MAHASARAKHAM UNIVERSITY

SUSTAINABILITY REPORT

2022-2023

CONTENT

Welcome to Mahasarakham University or MSU. I would like to extend my appreciation of your good vision considering pursuing your higher education with one of Thailand's foremost centers of higher education.

Beyond our offering of a 'world-class education,' we provide a small college experience in a large university setting creating a sense of community among our students through a wide variety of special programs and the work of our most talented professors and dedicated personnel.

Secondly, the university and its staff take pride in challenging young scholars to excel academically, think critically and to live their lives in an ethical manner. The local people of the province of Maha Sarakham are justifiably proud of their University and I hold that legacy in hand with a profound sense of stewardship. While the students and staff endeavor to honor and build upon MSU's proud heritage and local cultural traditions we also strive to move together into a future of endless opportunity for all through the promise of new knowledge and application of new technologies.

I am thrilled to be part of a learning community that is so talented, dedicated, and caring. I know you will be, too. Join us as you reflect upon your educational needs, options and goals.

Assoc.Prof. Prayook Srivilai, Ph.D.
President of Mahasarakham University

ABOUT MAHASARAKHAM UNIVERSITY

The historical development of Mahasarakham University, or MSU, may be traced back to March 27, 1968, when it was originally established as the College of Education, Maha Sarakham, for the purpose of extending higher education to the nation's Northeastern region. The college situated in an outer area north of Maha Sarakham, a small town right at the center of the region, to produce the quality teachers to serve educational institutions of all levels. The college's status was elevated when it became a regional campus of Srinakharinwirot University in 1974. At that time there were four faculties: Education, Humanities, Social Sciences and Science. The university finally gained independent status and became Mahasarakham University, Thailand's 22nd government university, on December 9, 1994, when the University Act was graciously authorized by His Majesty King Bhumibol Adulyadej and published in the Royal Gazette.

Mahasarakham University has since expanded rapidly in terms of both facilities and academic services and has become a comprehensive university, offering undergraduate and post-graduate degree programs in three academic clusters: Social Sciences; Pure and Applied Science; and Health Science. In response to this growth, in 1998, Khamriang Campus was set up in Kantarawichai District, approximately seven kilometers from the original campus. With 17 faculties, 2 colleges and 1 school currently operating, MSU has been widely recognized as one of Thailand's fastest-growing universities. The total enrollment has also increased, from fewer than 10,000 in its earlier years to more than 40,000 students at present. Many faculty buildings have been constructed on Khamriang Campus, now the administrative and academic center. Total area of main campus (Khamriang) is 1697600 m2

UI GREEN METRIC RANKING AT MAHASARAKHAMUNIVERSITY

Universitas Indonesia (UI) initiated world university rankings in 2010, later known as UI GreenMetric World University Rankings, to measure campus sustainability efforts. It was intended to create an online survey to portray sustainability policies and programs for universities around the world

The conceptual framework of Environment, Economy, and Equity served as a general foundation for our rankings. The rating criteria and indicators are meant to be universally applicable. The indicators and weightings were created with as little bias as feasible. Data collection and submission are simple tasks that take a modest amount of staff time to complete.

The 2010 edition of the UI GreenMetric included 95 institutions from 35 different countries, including 18 from the United States, 35 from Europe, 40 from Asia, and 2 from Australia. 912 colleges from 84 different nations took part in 2020. This demonstrates that UI GreenMetric is the first and only university rankings system in the world that considers sustainability.

The rankings are intended to support scholarly discussions on campus greening and sustainability in education. Encourage social change spearheaded by universities with an eye on sustainability aims, serve as a tool for higher education institutions (HEIs) all over the world to analyze their own on-campus sustainability, Governments, local and international environmental organizations, and the general public should be made aware of campus sustainability initiatives.

University may use the UI GreenMetric Planet University Rankings as a tool to address the sustainability issues our world is now experiencing. To assess, monitor, and evaluate their sustainability strategy plan, several institutions employ the UI GreenMetric questionnaire. Universities can cooperate to minimize harmful environmental effects. Since UI GreenMetric is a nonprofit organization, many colleges are able to take part in the rankings without paying anything.

Ecological preservation is valued at Mahasarakham University. Participating in UI GreenMetric World University Rankings is so appealing. It has participated since 2011 and has continued to do so, which has helped the university create its policies to become more effective at being green.

MSU AT A GLANCE

- Total campus area (m2) 5,364,800 m2
- Total campus ground floor area of buildings (m2) 193,629
- Total campus buildings area (m2) 652,018
- The ratio of open space area to total area 95.8%
- Total area on campus covered in vegetation and water absorption (%) 4,227,372
- Electricity usage per year (k-WH) 19,114,977 (k-WH)
- Recycling program for university waste 75%
- Consumption oftreated water (m3) 674,746 m3
- Number of courses to sustainability offered 55
- Total research funds dedicated to sustainability research ($) 2,499,566
- Total number of academic and administrative staff 3,617
- Total number of regular students 47,251

01

SETTING AND INFRASTRUCTURE (SI)

1. SETTING AND INFRASTRUCTURE (SI)

Mahasarakham University is located in Maha Sarakham province, the heart of North East Thailand. The university has five campus sites

1. Mahasarakham University (MSU) was originally established as the College of Education in 1968. The college's status was later elevated when it became a regional campus of Srinakharinwirot University in 1974. At that time there were four faculties: Education, Humanities, Social Sciences and Science. The university finally gained independent status and became

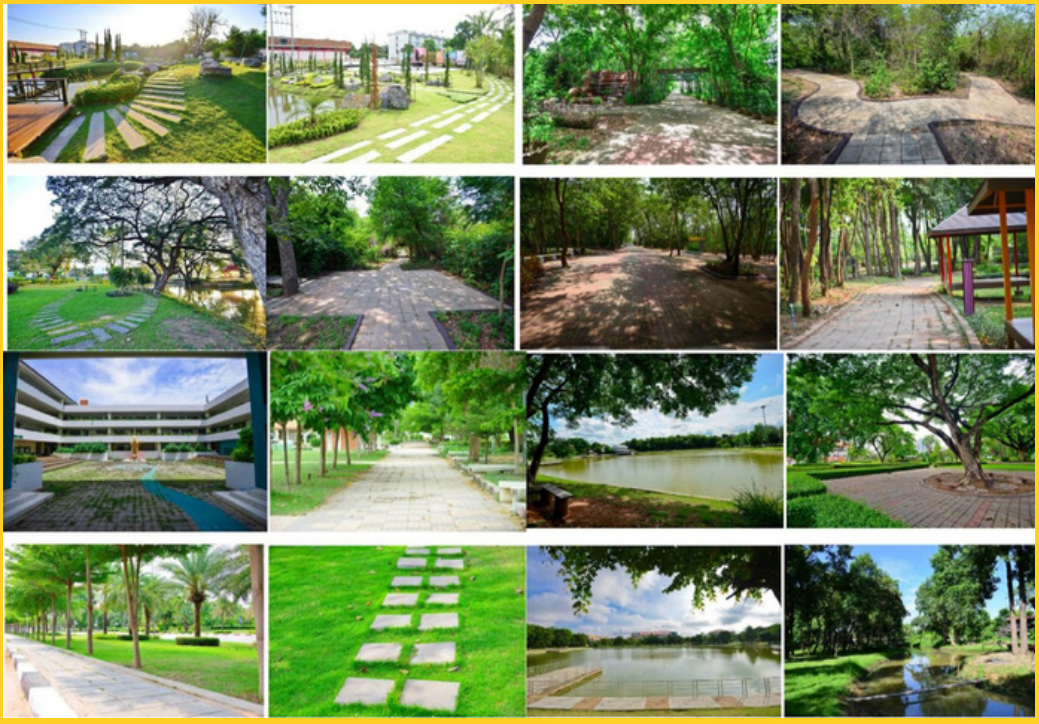
2. Mahasarakham University in 1994. The original campus “City campus” covers 589,600 m2 with the buildings of the 4 faculties (Faculty of Education, Faculty of Cultural Science, Faculty of Tourism and Hotel Management, and Faculty of Veterinary). In 1998, Khamriang Campus was set up in Khamriang sub-district, Kantarawichai District, approximately seven kilometers from the original campus, with the area of 1,697,600 m2 . Fifteen faculties and two colleges are located in this campus with all administrative buildings.

3. Na-sinuan campus site covers forest and planted vegetation areas of the university with the area of 1,400,000 m2 . It is used for farming of livestock, crop, and fruits and vegetables to provide educational service (mainly for the Faculty of Technology and Faculty of Veterinary), research activities, and academic services to the society and local communities.

4. Na doon campus site is in Nadoon district with the area of 1,200,000 m2 . Over 80% of the area is the forest which is used by both community and university. Asarn house museum, a learning center of sufficient economy, guesthouse, a laboratory building for medical plants were constructed and used for all missions of the university (provision of education, innovation from research work, academic services, and development of Isan arts, culture, and traditions).

5. Ban-kerng campus site is in Ban-kerng sub-district with the area of 437,600 m2 . It is a wet land surrounded by Chi river so a diversity of plants were found. This campus provides not only the academic activities but also the trip for hiking and camping.

Mahasarakham University has a total area covered with forests of 2,427,372 square meters and various plants are planted to enhance the beauty of the landscape. inside university and to conserve local native plants.



Campus facliities for disable, special needs and or maternity care Mahasarakham University has operated in accordance with the ministerial regulations. The determining the facilities in the building for the disabled or the handicapped and the elderly.

Therefore, the university has done in order to be in line with the ministerial regulations and university policies.

1. Ramp for the disabled
2. Toilet for the disabled
3. Lift button for the visually impaired

Mahasarakham University concerned the safety for the staff and students, therefore the administrative have plan to improve in the safety in the university:

1. Fire department
2. CCTV Installation Project
3. Fire Alarm Improvement System Project, Gudrang Dormitory
4. Fire Doors Setting Project at Chunchom and Nadoon Dormitory
5. Fireman
6. Security guard

Health Infrastructure Facilities for students, academics and administrative staffs' wellbeing Sudhavej Hospital is a public hospital under the Faculty of Medicine, Mahasarakham University. Sudhavej Hospital is providing diagnosis, treatment, medical services and public health to the general public and also to people who are eligible for universal health insurance, social security, officially, and life insurance, etc. Sudhavej Hospital is open in everyday and official time. Sudhavel Hospital divided in 2 places: (1) Primary Care Center in Khamriang Campus, and (2) Sudhavej Hospital in City Campus. Sudhavej Hospital, Faculty of Medicine, Mahasarakham University has opened a service to treat emergency patients and inpatients for 24 hours, providing general medical examination services, and specialized clinics with the expert doctors and medical staff with the tool and modern equipment. Currently, Sudhavej Hospital, Faculty of Medicine, Mahasarakham University had 200 beds and 400 more will be available in the future.

Conservation: plant, animal, and wildlife, genetic resources for food and agriculture secured in either medium or long-term conservation facilities Mahasarakham University has policies and budget support for the conservation of plants, animals and wildlife, genetics, food resources and safe agriculture for the medium and long term.

1. To make the community and related people aware of the importance and value of the importance of biodiversity at the local level and plant genetic conservation projects under the Royal Initiative.

2. To foster cooperation between communities and local authorities in the management of biodiversity conservation at the local level. and plant genetic conservation projects under the Royal Initiative.

3. To disseminate biodiversity activities at the local level and make sustainable use of biodiversity components. and the Plant Genetic Conservation Project under the Royal Initiative.

02

ENERGY AND CLIMATE CHANGE (EC)

2. ENERGY AND CLIMATE CHANGE (EC)

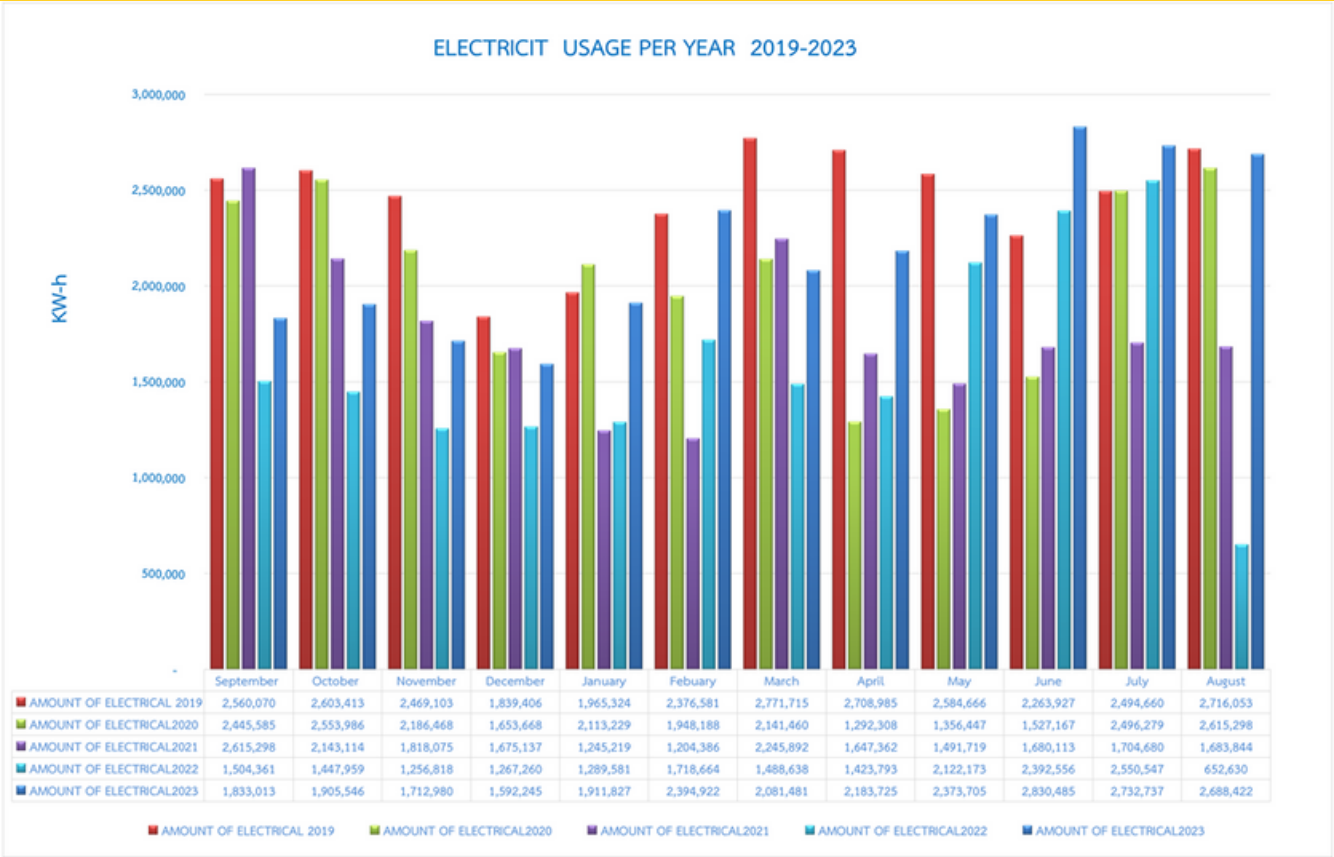
Mahasarakham University has a policy to design the school building to be a green building in order to maximize the efficiency of indoor energy and control the energy consumption automatically, as well as the rules and procedures for energy management in the controlled school building.

Mahasarakham University has recognized the benefits of in other words, it will enable the organization to use energy efficiently, concretely, and continuously, so there is a scope of the assembly list to be effective for materials and equipment replacement with higher efficiency. Or install new equipment to achieve higher overall system performance.

Mahasarakham University had policy to renewable energy for the university's activities which the solar cell on the 6 buildings roof. The energy of the solar cell on the 6 roofs with a capacity of approximately 1MW, energy consumption of 2,880,000 kWh per year. Both 2 campuses: city campus and Khamriang campus was setting solar cell on the roof with 12 buildings: Gymnasium building, College of Music, the building of the Faculty of Informatics, the building of the Faculty of Education I, the building of Academic Resources Center (old building), the building of the Faculty of Science IV, the building of A and B. The generation system consists of a set of crystalline solar panels which is a new technology. And its high electrical efficiency (more than 18%) makes it suitable for roof mounting. The installed capacity of approximately 1 megawatt (DC) uses 2,857 solar panels, which are the source equipment used to generate electricity from the sun. And the electricity produced by the solar panels will be DC power and will be sent to Inverter to convert from DC power to AC electricity. AC electricity will convert the 22 KV to connect to the high voltage system within the university. Switch to suit the 400/230 VAC power supply

Mahasarakham University has Inverter system and electricity system which control by the Provincial Electricity Authority. All the electricity generated by the university had the prevent flowing back.In 2023 – 2024 Mahasarakham University has been allocated funds from the Electricity Development Fund for the promotion of the use of renewable energy and technologies used in electricity business with low environmental impact in accordance with Section 100 of the Electricity Development Fund. In the budget amount of 18,180,000 baht to generate electricity with solar rooftops of 660 kilowatts for use in hospitals under Mahasarakham University. Wishing to make use of the space on the roof of the building. For installing solar rooftop power generation system 660 kW capacity to create electricity security Reduce greenhouse gas emissions (t CO2 E/year) and develop hospital personnel under Mahasarakham University to have knowledge and experience in utilizing energy with solar cells (Solar rooftop) according to the policy of the Office of the Energy Regulatory Commission.

ELECTRICITY USAGE PER YEAR 2019-2023 (IN KILOWATT HOUR)



	September	October	November	December	January	Febuary	March	April	May	June	July	August
AMOUNT OF ELECTRICAL 2019	2,560,070	2,603,413	2,469,103	1,839,406	1,965,324	2,376,581	2,771,715	2,708,985	2,584,666	2,263,927	2,494,660	2,716,053
AMOUNT OF ELECTRICAL2020	2,445,585	2,553,986	2,186,468	1,653,668	2,113,229	1,948,188	2,141,460	1,292,308	1,356,447	1,527,167	2,496,279	2,615,298
AMOUNT OF ELECTRICAL2021	2,615,298	2,143,114	1,818,075	1,675,137	1,245,219	1,204,386	2,245,892	1,647,362	1,491,719	1,680,113	1,704,680	1,683,844
AMOUNT OF ELECTRICAL2022	1,504,361	1,447,959	1,256,818	1,267,260	1,289,581	1,718,664	1,488,638	1,423,793	2,122,173	2,392,556	2,550,547	652,630
AMOUNT OF ELECTRICAL2023	1,833,013	1,905,546	1,712,980	1,592,245	1,911,827	2,394,922	2,081,481	2,183,725	2,373,705	2,830,485	2,732,737	2,688,422

AMOUNT OF ELECTRICAL 2019 AMOUNT OF ELECTRICAL2020 AMOUNT OF ELECTRICAL2021 AMOUNT OF ELECTRICAL2022 AMOUNT OF ELECTRICAL2023

Energy Management Office and Green University Group Monitor and record the amount of electrical energy supplied to Mahasarakham University. In 2022 to 2023, the university has constructed Outpatient Building 1 with a walkway connecting Building 1, increasing electricity consumptionby 6,107,488 kWh. The number of students in 2022 to 2023 is more than 40,000. Currently, Basutthavej Hospital and Mahasarakham University. Urban areas receive electricity from the Provincial Electricity Authority's distribution system, which is shared with other power users. This causes power outages and power outages on a regular basis. As a result, electrical equipment and medical equipment are defective due to such problems. In addition, there are plans to construct more new buildings, resulting in higher.

Electricity consumption. Therefore, there was a need for the construction of a substation. 115 KV to support increased demand for electricity supply and achieve higher power system stability.

Mahasarakham University (urban area) has received funding from the Office of the Energy Regulatory Commission B.E. 2023 to promote the use of renewable energy and technologies used in electricity business with low environmental impact according to Section 2023. In 2023 – 2024 Mahasakharm University has been allocated the Electricity Development Fund for the promotion of renewable energy and technology used in electricity business with low environmental impact under Section 10. 97 (4) with a budget of 18,180,000 baht to generate electricity with solar rooftops of 660 kilowatts for use in hospitals under Mahasarakham University. Wishing to make use of the space on the roof of the building. For installing solar rooftop power generation system 660 kW capacity to create electricity security Reduce greenhouse gas emissions (t CO2 E/year) and develop hospital personnel under Mahasarakham University to have knowledge and experience in utilizing energy with solar cells (Solar rooftop) according to the policy of the Office of the Energy Regulatory Commission.

Table showing total monthly electricity units of Mahasarakham University for the year 2023 (kw-h)

CAMPUS	NEW UNIVERSITY					IN THE CITY								NA DUN	Baan Geng	Nasi Nuan	Total amount of eletric power (Monthly/Year)
METER NUMBER	0263-020011688480	9806-020011991632	9801-020017539125	0138-020024720442	0265-020011741265	9809-020012020435	9075-020012020386	9801-020011862133	9801-020011861882	9801-020011861993	9012-020020871107	9012-020021335723	9806 020027092625	9011-020012227169	9041-020011950496	9011-020014401420	
METER NUMBER						PEA.27583983	PEA.413006A	PEA.23054041	PEA.23054039	PEA.23054042							
MONTH	New university sign lighting	Kham Riang University	Pumping raft	Donyom sign lighting	police station	Accounting+ Zoology	Suttawet Hospital	Kanasawad	Faculty of Education	Art Research Institute	Faculty of Medicine	Conference Centers	IN THE CITY 115 KV	Walailukkhawet Park	Walailukkhawet Park	University Farm	
Oct-65	265	1,280,000	-	5,258	-	27,690	292,800	64,980	29,070	15,144	74,080	1,290	-	4,894	-	37,560	1,833,013
Nov-65	160	1,345,600	-	5,746	-	24,600	265,800	79,740	30,840	18,012	81,960	-	-	5,688	-	47,400	1,905,546
Dec-65	101	1,128,000	5,279	3,916	-	27,600	267,000	88,620	35,370	13,980	67,320	40,710	-	5,608	4,922	24,555	1,712,980
Jan-66	300	1,092,800	9,648	5,879	-	24,390	240,000	69,600	24,360	10,320	60,800	11,190	-	5,368	2,730	34,860	1,592,245
Feb-66	633	1,380,000	2,645	5,076	-	23,760	220,200	86,640	40,860	15,540	71,560	12,840	-	5,872	1,651	44,550	1,911,827
Mar-66	682	1,721,600	12,552	5,550	-	24,390	307,800	105,360	47,880	21,864	90,320	10,260	-	8,136	1,328	37,200	2,394,922
Apr-66	563	1,376,000	6,343	5,339	-	32,220	345,000	89,100	44,010	26,496	101,320	16,650	-	5,920	1,350	31,170	2,081,481
May-66	568	1,359,600	936	5,503	-	29,160	453,000	88,740	46,200	23,856	100,080	14,670	-	6,008	3,834	51,570	2,183,725
Jun-66	536	1,609,200	1,714	4,698	-	28,680	371,400	108,060	45,023	22,908	99,080	36,390	-	6,298	5,608	34,110	2,373,705
Jul-66	684	2,036,800	8,061	4,444	-	30,210	351,600	145,740	54,456	43,668	103,320	8,040	-	6,168	6,834	30,660	2,830,485
Aug-66	586	1,905,600	4,560	4,624	-	29,070	324,600	117,000	-	83,424	104,360	21,360	76,288	5,000	7,125	69,140	2,732,737
Sep-66	745	1,832,800	6,144	5,568	-	14,220	206,400	25,800	-	22,536	5,600	660	528,912	5,252	6,055	27,750	2,688,422
Total	5,603	18,068,000	57,882	61,601	-	315,990	3,645,600	1,069,380	398,069	317,748	959,800	174,060	605,200	70,194	41,436	450,525	26,241,088
Average	467	1,505,667	4,824	5,133	-	26,333	303,800	89,115	33,172	26,479	79,983	14,505	50,433	5,850	3,453	37,544	2,186,757
Total eletric power					26,241,088	kw-h											

ACTIVITIES

Energy efficient appliances usage are replacing conventional appliances











ACTIVITIES

Smart Building Implementation







ACTIVITIES

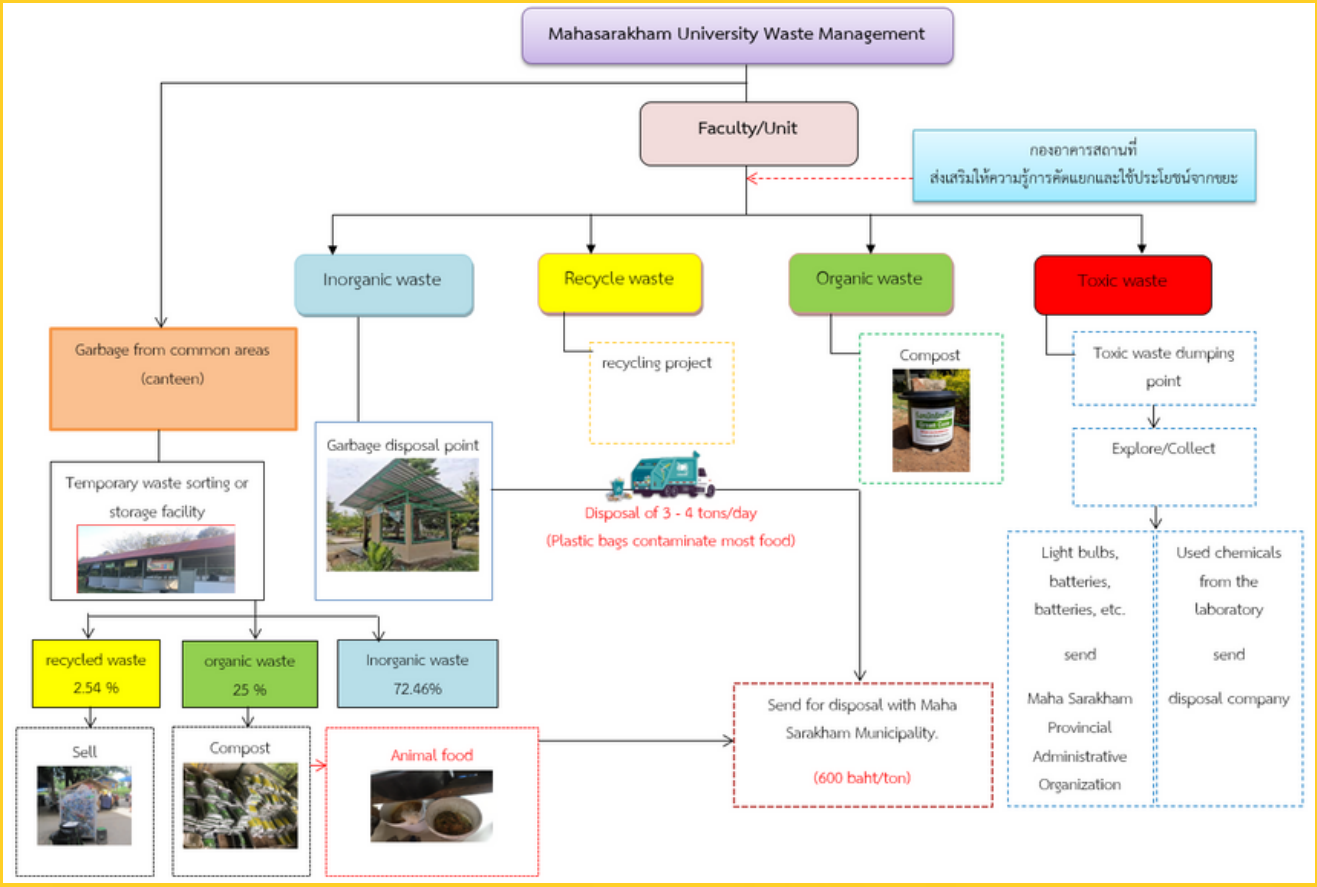
Renewable Energy Sources in Campus

03

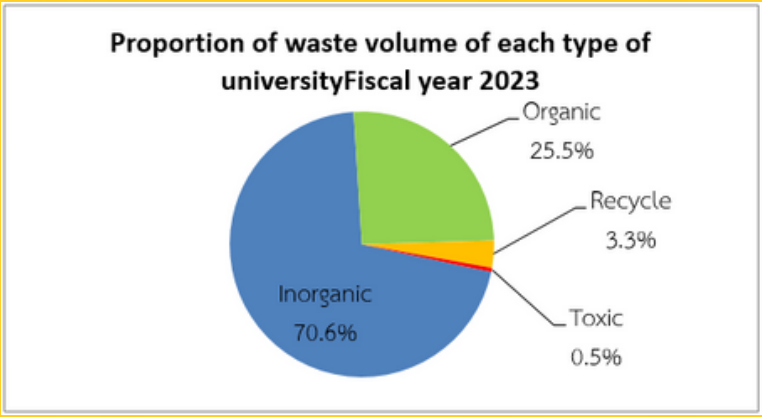
WASTE

3. WASTE

Mahasarakham University is a government agency that has a clear policy to create a good environmental management system. Its goals and principles are to strive towards being a green university with good environmental management in order to set an example for students, staff, and the community to put into practice and expand the results to families and communities. Therefore, we have developed an efficient waste collection and management system. It will be another way to help take care and preserve the environment. By managing waste correctly according to sanitary principles. Throughout the process of reusing waste by adhering to the 3R principles: Reduce, Reuse, Recycle in order to reduce the use of natural resources. All the while encouraging students, students, and personnel to participate in operations under the concept of "Use it wisely, separate it, and dispose of it properly," emphasizing the management process at the source before leading to management at the destination. For a good environment within the university.



CHARACTERISTICS OF MAHA SARAKHAM UNIVERSITY'S WASTE



types	Volume (kg)/day	percentage (%)
Inorganic waste	3,544.00	70.7
Organic waste	1,281.00	25.5
Recycle waste	166.00	3.3
Toxic waste	25.00	0.5
Total	5,016.00	100.0

From the study, survey and analysis of solid waste components of Maha Sarakham University. By studying the physical characteristics of solid waste (Physical Characteristic) from studying and collecting data on the amount of waste from faculties/departments that occur per day within Maha Sarakham University. Shows the amount or proportion of each type of waste generated to lead to further management planning. According to a study from Maha Sarakham University, there are 4 types of waste: general waste, organic waste, recyclable waste, and hazardous waste. When considering the percentage of solid waste components of each type of Maha Sarakham University, it was found that general solid waste had the highest amount, averaging 70.70 percent, followed by recycled waste, organic waste, hazardous waste, averaging 25.5 percent, 3.30 percent, and 0.5 respectively

If there is separation of recyclable waste and organic waste, it will be managed at the source. (Faculty/Department) will be able to

3R (REDUCE, REUSE, RECYCLE) PROGRAM FOR UNIVERSITY WASTE (WS.1)

Mahasarakham University adopts the 3R principle as a guideline for making the best use of existing resources. Can help reduce the amount of waste. By Reduce Reuse and Recycle. Starting with using less. Reduce the use of materials and products that create waste to reduce the amount of waste generated (Reduce), reuse materials and products that can still be used (Reuse), and reuse materials. Used products are processed to be reused or recycled (Recycle) by creating policies and various projects. In order for each faculty/unit to practice and promote participation from all parts within the university, the 3Rs are as follows:

Project
Green Heart University

Project
Waste sorting bins to create value

PROGRAM TO REDUCE THE USE OF PAPER AND PLASTIC ON CAMPUS (WS.2)

Mahasarakham University has a policy to reduce the use of plastic bags and paper since 2022 and has continued to practice it. Because there is a lot of plastic and paper bags being used. Especially plastic bags that take longer to decompose than other types of waste. The university has therefore issued guidelines to help reduce the use of plastic bags and paper on campus and will continue to practice them in 2023 as follows.

1. Project to reduce receiving, reduce giving, reduce use of plastic bags (MSU No Plastic)
2. Say no to plastic bag project
3. Ecolife program continues
4. Green Meeting
5. Bring Your Own Cup project: Get discounts and promote the use
6. of personal drinking glasses.
7. Electronic Document System and use 2-sided paper
8. Online system

ORGANIC WASTE TREATMENT (WS.3)

Organic waste is waste that decomposes and decomposes quickly and can be recycled. Make compost or use it. The organic waste on campus includes vegetable scraps, fruit peels, leaves, grass, and food scraps. The university separates them and uses them by composting them into fuel (charcoal) with the objective of reducing the amount of waste that must be sent for disposal. and manage existing resources in a way that is valuable and can be put to good use

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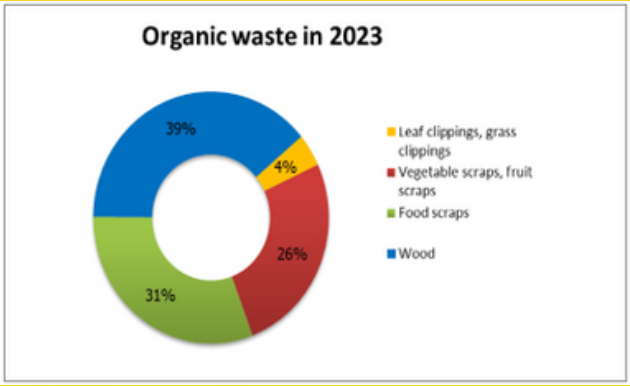
Organic waste in 2023	Volume (kg)
Leaf clippings, grass clippings	18,490.00
Vegetable scraps, fruit scraps	114,966.00
Food scraps	135,372.40
Wood	170,420.00
Total	439,248.40



ORGANIC WASTE TREATMENT (WS.3)

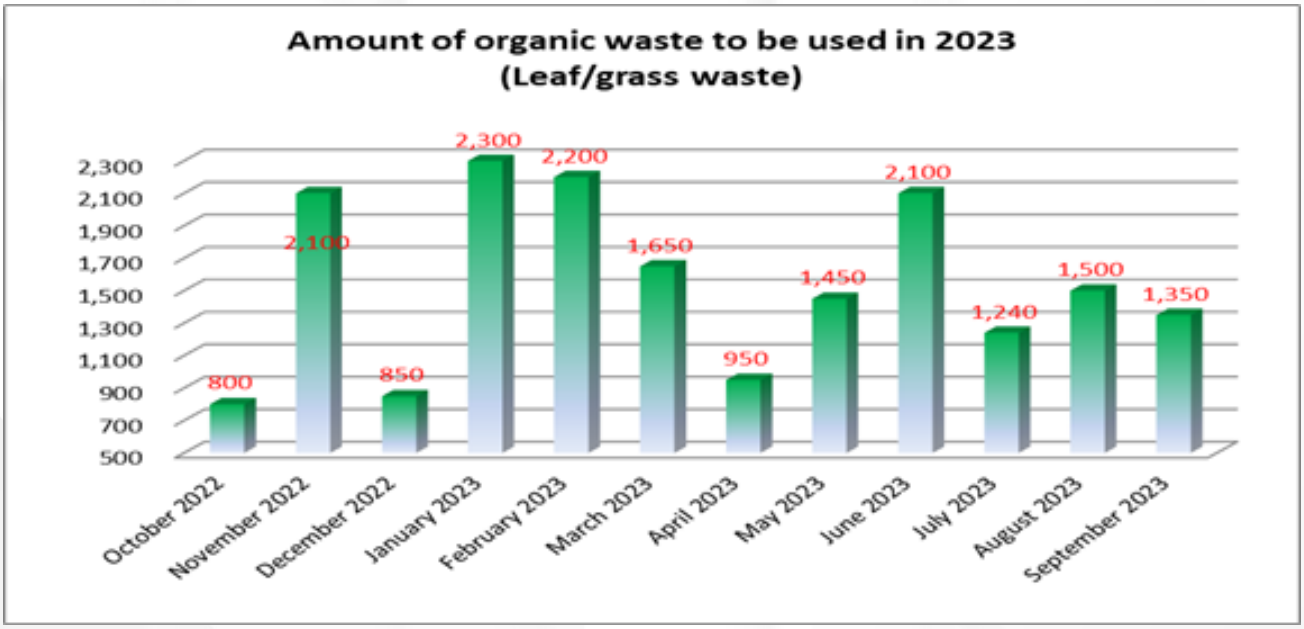


Table 1: Quantity of organic waste (Leaf/grass waste) used to produce compost.

month	Organic waste quantity (kg)	product (kg)
October 2022	800	550.00
November 2022	2,100	1,650.00
December 2022	850	650.00
January 2023	2,300	1,700.00
February 2023	2,200	1,400.00
March 2023	1,650	1,350.00
April 2023	950	680.00
May 2023	1,450	950.00
June 2023	2,100	1,450.00
July 2023	1,240	755.00
August 2023	1,500	1,050.00
September 2023	1,350	840.00
Total	**18,490.00**	**13,025.00**

ORGANIC WASTE TREATMENT (WS.3)

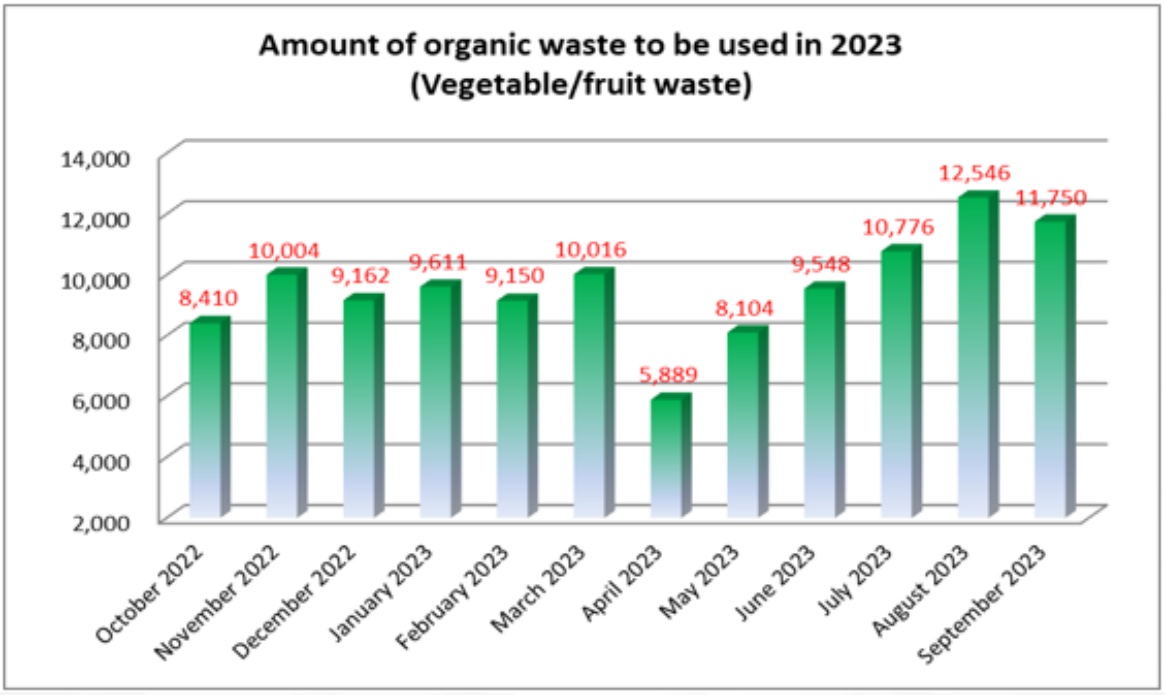


Table 2: Quantity of organic waste (Vegetable/fruit waste) used to make vermicompost.

month	Organic waste quantity (kg)	product (kg)
October 2022	8,410	4,800.00
November 2022	10,004	4,000.00
December 2022	9,162	4,000.00
January 2023	9,611	4,000.00
February 2023	9,150	4,400.00
March 2023	10,016	4,000.00
April 2023	5,889	4,000.00
May 2023	8,104	4,800.00
June 2023	9,548	5,600.00
July 2023	10,776	4,000.00
August 2023	12,546	4,800.00
September 2023	11,750	3,580.00
Total	**114,966.00**	**51,980.00**

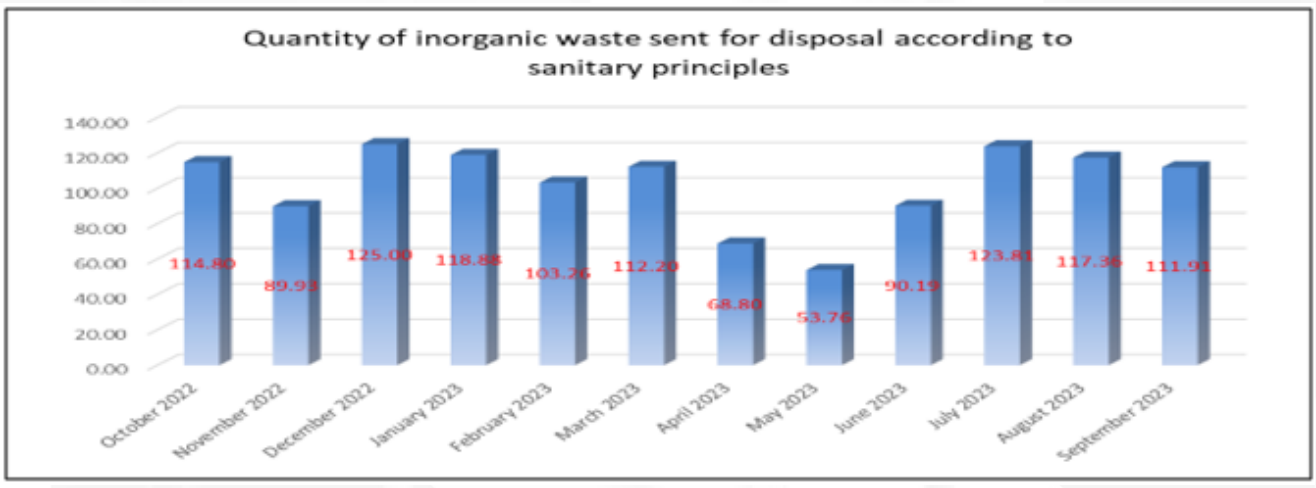
INORGANIC WASTE TREATMENT (WS.4)

Group 1 : Usable inorganic waste management: Inorganic waste that is used here means steel, metal sheets, and plastics that can be applied to gain benefits. To reduce the amount of waste that must be disposed of By repairing and modifying into various products.

Group 2 : Management of unusable organic waste: Inorganic waste that cannot be used or is not worth recycling here means Various plastic bags, foam boxes, instant noodle packets and electronic waste which the university manages by means of disposal (landfill).

The amount of inorganic waste that cannot be used is managed by proper disposal methods according to sanitary principles (landfill method).

month	weight (ton.)	Waste disposal cost (baht)
October 2022	114.80	69,000.00
November 2022	89.93	54,000.00
December 2022	125.00	75,000.00
January 2023	118.88	71,400.00
February 2023	103.26	62,100.00
March 2023	112.20	67,500.00
April 2023	68.80	41,400.00
May 2023	53.76	32,400.00
June 2023	90.19	54,300.00
July 2023	123.81	74,400.00
August 2023	117.36	70,500.00
September 2023	111.91	67,200.00
Total	1,229.90	739,200.00



TOXIC WASTE TREATMENT (WS.5)

Hazardous waste or toxic waste refers to materials that are no longer in use. Deteriorated products or various containers that contain elements or are contaminated with dangerous objects/substances that are toxic, flammable, and corrosive chemicals radioactive substances and substances that cause disease, etc., that cause harm to people, animals, plants, property, or the environment. Must be managed correctly and appropriately Mahasarakham University has managed toxic waste correctly according to academic principles. To ensure safety for students and personnel and not cause problems to the environment within the specified standards.

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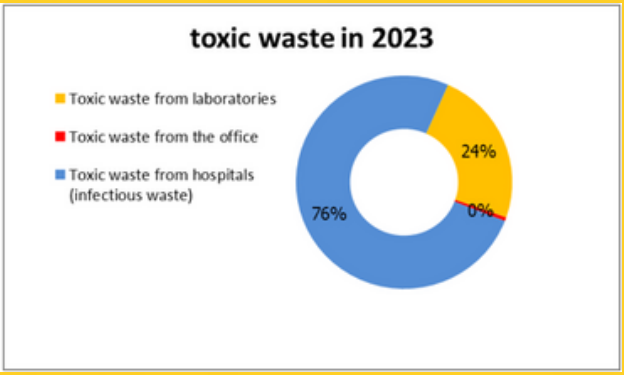
Toxic waste types	amount (Kg)
Toxic waste from laboratories	13,489.80
Toxic waste from the office	323.00
Toxic waste from hospitals (infectious waste)	43,132.33
Total	56,945.13



Amount of chemicals sent for disposal Fiscal year 2023

ON	Faculty/Department	Chemical type											amount (Kg)
		รหัส W01 (kg)	รหัส W02 (kg)	รหัส W03 (kg)	รหัส W04 (kg)	รหัส W05 (kg)	รหัส W06 (kg)	รหัส W07 (kg)	รหัส W08 (kg)	รหัส W09 (kg)	รหัส W10 (kg)	รหัส W11 (kg)	
1	Faculty of Environment and Resource Studies	0	0	0	800	0	0	0	0	0	0	0	800.00
2	Faculty of Public Health	0	120	0	150	75	0	0	800	0	118	40	1,303.00
3	Faculty of Pharmacy	0	500	0	0	0	0	0	0	100	100	10	710.00
4	Faculty of Medicine	5.2	66	20	22	3	0	300	0	0	40	15	471.20
5	Faculty of Science	80	400	900	130	0	20	0	30	0	400	580	2,540.00
6	Faculty of Technology	30	70	100	230	70	2	0	20	0	480	10	1,012.00
7	central tool center	6	300	0	0	0	0	0	0	0	40	0	346.00
8	Faculty of Engineering	0	0	0	15	3	0	0	0	0	0	97	115.00
9	Center of Innovation Excellence	38	0	0	5	0	0	33	0	0	0	35	111.00
10	Walairukkhawet Research Institute	0	20	10	10	5	0	80	0	0	20	20	165.00
11	Faculty of Veterinary Medicine	0	74	0	15	15	0	3	0	0	75	0	182.00
12	Building and Premises Division	0	0	0	0	0	0	0	0	0	0	4700	4,700.00
	Total	159.2	1550	1030	1377	171	22	416	850	100	1273	5507	
												Total	12,455.20

Not :

รหัส W01 คือ น้ำมัน
รหัส W02 คือ Organic solvent: Non halogenated
รหัส W03 คือ Organic solvent: Halogenated (Methylene
รหัส W04 คือ โลหะหนัก+กรด
รหัส W05 คือ เบส + aqueous
รหัส W06 คือ สารกำจัดศัตรูพืช
รหัส W07 คือ ฟอร์มาลีน (Formalin)
รหัส W08 คือ สารเคมีที่เป็นของแข็ง
รหัส W09 คือ ไซยาไนด์
รหัส W010 คือ ขยะจากห้องปฏิบัติการ (ถุงมือ, ผ้าปิดจมูก, ขวดแก้วเปล่า, เศษแก้ว)
รหัส W011 คือ ...อื่นๆ (รายละเอียด).....

Volume of infectious waste sent for disposal monthly (November 2022-September 2023)

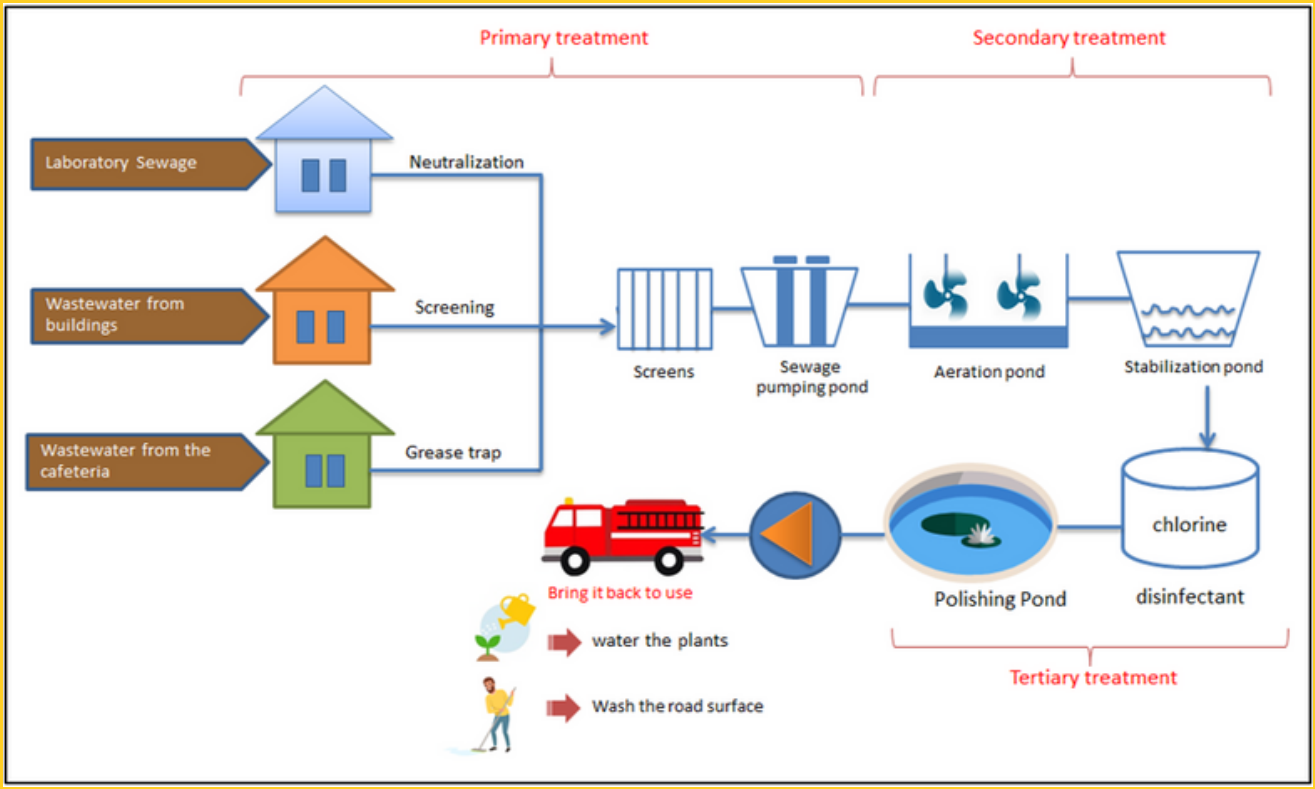
on	month	amount (Kg)	price/unit	Amount (Baht)
1	November 2022	4,990.33	12	59,884
2	December 2022	2,652.00	12	31,824
3	January 2023	5,778.00	12	69,336
4	February 2023	3,998.00	12	47,976
5	March 2023	3,760.00	12	45,120
6	April 2023	3,753.00	12	45,036
7	May 2023	4,091.00	12	49,092
8	June 2023	4,146.00	12	49,752
9	July 2023	4,238.00	12	50,856
10	August 2023	2,888.00	12	34,656
11	September 2023	2,838.00	12	34,056
Total		43,132.33	12	517,587.96

SEWAGE DISPOSAL (WS.6)

1) Wastewater from laboratories including the Faculty of Environment Laboratory, Faculty of Science Laboratory, Faculty of Technology Laboratory, Central Laboratory.

2) Wastewater from various buildings, including faculties/departments, student dormitories, personnel dormitories.

3) Wastewater from cafeteria including Talat Noi Cafeteria, Cafeteria Building D, Cafeterias in urban areas, Sutthawet Hospital Cafeteria, Secondary Demonstration School , Primary Demonstration School.



THERE ARE 3 SOURCES OF WASTEWATER WITHIN MAHA SARAKHAM UNIVERSITY AS FOLLOWS:

Maha Sarakham University collects and treats them using physical, chemical and biological processes to remove impurities in wastewater, including organic substances, acids, alkalis, solids, suspended solids, oil, fat, color, odor, and performs disinfection and measures water quality before use. By using water that has undergone treatment that does not exceed the specified standards to water trees and wash road surfaces.

Primary Treatment → **Secondary Treatment** → **Tertiary Treatment**

ACTIVITIES

3R (Reduce, Reuse, Recycle) program for university waste

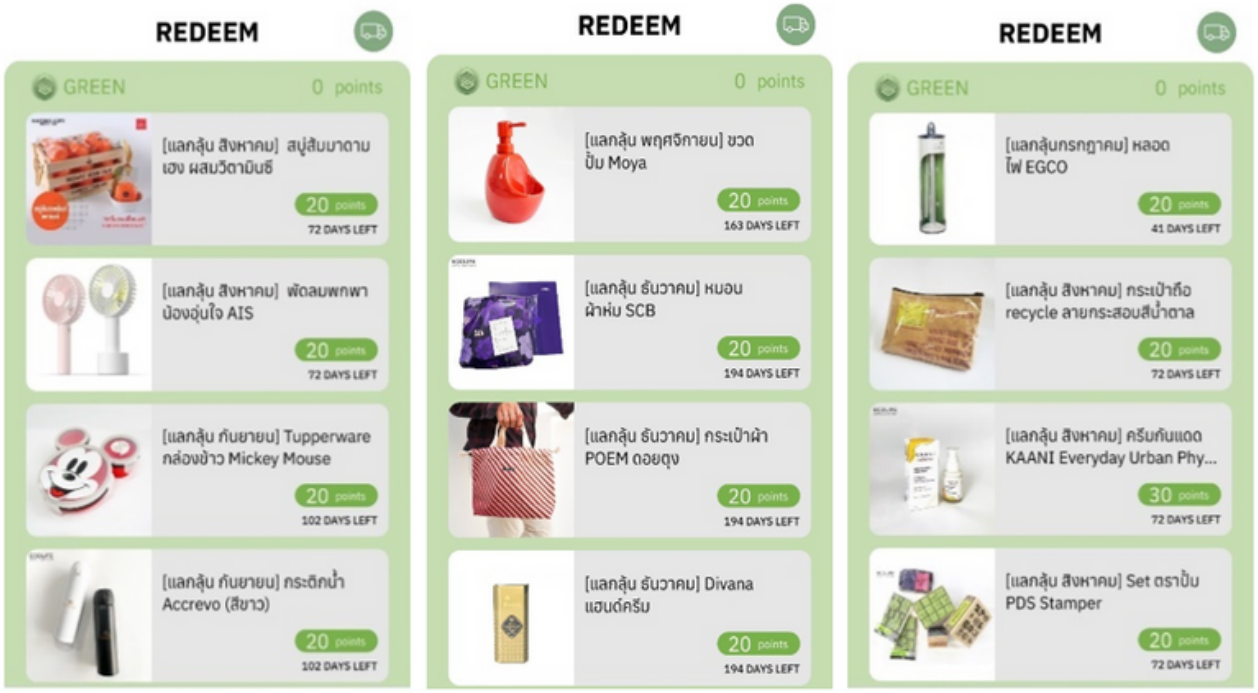
ACTIVITIES

Program to reduce the use of paper and plastic on campus

ACTIVITIES

Program to reduce the use of paper and plastic on campus

Participating stores will receive a QR Code. Students and staff can scan the QR Code to decline plastic receipts and earn points to redeem for various prizes. You can see details and prizes in the Ecolife application. The project is still ongoing.



ACTIVITIES

Organic waste treatment








ACTIVITIES

Inorganic waste treatment





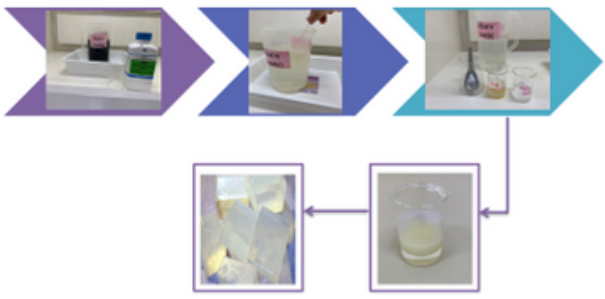







ACTIVITIES

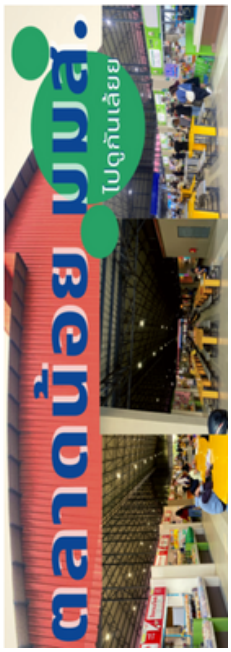
Toxicwaste treatment



Making soap from waste

ACTIVITIES

Sewage disposal



04

WATER (WR)

4. WATER (WR)

Mahasarakham University has implemented a comprehensive water conservation system, starting with groundwater preservation. This involves the construction of water storage reservoirs and large canals surrounding the university. Additionally, the university directly sources surface water from the Chi River without the need for groundwater extraction. This water is pumped and stored in dedicated raw water reservoirs within the university. When these raw water reservoirs are filled, rainwater is also collected without contamination during transport, ensuring its use for the university's water supply.

This system not only serves the university's water needs but also has the capacity to manage rainwater runoff to prevent flooding. All of these initiatives have been successfully constructed and are currently in operation.

Mahasarakham University has a wastewater treatment system designed to effectively remove impurities from the water to meet the standard criteria. This system utilizes an Aerated Lagoon, capable of accommodating influent BOD levels of up to 200 mg/l.

The water produced by this new water treatment plant will be utilized for direct human contact, both for consumer consumption and other uses. It will be 100% clean and treated tap water, without the utilization of other untreated water sources such as groundwater.

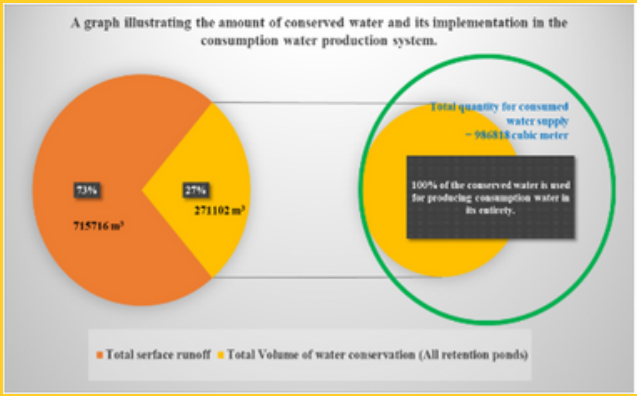
The policy for conserving water within Maha Sarakham University has been implemented.The announcement from Mahasarakham University, in effect since 2021, and continuing to the present, regarding the water conservation and efficient usage policy.

Mahasarakham University has implemented a comprehensive set of pollution prevention measures to safeguard its wastewater and prevent contamination. These measures include the full implementation and regular monitoring of policies and programs aimed at controlling water pollution.

4. WATER (WR)

Furthermore, Mahasarakham University places a strong emphasis on regular monitoring of wastewater quality to ensure compliance with established water quality standards. This commitment to ongoing assessment helps maintain the integrity of the water supply.

In conclusion, Mahasarakham University has a robust pollution prevention framework in place, which includes comprehensive monitoring of water quality, separate drainage systems, and the utilization of rainwater as a raw water source for consumption. This evidence demonstrates their dedication to maintaining clean and safe water sources within the campus environment.



ACTIVITIES

Carrying out public awareness campaigns and applying water conservation initiatives within the university.

The implementation of wastewater reuse for various activities.

Classification of water-saving sanitary ware of Mahasarakham University

ACTIVITIES

Water pollution control in campus area

Treated water consumed.

05

TRANSPORTATION

5. TRANSPORTATION

Mahasarakham University encourages students and staff to use public buses, organizes ecofriendly shuttles such as trams and electric buses, and encourages operators to bring electric scooters students and staff can try or rent, as well as negotiate for operators to bring electric scooters to students. Electric motorbike. Scooters will be maintained with in Mahasarakham University.

Mahasarakham University have public transportation for everyone on campus. There are four EV bus that operate around the University. EV bus have an origin point at student dormitories to all faculties and importantbuildings/places within theUniversity. and transportation services for personnel and students between universities To reduce the use of private cars.

ACTIVITIES

Electric trams for free

EV BUS for free

ACTIVITIES

Shuttle transferring for free

Free bicycle lending

ACTIVITIES

Electric scooter for rent

06

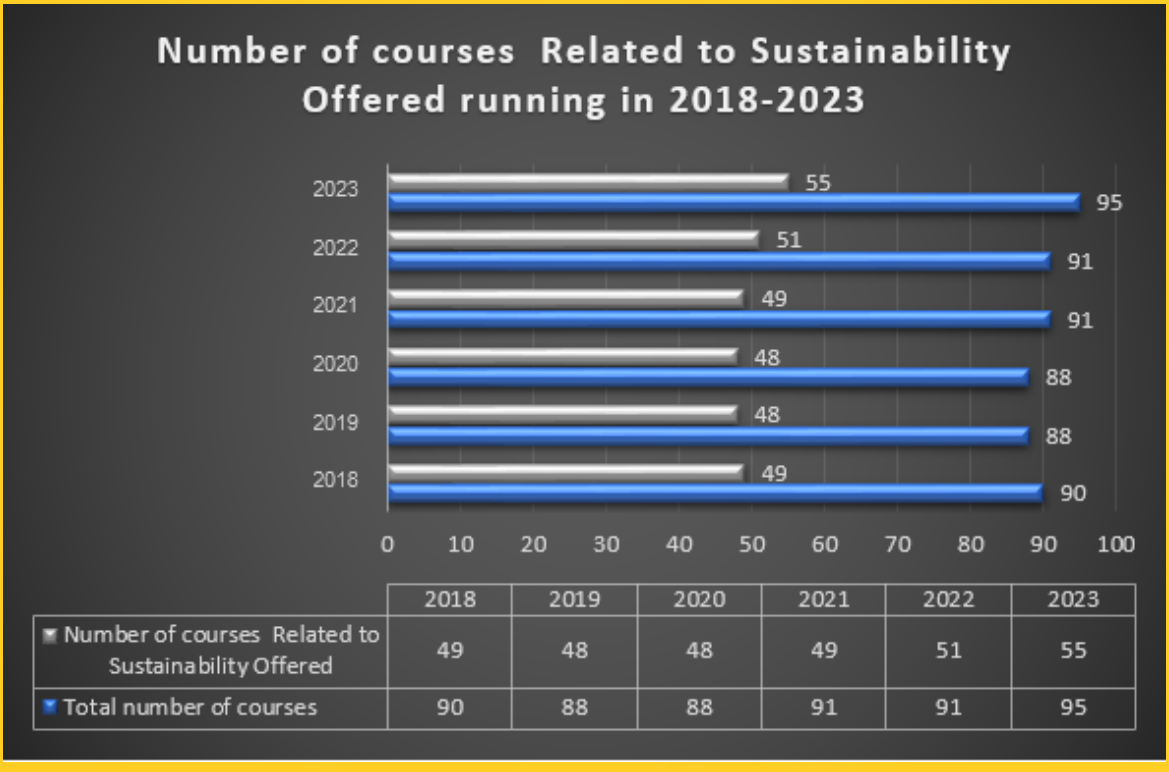
EDUCATION AND RESEARCH (ED)

6. EDUCATION AND RESEARCH (ED)

Mahasarakham is located in the northeastern region of Thailand. Mahasarakham University offers undergraduate and graduate degrees in three academic groups: social sciences, pure and applied. and science and health sciences Its mission is to organize teaching and learning, aiming to produce graduates with quality standards, and research development. and innovation towards excellence, providing academic services to communities and society To enable communities and society to be self-reliant in a sustainable way and to conserve, restore, protect, disseminate and develop the arts, culture and traditions of Isaan.

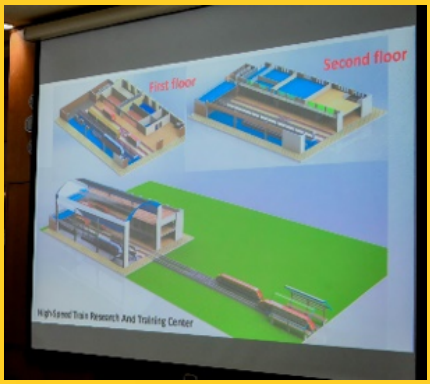
In response to this growth, it covers the Khamriang campus area. There are approximately 3,617 staff and 47,251 students enrolled at this main campus. Mahasarakham University has 17 faculties and 2 colleges. By 2023, there will be 95 programs, with courses embedded in sustainability and courses with sustainability performance certificates as part of the 55 courses curriculum.

Mahasarakham University receives research funding support. both funds within the university and external funding sources to develop research and innovation within the university.



	2018	2019	2020	2021	2022	2023
Number of courses Related to Sustainability Offered	49	48	48	49	51	55
Total number of courses	90	88	88	91	91	95

Mahasarakham University Held a meeting to discuss guidelines for signing an MOU in developing a high-speed rail curriculum. Between Hunan High Speed Railway Technical College People's Republic of China with Mahasarakham University.



ACTIVITIES

Events Related to Sustainability

MSU organizes training on "Patent Analysis for Strategic Research and Development"

MSU organizes "Workshop for creating little tourist guides" Providing tourism services"

MSU organizes training on "Guidelines for doing research using intellectual property"

MSU organizes peer-to-peer volunteer training for students with disabilities.

MSU organizes volunteer volunteer training to produce media for students with disabilities.

MSU joins hands with Bay Computing Company Limited to promote the potential of developing knowledge and new innovations in information technology security.

MSU joins hands with NSTDA to continue the 3rd Social Enterprise Roadshow project.

MSU welcomes Mr. Kwa Siong Tuay, Senior Manager, Infineon Technologies Asia Pacific Pte Ltd., Singapore.

MSU welcomes Prof.Jianwen Luo,Department of Biomedical Engineering, Tsinghua University,China

MSU welcomes experts Prof.Andrei Volodin (Visiting Professor), Department of Mathematics and Statistics, University of Regina, Canada and Prof.Sanghoo Yoon, Department of Statistics, Daegu University, South Korea.

MSU welcomes experts from Hanoi University of Science and Technology, Socialist Republic of Vietnam.

MSU aims to pursue research cooperation with Ming Chuan University, Republic of China (Taiwan).

MSU held a meeting to clarify policies to promote research. New generation teachers/researchers.

MSU held a meeting to discuss and sign an MOU with Hunan High-Speed Railway Technical College. People's Republic of China To develop a high-speed rail course

MSU hosts sports for health Lower Northeastern Network Higher Education Institutions

ACTIVITIES

Activities organized by student organizations

Faculty of Tourism and Hospitality together with Walairukwet Research Institute, MSU organized a volunteer camp to develop tourist attractions.

MSU Relations Club organized the "20th Camp to Light the Fire and Color Your Dreams".

A group of Namchi University students organized the project "Pick up natural fog for the 4th time.

MSU volunteers organized activities to develop and restore temples after the flood. In the area surrounding the university.

Ratchaphruek Rescue Club, MSU, organized the project "Ratchapruek Rescue Volunteers for School Development No. 2".

ACTIVITIES

Cultural activities on campus

All faculties/unit of MSU join in continuing and preserving the tradition of Bun Phawet.

MSU held a ceremony to invite Phra Upakut Parade into the city Bun Phawet tradition.

Mahasarakham University Procession to invite offerings Candle procession around Phra Borommathat Na Dun On the occasion of Makha Bucha Day 2023.

MSU together with Maha Sarakham Province Organize a garment art event From local to international "Maha Mai Mueang Kham" 3rd.

ACTIVITIES

Cultural activities on campus

MSU joins in opening the Boon Berk Fa tradition and the Maha Sarakham Provincial Red Cross Fair for the year 2023.

MSU joins the ceremony to worship Mae Phosop Bun Berk Fa tradition and Maha Sarakham Red Cross Fair.

MSU attended the opening ceremony of worshiping Phra Borommathat Na Dun for the year 2023.

MSU welcomes 5 institutions to attend the "Mahamit Volunteers Nakara Champasri" event opening the 25th Tao - Ngam Samphan.

ACTIVITIES

Programs with international collaborations.

MSU researchers win 4 gold medals on the world stage "The 16th International Invention and Innovation Show" (INTARG 2023)

Faculty of Education students at MSU join the EDU-MSU Summer Exchange Program.

Mahasarakham University MOU with SUEP, People's Republic of China Develop a joint curriculum.

Mahasarakham University Meeting to discuss and sign MOU of cooperation with Hunan High Speed Railway Technical College People's Republic of China To develop a high-speed rail course.

ACTIVITIES

Programs with international collaborations.

Mahasarakham University Welcoming experts Prof.Andrei Volodin (Visiting Professor), Department of Mathematics and Statistics, University of Regina, Canada and Prof.Sanghoo Yoon, Department of Statistics, Daegu University, South Korea.

Mahasarakham University met with the Minister of Education of Cambodia to sign an academic MoU to develop cooperation in education.

Mahasarakham University welcomes Prof.Roy Chantrell, an expert in theoretical physics and magnetic materials.

Mahasarakham University welcomes foreign students from Japan. Indonesia and the Philippines.

ACTIVITIES

Programs with international collaborations.

Mahasarakham University Discussed cooperation with MCUT Taiwan and signed MoA for 3+2 Fast Track Program.

Mahasarakham University Welcoming experts from the University of Innsbruck, Austria.

ACTIVITIES

Community services project organized

1. "Promoting the production process - making fertilizer pellets from community organic waste and leftover materials from sugar factories to strengthen the community's grassroots economy"

2.“Project to transfer technology for producing low-cost goat feed from local ingredients” at Prasit Goat Farm, Ban Non Hae, Ban Ku Subdistrict, Yang Si Surat District Maha Sarakham Province.

ACTIVITIES

Community services project organized

3.“A project to create a prototype community in using fermentation technology from beneficial microorganisms to produce animal feed from local raw materials and agricultural residues to upgrade them into community animal feed products. towards sustainable development”

4.“Project to create a model community for using fermentation technology from beneficial microorganisms (probiotics) to produce animal feed from local raw materials and agricultural residues. To upgrade it to be a community animal feed product towards sustainable development”

ACTIVITIES

Community services project organized

5.“Solar energy system design and installation project Model community learning area for quality of life development (CLM) at the sub-district level: the case of Nong Mek Subdistrict, Na Chueak District, Maha Sarakham Province”

ACTIVITIES

Startups relate to sustainability

1. Startup name : Titanium alloy surface treatment process by plasma nitriding using bipolar pulse plasma.

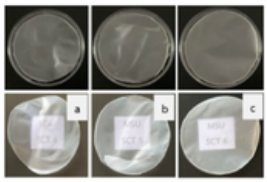
2. Startup name : High heat, pollution-free stove.

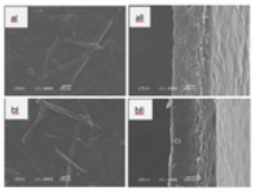
3. Startup name : The "Lai Taeng" application.

ACTIVITIES

Startups relate to sustainability

4. Startup name : Acupressure test kit for Thai medical handicrafts.



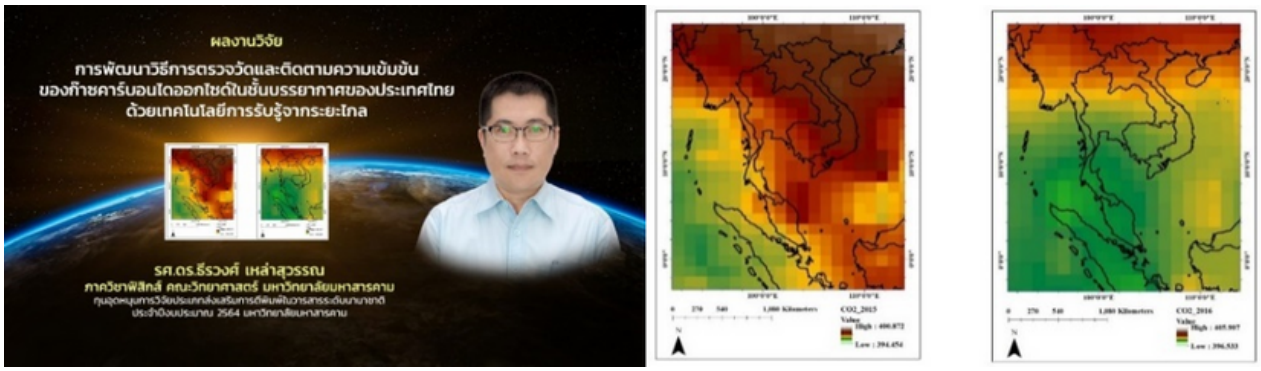


5. Startup name : Development of cellulose film from cattail as a food packaging material.

6. Startup name : Development of an atmospheric pressure plasma source for increasing the germination rate of Paniculata paniculata seeds.

ACTIVITIES

Startups relate to sustainability



7. Startup name : Developing a method for measuring and monitoring the concentration of carbon dioxide in Thailand's atmosphere using remote sensing technology.

8. Startup name : Program to help quit smoking with short messages. (Short Message Service: SMS)

9. Startup name : Microwave dryer combined with hot air.

ACTIVITIES

Startups relate to sustainability

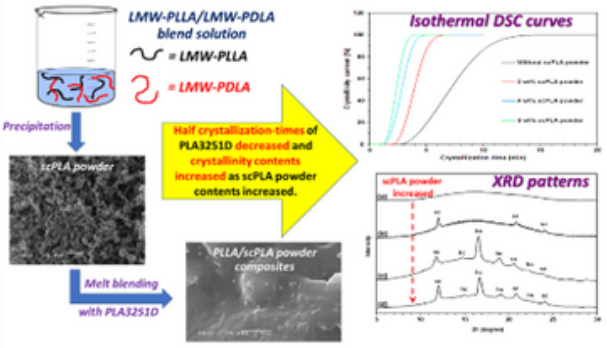
10. Startup name : Color, odor and salinity measuring device.

11. Startup name : Semi-automatic weaving loom to preserve Thai brocade fabric.

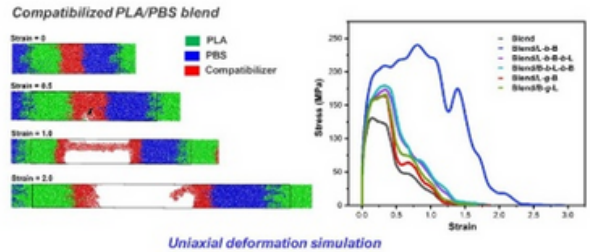
12. Startup name : Develop biological products in powder form Controlling durian anthracnose.

ACTIVITIES

Startups relate to sustainability



13. Startup name : How to form biological crystals for bioplastics.



รูปที่ 1 แผนภาพแสดงการจำลองการดึงระดับโมเลกุลและสมบัติเชิงกลของพอลิเมอร์ผสม PLA (สีเขียว)/PBS (สีน้ำเงิน) ที่มีสารช่วยเพิ่มกันได้ (สีแดง) ผสมอยู่

14. Startup name : Molecular design of compatibility enhancers for biodegradable plastics, polylactic acid/polybutylene succinate system.

15. Startup name : Development of a filtration system to reduce turbidity in wine production.

ACTIVITIES

Startups relate to sustainability

16. Startup name : Development of a mushroom cracker flour cutting machine and a solar oven.

17. Startup name : Magnetic field seed germination stimulant.

18. Startup name : Innovative semi-automatic indigo dyeing machine.

MAHASARAKHAM
UNIVERSITY