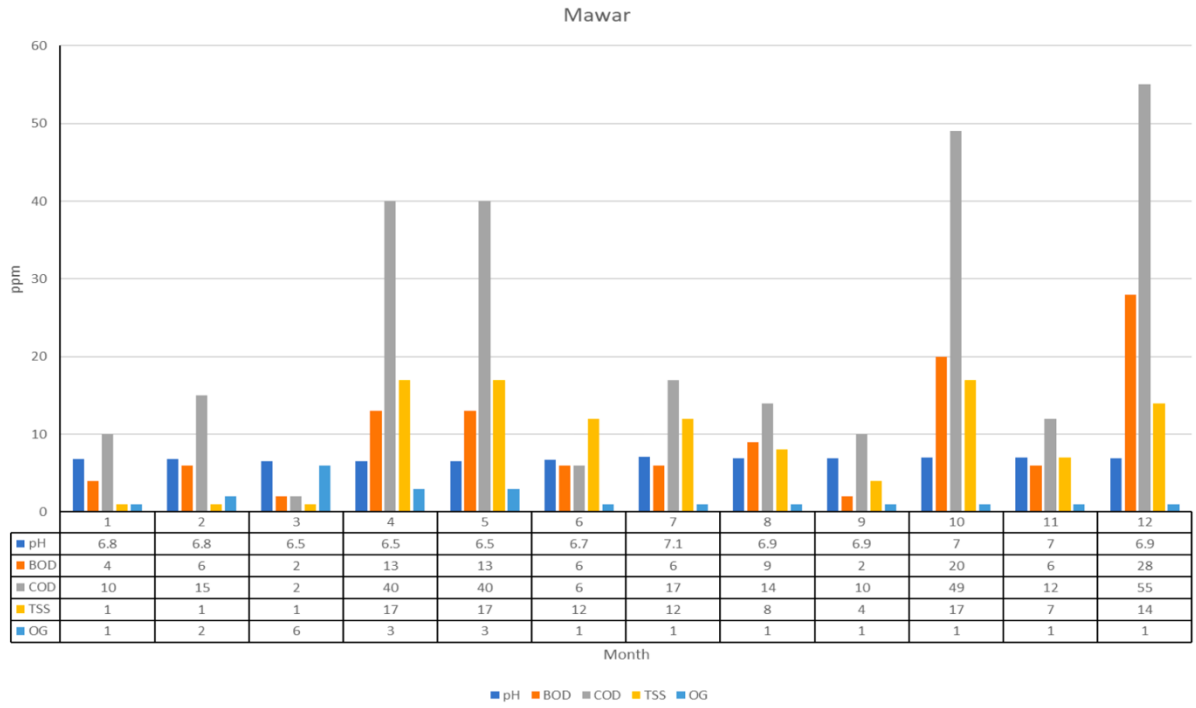


Effluent analysis results for 6 STPs in UiTM



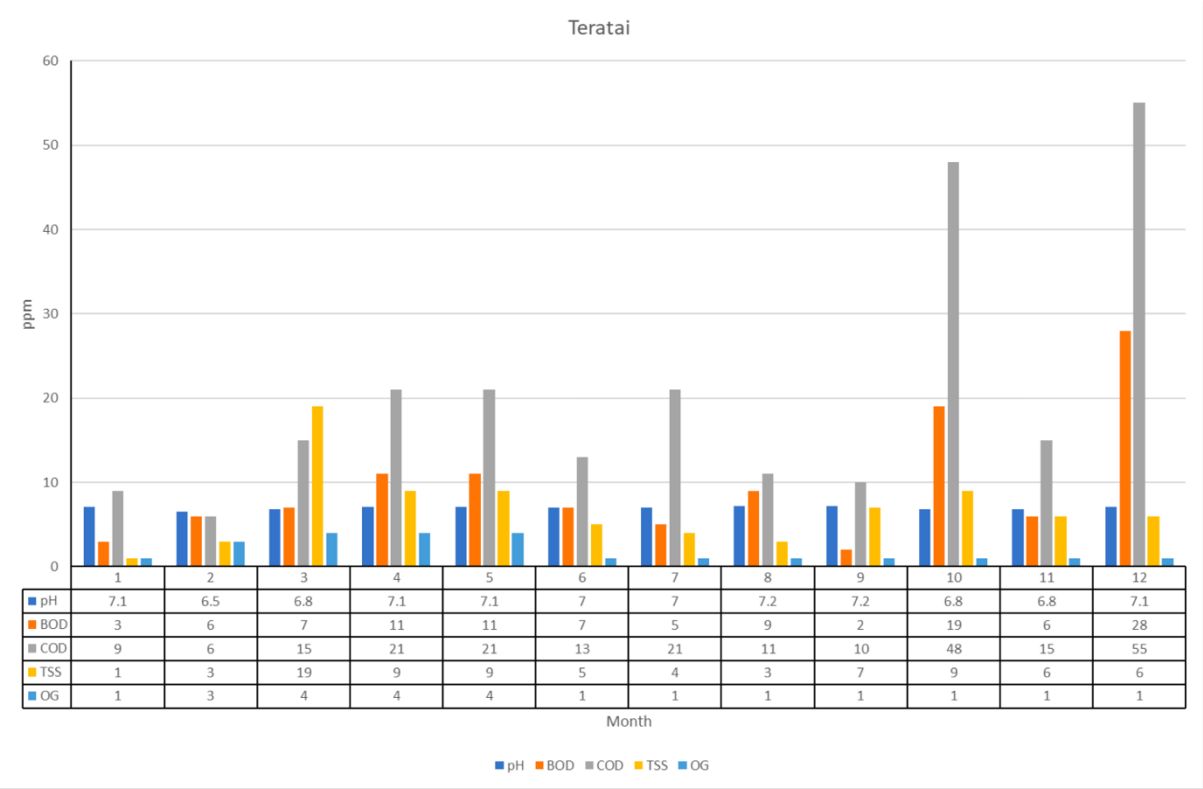
	1	2	3	4	5	6	7	8	9	10	11	12
pH	6.8	6.4	5.9	6.8	6.8	7	7	6.6	6.8	6.7	6.9	6.6
BOD	3	4	2	13	13	4	9	7	5	11	5	13
COD	12	11	20	28	28	8	18	16	10	27	11	23
TSS	1	1	10	1	1	5	1	6	1	3	7	1
OG	1	3	10	4	4	1	1	1	1	1	1	1

Chancellery STP results



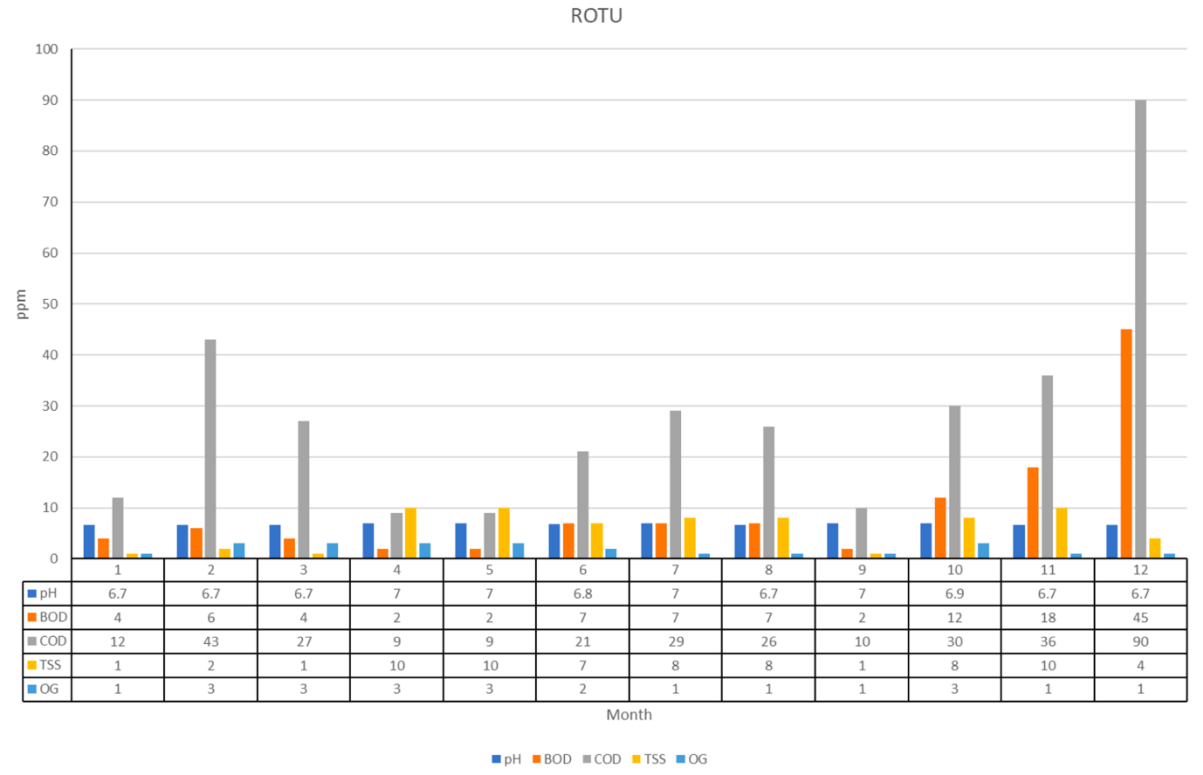
	1	2	3	4	5	6	7	8	9	10	11	12
pH	6.8	6.8	6.5	6.5	6.5	6.7	7.1	6.9	6.9	7	7	6.9
BOD	4	6	2	13	13	6	6	9	2	20	6	28
COD	10	15	2	40	40	6	17	14	10	49	12	55
TSS	1	1	1	17	17	12	12	8	4	17	7	14
OG	1	2	6	3	3	1	1	1	1	1	1	1

Mawar STP result



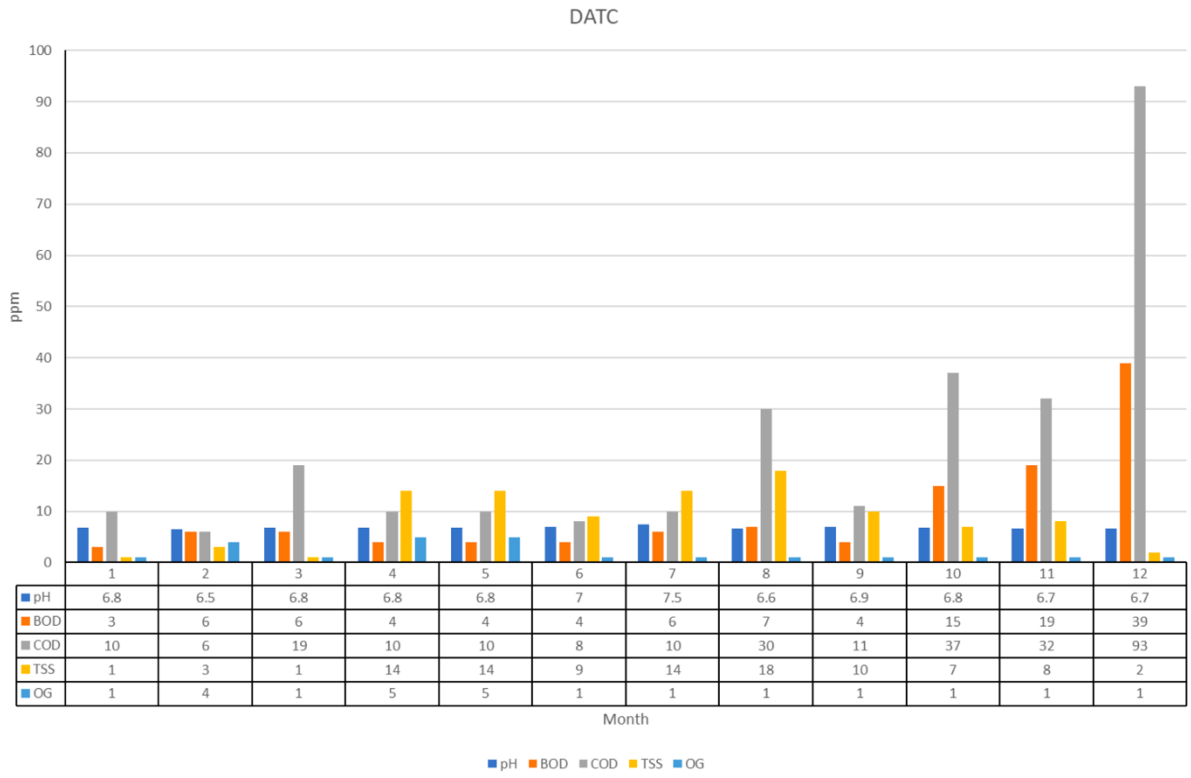
	1	2	3	4	5	6	7	8	9	10	11	12
pH	7.1	6.5	6.8	7.1	7.1	7	7	7.2	7.2	6.8	6.8	7.1
BOD	3	6	7	11	11	7	5	9	2	19	6	28
COD	9	6	15	21	21	13	21	11	10	48	15	55
TSS	1	3	19	9	9	5	4	3	7	9	6	6
OG	1	3	4	4	4	1	1	1	1	1	1	1

Teratai STP result



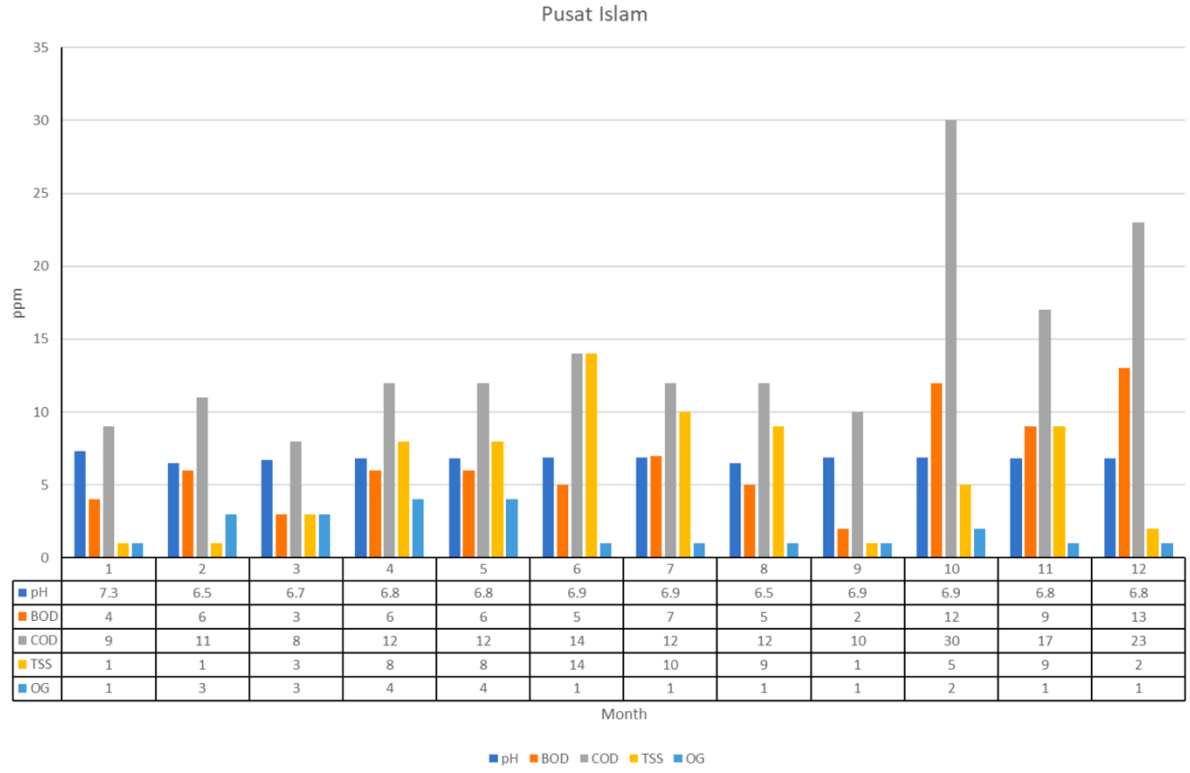
	1	2	3	4	5	6	7	8	9	10	11	12
pH	6.7	6.7	6.7	7	7	6.8	7	6.7	7	6.9	6.7	6.7
BOD	4	6	4	2	2	7	7	7	2	12	18	45
COD	12	43	27	9	9	21	29	26	10	30	36	90
TSS	1	2	1	10	10	7	8	8	1	8	10	4
OG	1	3	3	3	3	2	1	1	1	3	1	1

Reserve Officer Training Unit STP result



	1	2	3	4	5	6	7	8	9	10	11	12
pH	6.8	6.5	6.8	6.8	6.8	7	7.5	6.6	6.9	6.8	6.7	6.7
BOD	3	6	6	4	4	4	6	7	4	15	19	39
COD	10	6	19	10	10	8	10	30	11	37	32	93
TSS	1	3	1	14	14	9	14	18	10	7	8	2
OG	1	4	1	5	5	1	1	1	1	1	1	1

DATC STP result



	1	2	3	4	5	6	7	8	9	10	11	12
pH	7.3	6.5	6.7	6.8	6.8	6.9	6.9	6.5	6.9	6.9	6.8	6.8
BOD	4	6	3	6	6	5	7	5	2	12	9	13
COD	9	11	8	12	12	14	12	12	10	30	17	23
TSS	1	1	3	8	8	14	10	9	1	5	9	2
OG	1	3	3	4	4	1	1	1	1	2	1	1

Pusat Islam (PI) STP result

4.4 Moving Forward

Aiming towards a sustainable green community, UiTM Green Center (UGC), Infrastructure & Infrastructure Development Office, Universiti Teknologi MARA (UiTM) together with Pengurusan Aset Air Berhad (PAAB) has conducted the Sahabat Sungai Program to clean Sungai Langat, Kg. Kuala Pangsun. This program was conducted in conjunction with the celebration of World Water Day 2021 and was implemented simultaneously throughout the country under the National River Trail (DSK) mega program, Ministry of Environment & Water (KASA). A total of 40 volunteers from UiTM and PAAB agencies have participated in this program. This program is one of the programs conducted by UGC to strengthen the knowledge and experience of nature more closely, as well as to realize UiTM as an eco-friendly campus and support the sustainability agenda at UiTM. In this collaboration, UiTM has become Sahabat Sungai in Sungai Langat, Kg. Kuala Pangsun.

CLUSTER 5.0: Transportation

5.1 Introduction

Transportation management aims to minimize the impact of campus community travel by reducing the environmental impact, traffic, congestion, and air pollution. The daily transportation and choices of the campus community to and from the campus have an impact on the UiTM campus indirectly through carbon emission.

5.2 Cluster Objectives

The transportation cluster aims to reduce the environmental impact of campus community travel by encouraging and supporting environmentally efficient modes of transport. It is in line with the national policy on climate change and MBSA's low carbon city.

This objective will be achieved by the following:

- Assessing the amount of carbon emission released by vehicles that move to and from the UiTM campus.
- Evaluating the adequacy of low carbon facilities within the campus.
- Introducing a strategic solution to reduce the amount of carbon emission on the campus through efficient traffic management and effective transportation policies.
- Recommending comprehensive and suitable plan(s) to cultivate a low-carbon campus community.

Table 5.1: Indicators for Transportation Cluster

ELEMENT	CRITERIA
TR1	The total number of vehicles (cars and motorcycles) divided by the total number of campus population
TR2	Shuttle services
TR3	Zero Emission Vehicles (ZEV) policy on campus
TR4	The total number of Zero Emission Vehicles (ZEV) divided by total campus population
TR5	Ratio of ground parking area to total campus area
TR6	Programme to limit or decrease the parking area on campus for the last 3 years (from 2019 to 2021)
TR7	Number of initiatives to decrease private vehicles on campus
TR8	Pedestrian path policy on campus

5.3 Cluster Projects and Achievements

SDG Initiatives Related to Transportation Cluster

(© SLOCAT, 2020)

Figure 5.1: Sustainable Low Carbon Transport (© SLOCAT, 2020)

5.3.1 Total Number of Vehicles (Cars and Motorcycles) Divided by Total Number of Campus Population

UiTM Shah Alam Campus covers an area of 300 acres with a student population of 44, 091 and 4,714 academic and non-academic staff contributed to the high vehicle usage. The total vehicles that are actively used and managed by UiTM is 77 which consists of 12 buses, 4 minibuses, 4 trucks, 1 hearse van, 10 passenger vans, 31 cars, 9 MPVs, and 6 SUVs. In 2021, real data collection was conducted as the movement control order was lifted. In 2020, data are based on simulation as the country was under a movement control order. The number of cars and motorcycles was estimated to be 4468 and 2331 respectively. The ratio of the total number of vehicles to the total campus population is estimated to be 0.25.

The project for monitoring and recording the number of vehicles to and from the UiTM Shah Alam campus is progressing. Auxiliary police posts at the main and secondary entrance are installed with CCTV to enable them to identify the number of vehicles to and from the campus

5.3.2 Shuttle Services

The campus bus service and public buses operated around the campus for UiTM residents and visitors to move around the campus area. In addition, Smart Selangor free electric bus service has been allowed to operate in the campus area too. The total number of campus buses allocated daily is 18 buses that operate on 6 different routes, and which are scheduled from 7.00 am to 11.00 pm. It also covers nearby locations such as Section 2, Section 7, and i-City Shah Alam.

It has been proposed to increase the number of shuttle buses for better services on the campus. This would reduce the number of private vehicles entering the campus as well as meet the community's

expectation of better-quality shuttle bus services. Soon, the shuttle bus services will be expanded to reach a brand new MRT station next to the campus once the line services are in operation.

UiTM buses and third-party buses for shuttle bus services

5.3.3 Zero Emission Vehicles (ZEV) Policy on Campus

In 2021, UiTM still adopted the ODL approach which resulted in a minimal number of students and academic presence on campus. However, initiatives on ZEV such as e-scooter and e-bikes are progressing and will be materialized once students are back on campus.

ZEV Policy – Frequent reviews on the policy should be carried out regularly to ensure proper implementation of strategies. Findings from the review would identify critical factors for ZEV users and their behavior. It is suggested that the logistic department should constantly promote the policy and encourage the University community to embrace ZEV

5.3.4 Total Number of Zero Emission Vehicles (ZEV) Divided by Total Campus Population

To achieve the minimum ratio of ZEV on the UiTM Shah Alam campus, the university must have at least 100 units of ZEV to achieve 0.002. Unfortunately, at present the number of ZEV is less than the minimum target. UiTM is leveraging the opportunities to engage with private agencies to reduce the carbon emission in the university e.g., partnering with MITRANS to explore critical factors that contribute to vehicle usage. This is to enhance mobility and green transportation within the UiTM campus.

An advanced video analytics technology for detection and recording would address the issue of identifying the number of ZEV on campus. In addition, the Auxiliary Police unit should be able to identify it through registration for parking stickers by UiTM staff and students.

5.3.5 Ratio of Ground Parking Area to Total Campus Area

The feasibility and efficiency of parking arrangements were investigated for traffic planning and management in UiTM Shah Alam. It enabled the identification of several factors with vehicle ownership and usage which affected parking areas. A study on issues related to parking and traffic flow on campus was conducted by MITRANS in 2020. The total size of the parking area is 71, 689 square meters and the ratio of the parking area to the total campus area is 4.516 %.

The Logistic Department should review and strategize the management of parking needs based on the University events and capacity. A smart parking management system would be able to cope with various events to monitor the proportion of private vehicle users and ZEV. In addition, constant enforcement of the clamping zone policy would minimize the number of unauthorized vehicles on campus. It also helps minimize traffic congestion as well as reduce carbon emissions from vehicles.

Table 5.2: Parking Areas by Zone in the UiTM Shah Alam Campus

ZON A

BIL	TEMPAT	Jumlah Pakir Kereta Keseluruhan	Jumlah Pakir Kereta Bernama	Baki Pakir Kereta Tak Bernama
1	BANGUNAN FSPU A	40	7	33
2	BANGUNAN FSPU A (PARKIR PELAJAR)	155	0	155
3	BANGUNAN FSPU B	110	27	83
4	BANGUNAN STADIUM	155	0	155
5	AKADEMIK KEPOLISAN	11	0	11
6	MARKAS PALAPIS	24	0	24
7	CANSELORI	30	1	29
8	CANSELORI (PARKIR AWAM)	40	0	40
9	CANSELORI (PARKIR BERTINGKAT)	120	53	67
10	FAK PENGURUSAN HOTEL (MASMED)	46	13	33
11	KOMP SUKAN DELIMA	60	11	49
12	SEK TAMIL (FAK KEJ LAMA)	12	4	8
13	PUSAT I.LEARN (MITRAN)	15	14	1
14	KWS LAPANG LOT 10	44	0	44
15	DEPAN BANGUNAN WAWASAN	89	57	32
16	PUAST ISLAM	48	18	30
17	PPII (HADAPAN BANGUNAN)	59	20	39
18	PPII (UNIT KEWANGAN ZON 5)	10	10	0
19	PPII (SEPANJANG JALAN)	91	0	91
20	POS PENGAWAL PINTU 3	8	0	8
21	KAUNTER EMAS	49	0	49
22	MTDC	127	6	121
23	PERSIMPANG DATC	10	0	10
JUMLAH		**1353**	**241**	**1112**

ZON B

BIL	TEMPAT	Jumlah Pakir Kereta Keseluruhan	Jumlah Pakir Kereta Bermama	Baki Pakir Kereta Tak Bermama
1	MENARA SAAS, ANJUNG ANNEXE DAN PENDAFTAR	105	70	35
2	PARKING BERTINGKAT (PENDAFTAR)	387	0	387
3	FAKULTI SENILUKIS DAN SENIREKA	122	23	99
4	DEWAN SRI BUDIMAN	155	57	98
5	HEP (UNIT KEWANGAN)	19	4	15
6	HEP (HADAPAN)	84	0	84
7	FAKULTI UNDANG-UNDANG.	43	6	37
8	FAKULTI PENGURUSAN PERNIAGAAN DAN PTAR 2	113	45	68
9	FAKULTI SAINS GUNAAN DAN TEKNOLOGI PEJABAT	58	27	31
10	JLN UTAMA DSB KE PUSAT ISLAM	52	0	52
11	PTAR 1	7	0	7
JUMLAH		**1145**	**232**	**913**

5.3.6 Programme to Limit or Decrease the Parking Area on Campus for the Last 3 Years (From 2019 to 2021)

In 2019, a study was conducted by MITRANS to re-evaluate the use of parking areas at the UiTM Shah Alam campus. The study also aims to identify the main parking issues, propose improvements, and implement sustainable improvements for pedestrians, cyclists, and the handicapped (OKUs). The main finding of the study shows that the capacity of parking areas is limited and not strategically designated for community needs. This is particularly apparent during large events such as convocations and new semester registrations. In addition, the study also found that usage of fake parking students among students has resulted in congestion at parking spaces meant for the university employees.

Although carpooling would be a meaningful option to reduce congestion and carbon emissions, the awareness and practices among students and employees are minimal. Meanwhile, initiatives toward Zero Emission Vehicles on the campus have not materialized yet. Essential facilities such as cycling lanes and proper bicycle parking spaces are not available. Also, there are inadequate appropriate sign boards for parking spaces, cycling lanes, and pedestrian walkways. This study also found that the 'park and ride' system is inefficient and ineffective. It is mainly contributed by poor communication and information about the shuttle bus schedule, frequency, and route coverage. This resulted in the facilities being underutilized particularly by the students. Recommendations of the study are divided into short-term, and mid-term as indicated in the figures below.

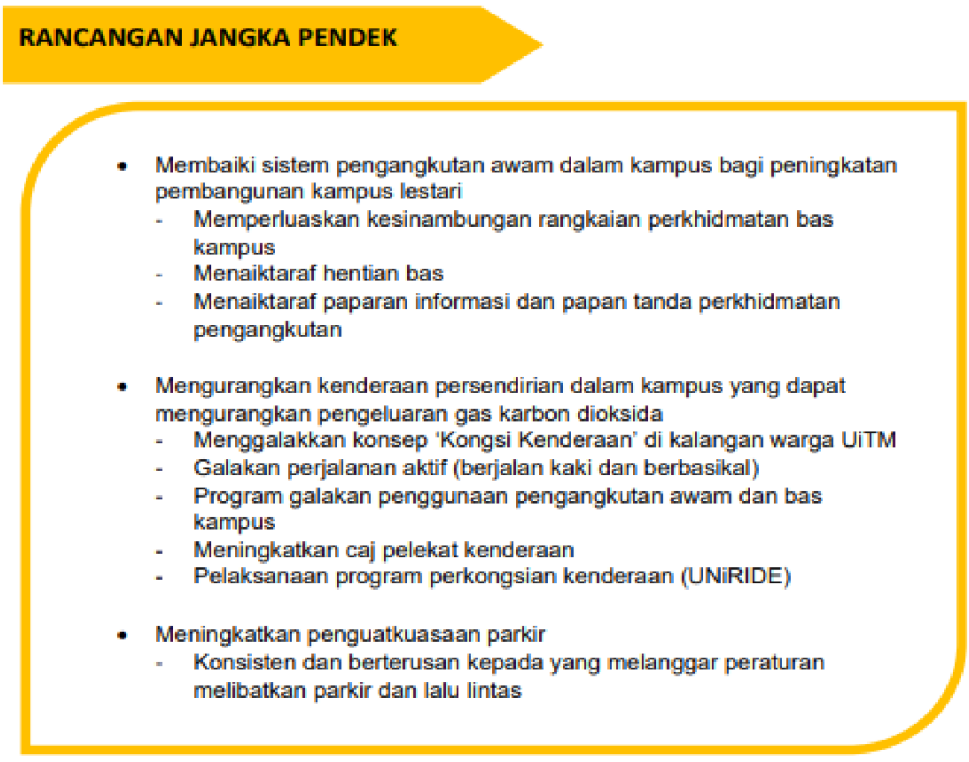


Figure 5.2: Short-Term Solutions to Limit or Decrease the Parking Area on Campus

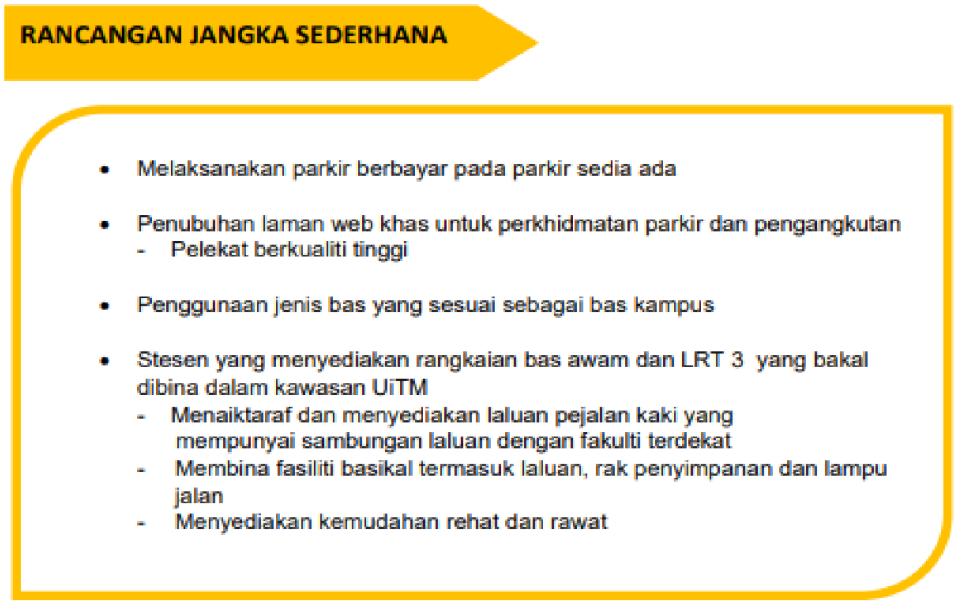


Figure 5.3: Mid-term Solutions to Limit or Decrease the Parking Area on Campus

Photo 5.3: Centralized parking and clamping enforcement would minimize excessive vehicles on campus

In 2021, UiTM still adopted the ODL approach which resulted in a minimal number of students and academic presence on campus. Hence, carbon emission was reduced drastically.

5.3.7 Number of Initiatives to Decrease Private Vehicles on Campus

UiTM Shah Alam campus is still working on materializing four initiatives that have been proposed as outlined below.

Initiatives	Description
Introduction of e-Scooter	Usage of e-scooter on the campus would encourage the UiTM community, particularly students to utilize public transport or share vehicles as the main transportation mode.
Introduction of e-Bikes	This project aims to electric bicycles (e-bikes) as well as electric cards for use by staff and students. It will increase the percentage of the UiGM index for the UiTM Shah Alam campus.

Free Public Transport, Sharing and Active Mode of Transportation	This is a long-term commitment and continuous effort in achieving low carbon emissions. The shuttle public transport services are a free public transport service for the UiTM community focusing on minibus services and other public transportation vehicles such as taxis, grab, and rental cars. Enhancing the public transportation on the campus would improve the air quality as well as provide convenient and efficient transportation for the UiTM campus community. In addition, this project will help reduce the cost of living and traffic congestion on the campus. Therefore, this project will improve the percentage of the UiGM index for UiTM soon.
Education and Engagement	The year 2020 and 2021 had been unprecedented in UiTM teaching and learning activities. The Open and Distance Learning (ODL) approach was adopted by faculty members, while administrative staff worked from home. This contributed to the reduction of carbon emissions within the campus.

An Expert Task Force was established to strategize and implement Green Transportation initiatives on campus. Activities such as awareness campaigns, education, technology, and infrastructure engagement with the University community can be adopted.

5.3.8 Pedestrian Path Policy on Campus

A Road Safety Audit (RSA) was conducted on August 20, 2020, to identify any potential hazards on the existing roads within the campus. It also aims to determine possible solutions to achieve a sustainable campus. The following are pedestrian paths on the campus.

Photo 5.4: Covered walkways and pedestrian crossings

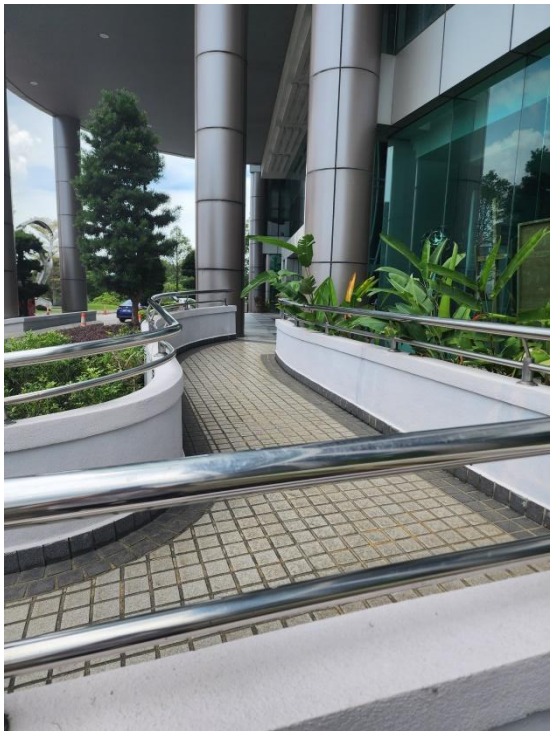


Photo 5.6: Ramp for wheelchair

The Logistic Department has been assigned to monitor and disseminate the pedestrian paths/ walkways policy among the University community. It is also responsible to promote the policy to all through constant and active engagements. UiTM is suggested to provide a special grant to upgrade the walkway in line with a proposal and policy from the European Transportation Consultancy (ETC).

5.3.9 Overall Cluster Achievements

The total score for the transportation cluster has increased steadily since UiTM participated in UiGM in 2017. The table below indicates the UiTM score for the last three years.

Table 5.3: Achievement of Transportation Cluster in UiGM from 2019 to 2021

Element	Criteria	Full Marks	Achievement		
			2019	2020	2021
TR1	The total number of vehicles (cars and motorcycles) divided by total number of campus population	200	150	200	*
TR2	Shuttle services	300	225	225	*
TR3	Zero Emission Vehicles (ZEV) policy on campus	200	100	100	*
TR4	The total number of Zero Emission Vehicles (ZEV) divided by total campus population	200	0	0	*
TR5	Ratio of ground parking area to total campus area	200	100	100	*
TR6	Programme to limit or decrease the parking area on campus for the last 3 years (from 2019 to 2021)	200	50	50	*
TR7	Number of initiatives to decrease private vehicles on campus	200	200	200	*
TR8	Pedestrian path policy on campus	300	300	300	*
	TOTAL	**1800**	**1125**	**1175**	**1375**

CLUSTER 6.0: Education and Research

6.1 Introduction

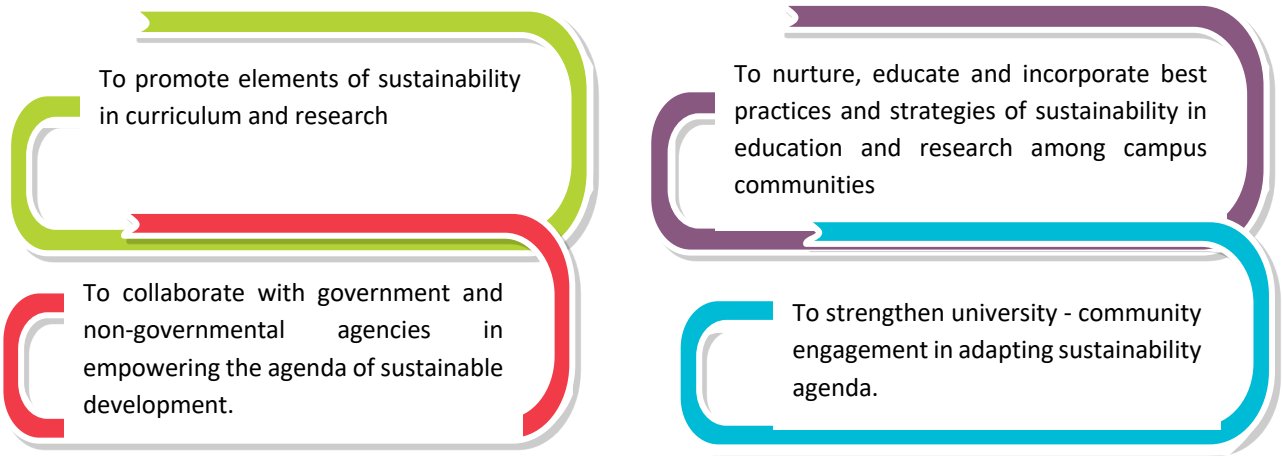
Universities and other higher education institutions play an important role in promoting sustainable initiatives to tackle a range of socio-economic issues to strive for the betterment of the nation. Quality education including the research agenda has been embedded as an integral part of the transformation programs in UiTM in the pursuit of the Sustainable Development Goals (SDGs).

The significance of quality education has not only been indicated by its standalone goal of SDG4 but also its connection to various other challenges in meeting the aims of SDGs such as poverty, quality of life and prosperity, economic growth, climate change, and environmental protection. For that, UiTM has continuously strategized various sustainability initiatives in relation to excellent and quality education and research incorporating all faculties, campuses, and departments for the benefit of UiTM's stakeholders.

Specifically, UiTM integrates sustainability principles in education and research to encourage the campus community in endeavoring sustainability principles and practices that focus on the provision of sustainability-based courses, sustainability-related grants, the development of UiTM sustainability hubs as well as creating sustainability leadership from the student and staff levels of UiTM (campus community). These strategies are believed to strengthen the sustainability ecosystem of the University at large.

6.2 Cluster Objective

The main goal of the education and research aspect is to foster awareness of the importance of sustainability in the lifestyle of campus residents. The application of these sustainable principles is beyond classroom education, it is extended to exemplify research, co-curricular activities as well as the development of self-leadership, and those involving community activities.
The education and research sustainability functions are:



There are 11 cluster indicators that are mapping to SDGs as shown in Figure 0-1 below:

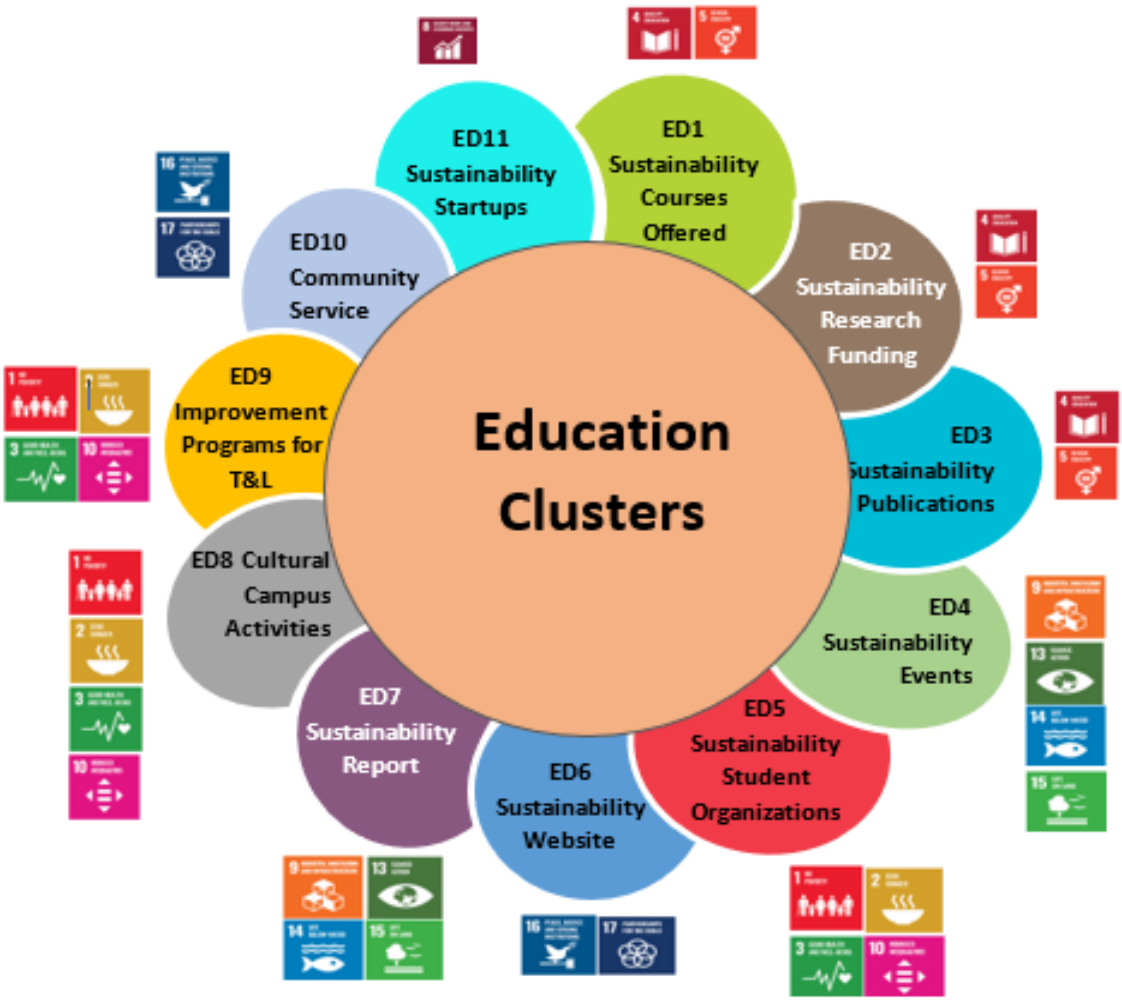


Figure 0-1: Number of indicators of education and research cluster and the mapping to SDGs

6.3 Cluster Initiatives / Projects and Achievements

In total there are 11 initiatives/projects of the cluster as outlined below.

6.3.1 Sustainability Course Offered

In nurturing a sustainability culture throughout the system and its people, UiTM is committed to ensure sustainability elements are embedded in many courses offered to students at all levels. In line with the commitment of the Malaysia Government towards SDGs, the central focus in offering sustainability-related courses is to equip the students with comprehensive knowledge of sustainable development in a highly competitive environment, hence the integration of people, institutions, and its environment has been prioritized in all sustainability courses offered.

In the year 2021, **2,923** sustainability-related courses have been offered by **29** Faculties, Academies, and Centres in UiTM. The Faculty of Architecture Planning & Survey has proudly exhibited as the top provider of sustainability-related courses among all Faculties, Academies, and Centres; they have been running **316 sustainability courses** in the year 2021. More detailed number of sustainability-related courses offered by the Faculties, Academy, and Centres in ascending order are exhibited in Table 6.

Table 6: Number of sustainability-related courses offered in 2021

No.	Faculty/Academy/Centre	Number of Sustainability-related Courses
1	Architecture Planning & Survey	316
2	Computer Science	276
3	Applied Science	263
4	Art and Design	201
5	Business Management	179
6	Music	173
7	Mass Communication	171
8	Academy Of Language Studies	142
9	Law	122
10	Sport Science	97
11	Electrical Engineering	88
12	Accountancy	86
13	Mechanical Engineering	81
14	Chemical Engineering	79
15	Curriculum	78
16	Administration Science	72
17	Muamalat	64
18	Information Management	62
19	Civil Engineering	61
20	Hotel Management	59
21	Business Administration	47
22	Arshad Ayub Business School	47
23	Centre Of Islamic Art and Understanding	20
24	College Of Art	16
25	Education	13
26	Language	9
27	Transport Management	6
28	College Of Engineering	5
29	Health Science	4
	Total number of sustainability-related courses	**2923**

UiTM is committed to integrate sustainability principles and concepts in many courses offered through engaging and mapping the course curriculum to SDGs as shown in Table 6.2. SDGs are addressed in all sustainable courses that enable students to develop skills and knowledge in widening and expanding their perspectives on social, cultural, political, and environmental aspects.

Table 6.2: Samples of the Sustainability-related Courses Mapping to SDGs

Course Code	Course Name	SDG	Description
MED309	PUBLIC HEALTH MEDICINE	4	SDG 1: No Poverty. Safeguarding the health of the public requires a healthcare workforce which is well educated in public health and its methods in prevention and control of diseases. In year 3 Public Health Medicine (PH) posting, students will be taught on the basic science of public health i.e. epidemiology; biostatistics and other scopes in public health i.e. family health, environmental health, occupational health and healthcare organization/ management.
MCS719	HUMAN SECURITY	3	SDG 2: Zero Hunger. The course discusses theories, concepts, and approaches in the study of human security from a broad perspective of physical security, political, economic, social, cultural as well as religion. Local conceptualizations versus universal interpretations of human security are emphasized. Relevant topics will encompass human security in a globalized world, national identities, genetic engineering, climatic change, migration issues, ethnocentrism and the like.
MED309	PUBLIC HEALTH MEDICINE	4	SDG 3: Good Health and Well-Being. Safeguarding the health of the public requires a healthcare workforce which is well educated in public health and its methods in prevention and control of diseases.
EDU620	EDUCATION AND SOCIETY	3	SDG 4: Quality Education. Covers sociological concepts related to education and society. It also focuses on global issues and challenges, and how these in turn critically influence education and pedagogy for global perspective.
MUF459	PERFORMING GROUPS II	1	SDG 15: Life on Land. This course provides students with training and practical experience in performing groups such as orchestra, large/small ensemble or choir. Students will be assigned to appropriate groups according to their instrumental or vocal abilities. A variety of repertoire and performance styles will be explored. Students will apply instrumental/vocal techniques to produce quality performances and cohesive group sound as an outcome of collaborative interaction, performance practice and creative musical expression.
ELE672	INDUSTRIAL TOPICS	2	SDG 7: Affordable and Clean Energy. This course provides an exposure to current technologies available in the Malaysia industries. Every student will choose two different topics on subjects related to his/her discipline. The period for each topic is 14 lecture hours. Each topic will be conducted by a person from industry who is very experienced in his/her own field, or, by academia who is having the experience to address the topic. Some examples of the coverage for each topic include theoretical applications in industries, case studies, practical experiences, usage of high-end equipment, etc.
CPE675	WASTEWATER ENGINEERING	3	SDG 6: Clean Water and Sanitation. This is a wastewater engineering course which concerns more on characteristics of wastewater and treatment technologies. The topics covered in the course are the regulation and policies, theory and fundamentals, characterization of wastewater and treatment practices, i.e. physical, chemical and biological methods.
HTT712	TOURISM DESTINATION ANALYSIS	3	SDG 8: Decent Work and Economic Growth. This course is designed to equip students with an understanding of tourism destinations and develop analysis on the role of the destinations within the broader tourism system. It will provide students with knowledge of the assessment, evaluation and appropriate methods/techniques on both changes occurring in tourist destinations and the development and activity. Thus, it will encourage students to use analytical thinking to evaluate tourism destinations according to current and future needs.
ISH602	HALAL AUDITING	3	SDG 9: Industry, Innovation and Infrastructure. The main objective of this course is to enhance knowledge on effective and efficient audit programs. This course will explain the concept of Sharia-compliant auditing in halal industry. Students will learn about the halal auditing requirements and the auditing process. Other than that, they will also be able to demonstrate the code of ethics for auditors in halal auditing process.
ALS451	MALAY SOCIOLINGUISTICS	3	SDG 10: Reduced Inequalities. Introduction to the role of language in society. This course emphasizes the influence of language in the community and cultural environment of the local community. The focus is on linguistic diversity as well as its impact in the context of the local community and the global community. Students are exposed to terms and concepts related to dialects, language abnormalities, language diversity, language preservation, language transition and language extinction.

Course Code	Course Name	SDG	Description
MLS742	DIGITAL LIBRARIES AND DIGITAL CONTENT	3	SDG 11: Sustainable Cities and Communities. The course introduces students to the development and application of digital libraries and digital content creation. It discusses the concepts, theories, practices, and issues related to the discipline. The management and applications of the open-source digital library management systems is studied and applied. This course provides new development and challenges in digital libraries and digital content creation.
LMW733	CONSUMER PROTECTION LAW	3	SDG 12: Responsible Consumption and Production. Consumer law is a hybrid – a collection of interconnected aspects of law. A study of the inter-relationship between these different branches of law shall be undertaken in this course. Besides that, the course attempts to provide a framework for examining social and legal changes and examines at an advanced level selected problems and issues concerning contracts of sale of goods, the rationale for consumer protection, the legal inroads into the principle of "freedom of contract" and the policy considerations involved therein. Exemption clauses and other unfair terms in consumer contracts are analyzed to examine major concerns of the consumer. A comparison will be made between liability of manufacturers and sellers in contracts and torts for defective products and services. The course will also examine the various consumer protection legislation, their adequacies and shortcomings, administration, enforcement and remedies, controls by enforcement agencies and consumer organizations and judicial redress
ISH500	PURIFICATION IN ISLAM	3	SDG 14: Life Below Water. This course covers the conceptual framework related to purification from Islamic perspective, compliance, and non-compliance to principles of purification and the principles of purification in daily lives and in the halal industry.
MEC600	ENGINEERS IN SOCIETY	3	SDG 16: Peace, Justice and Strong Institutions. This course covers the fundamentals of engineering ethics, Sustainable Development, and finance in the working environment. These include the implementation act and regulation for engineers in Malaysia such Professionalism and Codes of Ethics, Employment Act, law of contract, Employment Act, Bankruptcy Act, Cyber Law and SPRM. The course also covers Engineering Ethics and Crisis Management. Besides that, the course emphasizes on Sustainable Development, Economic sustainability, Environmental sustainability, Engineering economic, and Financial Management for engineers. The lecturers are academic staff with industrial experience. The invited external speakers from various professional engineering backgrounds will be invited for exposure to engineering practice
SPS431	FUNDAMENTAL OF SPORT PSYCHOLOGY	3	SDG 17: Partnerships for the goals. This course will cover various psychological principles associated with sport. This course is designed to assist students in examining how psychological variables influence participation patterns in sport and how participation in sport can affect the psychological characteristics of an individual. Class content will also illustrate numerous psychological techniques that can enhance sport performance. Among the topics to be examined are the definition of psychology and sport psychology, personality and athletes, motivation, sport team, leadership, anxiety, and stress in sport.
JRN549	ENVIRONMENT AND SCIENCE REPORTING	4	SDG 13: Climate Change. This course introduces students how to write on environment and science, which also involves helping them to understand the related research subjects, publications, and audiences. Opportunities in this sort of writing are growing rapidly as environment and science discoveries become more complex and there is an increasing need for writers to translate this information to the public.
LAW088	CONTEMPORARY GLOBAL AND LEGAL ISSUES	4	SDG 5: Gender Equality. This course gives foundation on selected international topics and discusses the various topics pertaining to the contemporary global and legal issues such as regional conflicts within a country, the human rights issue, terrorism, the struggle for self-determination and many other issues.

The achievement of ED1 is measured using the ratio of sustainability courses to total courses/subjects in a year. The number of sustainability-related courses has gradually increased each year. In the particular year 2021, it has been reported that **76.96% of 3,798 courses or 2,923** courses offered in UiTM are related to sustainability. Table 6.10 indicates comparative figures for three consecutive years

i.e., 2019, 2020, and 2021. The increment of 29% in 2021 of sustainability-related courses reflects UiTM commitment towards the Government aspiration for a global sustainable agenda.

Table 6.10: Comparative Figures of Sustainability-related courses Offered for 3 years

Year	2019	2020	2021
Sustainability-related courses	**2266**	**2266**	**2923**
Total courses	**3460**	**3461**	**3798**
%	**65.4%**	**65.4%**	**76.96%**
Increment	**NA**	**0%**	**29.0%**

6.3.2 Sustainability Research Funding

In view of research funding related to sustainability, UiTM has allocated quite a huge amount of research funding or grants for the last 3 years, in which **USD 9,048,879.28 per year** has been spent to award researchers who undertake research projects in sustainability and the environment. Table 6.3 shows the allocation of Non-UIGM and UIGM grants; and the average of each category for the last 3 years.

Table 6.3: The allocation of Non-UIGM and UIGM grants; and the average of each category for the last 3 years

Year	Non-UIGM Grant (USD)	UIGM Grant (USD)	Total Grant (USD)
2019	4,674,530.11	6,955,844.21	11,630,374.32
2020	3,523,889.92	5,790,386.64	9,314,276.56
2021	1,864,460.15	4,337,526.80	6,201,986.95
AVERAGE	3,354,293.39	5,694,585.88	**9,048,879.28**

A remarkable number of **544 research projects** were registered in relation to UIGM grants of 2021 indicating the credibility of UiTM's researchers in carrying out sustainability-related research projects in response to the disruption of the Covid-19 pandemic. As evidence, all granted research projects should be at least mapped to one goal of SDGs. The samples of the research titles are listed below:

Goal 1: No Poverty
1. Sustainable Growth of Micro Entrepreneurs for Poverty Reduction Using Resource-Based View Approach
Goal 2: Zero Hunger
1. Road Safety Framework for Food Delivery Riders to Support E-Economy 2. Development of Delicatus Malaysian Matcha as A Functional Food for Diabetes 3. Novel High-Quality Food Protein Through Sustainable Production and Processing 4. Exploring Food Bank Distribution Efficiency Via Smart Mobility 5. 5. Digitalization Readiness Among SME Food Business Operators
Goal 3: Good Health and Well-Being
1. Exploring Determinants for online-Based Training Effectiveness Framework 2. Exploring Mobility of Elderly in Urban Public Spaces and Transportation Facilities 3. Radar Entomology for insect Migration Impact in Agricultural industry 4. Effect of Silica Nano Granite on Mechanical Properties of Surface Treated Arenga Pinnata 5. Natural Fiber Composites 6. the Role of Digital Technologies and internal Control Systems on SMEs Sustainability

7. Performance During the Covid-19 Pandemic

Goal 4: Quality Education

1. Teacher's Attitude and Emotions Toward online Teaching Physical Education During Covid-19 Pandemic
2. the Role of Development Banks Mobilizing Waqf Fund for Financing Higher Educational institutions
3. Creative Music Teaching Designing interactive and Flexible Educational Programmes for School Children
4. Dynamic Dashboard Handling High Velocity Stream Data on Opinionated Mining for Digital Education Issues During Covid-19 Pandemic
5. Smart Personalized Autism Collaborative Education System (Spaces)

Goal 5: Gender Equality

1. Antecedents of Successful Women Entrepreneurs: Empowering Women & Gender Equality
2. The Gender and Transport Assemblage of Learning and Knowledge (Gtalk)

Goal 6: Clean Water and Sanitation

1. Development of A Modular Remote Monitoring System for Agricultural Applications in indoor Cultivation of Freshwater Prawn Macrobrachium Rosenbergii
2. Microalgal Biofilm for Post-Treatment Polishing of Wastewater and Bioresource Recovery
3. Encapsulated Cr Tio2 Powder in Cr Tio2 Nanofibers Layers for Photocatalytic Water Purification
4. Ranking System for Water Efficiency Improvement Strategies in Malaysian Residential Buildings
5. Estimation on Dielectric Properties of Sludge Wastewater Treatment at Microwave Frequencies

Goal 7: Affordable and Clean Energy

1. Development of Energy Storage Devices for Stationery and E-Mobility Applications
2. Hybrid Manufacturing: integration of Direct Energy Deposition (Ded) Wire-Arc
3. Additive Manufacturing (Waam) with forging Operations for Production of Netshaped Lightweight Metal Alloy Components
4. Smart Energy Harvester for Commercialization
5. Sustainable Operation of Microgrid Using Unified Power Quality Conditioner (Upqc) integrated with Photovoltaic and Energy Storage Systems

Goal 8: Decent Work and Economic Growth

1. Negotiating Multiple Literacies to Mek Mulung Pedagogy: A Hybrid Approach to Ensure the
2. Sustainability of the Community's Century Old Tradition and Empowering Rural Areas to Promote Economic Growth with Performing Arts
3. Evaluating Quality of Governance, Political & Social Globalization, Budget Deficit on Economic Growth
4. Social innovation and Smart Economy: A Transition for Social and Economic Improvement
5. Techno Economics of thermoelectric Generator System for industrial Waste Heat Recovery
6. 5. Energy Savings and Techno-Economic Assessment of Led Lighting Retrofit with Dynamic Occupancy and Operation Hours in Campus Building Considering Uncertainty formulating Sustainability Entrepreneurship Framework of Cashless Payment Usage Among Small Business Owners in the Digitized Economy Context

Goal 9: Industry, Innovation, and Infrastructure

1. Innovation on 360 AppIIcation and Database Development on Bidong Island the Case Vietnamese Boat People (Vpb) Campsite Facilities and Graveyard industry Viable Electrochemical Covid-19 Dna Detection Sensor Architecture Coupled with Lamp and Rapid in Situ Probe Mobilization Method
2. Operational Strategy Management System Framework for Rating Scale Measurement System in Shariah Compliant Hotel industry
3. Hybrid Cloud Topology for Virtual Desktop infrastructure To Support Virtual Learning
4. Factors influencing Contractors Bid Price Determination in Public infrastructure Project

5. Sulh Board a Proposed Framework for Shariah Compliant Dispute Prevention in the Malaysian Construction industry
Goal 11: Sustainable Cities and Communities
1. Negotiating Multiple Literacies to Mek Mulung Pedagogy: A Hybrid Approach To Ensure the 2. Sustainability of the Community's Century Old Tradition and Empowering Rural Areas to Promote Economic Growth with Performing Arts 3. Novel High-Quality Food Protein Through Sustainable Production and Processing 4. Development of Sustainable Typhonium Flagelliforme Products with Cancer therapeutic Functions 5. Sustainable Textile Design Pattern Biological Image Brand **6.** Post Occupancy Evaluation Model for Sustainable Green Development Poem SDG initiatives among UiTM Campuses in Malaysia
Goal 12: Responsible Consumption and Production
1. Hybrid Manufacturing: integration of Direct Energy Deposition (DED) Wire-Arc 2. Additive Manufacturing (WAAM) with forging Operations for Production of Net Shaped Lightweight Metal Alloy Components 3. Malaysia Life Support Committee: Prototyping to Production 4. In-Situ Low-Energy Catalytic Electrolysis on Palm Oil Mill Effluent Degradation by Ferric- 5. Ferrous Proton Exchange Electrolyzer Cell for Hydrogen Production. 6. Theorizing innovation Capacity for Sustainable Livestock Farming Towards Halal Consumption
Goal 13: Climate Action
1. Strengthening Policy Framework on Wetlands Conservation to Tackle Climate Change **2.** Tree Species Rarity-Weighted Richness (RWR) index Establishment for Tropical Forest Conservation Based on Climate Change Scenarios
Goal 14: Life Below Water
1. Monitoring and Maintenance of 100 Fishpond online System Using Iot (Web and Mobile App) 2. Elucidating the Challenges of Becoming Fisherpreneurs and Developing Fisherpreneurs Business Model to Fisherman in Malaysia and India
Goal 15: Life on Land
1. The Electromagnetic Radiation from Indoor Plants Using Frequency Detector 2. Organogenesis and Somatic Embryogenesis of Kaempferia Parviflora: the Effects of Plant Growth Regulators 3. Flying Quality Evaluation of a Multi-Role, Fixed Wing-Multirotor Hybrid Unmanned Aerial Vehicle for Crop Spraying on Pineapple Farm 4. Study of Design for Additive Manufacturing (Dfam) for Coated Hip Implant **5.** Development of Tensile Strength Class and Charring Rate for Glued Laminated Timber (Glulam) From Laran Plantation Timber Species
Goal 16: Peace and Justice Strong institutions
1. Country Led Evaluation of Child Justice Reform: The Diversion Pilot
Goal 17: Partnerships to Achieve the Goal
2. Strategic Research Partnership (SRP) Grant Bilateral; Strategic Alliance (Unissa-Uitm) Matching Grant

In line with UiTM's commitment toward SDGs, an average amount of **USD5,694,585.88** has been spent in a year to encourage more sustainability-related research among the researchers. Table 6.x shows a comparative figure of the average amount of research funding or grants from 2019 to 2021. Although the dedicated amount for UIGM grants has shown downward trends each year (see Table 6.11 for USD6,955,844.21 in 2019 to USD4,337,526.80 in 2021), the percentage of UIGM grants to the total grants in the US Dollars each year has indicated positive trends throughout the last 3 years, as reported

at 59.81% to 69.94%. This has marked the satisfactory ratio of sustainability research funding to total research funding at 62.93% in the year 2021.

Table 6.11: A comparative figure of the average amount of research funding /grants from Year 2019 to 2021

Year	Non-UIGM Grant (USD)	UIGM Grant (USD)	Total Grant (USD)	Percentage (%) (UIGM Grant)
2019	4,674,530.11	6,955,844.21	11,630,374.32	59.81
2020	3,523,889.92	5,790,386.64	9,314,276.56	62.17
2021	1,864,460.15	4,337,526.80	6,201,986.95	69.94
AVERAGE	**3,354,293.39**	**5,694,585.88**	9,048,879.28	
RATIO (Avg of UiGM Grants / Avg of total grants) *100				**62.93**

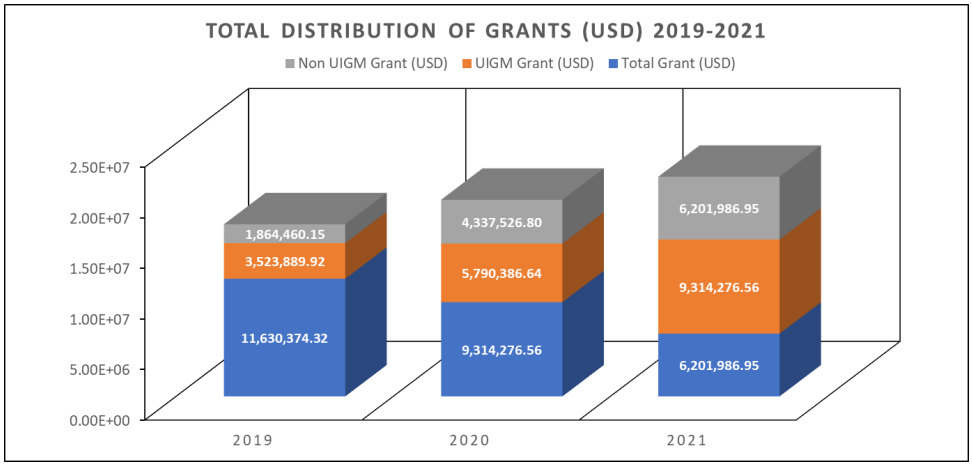


Figure 6.4 The distribution of research grants in US Dollars from 2019 to 2021.

6.3.3 Sustainability Publications

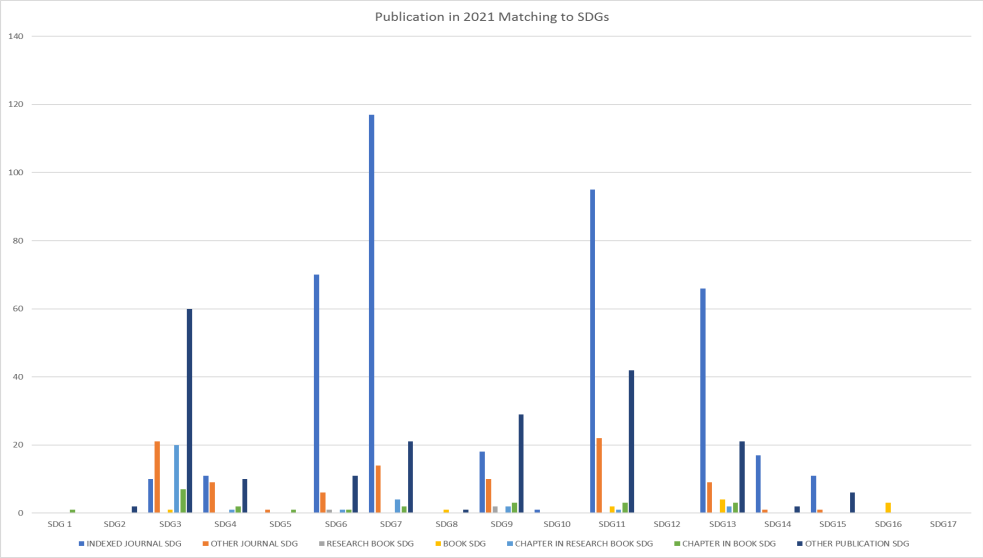
UiTM has outlined the publications as one of the important aspects to increase the visibility of UiTM researchers. As reported in Google Scholar, UiTM researchers have published a total of 6,865 publications over the last 3 years i.e., from 2019 to 2021. Out of these numbers, **1,658 publications** have been published in the field of environment, sustainability, and SDGs. Table 6.4 indicates the total number of publications by showing the highest number of **158 publications** being published under the theme of **SDG7: Affordable and Clean Energy**.

Table 6.4: Total Number of Publications In 2021 Based on SDGs

SDGs	Total number of Publications
SDG 1	1
SDG 2	2
SDG 3	119
SDG 4	33
SDG 5	2
SDG 6	90
SDG 7	**158**
SDG 8	2
SDG 9	64
SDG 10	1

SDG 11	165
SDG 12	0
SDG 13	105
SDG 14	20
SDG 15	18
SDG 16	3
SDG 17	0

Figure 6.2 illustrates the mapping of publications addressing sustainability keywords such as green, environment, sustainability, renewable energy, climate change to SDGs.



While Table 6.5 shows the samples of the publication titles in 2021 that mapped to SDGs.

SDGs	Example Of Publication
SDG 7	**Cement Stabilisation of Subgrade Soil for Sustainable Pavement Structure** **Ahmad Kamil Arshad, Ekarizan Shaffie, Khairil Azman Masri, Ramadhansyah Putra Jaya, and Yulinar Ismail** **Abstract** Unsuitable or poor quality subgrade material requires proper treatment in order to make the subgrade suitable for overlying top layers of pavement for road construction. Stabilisation of the subgrade layer using cement is a method to improve the strength and stiffness of the subgrade, minimising the risk of road damage such as permanent deformation and improve the long-term performance of the pavement. This paper details a study on the soil–cement stabilisation method for a low-volume road in Malaysia. The scope of this study involved mix design in the laboratory and site verification. The laboratory tests involved soil classification, compaction test, unconfined compressive strength and California Bearing Ratio (CBR) tests while site verification tests comprised of field density test and unconfined compressive strength tests. From the laboratory tests, it was determined that the type of soil for the study area (silty clay) was suitable to be stabilised using cement based on the results obtained from soil classification test and unconfined compressive strength achieved of more than 0.8 MPa obtained after the addition of 5% cement by weight. Field density test achieved more than 95% laboratory com paction density and unconfined compressive strength of 1.01 MPa, indicating that the method was successfully implemented as site. It is recommended that future research should be carried out on more sites and on different types of soil to determine the suitability of cement as additive for subgrade stabilization in Malaysia. **Keywords** Subgrade soil · Subgrade stabilisation · Cement stabilisation · Subgrade improvement · Sustainable material A. K. Arshad (✉) · E. Shaffie Institute for Infrastructure Engineering and Sustainable Management (IIESM)/Faculty of Civil Engineering, Universiti Teknologi MARA, 40450 Shah Alam, Selangor, Malaysia e-mail: drahmadkamil@salam.uitm.edu.my K. A. Masri · R. P. Jaya Faculty of Civil Engineering and Earth Resources, Universiti Malaysia Pahang, Gambang, Malaysia Y. Ismail Public Works Department of Malaysia, Kuala Lumpur, Malaysia S. S. Mohd Zuki et al. (eds.), *Proceedings of the Sustainable Concrete Materials and Structures in Construction 2020*, Lecture Notes in Civil Engineering 157
SDG13	**Luffa Gourd Production Practices from Transplanting and Direct Seeding Methods for Composite Productions** Asmah Awal[1,3*], Salwa Adam[2], Shampazuraini Shamsuri[2], Nor Azma Yusuf[1,3], Nordiana Ibrahim[2], Erfan Zafran Elias[1] *[1]Faculty of Plantation and Agrotechnology, Universiti Teknologi MARA, 40450 Shah Alam, Selangor, Malaysia.* *[2]Faculty of Plantation and Agrotechnology, Universiti Teknologi MARA (Kampus Melaka), 77300 Merlimau, Melaka, Malaysia.* *[3]Agricultural Biotechnology Research Interest Group (REI), Faculty of Plantation and Agrotechnology, Universiti Teknologi MARA, 40450 Shah Alam, Selangor, Malaysia.* **Corresponding author: asmah138@uitm.edu.my* **Abstract.** World is facing an increase of environmental concerns recently regarding on natural and synthetic fibers problems. Producing synthetic fibers may cost highly and create a few financial issues on the production matter. Moreover, synthetic fiber products have several disadvantages such as they are non-biodegradable. Some of them may cause health related problems and expose a significant risk. Researchers aimed to find the replacement for synthetic fibers with less cost production and renewable sources which lead to development of biomaterials-based composites production. Luffa is an eco-friendly crop, has been added as the new fibrous fruit with short harvest period. This study have applied a few practices using direct seeding and transplanting methods for low cost luffa production that aim for composites production. On the other hand, this study showed that transplanting (TP) method is better than direct seeding (DS) method based on the growth performance. TP method showed highest average of plant height (cm) and average total dry weight (g) of luffa fruits with 74.42±0.68 and 91.08±2.26 respectively whereas lower growth yield performance showed by DS method. Other parameters observed are the number of leaves and number of fruits which is a competent sources to the current composites sources, synthetic fibers. Hence, the results showed that luffa has the potential as a low cost and short harvest duration production plant.

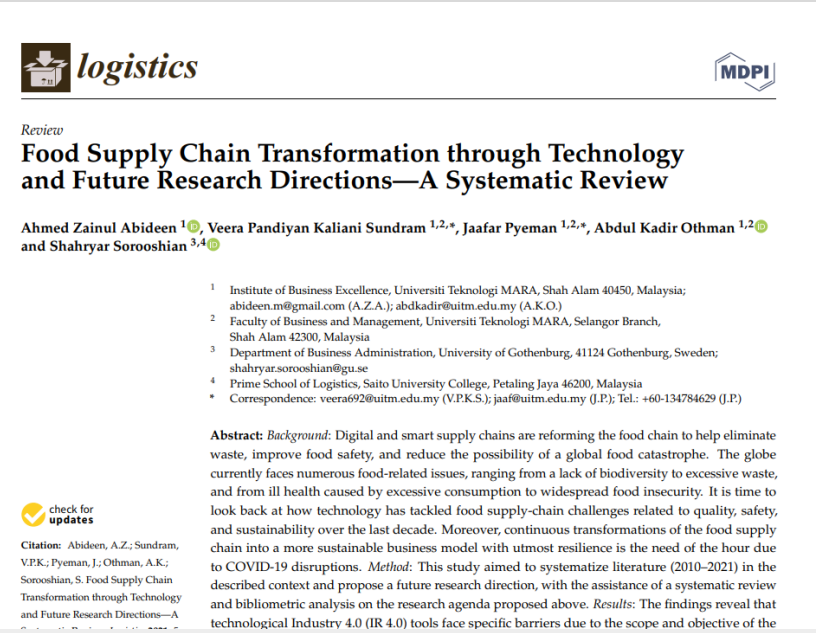
SDGs	Example Of Publication
SDG 3	

Table 6.5: Samples of Mapping the Publication Titles in 2021 to SDGs.

Articles and proceedings published in relation to sustainability have shown a steady number of **671 publications** considering many projects are still on-going in 2021. Although there was a slight plunge from 2020, the numbers of publications are expected to gradually grow in the next periods in line with the escalated sustainability-related research grants awarded to researchers in 2021. The numbers of publications related to sustainability were constantly growing as comparatively shown for 3 years in Table 6.12.

Table 6.12: Total Number of Publications based on SDG for Year 2019 to 2021

YEAR	TOTAL PUBLICATIONS/ SDG	ALL	%
2019	361	2318	15.57
2020	707	2171	32.56
2021	671	4204	15.96
TOTAL	**1658**	**6865**	**24.15**

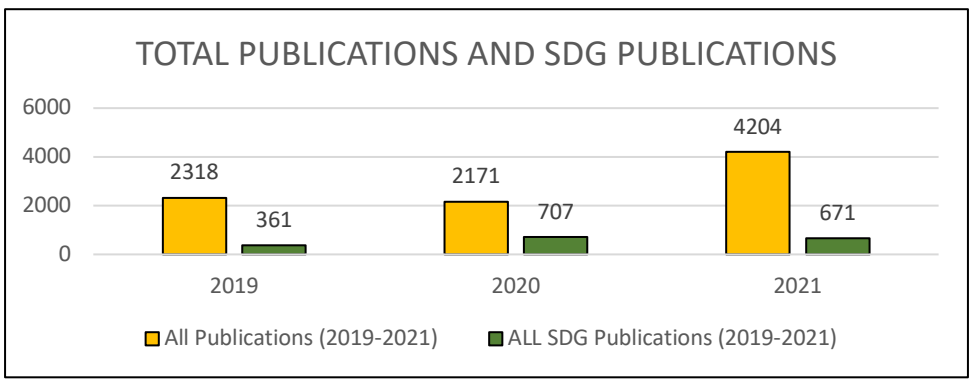


Figure 6.5: Total Number of Publications based on SDG 2019-2021

Table 6.13 Mapping of Sustainability-related Publications to SDGs

	Number of Publication/SDG Theme	
SDG	**2020**	**2021**
SDG1	8	1
SDG 2	0	2
SDG3	79	119
SDG4	55	33
SDG 5	0	2
SDG 6	0	90
SDG7	88	158
SDG 8	0	2
SDG9	55	64
SDG 10	0	1
SDG 11	0	165
SDG 13	0	105
SDG14	176	20
SDG15	41	18
SDG16	0	3
SDG1 & SDG2 & SDG3 & SDG5 & SDG10 & SDG16	3	-
SDG1 & SDG2 & SDG8 & SDG9	5	-
SDG6 & SDG14	128	-
SDG6 & SDG11 & SDG12	67	-
SDG6 & SDG7	34	-
SDG14 & SDG15	50	-
SDG6 & SDG13 & SDG14 & SDG15	81	-

6.3.4 Sustainability Events

The Covid-19 has slowed down the physical interactions of people across sectors. Most large-scale events planned for implementation in 2021 had to be postponed adapting to the pandemic situation, particularly those involving international participants. However, the University had experienced an immensely positive impact on the shift to virtual and hybrid events that widened the connection between more people internationally. Despite all challenges, UiTM managed to organize a total of **135 sustainability events** in 3 years i.e., 2019 to 2021 ranging from MoU signing ceremonies, talks, site visits, workshops, seminars, exhibitions, and community service programs. Out of that, **34** sustainability events were organized in 2021. Among impactful sustainability events are as follows:

a) MoU with Huawei Technologies Malaysia

The ICAN Office has signed a joint Memorandum of Understanding (MoU) with Huawei Technologies Malaysia for a period of 3 years to cooperate in developing Smart Campuses, Smart Data Centers, and ICT Infrastructure Solutions at UiTM. Following the MoU, several activities have been successfully implemented among them is UiTM's participation in the Huawei Industrial Digital Transformation Conference on 24 to 26 March 2021 online through the keynote session presented by YBhg. Professor Dato' Dr Rahmat Mohamad as UiTM's representative, also the sole representative of a local university invited by Huawei for the title "How ICT Transforms the Education and Campus".

b) Webinar Knowledge Transfer Programme (KTP)

A program organized by Arshad Ayub Graduate Business School (AAGBS) in collaboration with Pusat Jaringan Industri on 5 March 2021 to all AAGBS staff and lecturers which aims to reveal knowledge related to the "Knowledge Transfer Program (KPT)". This webinar held online (Virtual) using the Cisco Webex platform was attended by Associate Professor Dr. Hashbullah Ismail and invited Associate Professor Dr. -Ing. Oskar Hasdinor Hassan."

c) Lawatan Delegasi Keretapi Tanah Melayu Berhad (KTMB)

The official visit of Keretapi Tanah Melayu Berhad (KTMB) to Universiti Teknologi Mara (UiTM) was carried out on 27 April 2021 at Level 4, Tuanku Syed Sirajuddin's Chancellery Senate Hall. This collaboration aims to establish strategic collaboration with industry partners while leveraging the collaboration network for mutual benefit between industry and universities following the MoU that was signed in 2018. The College of Engineering Studies is the PTJ Lead for collaborative projects with KTMB in development and research in the rail industry.

e) **CREST TGL Youth Industry e-Bootcamp**

Together with Universiti Sains Malaysia, CREST and UiTM organized the TGL Youth Industry e-Bootcamp (YIEB) on 29 July to 7 August 2021. The YIEB, which was conducted entirely online, was attended by 120 students from 20 schools from all over the country. The completion of YIEB consists of hands-on training in the use of microcontrollers, writing programming, training in developing ideas and prototyping projects based on design thinking, and honing presentation skills because participants have to present the results of their project ideas to industry representatives on the last day of the program.

f) **Collaboration with School Communities**

Supporting the aspirations of the Ministry of Higher Education stated in the Malaysian Education Development Plan 2015 - 2025 (Higher Education), ICAN's Community Network

Office (CNC) carries out various projects by ensuring engagement based on the quadruple helix as recommended by the Ministry of Education. CNC ICAN ensures the existence of smart cooperation between UiTM, the industry and the Ministry in every project that should benefit the community. In principle, UiTM and industry are the driving force behind the project, the ministry is the party that gives approval and recognition, and the school is the beneficiary community.

g) **Celcom Young Digital Innovators Program (CYDIP)**

ICAN, has collaborated with Celcom Axiata Berhad to foster interest and train children in primary and secondary schools in the use and development of projects based on digital technology, especially those from the B40 group and rural schools. Despite the constraints due to the Covid-19 pandemic, UiTM and Celcom Axiata Berhad have supplied electronic kits to nine schools around the Klang Valley and Sabak Bernam district. A total of over 100 students have participated in the Celcom Young Digital Innovators Program (CYDIP) Hands-on Bootcamp online to learn about the use of electronic devices, basic microcontroller programming and mobile application development.

h) **Maxis Edu Young Influencer (EYI)**

This program will last for 2 years under the memorandum of agreement between UiTM and MoA that will be signed. The program called Maxis Edu Young Influencer (EYI) will mediate the concept of relaxation in delivering scientific content using real-life examples that will add value to the knowledge that students learn in the syllabus at school. Using the "influencer" approach on social media, UiTM students will be trained to become Edu Young Influencers (EYI) to become content creators and then deliver the content to the public through the Maxis eKelas platform and other social media such as YouTube, Tiktok and Instagram. The first phase (Season 1) of the Maxis EYI program starts from October 2021 - March 2022.

i) Program Mental Health ANC

ICAN has taken the initiative by holding programs around Mental Health with the involvement of the responsibility centre at UiTM. Among the programs organized are the Yasin Reading Ceremony, a series of Spiritual Tazkirah in collaboration with the Islamic Affairs Division, the Academy of Islamic and Contemporary Studies (ACIS), UiTM, Health Care Partnership with the Faculty of Health Sciences, light exercise with the Faculty of Sports Science and Recreation, several a series of Recipes/Cooking Demos in collaboration with UiTM Hotel, Counseling Services on Mental Health Management with ACIS and information sharing sessions on mental health through posters or graphics on a monthly basis.

j) **Alumni Engagement Program- PPE Giving, Food and Drinks Donations, Giving Daily Necessities and Motivational and Self-Development Sessions.**

Alumni's contributions throughout 2021 have been successfully carried out in various forms such as Covid-19 PPE donations, donations in the form of food and drinks, donations of daily necessities and motivational and self-development sessions.

Table 6.6 details out a mapping of sustainability events to SDGs indicating

Bil.		*UN - Sustainable Development Goals (SDG)*																
		SDG1	SDG2	SDG3	SDG4	SDG5	SDG6	SDG7	SDG8	SDG9	SDG10	SDG11	SDG12	SDG13	SDG14	SDG15	SDG16	SDG17

		No Poverty	Zero Hunger	God Health and Well-Being	Quality Education	Gender Equality	Clean Water and Sanitation	Affordable and Clean Energy	Decent Work and Economic Growth	Industry, Innovation and Infrastructure	Reduced Inequalities	Sustainable Cities and Communities	Responsible Consumption and Production	Climate Change	Life Below Water	Life on Land	Peace, Justice and Strong Institutions	Partnerships for the goals
	2021																	
1	MoU with Huawei Technologies Malaysia				/					/								/
2	Webinar Knowledge Transfer Programme (KTP) anjuran Arshad Ayub Graduate Business School (AAGBS)				/													
3	MeTIC 2021				/												/	
4	Lawatan Delegasi Keretapi Tanah Melayu Berhad (KTMB)				/													/
5	MoU with Malayan Banking Berhad (Maybank)				/													/
6	Engagement Session with Faculty and Campus				/													
7	Collaborations with school communities				/													/
8	Celcom Young Digital Innovators Program (CYDIP)				/					/		/						/

9	CREST TGL Youth Industry e-Bootcamp				/													/
10	Maxis Edu Young Influencer (EYI)				/					/								
11	U4S Fiscent-Opening Ceremony and Webinar UFS	/							/									
12	MoU with Pfizer Signing Ceremony				/													/
13	E-Townhall Gabungan Alumni UiTM				/												/	/
14	Alumni UiTM Indonesian Chapter Enggagement Session				/													/
15	Program Mental Health			/														
16	Alumni Engagement Program-PPE Giving,Food and Drinks Donations, Giving Daily Necessities and Motivational and Self-Development Sessions.			/								/						/
17	Siri Webinar Guru 2021				/													/
18	Community Talk 2021 Siri									/		/						

	1: Strategik Cabaran dan Peluang 23 Ogos 2021																	
19	Community Talk 2021 Siri 2: Dunia Sukarelawan, Cerita Suka dan Duka 15 September 2021									/		/						
20	Pusat Penempatan Sementara (PPS) Intekma @ Rumah Alumni		/				/					/						
21	Kempen 1 Alumni 1 Laptop				/							/						
22	Projek Tabung RM5 #alumniuitmprihatin				/													
23	Projek Tabung RM5 'Kelangsungan Pengajian Mahasiswa'				/													
24	E-Townhall SMART ICAN 11 Nov 2021				/													
25	BengkeleAlumni UiTM dan MyAlumni UiTM				/													
26	Pelancaran MyAlumni UiTM & Kad Maya MyAlumni UiTM				/													
27	Dana Penjana				/					/								

	KPT-Career Advancement Program (KPT-CAP)																	
28	Taklimat dan Bengkel penggunaan sistem maklumat analisa dan repisotari (SMART)				/													
29	Bengkel Penambahbaikan Pengurusan Dana Intervensi Kebolehpasaran Graduan				/													
30	Program “Maybank Careers For Uitm Grads – How The Uni Can Assist” Dengan Kerjasama GTI Media Dan Maybank								/	/								/
31	Program On Air with Protege-Pengurusan Kewangan Usahawan Muda								/									
32	Karnival Mahasiswa Keluarga Malaysia @IPT				/				/									/
33	Webinar "UiTM-ICAN SDG Agenda: Towards Sustainability-			/					/									

	Biologically, Culturally and Economically"																		
34	SDG International Innovation Award, Malaysia Technology Expo, 2021			/					/										

Table 6.6: A mapping of Sustainability events to SDGs

UiTM continues to give full commitment and support to organize impactful events despite all challenges during Covid-19 pandemic era. Organizing the events with new insights and perspectives has greatly invited the interest of substantial speakers, guests, and participants from international and national organizations. The postponement and adjustment of many major events, especially those involving physical engagements and commitments from local and international participants, resulted in a slight decline in numbers reported in 2021. Figure 6.6 shows the distribution of the number of sustainability events for 3 years; 2019 (50 events), 2020 (51 events) and 2021 (34 events).

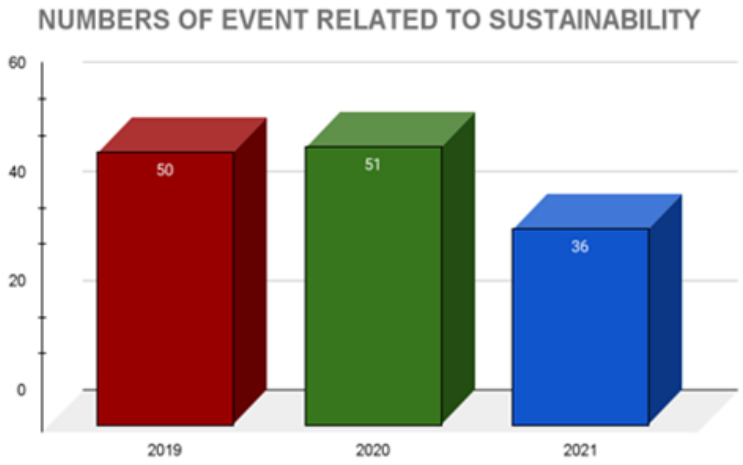


Figure 6.6: The distribution of the number of sustainability events for 3 years

6.3.5 Sustainability Student Organizations

UiTM embraces the potential of future generations in creating the sustainability ecosystem of the University. UiTM believes in inculcating the values and norms in students' life experience will eventually develop the best acts and thinking as future leaders. Hence, students' participation in sustainability-related activities through student organization movements are well encouraged.

Numerous students' activities mostly related to sustainability were carried out by **11** students' organizations in 2021. Among others, the activities conducted were webinars, outdoor activities, and community works with the aim to enhance the students' knowledge and skills as well as benefiting

the societies in general. In general, these activities are mapped to Sustainable Goal Development - SGD 2, 3, 4, 9 and 11 as shown in Table 6.7.

Table 6.7: A List of Students Organization in 2021

No	SDGs	Student Organization	Social Media Link
1	4	Applied Chemistry Society Faculty of Applied Science, UiTM Shah Alam	https://www.instagram.com/acesuitm/?hl=en
2	11	Kelab Rekreasi UiTM Malaysia A combination of all recreation clubs under UiTM	https://www.instagram.com/kresmauitm/?hl=en
3	2	Persatuan Pelajar Teknologi Makanan Faculty of Applied Science, UiTM Shah Alam	https://twitter.com/pertema_uitmsa?lang=en
4	4	Environmental Law and Awareness Club (EnLAC)	https://www.instagram.com/enlacuitm/?hl=en
5	11	Park Amenity Management Society Faculty of Architecture, Planning & Surveying (FSPU) UiTM Shah Alam	https://www.instagram.com/pams_uitmsa/?hl=en
6	11	Persatuan Kejuruteraan Awam UiTM Shah Alam	https://www.instagram.com/perka_uitmsa/?hl=en
7	11	Netcentric Computing Club (NetCom) Faculty of Computer and Mathematical Sciences (FSKM) UiTM Shah Alam	https://www.instagram.com/netcomuitmsa/?hl=en
8	4	Computer Science Club UiTM Faculty of Computer and Mathematical Sciences (FSKM) UiTM Shah Alam	https://www.instagram.com/csclub__/?hl=en
9	11	Briged Sukarelawan UiTM UiTM Shah Alam	https://www.instagram.com/brigedsukarelawan_uitm/
10	9	IMeche UiTM Student Chapter UiTM Shah Alam	https://www.instagram.com/imeche_uitmsa/
11	4	Boiler & Safety Engineering Club UiTM Shah Alam	https://www.instagram.com/bosecofficial/

Student organization acts as a platform for students to exploit their leadership and social responsibility potentials that incorporate sustainability goals in all programs conducted involving close interactions with communities beyond the classroom setting. Figure 6.7 shows a mapping of student organizations to SDGs.

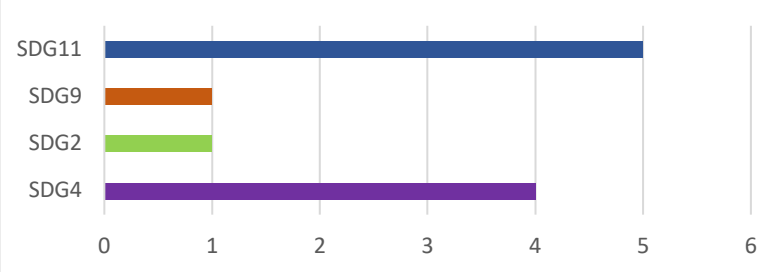
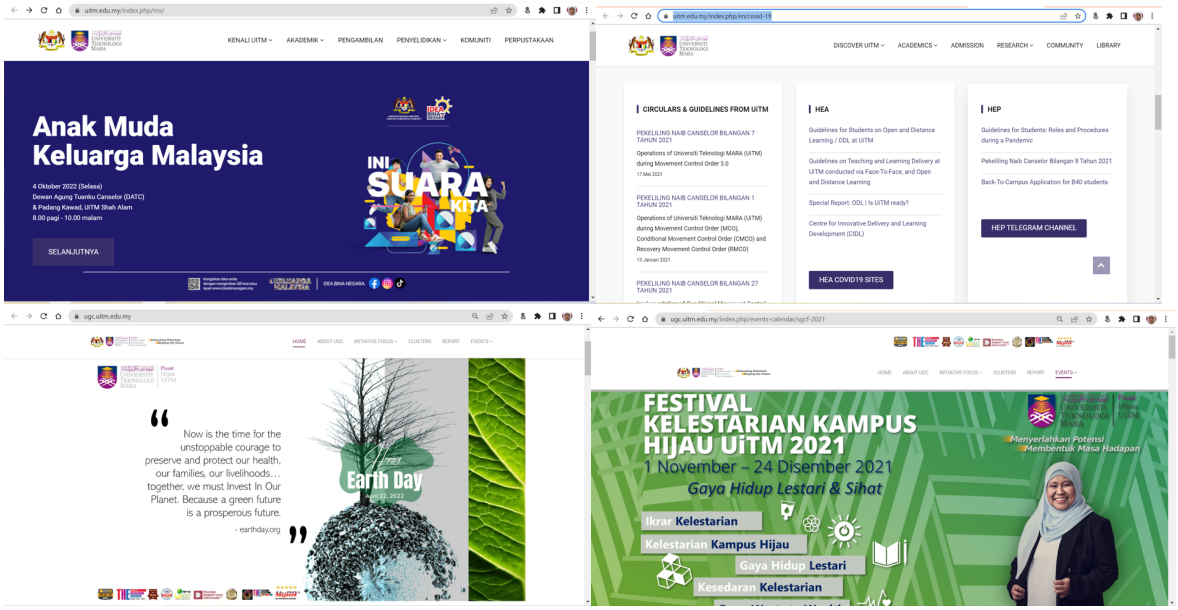


Figure 6.7 Mapping Student Organizations to SDGs

6.3.6 Sustainability Website

In the era of technological advancement, the website stands as an image of the organization in communicating and disseminating important information to the public. UiTM has taken proactive action in ensuring the website is accessible, attractive, user-friendly, and informative to increase the global visibility of the University. UiTM's official website can be accessed at https://www.uitm.edu.my/index.php/ms/. More information on health and safety pertaining to Covid-19 commitments toward the campuses and people can be viewed at https://www.uitm.edu.my/index.php/en/covid-19. Meanwhile, the University and its people's involvement in green campus, environment, and sustainability programs to the communities, as well as the University performance on sustainability can be accessible at the following links:

Main Website of UiTM Green Centre	https://ugc.uitm.edu.my/
UiTM Green Centre Events Calendar	https://ugc.uitm.edu.my/index.php/events-calendar/sgcf-2021
UiTM Sustainability Report	https://ugc.uitm.edu.my/index.php/report
Latest news on UiTM Green Centre	https://news.uitm.edu.my/tag/uitm-green-centre/



The UiTM Sustainability report was first published in 2019. During the first year, the internal report was prepared by the UiTM Sustainability Committee aiming to disseminate initiatives undertook by UiTM through six clusters: Setting and Infrastructure (SI), Waste Management (WS), Water Management (WM), Energy and Climate Change (EC), Education and Research (ED) and Transportation (TR). In 2020, the sustainability report was prepared by the dedicated division purposely established for sustainability; namely UiTM Green Centre. This enhanced sustainability report has highlighted and communicated in detail initiatives and yearly and comparative achievements of the University throughout a year, and it has been communicated to the public at large and available online at https://ugc.uitm.edu.my/index.php/report. Figure 6.8 illustrates the sustainability report's number of pages to reflect in-depth communication of significant initiatives and achievements.

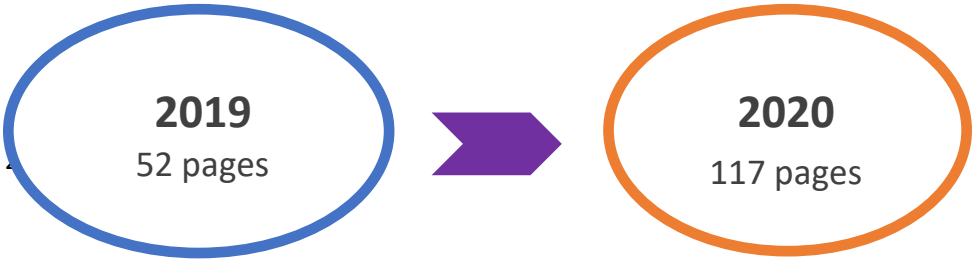


Figure 6.8 Sustainability Reports' Number of Pages

6.3.7 Sustainability Report

UiTM's sustainability initiatives have been in action for many years before it was officially executed on 7 November 2018 by the establishment of UiTM Sustainability Committee. Specifically, the committee was established to carry out sustainability activities as well as responsible for the collection of data and monitoring for UiTM sustainability initiatives. This sustainability working committee has focused on six key clusters namely (1) infrastructure and facilities, (2) waste management, (3) water management, (4) energy and climate change, (5) education and research and (6) transportation. Sustainability Report of UiTM serves to communicate the sustainability key initiatives and achievements of the University to the public at large. This sustainability reporting aims to show our sustainability commitment in all aspects towards enabling the sustainability agenda into university life. This report highlights sustainability achievements on six clusters namely Setting and Infrastructure (SI), Waste Management (WS), Water Management (WM), Energy and Climate Change (EC), Education and Research (ED) and Transportation (TR).

Despite the physical restriction imposed by the Ministry of Higher Education due to the Covid-19 pandemic, UiTM managed to organize 14 cultural activities in 2021. A progressive increase of 75% shows UiTM's commitment to enriching heritage and culture for future generations. Figure 6.9 illustrates the number of cultural activities conducted in 2020 and 2021.

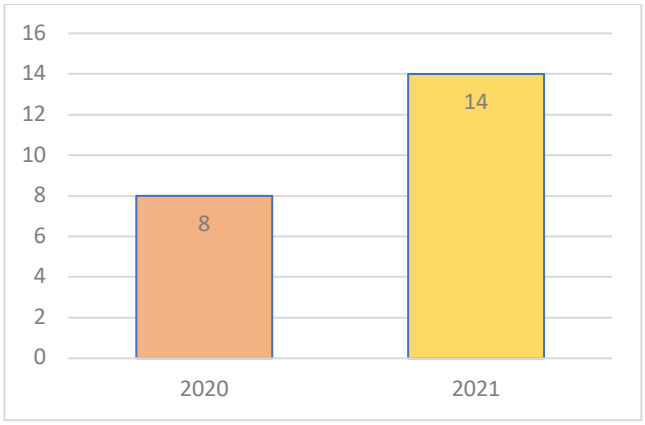


Figure 6.9: Number of cultural activities conducted in 2020 and 2021.

The UiTM Sustainability report was first published in 2019. During the first year, the internal report was prepared by the UiTM Sustainability Committee aiming to disseminate initiatives undertaken by UiTM through six clusters: Setting and Infrastructure (SI), Waste Management (WS), Water Management (WM), Energy and Climate Change (EC), Education and Research (ED) and Transportation (TR). In 2020, the sustainability report was prepared by the dedicated division purposely established for sustainability; namely UiTM Green Centre. This enhanced sustainability report has highlighted and communicated in detail the yearly initiatives and comparative achievements of the University throughout a year, and it has been communicated to the public at large and available online at https://ugc.uitm.edu.my/index.php/report. Figure 6.8 illustrates the sustainability report's number of pages to reflect in-depth communication of significant initiatives and achievements.

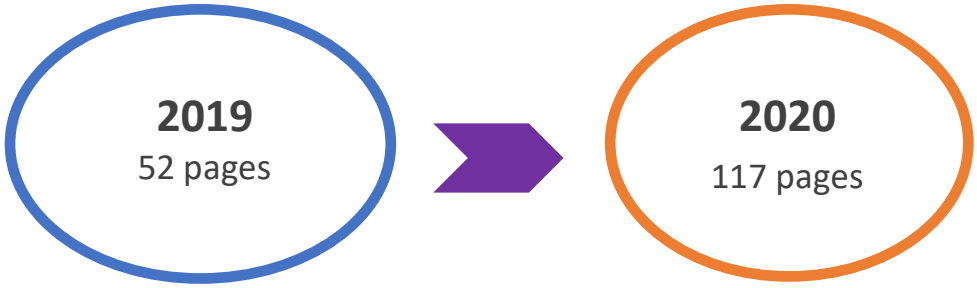


Figure 6.8 Sustainability Reports' Number of Pages

6.3.8 Cultural Campus Activities

As one of drivers of sustainable development, engaging cultural activities among the people of UiTM throughout campuses have reflected UiTM devotion in enriching multi-racial cultural and heritage preservation. It is truly important to preserve cultural identities around the world, as they can hasten the transition to a more sustainable future. The wider impact of the green campus' existence to its surroundings can be experienced through **14 cultural activities** carried out around the campus in 2021 which benefited its people and national communities in knowledge, skills, and social and economic growth. UiTM's active coordination of cultural activities can be indirectly mapped to Sustainable Development Goals (SDGs) as shown in Table 6.8.

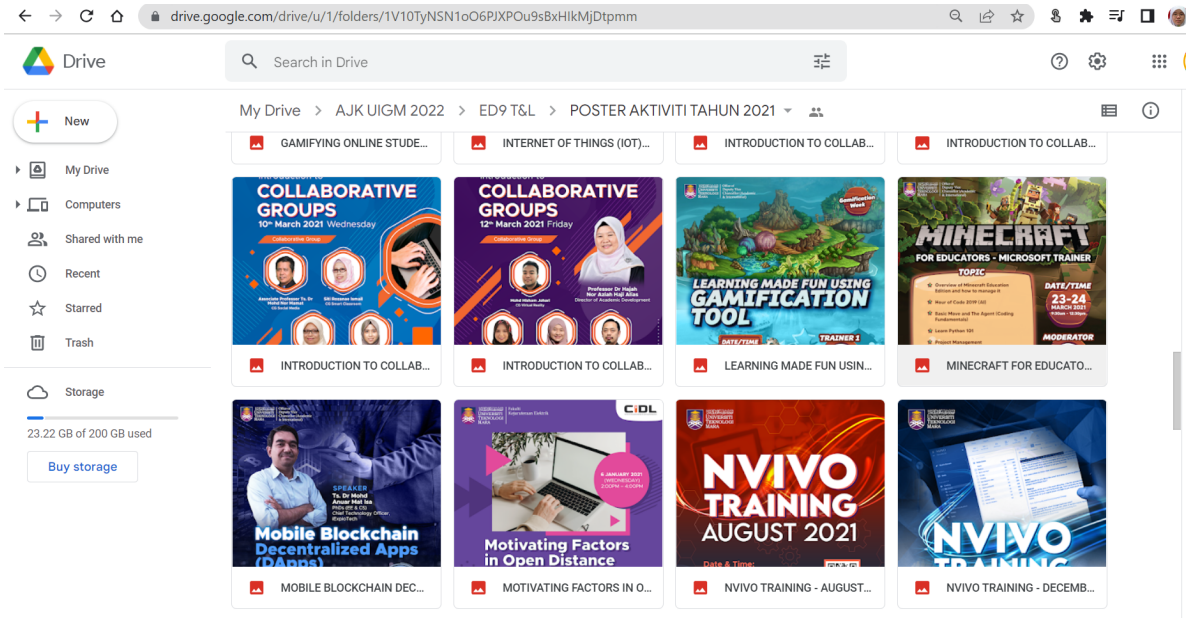
No	Cultural Activities	SDGs
1	Demonstration of Stage Makeup (Special Effects) And Tutorial using Henna in making and preparing Props and Accessories (Theater)	4, 9
2	Program Bicara Seni Industri Kreatif (BISIK) SIRI 1: Smule, Joox, Tik Tok, We Sing … Pencemaran Atau Kebaikan	4, 9, 16
3	Raikan Merdeka 2021 “Malaysia Prihatin”	4, 16
4	Webinar Refleksi Seni Budaya: Diaspora Alam Melayu: Sejarah & Ketamadunan	4, 11, 16
5	Webinar Asas Persembahan Kesenian dan Kebudayaan/ Fundamentals of Art and Culture Performance Webinar	4, 11
6	Bicara Seni Industry Kreatif – BISIK – Pemakaian Busana Melayu	4, 11
7	KARYAKU 2021	4, 11
8	Bicara Seni Budaya Industri Kreatif (BISIK): Pemakanan Herba Tradisional: Mudarat atau Manfaat	3, 4, 11
9	KARYAKU: Deklamasi Puisi	4, 11
10	Hikayat Suara Hati	4, 11
11	Dokumentari Budaya	4,11
12	Asas Dendangan Syair	4, 11
13	Sayembara Mencipta Lagu Puisi Remaja 2021	4, 11
14	Webinar Warna-Warna Budaya – Adat Perkahwinan Masyarakat Islam Malaysia, Indonesia & Brunei.	4, 11

Table 6.8: Mapping of cultural activities to SDGs

6.3.9 Improvement Programs for T&L

A disruption in learning opportunities involving physical interaction during the Covid-19 pandemic has impacted many people in the educational sector i.e., the schools, universities, and colleges. Prompt adaptation to other teaching and learning alternatives has been utmost importance to the University to minimize the impact on students' effective learning process. The effective learning process helps students to recognise their potential talent, identify opportunities through the enhancement of abilities and skills, improvement in teaching and learning through many programs have been carried out to support the academics and students aiming to maximizing the potential of online learning for the continuation of effective teaching and learning process.

UiTM Academic & International Office and Infrastructure & Infostructure Development Office had immediately taken necessary actions through **81 programs** during 2021. UiTM Academic Assessment & Evaluation Division has organized **18 online teaching methods workshops**. The Centre of Innovative and Learning (CIDL), UiTM has pro-actively utilized all digital and social media platforms such as Facebook, YouTube, Twitter, Instagram, and Website to disseminate and communicate information pertaining to teaching and learning especially those in rural and remote areas. **59 online webinars** and training are free and available on all social media platforms for academics and students.



Meanwhile, the Office of Infrastructure & Infostructure Development managed to improve **3 facilities** such as upgrading the lecture halls, studios, and exhibition centre in supporting online and hybrid learning. To improve the internet bandwidth, UiTM has spent a considerable amount of RM576,766.20 (USD125,090.32) for setting up the wireless Wi-Fi routers to enhance wi-fi performance.

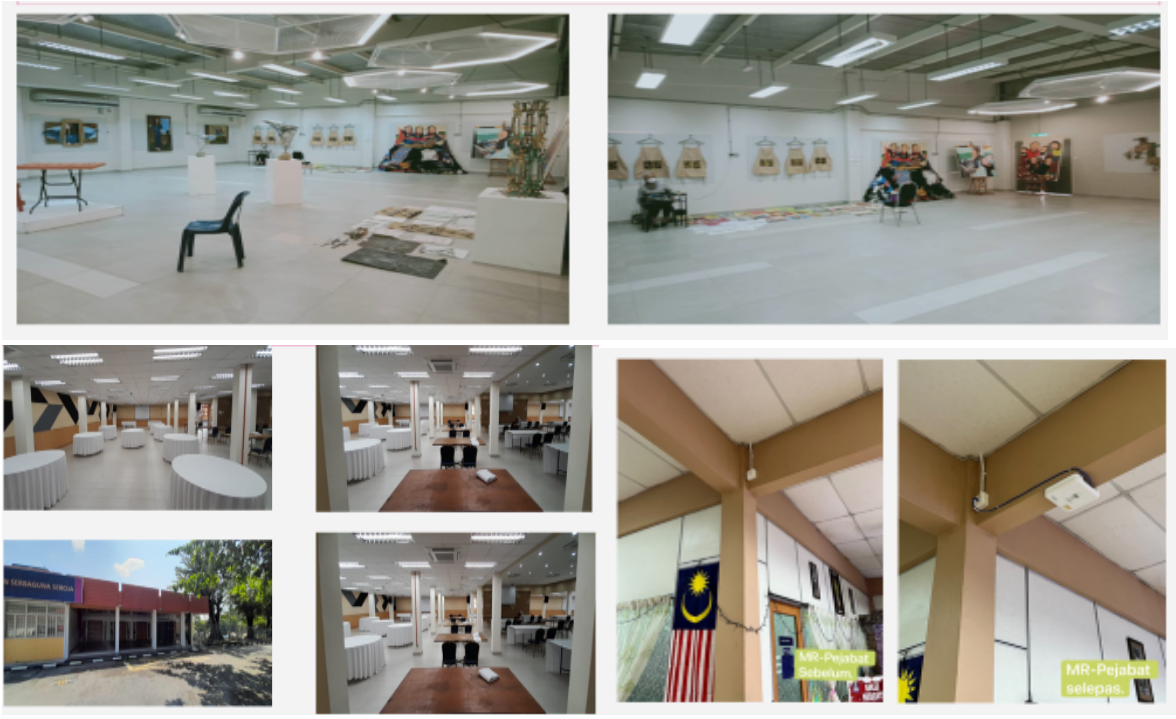


Table 6.14 provides samples of evidence for teaching & learning improvement programs conducted during 2021.

Type of Improvement	Duration	Particular	Links
Facilities	21/7/2020 – 28/3/2021	Renovation and upgrade of Dewan Makan Seroja to Multipurpose Hall for enhanced teaching & learning practices at UiTM Shah Alam, Selangor Darul Ehsan.	
	1/8/2020 – 28/2/2021	Renovation of Washrooms for hygiene purposes to promote a good environment among students at INTEC UiTM Kampus Seksyen 17, UiTM Shah Alam, Selangor Darul Ehsan.	
	1/9/2021 – 9/11/2021	Renovation and upgrade of Studio Catan 3, 4, 5 for a more conducive and attractive environment at the Faculty of Art & Design, UiTM Shah Alam, Selangor.	
	1/1/2021 – 31/12/2021	Set up Wireless wi-fi routers for enhanced Wi-fi performance	
Teaching Methods	18/6/2021	Designing Rubrics for Digital Skills	https://www.youtube.com/watch?v=4oQoo4UIwhA
	9/7/2021	Sesi Taklimat Pengendalian Pentaksiran dan Penilaian UITM Semasa Pandemik COVID-19	https://www.youtube.com/watch?v=LQ5iGq6NYmw
	30/7/2021	Positioning Graduates' Employability through Digital Portfolio	https://www.youtube.com/watch?v=FrA48BCeIgk
	30/7/2021	Best Practices for Psychomotor Assessment	https://www.youtube.com/watch?v=wjGJBv_FOME
	11/8/2021	Combatting Academic Dishonesty with Ouriginal	https://www.youtube.com/watch?v=GtrnNaLKLqs
	28/9/2021	The Rise of Online Cheating: Rigor vs Lenience	https://www.youtube.com/watch?v=sYfRB1Kkjyw
	28/9/2021	A Better Tomorrow: Augmenting UiTM's Assessment & Evaluation Ecosystem	https://www.youtube.com/watch?v=VQVfkIlbEio
	28/9/2021	Integrity Matters: Academicians & Academic Misconduct	https://www.youtube.com/watch?v=jZ6CSiT4rdA
	29/9/2021	Open-Book Exams: Issues & Challenges	https://www.youtube.com/watch?v=-5VxQr9LyYg
	29/9/2021	Promoting Higher-Order Thinking through Case Studies	https://www.youtube.com/watch?v=i-Hu8A40ks8
	30/9/2021	Technology Enhanced Assessment in Higher Education	https://youtu.be/OIxT9ittq9M
	30/9/2021	Proctoring Online Assessments with UFuture	https://www.youtube.com/watch?v=RLsXc0nxFHc
	12/11/2021	Enhancing the Effectiveness of Online Assessments	https://www.youtube.com/watch?v=B3aei69TpEc
Trainings for Academics & Students	6/1/2021	Motivating Factor In ODL	https://youtu.be/eQhMN7ts-OE
	9/3/21	Introduction To Collaborative Groups - Day 1 (Alternative Assessment and e-Portfolio, Collaborative Teaching, 360 Video Learning and Gamification)	https://youtu.be/uWSEp6PmHvI
	10/3/21	Introduction To Collaborative Groups - Day 2 (social media, Smart Classroom, Global Learning and Big Data Analytics)	https://youtu.be/RMgloBU7NL0

Type of Improvement	Duration	Particular	Links
	11/3/21	Introduction To Collaborative Groups - Day 3 (Blockchain, Virtual Learning, Design Thinking, Mooc and Inclusive Education)	https://youtu.be/hzeAYCZhlyU
	12/3/21	Introduction To Collaborative Groups - Day 4 (Virtual Reality, Makerspace, IOT, ODL)	https://youtu.be/VnMmfBuhmAU
	18/6/21	CG Design Thinking Webinar Series: Designerly Strategy for everyone	https://youtu.be/4IT6L18XeFQ
	1/7/21	CG 360 Video Learning Webinar: Tech Talks: Making Educational Videos Education	https://youtu.be/fGxDNBGe6SA
	16/7/21	CG Design Thinking Webinar Series: Designerly Ways of Solving Problem	https://youtu.be/8zq3n6xezyE
	22/7/21	Program 1 (Webinar): CG ODL Publication Series How to Write and Publish Your ODL Practices?	https://youtu.be/QCyT4jn1KQY
	22/9/21	Content Creation Masterclass: Animated PowerPoint Basics	https://youtu.be/gFRQnP0IWrA
	22/9/21	Content Creation Masterclass: Video Editing by Davinci Resolve	https://youtu.be/yOZQTiOKkJY
	5/10/21	CG ODL Webinar Series: Embracing ODL 4.0 "ODL 4.0 Content Development & Delivery"	https://youtu.be/gSeFL4wn48s
	8/12/21	Content Creation Masterclass: Canva Video Basics	https://youtu.be/RKItcC1UOZQ
	21/12/21	Universal Design in education: An ODL Perspective on Teaching & Learning Approaches	https://youtu.be/lpJUq_wE0u8

Table 6.14: Samples of evidence for Teaching & Learning Improvement Programs Conducted in 2021.

6.3.10 Community Service

Community service is one of experiential education that aims to address community needs together with structured opportunities intentionally designed to promote student learning. In line with the aspiration of the Ministry of Higher Education, community services by UiTM students have been executed through the Service-Learning Malaysia-University for Society or SULAM in UiTM starting in 2021.

In the year 2021, there were **87 sustainability** community services projects organized. Several community service projects were conducted by the students for SULAM-compulsory courses as part of the requirements to complete those courses in most faculties.

SULAM is a course-based, credit-bearing educational experience in which the student participates in a structured service activity that meets identified community needs, reflects on the service activity and experiences to achieve desired learning outcomes, in such a way as to gain a deeper understanding of course content, a broader appreciation of the discipline, enhanced sense of personal values and civic responsibility. Following elaboration are for selected community service projects in 2021:

a) O-some Community Project

A joint program between JACK 'n JILL Cream-O and Universiti Teknologi MARA (UiTM), aims to implement an exciting community outreach program to help visually impaired people, as part of the final year project of the Faculty of Architecture, Planning and Surveying students. A total of 40 students presented 6 ideas for this project through an e-session to be carried out at Permata Community Rehabilitation Center in Brickfields.

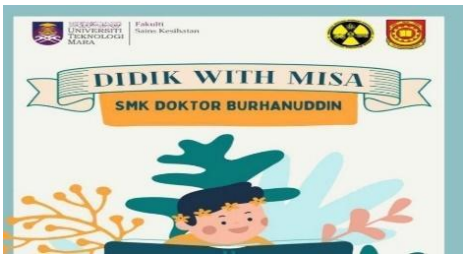
b) Didik with MISA

This program was organized by the Medical Imaging Students Association (MISA) 2021, Faculty of Health Sciences, UiTM Kampus Puncak Alam. The program aims to provide an understanding on the importance of curriculum activities and learning approaches for the secondary school of SMK Doktor Burhanuddin with targeted groups of Form 1 to Form 3 students.

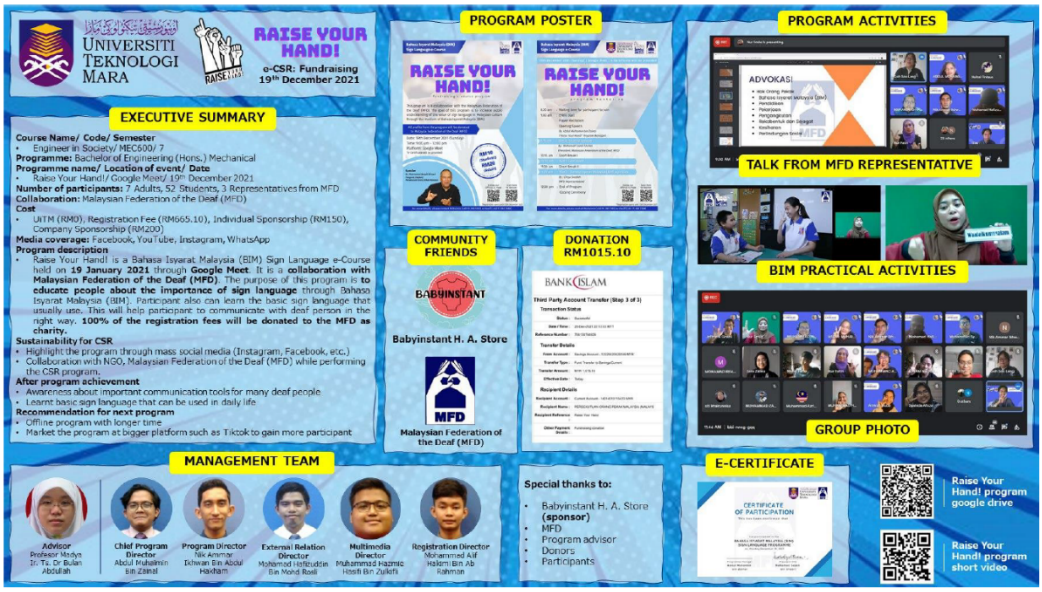
c) **Skip-Pink 2021: Hop for Hope**

Skip-PINK 2021: Hop for Hope was organized by the Medical Imaging Student Association (MISA) 2021, Faculty of Health Sciences, UiTM Campus Puncak Alam together with MAKNA (National Cancer Council) with the aim of providing exposure and awareness to UiTM Puncak Alam Campus and the community outside about breast cancer as well as encouraging healthy lifestyle practices to UiTM Puncak Alam Campus residents and the outside community. This program also aims to build good relationships with the community outside UiTM Puncak Alam Campus and as a sign of moral support for breast cancer patients.

d) **Raise Your Hand!**



This online program was organized under the course Engineer in Society (MEC600) by the students of Semester 7, Bachelor of Engineering (Hons) Mechanical, School of Mechanical Engineering, College of Engineering, Universiti Teknologi MARA, Shah Alam in collaboration with Malaysian Federation of the Deaf (MFD). There were 7 adults, 52 students and 3 representatives from MFD. This program is a Malaysia Signed Language /Bahasa Isyarat Malaysia (BIM). The purpose of this program was to educate people about the importance of sign language through BIM. Participants also could learn the basics of sign language that they commonly use. All the registration fees were donated to MFD.



e) **Bins Less Give More!**

To increase the importance of preserving and sustaining the environment, 53 final semester students from the Business Economics course organized Bins Less Give More! from the 12 April until 4 June 2021. It is an initiative to collect recycled items via Facebook "Bin Less Give More". The items collected such as garments, toys, bags, and books. The objective of this program is to increase awareness of the benefit of recycling activities of recycling and donating used/preloved items among students and society to recycle and reuse. These activities inevitably could reduce the garbage in the current sanitary landfills site.

f) **Karnival Kesihatan Imunisasi Covid-19: Imun Bersama "Menuju Imuniti Kelompok"**

The students from the Faculty of Medicine organized a program *Karnival Kesihatan Imunisasi* Covid-19: Imun Bersama Menuju Imuniti Kelompok from 28th of July to 4th of August 2021. The main objective of this virtual health carnival was to raise public awareness as well as educate them about the importance of COVID-19 immunization. The main highlight of this health promotion was an online talk that mainly discussed issues surrounding COVID-19 immunization in Malaysia. This talk provides the public with valid information about immunization from reputable panelists and at the same encourages them to get vaccinated.

g) **FSKM Santuni Komuniti FELDA**

This program was organized under e-SULAM by the Faculty of Computer & Mathematical Sciences to assist youth and elderly people of Felda Jengka 2, 4,6,12 and 15 in conducting an online business and the safest way to do online business. An online tutorial was prepared as a guide to conduct business via social media i.e., Facebook, Shopee and Wix, including a marketing tutorial using application of Facebook Ad, Instagram and creating e-poster tutorial. In addition to that, a platform for e-marketplace for Small Medium Industries (SMI) was also developed by the students to help FELDA communities to market their products. They were guided to use online applications ethically and equipped with the basic knowledge of Cyber security to avoid becoming the victims of scammers. The students also developed an official social media for the Felda Management office to ensure fast and reliable dissemination of information to all communities.

h) **Program Pelajar Kongsi Kasih Bantu Anak Yatim Terkesan Akibat Covid 19**

The Faculty of Film, Theater & Animation took the initiative to donate to nearly 150 orphans from Pusat Jagaan Cahaya Kasih Bestari, Selangor. This program was organized by the Head of the program of Center of Industry creative management, College of Creative Arts with 2 lectures and 27 students in the third semester of the Diploma in Arts Management. This program was for students to be conscientious of the effect of Covid-19 towards society. This program also is the platform for students to practice the classroom knowledge i.e., planning, organizing, leading, sponsorship and collaborating with the industry/external organization. The donation was sponsored by Daya Gabungan Sdn Bhd. The items consisted of babies and children needs, foods, kitchen utensils.

Table 6.9 indicates a sample of **87 community service programs** conducted in 2021 by the 9 faculties:

Table 6.9: Samples of community service programs conducted by 9 faculties

No	Faculty	Total Programs	Links
1	Faculty of Architecture, Planning Surveying	6	https://news.uitm.edu.my/academic-webinar-plant-a-billion-trees/ https://news.uitm.edu.my/projek-komuniti-o-some-jack-n-jill-cream-o-dan-uitm/
2	Faculty of Administrative Science & Policy Studies	1	https://drive.google.com/file/d/1S4eGoyGqd3jMPU8d9RFsMbyAo9gsS_Y1/view?usp=sharing
3	Faculty of Law	1	https://drive.google.com/drive/folders/1lllF_MfflFPuDpE9yOcp5EesZ-sHRu7h?usp=sharing
4	Faculty of Health Sciences	2	https://news.uitm.edu.my/didik-with-misa/ https://news.uitm.edu.my/skip-pink-2021-hop-for-hope/
5	School of Mechanical Engineering	69	https://www.slideshare.net/BulanAbdullahDr/csr-mec600-engineers-in-society-may-july-2021 https://www.slideshare.net/BulanAbdullahDr/csr-mec600-engineers-in-society-may-july-2021 https://youtu.be/LQSGnqMYdeg CSR OCT-DEC 2021 MEC600 ENGINEERS IN SOCIETY https://www.slideshare.net/BulanAbdullahDr/ecsr-mec600-octdec-2021pdf https://youtu.be/hW6efyBBiSM
6	Faculty of Business Management	24	https://fbm.uitm.edu.my/index.php/ba114-diploma-in-investment-analysis/2021?view=archive&month=3 https://fbm.uitm.edu.my/index.php/events

			https://news.uitm.edu.my/53-pelajar-uitm-puncak-alam-menjayakan-program-kesedaran-memelihara-alam-sekitar/ https://news.uitm.edu.my/webinar-lestari-ke-arah-pengurangan-sisa-makanan/
7	Faculty of Medicine	1	https://youtu.be/hqv7e7h1D7c
8	Faculty of Computer & Mathematical Sciences	3	https://news.uitm.edu.my/fskm-santuni-komuniti-felda/ https://news.uitm.edu.my/fskm-menyulam-bakti-kepada-komuniti-melalui-e-sulam/ https://news.uitm.edu.my/pelajar-kongsi-kasih-bantu-anak-yatim-terkesan-akibat-covid-19/
9	Faculty of Film, Theater & Animation	1	https://news.uitm.edu.my/pelajar-kongsi-kasih-bantu-anak-yatim-terkesan-akibat-covid-19/

The number of community service projects has enormously increased in 2021 due to the introduction of SULAM-compulsory courses in the same year and the lift of Covid-19 physical restriction. Students managed to reach out for targeted communities, in which 87 community service projects were reported in 2021. Figure 6.10 shows comparative figures on the community service projects conducted in 2020 and 2021.

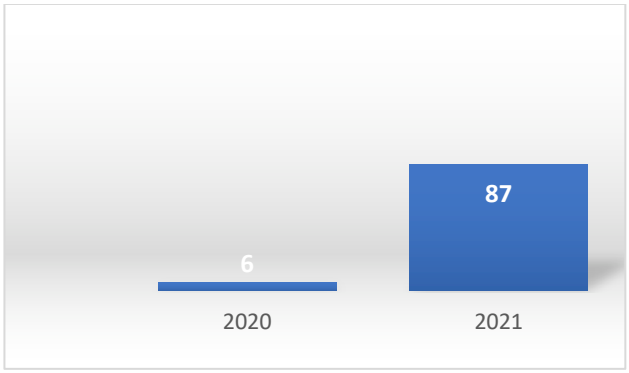


Figure 6.10: Community Service Projects Conducted in 2020 and 2021

6.3.11 Sustainability-related Start-ups

UiTM embraces entrepreneurial potential among the students and has incorporated this element into its curriculum. UiTM believes that exposure to entrepreneurial skills may guide them becoming a well-balanced and globally competent student. Hence, entrepreneurship subjects have been introduced at all levels: undergraduate and postgraduate programs. Further, the establishment of the Malaysian Academy of SME & Entrepreneurship Development (MASMED) has played an effective role in the development of entrepreneurship skills among students. Students are encouraged to regularly participate in entrepreneurial activities and competitions in Malaysia and abroad. To sustainability initiatives, UiTM has been providing full support to staff and students to incorporate sustainable practices into commercial and non-commercial activities through start-ups. In 2021, **6 new commercial start-ups and 563 non-commercial** start-ups were initiated.

More information on 6 new start-ups established in 2021 are as follows:

a) AA 3 D SHOP' and 'AA 3 D PRINTING & ENGINEERING (AA3DP)

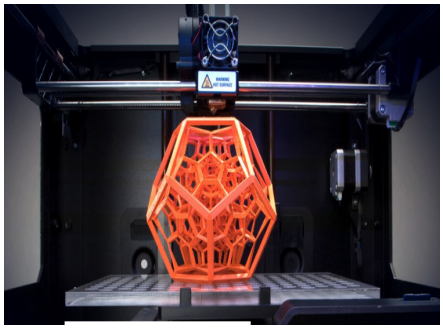
AA3DP is a local 3D printing company started by two local university engineering students with the intention to grow in 2018. Their specialties are in '3D Printing' and '3D Design' which has helped multiple individual's and companies' projects. AA3DP is bringing additive manufacturing to local manufacturing companies to help their companies to grow in terms of technology. AA3DP also takes the step to educate Malaysians on the benefits and endless possibilities of 3D Printing technology.

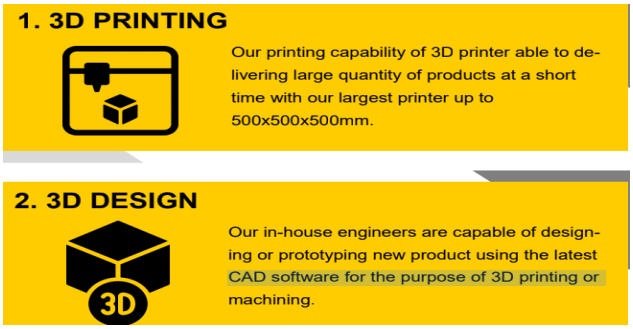
b) **Araliya Resources**

Araliya Resources offers a wide selection of used furniture that has been restored with high quality and reasonable prices. These pieces of furniture are restored and refurbished with skilled craftsmen and high-quality refurbishments. Customers can save a lot of money when they purchase furniture from Araliya Resources.

c) **Aidil Tasneem 3D Printing and Engineering**

Aidil Tasneem 3D Printing & Engineering is commercialized as AT3D. Their office and operation are currently situated in Rawang, Selangor with a single unit of 3D printer and Button Badge Stamping Machine. AT3D offers complete online '3D printing', '3D modeling', 'Button Badge stamping' and 'Graphic Designing services. Using high-performance 3D printers, they produce industrial 3D standard printing with excellent quality finishing and using selected high quality printing materials. Their service caters to all types of client's project, either small or big, and they can ship globally, for any customized 3D printing, modeling, prototyping, special gift, and replica.





d) **IZARA COOKIES**

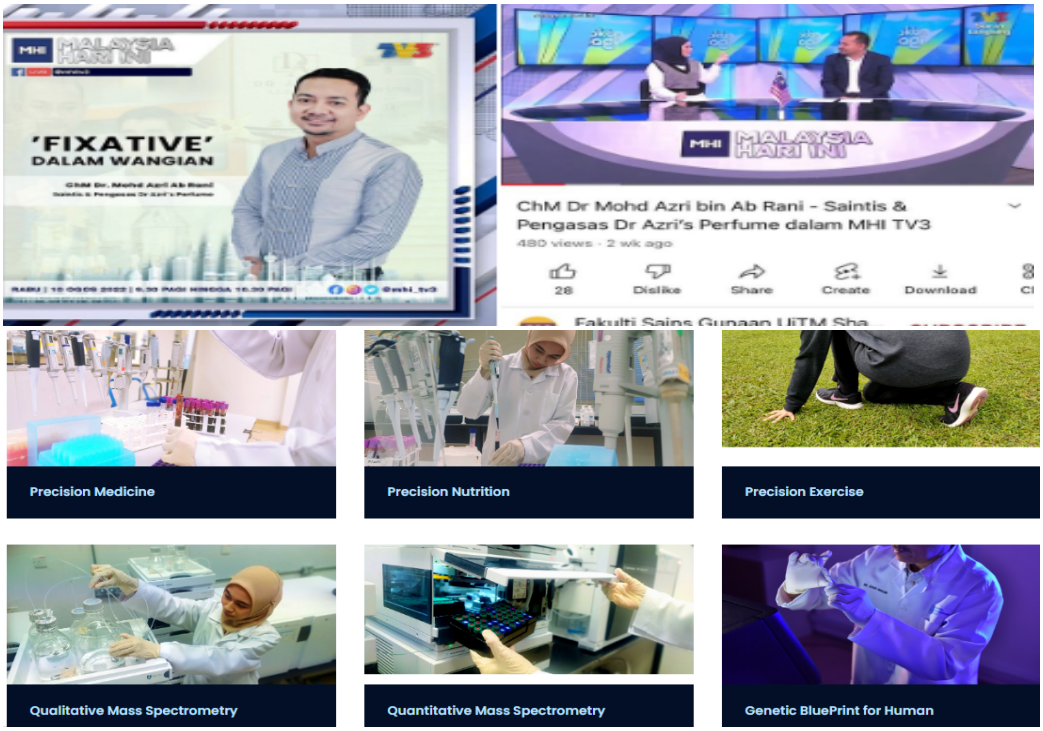
Izara Cookies is owned by Mohd Razlil Ilahi and is based in Kelantan. Izara Cookies sells a variety of cookies including cocoa chocolate chips with almonds. The products are sent to many shops, and petrol stations all over Malaysia.

e) **Smart Horizon Tech Solution**

Smart Horizon Tech Solution services any kind of solutions that are related to the IoT base system from school projects to industrial applications. Their tagline: “You request and give the idea to build, we build it for you!!!”

f) **Dr Azri Perfume**

With 18 years of experience in the field of Chemistry, two Universiti Teknologi MARA (UiTM) lecturers succeeded in creating the *Dr. Azri Perfume* brand that can last for 72 hours compared to regular perfumes. This perfume is an innovation that is to be proud of because famous or common brand perfumes can only last for a limited number of hours only. According to Dr Mohd Azri Ab Rani, the main inspiration behind this innovation is to produce a perfume that can be used during performing prayers (worshiping), and recreation and can last long. Hence, *Dr Azri Perfume* was invented.



In 2021, **11 start- ups** that relate to sustainability were reported. Some of them have commenced a year earlier and continue to operate their businesses in 2021. As a result, a total number of 24 commercial start-ups have been established in UiTM in 2 years i.e., 2020 and 2021. Most of them have integrated sustainable processes or activities into their operation. A cumulative number of start- ups in 2 years are provided in Figure 6.11.

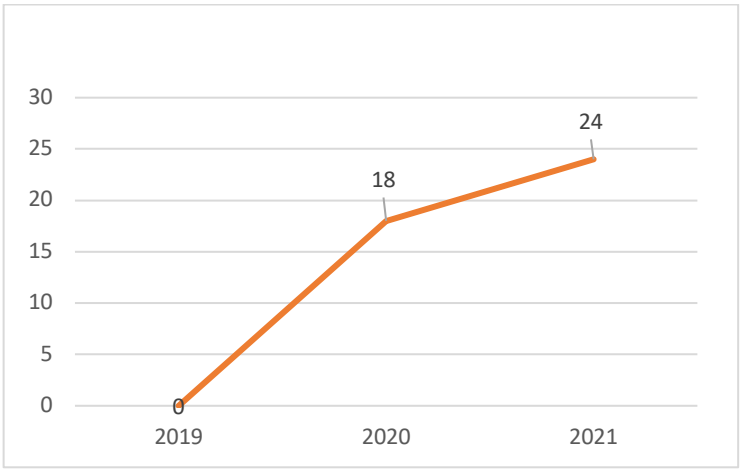


Figure 6.11: A cumulative numbers of Start-ups Establishment for 2 years

References

Coffee Talk with Rozie | Episode 4: https://www.youtube.com/watch?v=qgWihRhwYn0

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