MAEJO UNIVERSITY

THE OPERATION GREEN UNIVERSITY REPORT 2021

รายงานผลการดำเนินงาน
แม่โจ้ มหาวิทยาลัยสีเขียว 2564

UI GreenMetric

มหาวิทยาลัยแม่โจ้
MAEJO UNIVERSITY

The operation green university report 2021

Operated by

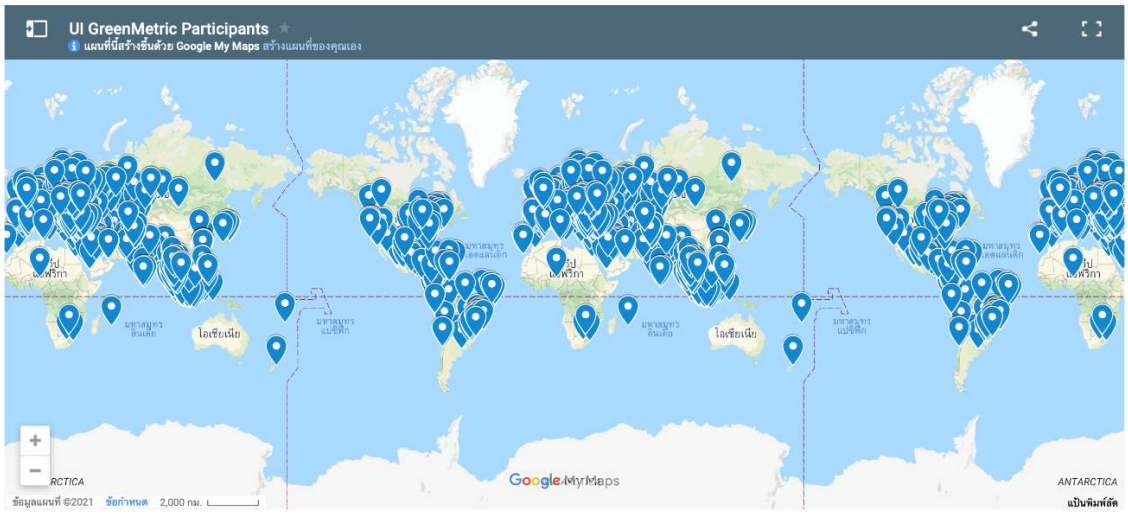
Green University Strategy Board

Executive Summary

Operation of Maejo University to join the Green University Ranking

The UI Green metric World University Ranking is one of the projects that will help university moves towards Green and Eco-university internationally. The assessment criteria refers to criteria compiled from numbers of universities around the world, which is a collective agreement to move towards a Green and Sustainable Future. Maejo University entered the rankings for the first time in 2013 and was ranked 194th among universities worldwide. In the following year (2014), the university was ranked 10th in Thailand, and has continued to operate until the present. In the year 2020, the university was ranked 6th nationally and 110th internationally from 912 universities around the world. Based on performance and scores, the university ranking can be considered to have a good development.

However, in 2021, due to the COVID-19 pandemic, project activities are cannot be done as usual, which is something that universities and organizations around the world are also affected. Therefore, this year some plans may be revised to suit the epidemic prevention measures.



List of UI GreenMetric participant in 2020 base on location (UI GreenMetric website)

Since more and more universities around the world apply for the ranking competition each year, more details and up-to-date assessment criteria are updated annually. Sustainable development issues (SDGs), global climate change planning and biodiversity planning have been added, and the situation prepared for the epidemic but still based on the same 6 key criteria and indicators.

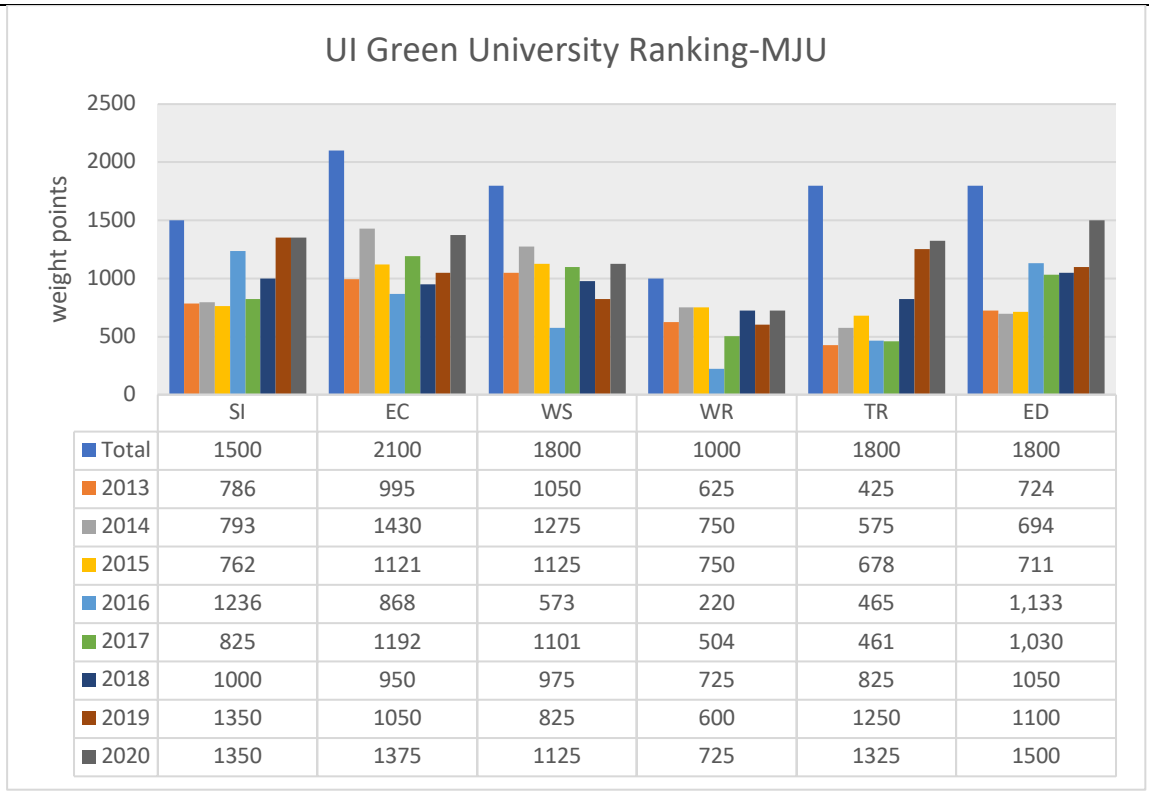
The criteria for consideration consisted of 6 main indicators as follows:

1. Setting and infrastructure - 15%
2. Energy and Climate Change - 21%
3. Waste - 18%

4. Water - 10%
5. Transportation - 18%
6. Education and research- 18%

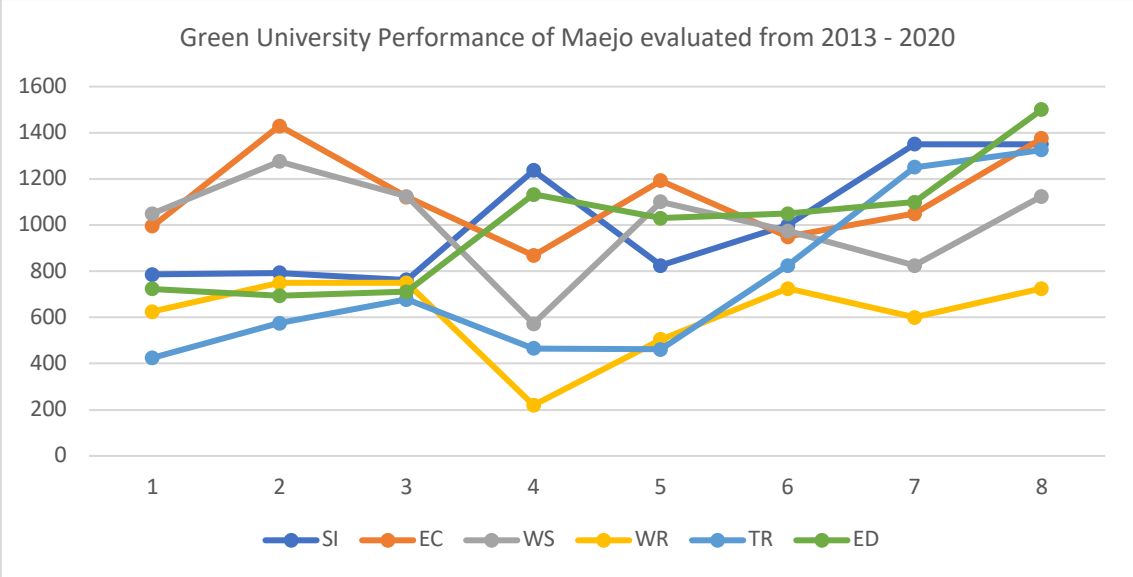
The results of the assessment of scores according to the criteria of all 6 indicators of Maejo University from 2013-2020.

However, in 2017, a detailed method of calculating and evaluating key indicators and sub-measures for each topic was announced in order to understand the assessment methods. This should cause each university to plan for improvement, to develop more deficiencies in each area (refer to the World Green Universities Ranking Guide), and to make small improvements to each of the criteria and indicators each year. If you look at the past 3 years, it will be found that Maejo University has improved in global rankings. It was found that in 2018 it ranked 215 out of 719 universities, 2019 ranked 181 out of 780 universities and last year ranked 110 out of 912 universities worldwide. The country's ranking is sixth with a score of 7,400, a 74% increase from 2019's total score of 6,175 (61.75%). The best ranking in the world is Infrastructure category (Setting and infrastructure, SI) ranked No. 5 in the world and No. 1 in Thailand.



	SI	EC	WS	WR	TR	ED
Total	1500	2100	1800	1000	1800	1800
2013	786	995	1050	625	425	724
2014	793	1430	1275	750	575	694
2015	762	1121	1125	750	678	711
2016	1236	868	573	220	465	1,133
2017	825	1192	1101	504	461	1,030
2018	1000	950	975	725	825	1050
2019	1350	1050	825	600	1250	1100
2020	1350	1375	1125	725	1325	1500

Maejo University Green University Performance evaluated from 2013 - 2020



From the performance of each category, compared to the year in which the data was collected, it was found that several categories had nearly doubled their assessment results over the past 8 years. For example, the setting category from the first year 786 points increased to 1,350 points, the Transportation category from 425 to 1,325 points, and the Education category from 724 to 1,500 points in 2020. In the rest of the categories, the results were satisfactory. In its implementation, the working team has applied assessment criteria and assessment results to analyze and improve work practices in terms of data collection and development of project activities to be consistent with sustainability and environmental friendliness according to the context and consistently appropriate with the university.

UNIVERSITY PROFILE

Name	:	Maejo University
Established	:	1934
Country	:	Thailand

1. VERIFIED DATA

Category	Point	Percentage of Point to Total Score	Maximum Point	Percentage of Point to Maximum Point
Setting and Infrastructure (SI)	1,350	18 %	1,500	90.00 %
Energy and Climate Change (EC)	1,375	19 %	2,100	65.48 %
Waste (WS)	1,125	15 %	1,800	62.50 %
Water (WR)	725	10 %	1,000	72.50 %
Transportation (TR)	1,325	18 %	1,800	73.61 %
Education (ED)	1,500	20 %	1,800	83.33 %
Total Score	7,400	100 %	10,000	74.00 %

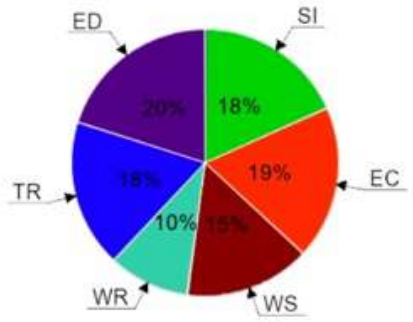


Figure 1.1 Overall Score Diagram

Performance in 2020

Figure 3.1 World Rankings History Diagram

Performance in 2020

In 2021, the team gathered data on operations and activities related to becoming a green university according to the assessment criteria of UI GreenMetric 2021 and imported the data into the assessment system on November 7, 2021. The results of the self-assessment are as follows:

	SI (1,500)	EC (2,100)	WS (1,800)	WR (1,000)	TR (1,800)	ED (1,800)	Total (10,000)
2020	1,350	1,375	1,125	725	1,325	1,500	7,400
2021	1,400	1,725	1,350	850	1,725	1,675	**8,725**

Questionnaire Data

University Profile

Username : mju.ac.th
University Name : Maejo University
University Leader : President : Assoc. Prof. Weerapon Thongma, Ph.D

PIC Profile

PIC Name : Yaowanit Tarachai
PIC Position : Secretary of MJU green university Project
Email : yaowanit555@gmail.com

Submitted Date : 07 November 2021 15:14:08 (GMT +7)

Setting and Infrastructure		
Question		Answer
1.1()	Type of higher education institution	◉ Comprehensive ○ Specialized higher education institution
1.2()	Climate	○ Tropical Wet ◉ Tropical Wet and Dry ○ Semiarid ○ Arid ○ Mediterranean ○ Humid Subtropical ○ Marine west coast / Oceanic Climate ○ Humid Continental ○ Subartic
1.3()	Number of campus site	3
1.4()	Campus setting	○ Rural ◉ Suburban ○ Urban ○ In city center ○ High rise building
1.5()	Total campus area (m^2)	3374680
1.6()	Total campus ground floor area of buildings (m^2)	110869
1.7()	Total campus buildings area (m^2)	343323
1.8(SI.1)	The ratio of open space to total area.	○ <= 1% ○ > 1 - 80% ○ > 80 - 90% ○ > 90 - 95% ◉ > 95%
1.9(SI.2)	Total area on campus covered in forest vegetation (please provide total area in square meters)	○ <= 2% ○ > 2 - 9% ◉ > 9 - 22%: **17 m^2** ○ > 22 - 35% ○ > 35%
1.10(SI.3)	Total area on campus covered in planted vegetation (please provide total area in square meters)	○ <= 10% ○ > 10 - 20% ○ > 20 - 30% ○ > 30 - 40% ◉ > 40%: **42 m^2**
1.11(SI.4)	Total area on campus for water absorption besided forest and planted vegetation (please provide total area in square meters)	○ <= 2% ○ > 2 - 10% ◉ > 10 - 20%: **19 m^2** ○ > 20 - 30% ○ > 30%
1.12()	Total number of regular students (part time and full time)	13109
1.13()	Total number of online students (part time and full time)	1445
1.14()	Total number of academic and administrative staff	14554
1.15()	Estimated total population in campus during pandemic	10916

1.16(SI.5)	The total open space area divided by total campus population.	○ <= 10 m^2 / person ○ > 10 – 20 m^2 / person ○ > 20 – 40 m^2 / person ○ > 40 – 70 m^2 / person ◉ > 70 m^2 / person
1.17()	Total university's budget (in US Dollars)	22876031432
1.18()	University's budget for sustainability effort (in US Dollars)	7104852860
1.19(SI.6)	Percentage of University's budget for sustainability effort	○ <= 1% ○ > 1 - 5% ○ > 5 - 10% ○ > 10 - 15% ◉ > 15%
1.20(SI.7)	Percentage of Operation and Maintenance activities during Covid-19 pandemic	○ < 25% ○ > 25 - 50% ○ >50 - 75% ○ >75-99% ◉ 100%
1.21(SI.8)	Campus facilities for disable and maternity care	○ None ○ Policy is inplace ○ Planning stage ○ Implemented stage ◉ Facilities availiable
1.22(SI.9)	Security and safety facilites	○ Passive security system ○ Security infrastructure (CCTV, panic button) available ○ Security infrastructure (CCTV, panic button, personel, fire extinguisher, hydrant) available ○ Security infrastructure available and security responding time for accident, crime, fire and natural dissaster more than 10 minutes ◉ Security infrastructure available and security responding time for accident, crime, fire and natural dissaster less than 10 minutes
1.23(SI.10)	Health infrastructure facilities for students and academic and administrative staff wellbeing	○ Health infrastructure in preparation (first aid) ○ Health infrastructure (first aid, emergency room, clinic and personel) available ○ Health infrastructure (first aid, emergency room, clinic and certified personel) available ○ Health infrastructure (first aid, emergency room, clinic, hospital and certified personel) available ◉ Health infrastructure available (first aid, emergency room, clinic,hospital and certified personel), system and accessible for public
1.24(SI.11)	Conservation: plant, animal and wildlife, genetic resources for food and agriculture secured in either medium or long-term conservation facilities	○ Conservation program in preparation ○ Conservation program 1-25% implemented ○ Conservation program 25-50% implemented ○ Conservation program 50-75% implemented ◉ Conservation program fully implemented
Energy and Climate Change		
Question		Answer
2.1(EC.1)	Energy efficient appliances usage	○ < 1% ○ 1 - 25% ○ > 25 - 50% ○ > 50 - 75% ◉ > 75%
2.2()	Total campus smart building area (m^2)	198,077.87
2.3(EC.2)	Smart Building implementation (percentage of the total floor area of smart building to the total all floors building area (smart and non-smart buildings area).	○ < 1% ○ 1% - 25% ○ > 25% - 50% ◉ > 50% - 75% ○ > 75%
2.4(EC.3)	Number of renewable energy sources in campus (solar power, bio diesel, wind power, etc)	○ None ○ 1 source ○ 2 sources ○ 3 sources ◉ > 3 sources

2.5()	Please specify renewable energy sources in campus and provide capacity produced in kilowatt hour	☐ Not Applicable ☒ Bio Diesel: **2232927 kWh** ☒ Clean Biomass: **869.80 kWh** ☒ Solar Power: **11 kWh** ☒ Wind Power: **517.90 kWh** ☐ Geothermal ☐ Hydropower ☒ Combine Heat and Power: **2 kWh**
2.6()	Electricity usage per year (in kilo watt hour)	9,092,800.74
2.7(EC.4)	The total electricity usage divided by total campus population (kWh per person). Formula: (2.6) / (1.15)	○ >= 2424 kWh ○ > 1535 - 2423 kWh ◉ > 633 - 1535 kWh ○ 279 - 633 kWh ○ < 279 kWh
2.8(EC.5)	The ratio of renewable energy production divided by total energy usage per year	○ <= 0.5% ○ > 0.5 - 1% ○ > 1 - 2% ◉ > 2 - 25% ○ > 25%
2.9(EC.6)	Elements of green building implementation as reflected in all construction and renovation policies	○ None ○ 1 element ○ 2 elements ○ 3 elements ◉ > 3 elements
2.10(EC.7)	Greenhouse gas emission reduction program	○ None (reduction program is needed, but nothing has been done) ○ Program in preparation (e.g. feasibility study and promotion) ○ Program(s) aims to reduce one out of three scopes emissions (Scope 1 or 2 or 3) ○ Program(s) aims to reduce two out of three scopes emissions (Scope 1 and 2 or Scope 1 and 3 or Scope 2 and 3) ◉ Program(s) aims to reduce all three scopes emissions (Scope 1, 2 and 3)
2.11()	Please provide the total carbon footprint (CO_2 emission in the last 12 months, in metric tons)	7,760.19
2.12(EC.8)	The total carbon footprint divided by total campus population (metric tons per person). Formula: (2.11)/(1.15)	○ >= 2.05 metric ton ○ > 1.11 - 2.05 metric ton ◉ > 0.42 - 1.11 metric ton ○ > 0.10 - 0.42 metric ton ○ < 0.10 metric ton
2.13(EC.9)	Number of innovative program(s) during covid-19 pandemic	○ None ○ 1 program ○ 2 programs ○ 3 programs. ◉ More than 3 programs
2.14(EC.10)	Impactful university program(s) on climate change	○ None ○ Program in preparation ○ Provide training and educational materials for surrounding communities ○ Provide training and educational materials for surrounding communities and at national level ◉ Provide training and educational materials for surrounding communities, at national level, and at regional and international level
Waste		
Question		Answer
3.1(WS.1)	Recycling program for university waste	○ Not Applicable ○ Partial (1% - 25% of waste) ○ Partial (> 25% - 50% of waste) ◉ Partial (> 50% - 75% of waste) ○ Extensive (> 75% waste)
3.2(WS.2)	Program to reduce the use of paper and plastic on campus	○ Not applicable. If there is no program in your university. ○ 1 program ○ 2 programs ○ 3 programs ◉ more than 3 programs

3.3(WS.3)	Organic waste treatment	○ Open dumping ○ Partial (1% - 25% of treated) ○ Partial (> 25% - 50% of treated) ◉ Partial (> 50% - 75% of treated) ○ Extensive (> 75% treated)
3.4(WS.4)	Inorganic waste treatment	○ Burned in the open ○ Partial (1% - 25% of treated) ◉ Partial (> 25% - 50% of treated) ○ Partial (> 50% - 75% of treated) ○ Extensive (> 75% treated)
3.5(WS.5)	Toxic waste treatment	○ Not Managed ○ Partial (1% - 25% of treated) ○ Partial (> 25% - 50% of treated) ◉ Partial (> 50% - 75% of treated) ○ Extensive (> 75% treated)
3.6(WS.6)	Sewage disposal	○ Untreated to waterways ○ Treated conventionally ○ Treated technically for reuse ◉ Treatment for down cycling ○ Treatment for up cycling
Water		
Question		Answer
4.1(WR.1)	Water conservation program and implementation	○ None (Conservation program is needed, but nothing has been done) ○ Program in preparation (e.g. feasibility study and promotion) ○ 1 - 25% implemented at early stage (e.g. measurement of potential surface runoff volume) ○ > 25 - 50% water conserved ◉ > 50% water conserved
4.2(WR.2)	Water recycling program implementation	○ None (Water recycling program is needed, but nothing has been done) ○ Program in preparation (e.g. feasibility study and promotion) ○ 1 - 25% Implemented at early stage (e.g. measurement of waste water) ○ > 25 - 50% water recycled ◉ > 50% water recycled
4.3(WR.3)	Water efficient appliance usage	○ None (Water efficient appliances is needed, but nothing has been done) ○ Program in preparation (e.g. feasibility study and promotion) ○ 1 - 25% of water efficient appliances installed ◉ > 25 - 50% of water efficient appliances installed ○ > 50% of water efficient appliances installed
4.4(WR.4)	Treated water consumed	○ None ○ 1% - 25% treated water consumed ◉ > 25% - 50% treated water consumed ○ > 50% - 75% treated water consumed ○ > 75% treated water consumed
4.5(WR.5)	Percentage of additional hand washing and sanitation facilities during pandemic	○ None ○ 1 - 25% of total number of bulding ○ > 25 - 50% of total number of bulding ○ > 50 - 75% of total number of bulding ◉ > 75% of total number of bulding
Transportation		
Question		Answer
5.1()	Number of cars actively used and managed by University	89
5.2()	Number of cars entering the university daily	963
5.3()	Number of motorcycles entering the university daily	883
5.4(TR.1)	The total number of vehicles (cars and motorcycles) divided by total campus population. Formula: (5.1+5.2+5.3)/(1.15)	○ >=1 ○ > 0.5 - 1 ○ > 0.125 - 0.5 ◉ > 0.045 - 0.125 ○ < 0.045

5.5(TR.2)	Shuttle service	○ Shuttle service is possible but not provided by university ○ Shuttle service is provided (by university or other parties) and regular but not free ○ Shuttle service is provided (by university or other parties) and the university contributes a part of the cost. ○ Shuttle service is provided by university, regular, and free ◉ Shuttle service is provided by university, regular, and environment friendly. Or shuttle use is not possible (not applicable)
5.6()	Number of shuttles operated in your university	4
5.7()	Average number of passengers of each shuttle	8
5.8()	Total trips of shuttle services each day	126
5.9(TR.3)	Zero Emission Vehicles (ZEV) policy on campus	○ Zero Emission Vehicles are not available ○ Zero Emission Vehicles use is not possible or practical ○ Zero Emission Vehicles are available, but not provided by university ○ Zero Emission Vehicles are available, and provided by university and charged ◉ Zero Emission Vehicles are available, and provided by university for free
5.10()	Average number of Zero Emission Vehicles (e.g. bicycles, cano, snowboard, electric car, etc.) on campus per day	186
5.11(TR.4)	The total number of Zero Emission Vehicles (ZEV) divided by total campus population. Formula: (5.10)/(1.15)	○ <= 0.002 ○ > 0.002 - 0.004 ○ > 0.004 - 0.008 ◉ > 0.008 - 0.02 ○ > 0.02
5.12()	Total ground parking area (m^2)	32041
5.13(TR.5)	Ratio of parking area to total campus area. Formula: ((5.12/1.5) x 100%)	○ > 11% ○ > 7 - 11% ○ > 4 - 7% ○ > 1 - 4% ◉ < 1%
5.14(TR.6)	Transportation program designed to limit or decrease the parking area on campus for the last 3 years (from 2018 to 2020)	○ None ○ Program in preparation (e.g. feasibility study and promotion) ○ Less than 10% decrease ◉ Between 10% - 30% decrease ○ Program resulting in more than 30% decrease in parking area or parking area reduction has reaches its limit.
5.15(TR.7)	Number of transportation initiatives to decrease private vehicles on campus (e.g. car sharing, charging high parking fees, metro / tram / bus services and etc)	○ No initiative ○ 1 initiative ○ 2 initiatives ○ 3 initiatives ◉ > 3 initiatives, or initiative no longer required
5.16(TR.8)	Pedestrian path on campus	○ None ○ Pedestrian paths are available ○ Pedestrian paths are available, and design for safety ○ Pedestrian paths are available, designed for safety and convenience ◉ Pedestrian paths are available, designed for safety, convenience, and in some parts provided with disabled-friendly features
5.17()	Approximate daily travel distance of a vehicle inside campus only (in Kilometers)	1478.9
Education and Researc		
Question		Answer
6.1()	Number of courses/subjects related to sustainability offered	822
6.2()	Total number of courses/subjects offered	3624

6.3(ED.1)	The ratio of sustainability courses to total courses/subjects	○ <= 1% ○ > 1 - 5% ○ > 5 - 10% ○ > 10 - 20% ◉ > 20%
6.4()	Total research funds dedicated to sustainability research (in US Dollars) (average per annum over the last 3 years).	2180458
6.5()	Total research funds (in US Dollars) (average per annum over the last 3 years).	3934077
6.6(ED.2)	The ratio of sustainability research funding to total research funding	○ <= 1% ○ > 1 - 8% ○ > 8 - 20% ○ > 20 - 40% ◉ > 40%
6.7(ED.3)	Number of scholarly publications on sustainability published. (average annualy for the past 3 years)	○ 0 ○ 1 - 20 ○ 21 - 83 ◉ 84 - 300 ○ > 300
6.8(ED.4)	Number of events related to sustainability. (average annualy for the past 3 years)	○ 0 ○ 1 - 4 ○ 5 - 17 ○ 18 - 47 ◉ > 47
6.9(ED.5)	Number of student organizations related to sustainability	○ 0 ○ 1 - 2 ○ 3 - 4 ○ 5 - 10 ◉ > 10
6.10(ED.6)	University-run sustainability website	○ Not available ○ Website in progress or under construction ○ Website is available and accessible ○ Website is available, accessible, and updated occasionally ◉ Website is available, accessible, and updated regularly
6.11()	Sustainability website address (URL) if available	https://green.mju.ac.th/?page_id=3289lang=en
6.12(ED.7)	Sustainability report	○ Not available ○ Sustainability report is in preparation ○ Available but not publicly accessible ○ Sustainability report is published ◉ Sustainability report is published annually
6.13(ED.8)	Number of cultural activities on campus	○ None ○ 1 event per year ○ 2 events per year ○ 3 events per year ◉ More than 3 events per year
6.14(ED.9)	Number of university program(s) to cope with covid-19 pandemic	○ None ○ 1 Program ○ 2 Programs ○ 3 Programs ◉ More than 3 Programs
6.15(ED.10)	Number of sustainablity community services project organised and/or involving students	○ None ○ 1 Project ○ 2 Projects ○ 3 Projects. ◉ More than 3 Projects
6.16(ED.11)	Number of sustainability-related startups	○ None ◉ 1 - 5 startups ○ 5- 10 startups ○ 10 - 15 startups ○ > 15 startups

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Performance summary

[1] Setting and Infrastructure (SI)

Number of Campus sites

Due to the year 2021, Maejo University area has changed physically, the university area has changed the area as follows.

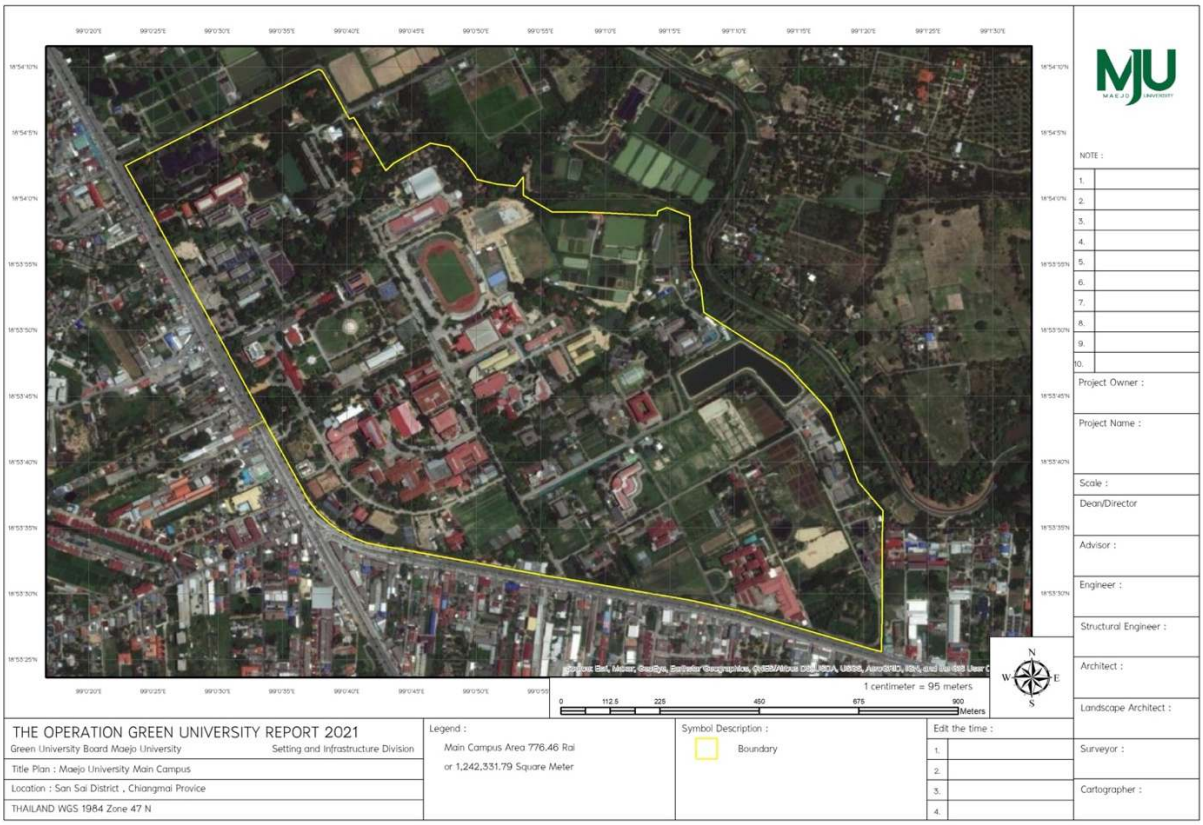
Maejo University is an academic institution in Chiangmai with an area of 1,035.46 hectares and divided into 3 campuses:

1. Main campus (124.23 has/776.46 rai) and Wat Wiwek sub-campus (46.88 has) Ban Pong Royal Project (4.04 has) Maejo Farm (162.31 has)
2. Phrae campus (377 has/2,357 rai)
3. Chumphon campus (321 has/2,004 rai)

Main campus (124.23 has/776.46 rai) and Wat Wiwek sub-campus (46.88 has) Ban Pong Royal Project (4.04 has) MJU Farm (162.31 has)

MJU Phare Province Campus 3,200,000 m2 consists of buildings, farms, gardens, and forests.

MJU Chumporn Province Campus; area 3,217,600 m^2; consists of buildings, farms, beach, and forests.



Maejo University is located in Sansai District, Chiang Mai Province, Thailand. It is in the suburb of Chiang Mai and approximately 15 km away from the city.

The area evaluated for UI green issues is composed of the main campus of Chiang Mai and an agricultural farm. The lands on the campus are as follows:

Total main campus area

	Area description	Total area (m^2)
	Total main campus area - Main campus 776.46 rai - Faculty of Animal Science and Technology 293.00 rai - School of Renewable Energy 25.25 rai - Agricultural farm 1,014.44 rai - Total : 2,019.15 rai **Total area** = {(776.46+1,014.44+25.25+293.00 rai) X 1,600} = 3,374,680.54 m^2	3,374,680.54 m^2

Total population

Student (full time) = 13,109
Staff = 1445
Sum = 14,554

Estimated total population in campus during pandemic

There was some period we operated work from home and online learning so we estimated population into 75% working in campus.

14,554 x 75% = 10,915.5 (**~ 10,916 person)**

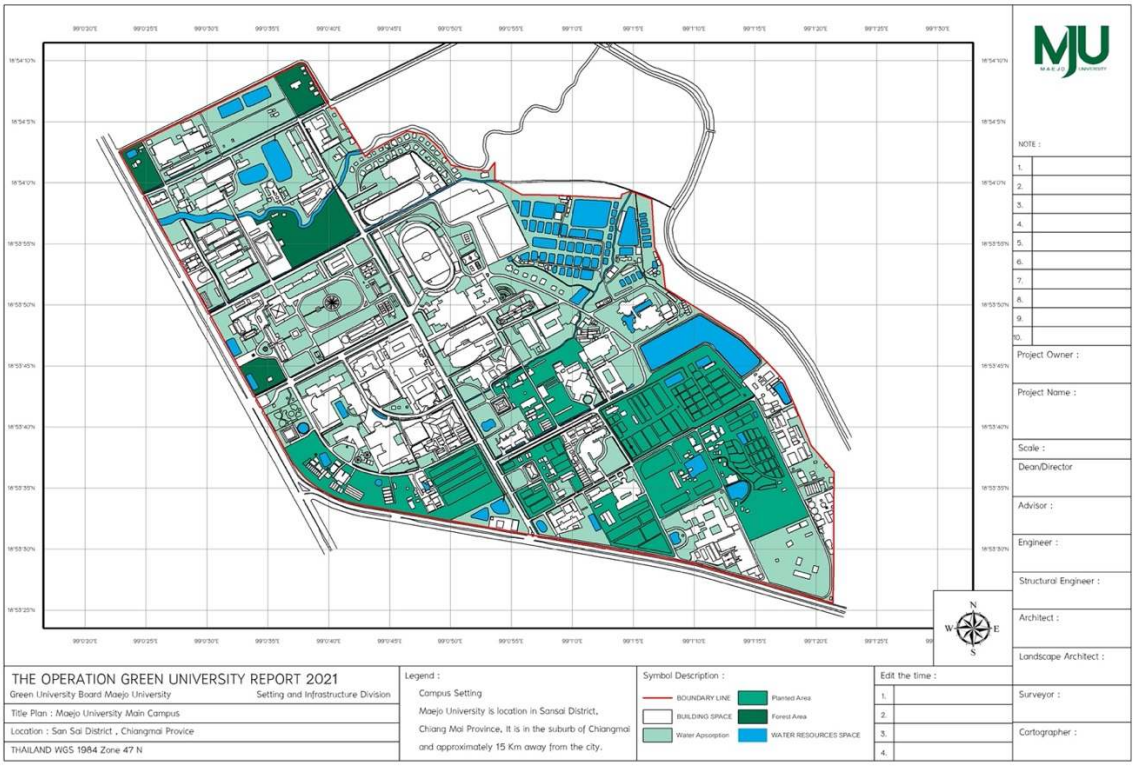
The total campus buildings of Maejo University is **343,323.75 m^2** from 116 buildings in main campus Chiang Mai.

Some buildings of Maejo university, Chiang Mai.

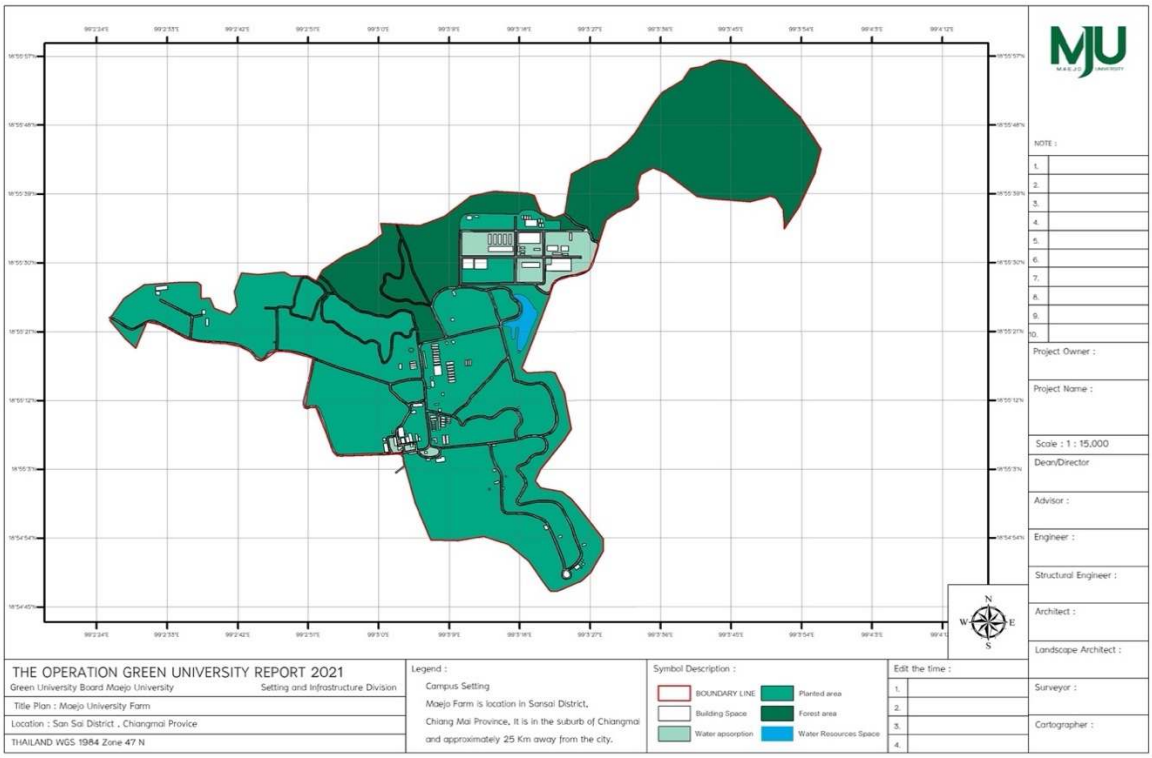
The ratio of open space to total area

	Total main campus ground floor area of buildings	110,869.35
	The ratio of open space towards total area {(3,374,680.54-110,869.35)/ 3,374,680.54 x 100}	**96.71%**

Open space area in the university



Maejo University Main Campus				
No.	list	square meter area	Rai area	percentage (%)
1	Building Space	520837.02	325.52	41.92
2	Water Apsorption	372930.54	233.08	30.02
3	Planted Area	211811.89	132.38	17.05
4	Forest Area	39988.01	24.99	3.22
5	WATER RESOURCES SPACE	96764.34	60.48	7.79
total		1242331.8	776.45	100.00



Maejo University Farm				
No.	list	square meter area	Rai area	percentage (%)
1	Building Space	124498.99	77.81	7.67
2	Water Apsorption	57835.84	36.15	3.56
3	Planted Area	899878.82	562.42	55.44
4	Forest Area	529437.60	330.90	32.62
5	WATER RESOURCES SPACE	11489.35	7.16	0.71
total		1623140.59	1014.44	100.00

Buildings and open space area (green color) in Maejo Farm

Faculty of Animal Sc and Technology				
No.	list	square meter area	Rai area	percentage (%)
1	Building Space	79609.88	49.76	16.98
2	Water Apsorption	62522.59	39.08	19.14
3	Planted Area	314971.14	196.86	61.38
4	Forest Area	0.00	0.00	0.00
5	WATER RESOURCES SPACE	11703.31	7.31	2.50
total		468806.91	293.00	100.00

Buildings and open space areas (green color) in Faculty of Animal Sc and Technology

School of Renewable Energy

No.	list	square meter area	Rai area	percentage (%)
1	Building Space	17067.41	10.67	42.24
2	Water Apsorption	16273.12	10.17	40.28
3	Planted Area	4941.81	3.09	12.23
4	Forest Area	0.00	0.00	0.00
5	WATER RESOURCES SPACE	2119.08	1.32	5.25
total		40401.42	25.25	100.00

Buildings and open space area (green color) in School of Renewable Energy

Total area on campus covered in forest (percentage)

The forest in our main campus area is referred to the previous trees and old trees that are still conserved until now, although some areas were already developed.

	Total area on campus covered in forest (percentage) main campus = 39,988.01 m² farm = 529,437.60 m² % total area campus covered in forest is {(39,988.01 +529,437.60)/ 3,374,680.54} x 100= 16.87%	16.87%

Total area on campus covered in planted vegetation (percentage)

	Total area on campus covered in planted vegetation (percentage) main campus = 211,811.89 m² farm = 899,878.82 m² Faculty of Animal Science and Technology = 314,971.14 m² School of Renewable Energy = 4,941.81 m² % total area campus covered in in planted vegetation is {(211,811.89 +899,878.82+314,971.14+4,941.81) = (1,431,603.36/ 3,374,680.54} x 100% =42.42%	42.42%

In our university area, both annual flowering and perennial plants are cultivated. The field crops and ornamental plants are cultivated for educational and research study purposes as well as for events and landscape. Thus our campus can support environment in case of air pollution and water absorption.

Planted vegetation and water absorption areas

Total area on campus for water absorption besides forest and planted vegetation (percentage)

	Area description	Total area (m^2)
	Total area on campus for water absorption besides forest and planted vegetation (percentage) main campus = 372,930.54 m^2 farm = 57,835.84 m^2 Faculty of Animal Science and Technology = 62,522.59 m^2 School of Renewable Energy = 16,273.12 m^2 Total WATER RESOURCES SPACE = 112,076.08 m^2 % total area campus covered in in planted vegetation is {(372,930.54 +57835.84 +62,522.59 +16,273.12+112,076.08) = (631,638.17/ 3,374,680.54} x 100% =18.72%	**18.72%**

Water absortiop, the area besides forest and planted on our campus

University budget for sustainability effort (in US Dollars)

The average of total university budget per annum over the last 3 years in US Dollars. (2019 - 2021)

Year / Budget	2019	2020	2021	Average
Baht	1,477,444,700	2,082,049,260	2,062,099,610	**1,873,864,523.33**
USD	4,898,689.32	66,631,972.99	68,822,483.75	**22,876,031,432.12**

University budget for sustainability efforts

Year / Budget	2019	2020	2021	Average
Baht	265,158,726	417,299.314	638,010,846	**301,195,623.77**
USD	7,591,734.94	13,354,860.11	21,293,611,985.25	**7,104,852,860.10**

**1 USD = 33.375 bath, 27 October 2021)*

In 2021, Maejo university has an annual budget **1,873,864,523.33** Baht (**22,876,031,432.12** USD$) and has invested **301,195,623.77** Baht (**7,104,852,860.10** USD$) in sustainability which is **22.98** percent of the total budget

The average of sustainability efforts per annum over the last 3years in US Dollars. ((2021-2019 (SI6))

2019	2020	2021	Average
17.95 %	20.04 %	30.94 %	22.98 %

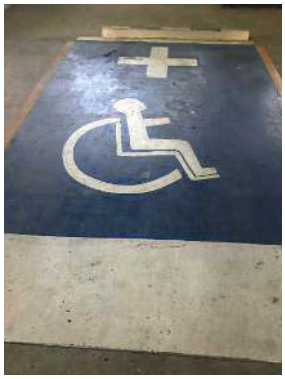
Percentage of operation and maintenance activities during Covid-19 pandemic

1. All buildings are always maintained in a ready-to-use condition.
2. There is an annual maintenance of utility systems such as air conditioning systems, electrical systems, elevators, etc.
3. A big cleaning day for the university is established annually. Disinfectants (Silver-Nano) are sprayed in all buildings and the university's COVID-19 prevention measures are always in compliance.
4. Renovate the building to be a co-working space.

https://erp.mju.ac.th/informationDetail.aspx?newsId=4119&lang=

Campus facliities for disable, special needs and or maternity care

1	Total campus buildings area	343,322.75 m^2
2	Total operated building	343,322.75 m^2
	Percentage building that operated and maintenanced	100%


Reserved parkings for people with disabilities



Wheelchair ramp



Biking, jogging and walking paths



Area for religious ceremonies


Area for religious ceremonies

Maejo University cares about the well-being and lifestyle of all students, and personnel, both public utilities and public facilities, have been arranged to facilitate the disabled, the elderly, women and children. In addition, the area has been provided for various religious activities.

1. Reserved parkings for people with disabilities
2. Wheelchair ramp
3. Accessible toilet
4. Biking, jogging and walking paths
5. *Area* for religious ceremonies

(https://fkm.unair.ac.id/pojok-laktasi-fkm-unair-fasilitas-yang-memadai-hingga-research-group/)

Security and safety facilites

The university has a safety infrastructure and safety response times for accidents, crimes, fires and natural disasters in less than 10 minutes;

1. CCTV at University's gate
2. Fire Hidrant at Maejo University
3. Preparation of plans and fire drill drills once a year

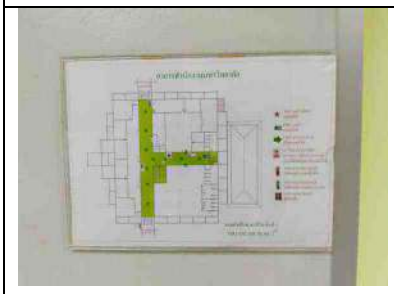
The system as for the security of the buildings, student dormitories, sports fields, and other university facilities, security personnel are stationed at key points and CCTVs are installed to enhance security. Security personnel patrols around the university's area 24 hours to secure the bank located

in the campus and the area with ATMs. If any abnormal events are found, they will be reported to the radio center. The radio center has staffs stand by 24 hours. They will coordinate with related parties or external agencies such as Mae Jo Police Station to support the personnel or to suppress the incident immediately after the incident. They also helps to take care of the safety of assets such as wallets, ATM cards that students or owners have left at the ATMs, which can be picked up at the Kasetsart Network Radio Control Center.

The university has a policy for various faculties to participate in the Green Office project, with some activities related to the environment and safety in the office. Disaster prevention and mitigation plan drills will be conducted at least once a year by external speakers. The goal of the drill is to use the safety response time in fire evacuation drills not more than 10 minutes/time.

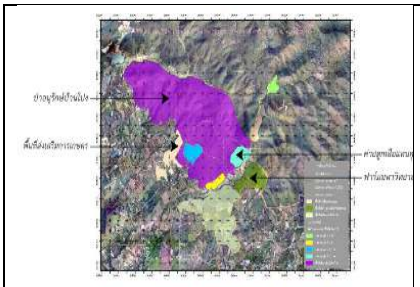
https://drive.google.com/drive/folders/1LO8GcuVi1DU7hgpeGNaDj918NTzdVigh
https://infocomm.mju.ac.th/wtms_newsDetail.aspx?nID=24614&lang=th-TH
https://library.mju.ac.th/greenlibrary/?portfolio=%e0%b8%ab%e0%b8%a1%e0%b8%a7%e0%b8%945
https://drive.google.com/drive/folders/1LO8GcuVi1DU7hgpeGNaDj918NTzdVigh

<table>
<tr><td>  </td><td>  </td><td>  </td></tr>
<tr><td>The university CCTV system control room</td><td>CCTV cameras at different key points within the university</td><td>CCTV cameras at the intersections inside the university</td></tr>
<tr><td colspan="2">Security personnel patrols the university’s area for safety</td><td></td></tr>
<tr><td>  </td><td>  </td><td>  </td></tr>
<tr><td>24 hours security</td><td colspan="2">Fire extinguisher and building alarm equipment</td></tr>
</table>

		
Fire extinguishers and equipment	Fire extinguishers and equipment	Fire exit sign
		
Fire escape route	Graphic Annunciator informs the location of the incident in the building	
		
Disaster Prevention and Mitigation Plan Training at the Faculty of Science	Checking the readiness of the fire extinguisher	
		
Fire evacuation drill	Disaster Prevention and Mitigation Drills	The team of lecturers and participants participates in the training

Conservation: plant, animal, and wildlife, genetic resources for food and agriculture secured in either medium or long-term conservation facilities

The university has conservation areas for both plants and animals for the benefit of preserving agricultural species for research and teaching and learning support both in the field and in online databases for academic services such as planting plots to collect and conserve food crops (rice, corn), local vegetables and economic vegetables (chilli, eggplant, lime, okra, long beans), local medicinal plants and fruit trees (longans, mangos). We also a conserves various orchid species as well.

<table>
<tr><td>  </td><td>  </td><td>  </td></tr>
<tr><td>Map showing the operating areas of the Plant Genetic Conservation Project Maejo University Chiang Mai Province</td><td>Animal conservation</td><td>Vegetables plots</td></tr>
<tr><td>  </td><td>  </td><td> 
</td></tr>
<tr><td>Orchids garden</td><td>Fruit trees plot</td><td>Fish conservation</td></tr>
<tr><td>  </td><td> 
</td><td>  </td></tr>
<tr><td colspan="2">RSPG website</td><td>Herbs garden</td></tr>
</table>

In addition, the university also has projects related to the conservation of biological, physical and socio-cultural resources, namely: Plant Genetic Conservation Project under The Royal Highness Princess Maha Chakri Sirindhorn which aims to:

- Progressing the understanding of personnel and organization, and to introduce volunteers and companies to plant genetic conservation.
- To build links between various organization, including government agencies and private sections on virtue foundation.
- To create a plant genetics database system that can be communicated around the country.

Additional evidence link:

https://researchex.mju.ac.th/dbplant/

https://rspg.mju.ac.th/wtms_index.aspx?&lang=th-TH

https://www.youtube.com/watch?v=**03**ujJo**9**sTeY

Maejo University has worked in response to the royal initiative of the Plant Genetic Conservation Project under the Royal Initiative of Her Royal Highness Princess Maha Chakri Sirindhorn by allocating some areas of the Ban Pong Forest Conservation and Development Project to participate in the project since 1994 and expanding the project area to 3 areas as follows: Plant Genetic Conservation Project Maejo University-Chiang Mai, Plant Genetic Conservation Project Maejo University-Phrae Chalermprakiet, Plant Genetic Conservation Project Maejo University-Chumphon. Its objectives are to understand and see the importance of plant genetics, to share ideas and practice until the benefits of the Thai public, and to have a system of plant genetic information to be communicated throughout the country.

1. Maejo University-Chiang Mai Area, Chiang Mai Province

1. Conservation project collecting wisdom and propagating Lanna herbal plants can collect and conserve herbs. There are a total of 600 plants on an area of approximately 10 rai located in a conservation forest area and are utilized by communities in the area of Pong Village, Pa Phai Sub-District, Sansai District, Chiang Mai Province.



2. Project on the establishment of a botanical garden for collecting indigenous medicinal plants in the northern region at Maejo University farm area. A total of 34 species of medicinal plants can be gathered to be planted in the area.



4. Conservation and utilization of Thai orchids under the Plant Genetic Conservation Project, Maejo University conducts breeding, nursery, and cultivation of Thai orchids, exploring and collecting Thai orchid species.



5. The project to study the genetic and physical characteristics of indigenous Thai melon varieties operates in the field of Vegetable Crops, Horticulture Course, Faculty of Agricultural Production to collect and study the physical characteristics of indigenous Thai melons to conserve and collect Thai melon varieties so that they do not disappear in the future.



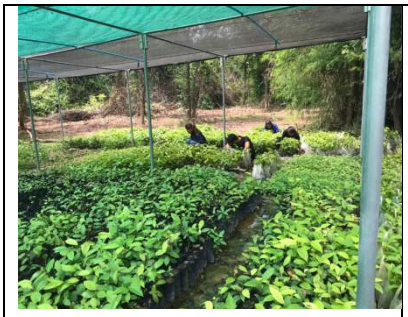
2. Maejo University-Phrae Chalermprakiet Area, Phrae Province

1**.** Conservation of local plant diversity in the area of Maejo University-Phrae Chalermprakiet in honor of His Majesty the King has organized 3 sub-activities, which are projects that promote and support the conservation of local plant species and the transfer activities to the community and youth as follows:

- Activity 1: Cultivate local seedlings to conserve plant genetics, carry out activities in nursery plots by collecting seeds from plant saplings and cultivating rubber trees, 6,000 seedlings, Payom 2,000 seedlings, 1,500 seedlings, Wah 1,500 seedlings, Takhianthong 3,000 seedlings, Siao 500 seedlings and planting in 7 local plant test plots, namely Takhianthong, Yang Na, Phayom, Macha Mong, Yang Pluang, Rang and Yang. Hiang, total number of 245 trees.

- Activity 2: Management of fang planting plots in the area of Maejo University-Phrae Chalermprakiet, activities such as as weed control, fire prevention line, pet protection fence.

- Activity 3: Caring for and restoring forest plots in a degraded deciduous dipterocarp forest area of 3 rai in the conservation area of Maejo University-Phrae Chalermprakiet.



2. Conservation and Prototyping of Makiang Products in Maejo University-Phrae Chalermprakiet Area.



3. Maejo University-Chumphon, Chumphon Province

1. The Cultivation and Conservation Project, focusing on the conservation of the *Tetragonula pegdeni* Schwarz was intended to conserve the stingless bee in Maejo University- Chumphon area and to pass on the knowledge on raising and conserve the stingless bee (*Tetragonula pegdeni* Schwarz) and its products. which is a species that exists locally in the south.



2. Conservation and breeding project for sustainable conservation in Maejo University-Chumphon area and conserved forest area plant genetic conservation project of Maejo University – Chumphon



3. The project to collect local medicinal plants in the form of seeds, fruits, branches, tubers, roots for tissue culture can collect 40 types of herbs such as ginger, *Aeginetia indica*, Tiger orchid, Philodendron, Paphiopedilum, Butterfly Pea, Karanda, Sweet Pepper, Cape Gooseberry, etc



Sargassum *C. Agardh* Brown Algae Conservation Project, Maejo University - Chumphon

[2] Energy and Climate Change (EC)

Energy efficient appliances usage are replacing conventional

One of Maejo University's most crucial policies is to encourage the use of energy-efficient appliances in the university for leading to the Eco University. By the result of COVID – 19, The university has not undergone any actions to install or replace new energy-efficient appliances in the university's buildings this year. However, the division of physical systems and environment in the university has surveyed additional appliances which are computer monitors, printers, televisions and Refrigerators. Maejo University has provided significant additional appliances with an emphasis on the energy star symbol over last year. Thus, the percentage of energy- efficient appliances increases from 32.02% to 77.68% compared to last year. The number of appliances which were surveyed is depicted in Table 2.1. Appendix 1 demonstrates the number of appliances categorized by factors.

Table 2.1 Number and percentage of energy efficient appliances compared to all appliances in the campus.

Number of Lighting Appliances	Number of total light bulb	Number of Energy Efficient Appliances (LED)	Percentage of Energy Efficient Lighting Appliances
	62,885	31,674	50.37%
Number of Air Conditioners	Number of total A/C	Number of Energy Efficient Inverter A/C	Percentage of Energy Efficient A/C
	2,881	454	15.76%
Number of Monitors and Computers	Number of total monitors	Number of Energy-Stars certified monitors	Percentage of Energy Efficient Monitors
	1,593	1,593	100.00%
Number of Printers	Number of total printers	Number of Energy-Stars certified printers	Percentage of Energy Efficient printers
	297	297	100.00%
Number of TVs	Number of total TVs	Number of Energy-Stars certified TVs	Percentage of Energy Efficient TVs
	136	136	100.00%
Number of Refrigerators	Number of total Refrigerators	Number of Energy-Stars certified Refrigerators	Percentage of Energy Efficient Refrigerators
	109	109	100.00%
		Average Percentage	**77.68%**

Total main campus smart building area (m^2)

Main requirements of smart buildings are

- Automation
  - BMS
  - APP
- Safety
  - Intruder Alarm System
  - Fire-Fighting
  - Video Surveillance
  - Anti - Flooding
- Energy
  - Monitoring
  - Management
- Water
  - Monitoring
  - Recovery
- Indoor Environment
  - Thermal comfort
  - Air quality
  - Real-Time
  - Passive System
- Lighting
  - LEDs
  - Sensors
  - Shielding
  - Natural light

To be considered a smart building, the building needs to acquire at least 5 features.

From the thirty buildings that were audited last year, only ten were designated as smart buildings. Additional buildings that are suitable for the requirements have been surveyed by the division of physical systems and environment this year.

Table 2.2 demonstrates that thirty buildings are classified as smart buildings, up from twenty last year, from fifty-four that have been examined and the total area of all smart buildings is at 198,077.87 m^2. Table 2 contains a list of all Maejo buildings that have been observed by the division of physical systems and environment. Fig 2.1 also illustrates the comparison of smart buildings in terms of numbers of smart buildings and area of smart buildings over the last 2 years. The pictures of each feather in the smart buildings are in this link. Appendix 2 demonstrates a list of all buildings in Maejo University.

Table 2.2 List of Smart Buildings in MJU

Order	Building's Name	Area of the building (m^2)	Automation		S. Safety				E. Energy		A. Water		I. Indoor Environment				L. Lighting			
			B1	B2	S1	S2	S3	S4	E1	E2	A1	A2	I1	I2	I3	I4	L1	L2	L3	L4
1	70th year Maejo building	13,422.00				/	/		/								/	/		
2	80th year Maejo building	10,200.00				/	/		/								/	/		
3	Wiphat Boonsri Wangsai Building	4,000.00			/	/	/		/			/					/	/		/
4	60th year Maejo Building	18,500.00				/	/		/								/	/		
5	Yangyong Sitthichai Building	4,880.00				/	/		/								/	/		
6	75th year Maejo Building	5,562.50				/	/		/								/	/		
7	Engineering Laboratory Building Classroom	17,175.00				/	/		/								/	/		
8	Renewable Energy Classroom Building	11,360.59				/	/		/	/		/					/	/	/	/
9	Renewable Energy Workshop Building	1,123.50				/			/	/		/					/	/		/
10	Renewable Energy Comphehensive Knowledge Center	1,071.56				/	/		/	/		/					/			/
11	Maejo University Gymnasium Zone A	18,700.00				/	/		/			/					/	/		/
12	Maejo University Gymnasium Zone B	5,859.50				/	/		/			/					/	/		/
13	President’s Office 1	860.00				/	/					/					/	/	/	/
14	President’s Office 2	5,975.00				/	/					/					/	/	/	/
15	President’s Office 3	1,496.00				/	/					/					/	/	/	/

Order	Building's Name	Area of the building (m^2)	Automation		S. Safety				E. Energy		A. Water		I. Indoor Environment				L. Lighting			
			B1	B2	S1	S2	S3	S4	E1	E2	A1	A2	I1	I2	I3	I4	L1	L2	L3	L4
16	Umuay Yotsuk Building	16,262.60			/	/	/					/				/	/	/		/
17	Ubonratana Rajakanya Swimmimg Pool	4,180.60				/	/										/	/		/
18	International Students Dormitory	1,048.40			/		/					/					/			/
19	Male Dormitory 2	5,968.00			/		/					/					/			/
20	Male Dormitory 3	1,200.00			/		/					/					/			/
21	Male Dormitory 4	3,854.00			/		/					/					/			/
22	Male Dormitory 5	1,160.00			/		/					/					/			/
23	Male dormitory 6	3,854.00			/		/					/					/			/
24	Female dormitory 7	3,854.00			/		/					/					/			/
25	Female dormitory 8	6,651.00			/		/					/					/	/		/
26	Female dormitory 9	6,651.00			/		/					/					/	/		/
27	Female dormitory 10	7,175.00			/	/	/					/					/			/
28	Female dormitory 11	1,722.25			/	/	/					/					/			/
29	Fishery Technology Laboratory Building	2,390.00				/	/		/			/					/	/		/
30	Permpool Building	10,723.00			/	/	/					/					/			/
Sum of smart buildings area		**198,077.87**																		

Fig 2.1 Smart Buildings in Maejo University

70th year Maejo University	80th year Maejo University
	
Wiphat Boonsri Wangsai Building	60th year Maejo Building
	
Yangyong Sitthichai Building	75th year Maejo Building
	

Engineering Laboratory Building Classroom	Renewable Energy Classroom Building
	
Renewable Energy Workshop Building	Renewable Energy Comphehensive Knowledge Center
	
Maejo University Gymnasium Zone A	Maejo University Gymnasium Zone B
	
President's Office 1	President's Office 2

	
President's Office 3	Umuay Yotsuk Building
	
Ubonratana Rajakanya Swimmimg Pool	International Students Dormitory
	
Male Dormitory 2	Male Dormitory 3
	

Male Dormitory 4	Male Dormitory 5
	
Male dormitory 6	Female dormitory 7
	
Female dormitory 8	Female dormitory 9
	
Female dormitory 10	Female dormitory 11
	

Fishery Technology Laboratory Building	Permpool Building
	

Smart Building implementation

According to Table 2, The area of the smart buildings in Maejo University which has been qualified at least 5 features is at 198,077.87 m^2 of area of smart buildings . Compared to all building areas in Maejo University, the percentage of smart building implementation is approximately 57.69 %.

- The area of smart buildings in Table 2.2 is about 198,077.87 m^2
- The total building areas of Maejo University in Appendix 2 is about 343,322.75 m^2
- The percentage of smart building implementation = (198,077.87/343,322.75) x 100
  = 57.69 % of total building area of Maejo University.

Number of renewable energy sources on campus

Maejo University has eventually pushed the use of renewable energy as an atonement energy source to generate both electricity and heat, Following the university's Green University and Green Office goals. Over the course of a decade, the university's renewable energy-producing capacity has steadily expanded. The University now uses five renewable energy sources such as.

- Solar Power
- Biogas
- Biodiesel
- Biomass
- Wind Power

Solar power (Solar rooftop and Solar Collectors) is the primary renewable energy source on campus. Solar rooftop and solar collectors have been put in the offices and student dormitories to reduce energy consumption from daily activities. The solar rooftop panels were installed at

- The Office of President => 110 kW
- School of Renewable Energy => 660 kW
- Udomslip Female Dormitory => 80 kW
- Faculty of Economics => 20 kW
- Intanin Stadium Stands => 40 kW

This year, The university completed the installation of a 300 kW solar rooftop plant at Umnuay Yodsuk building, which was finished in July.

In addition, the solar collector panels are installed at

- All dormitories => 1,331 m^2
- International Education and Training Center => 85 m^2

Maejo University has also used biogas as renewable energy. the Faculty of Animal Science (650 m^3) has established a biogas plant, which utilizes livestock byproducts to generate electricity, while the School of Renewable Energy (3 m^3) has installed a biogas facility that uses residential raw waste to generate heat.

Biodiesel is another renewable energy source that Maejo University has used to manufacture oil from leftover cooking oil. The oil waste delivered from the canteen and cookery shop is converted by transesterification from the biodiesel station, 150-liter production capacity, that is located at the School of Renewable Energy; The biodiesel is used for trucks and tractors at the institution.

Furthermore, Maejo University has implanted the biomass and ORC (Organic Rankine Cycle) plants, each producing 20 kW of electricity, using refuse-derived fuel (RDF) as a fuel. Gases from biomass plant's gasification process are used to generate electricity, which is subsequently sent to a gas generator. The ORC plant, on the other hand, generates electricity by boiling water into superheated steam and operating steam turbine.

Finally, at the School of Renewable Energy, wind power is clean energy that is used for street lights and generates electricity. In the case of street lights, the wind turbine on the street light, which is powered by the wind, generates power for the battery. On the other hand, the wind turbine (16.5 kW) generates power for the buildings of the School of Renewable Energy, reducing energy consumption from the primary source.

Fig. 2.1 The renewable energy sources at Maejo University.

Biogas	
	
Biogas production system with the capacity of 650 m^3 for electricity generation	Biogas production system with the capacity of 3 m^3
Faculty of Animal Science	School of Renewable Energy

Biodiesel	
 	
Biodiesel plant with a 150-liter-per-batch capacity made from cooking oil waste and oil plants. The plant has been operated twice a month.	
School of Renewable Energy	

Biomass and ORC
 
Biomass plant ORC plant
The biomass and ORC power plant with a 20 kW capacity have been built.
School of Renewable Energy

Solar Power

Solar rooftop with a 110-kW installed capacity
President's Office

Solar rooftop with a 40 kW installed capacity at a parking lot

Solar rooftop with a 300-kW capacity on a renewable energy classroom building

Solar panels on the roof of the School of Renewable Energy have a capacity of 660 kW.

A solar tracking station with a capacity of 20 kW has been erected.

School of Renewable Energy

Solar rooftop with 80-kW installed capacity, Udomslip Female Dormitory (11th Dorm)

Solar panels with 20-kW installed capacity at a parking lot, Faculty of Economics

Solar panels with 40-kW installed capacity at the stand, Inthanin Stadium's Stand

Solar panels with 40-kW installed capacity on the roof, Umnuay Yodsuk

Solar Collectors

Solar collectors' panels with 1331 m^2 installed capacity and tanks on Students' Dorm
All Student Dormitories

Solar collectors' panels with 84 m^2 installed capacity and tanks on Students' Dorm,
International Education and Training Center

Wind Power

For street lighting, 35 units of hybrid system of solar and wind turbines are used,
School of Renewable Energy

For street lighting, 35 units of hybrid system of solar and wind turbines are used. (cont.)

On the school of renewable energy, wind turbines with a total capacity of 16.5 kW generate electricity.

Renewable energy produced on campus per year

The production of renewable energy

Table 2.3 illustrates the productions of renewable energy compared in kWh/year. Biogas production systems with 653 m^3 capacity compensate 2,517.90 kWh/year electricity usage. as well as biomass and ORC power plant can replace 144,000 kWh/year. To consider the biodiesel production system, it has produced 3,132 liters of biodiesel/year which can secure 24,114.52 kWh/year electricity usage. Solar sources including solar power systems and solar collector systems are the most amount of the electricity production generating at 2,232,927.05 kWh/year. Furthermore, Wind power systems produce 11,869.80 kWh/year generating electricity and light. Therefore, the summarize of the renewable energy produced on campus is around 2,415,429.27 kWh/year. Table 2.4 shows the electricity production of solar power annually from September 2020 to August 2021. Appendix 3 eventually depicts the energy compensation calculation of the renewable energy sources on the campus.

Table 2.3 Electricity Compensation from renewable energy sources at Maejo University in 2021

Sources	Place(s) where the system is installed	Capacity of the system(s)	Electricity Compensation in kWh/year
Biogas	Biogas production system at the Faculty of Animal Science	650 m^3	1,751.40
	Biogas production system at School of Renewable Energy	3 m^3	766.50
	Total	653 m^3	2,517.90
Biodiesel	Biodiesel production system at School of Renewable Energy	150 Liters	24,114.52
Biomass and ORC	Biomass Power Plant at School of Renewable Energy	20 kW	57,600.00
	ORC Power Plant at School of Renewable Energy	20 kW	86,400.00
	Total	40 kW	144,000.00
Solar Power	President's Office	110 kW	81,835.00
	Inthanin Stadium's Stand	40 kW	29,804.00
	Solar Tracking Station at School of Renewable Energy	660 kW	637,032.00
	Udomslip Female Dormitory (11th Dorm)	80 kW	76,614.00
	Faculty of Economics	20 kW	15,363.00
	Umnuay Yodsuk	300 kW	413,027.00
	Total	1,210 kW	1,263,464.00
Solar Collector	All dormitories	1,313 sq.m.	910.779.72
	International Education and Training Center	84.60 sq.m.	58,683.33

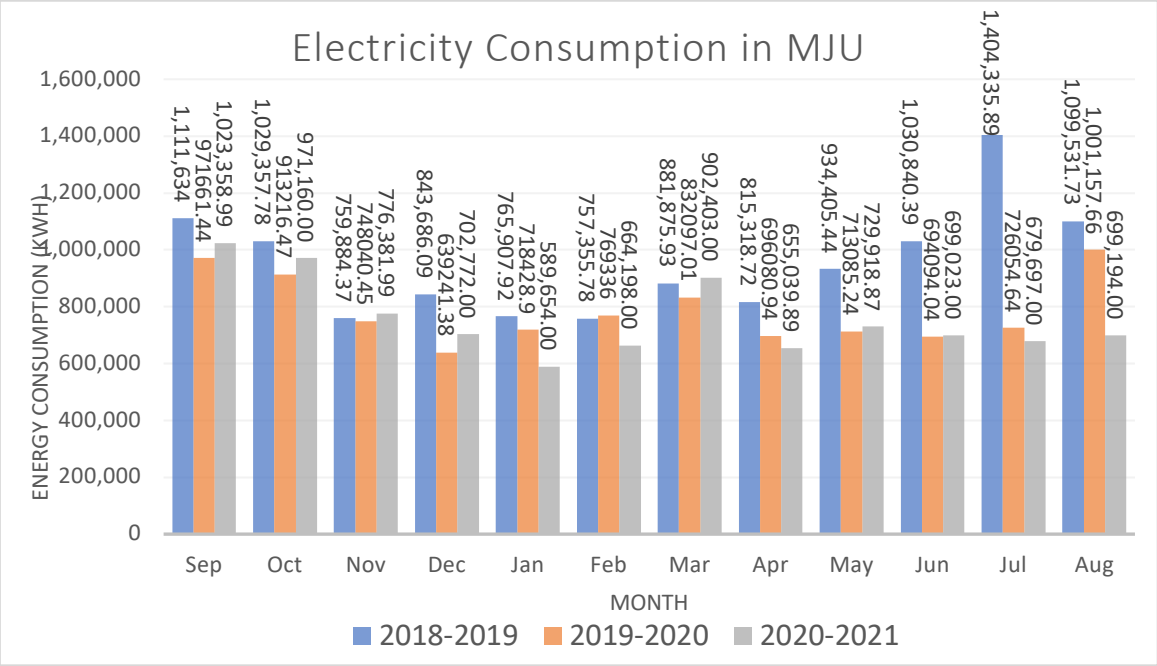
Sources	Place(s) where the system is installed	Capacity of the system(s)	Electricity Compensation in kWh/year
	Total	**1,397 sq.m.**	**969,463.05**
Wind Power	**Street Light system at School of Renewable Energy**	**35 x 100 w**	**10,731.00**
	Wind Power Plant	**10 x 1 kW**	**1,051.20**
	Wind Power Plant	**1 x3 kW**	**87.60**
	Total	**16.5 kW**	**11,869.80**
Sum of Total			**2,415,429.27**

Electricity usage per year (in kilo watt hour)

Maejo University's total annual electricity consumption is 9,092,800.74 kWh (from September 2020 to August 2021), which is approximately 3.5 percent less than the previous year (9,422,494.17 kWh). Maejo University opens trimester every year. The first term begins in early August and concludes in October. The second term embarks in late November and finishes in March and the Summer term, when the number of students is less than the first and second term, starts in mid-April and ends in June. Due to the COVID-19 pandemic, Although the majority of the educational activities this year has been conducted online following the ministry of public health's measurements, all of the buildings in Maejo University has still opened to support educational activities such as laboratories and offices.

In comparison to 2019 and 2020, Figure 1 illustrates the electricity consumption in MJU in 2021. The electricity consumption from December 2020 to February 2021 was dropped down because of the announcement from Thailand's ministry of public health that all educational activities were run online and work from home measure was activated due to COVID – 19 pandemics. The university reopened in March, with increased energy consumption in the university due to a fall in COVID – 19 cases in Thailand. However, due to the Delta variation, the COVID – 19 cases in Thailand, including Chiang Mai, have significantly grown from April to May. For this reason, the university established a field hospital (400 beds), at the university's gymnasium, and a hospitech (hospital and university) with 150 beds at the international education and training center in April to support the COVID – 19 cases from nearby hospitals in Chiang Mai. The field hospital and hospital operated until the end of May, slightly increasing of energy consumption, clearing away the beds and renovating the buildings for educational activities in the incoming term. However, the COVID - 19 pandemic's condition did not enhance, all of the educational activities such as teaching and meetings were performed online from July to August.

Furthermore, The Sport complex has been constructed since October 2020. For this reason, the power consumption in the campus has significantly increased, 5 – 10 percent approximately, all over this year.



(11,434,134.04 kWh/year) (9,422,494.17 kWh/year) (9,092,800.74 kWh/year)

The total electricity usage divided by total campus population (kWh per person)

In this section, it is desired to determine the amount of electricity used on a yearly basis per person working and studying inside the campus. The total electricity consumption is divided by the total campus population is equal to 832.98 kWh/person.

- Electricity usage per year of MJU in 2021 = 9,092,800.74 kWh/year
- Total campus population = 10,916 persons
- The total electricity usage divided by total campus population
  = 832.98 kWh/person

Ratio of renewable energy produce/production towards total energy usage per year

In 2021, Total electricity consumption is 9,092,800.74 kWh/year, and total renewable energy output is 2,415,429.27 kWh/year, or 20.99 percent of total electricity consumption. However, compared to the last year, the ratio of renewable energy production towards total energy usage per year decreased about 2 %

- The total renewable energy production in MJU = 2,415,429.27 kWh/year
- Electricity usage per year of MJU in 2021 = 9,092,800.74 kWh/year
- Ratio of renewable energy produce/production towards total energy usage per year

= 2,415,429.27 / (2,415,429.27 + 9,092,800.74) x 100
= (0.2099 x 100) = 20.99 %

Elements of green building implementation as reflected in all construction and renovation policy

In the previous year, there were two buildings that passed the Green Building Approvement from the Ministry of Energy of Thailand, which were Renewable energy classroom building and 80th year classroom building. This year, the university's Sport Complex has been constructed which is designed following the green building concept, with no trees being cut. The major features that promote the design are natural ventilation and full-day lighting. This building is a 4-floor building with 14,920 m^2 building area which can accommodate up to 15,000 visitors. It also contains an EV charging station for the electric buses that transport all of the students and staffs around the university.

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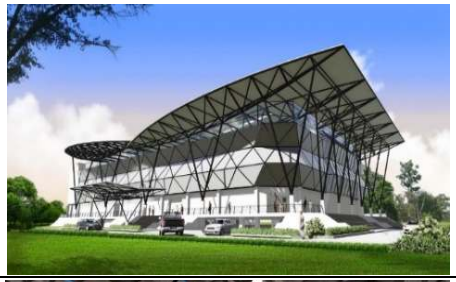
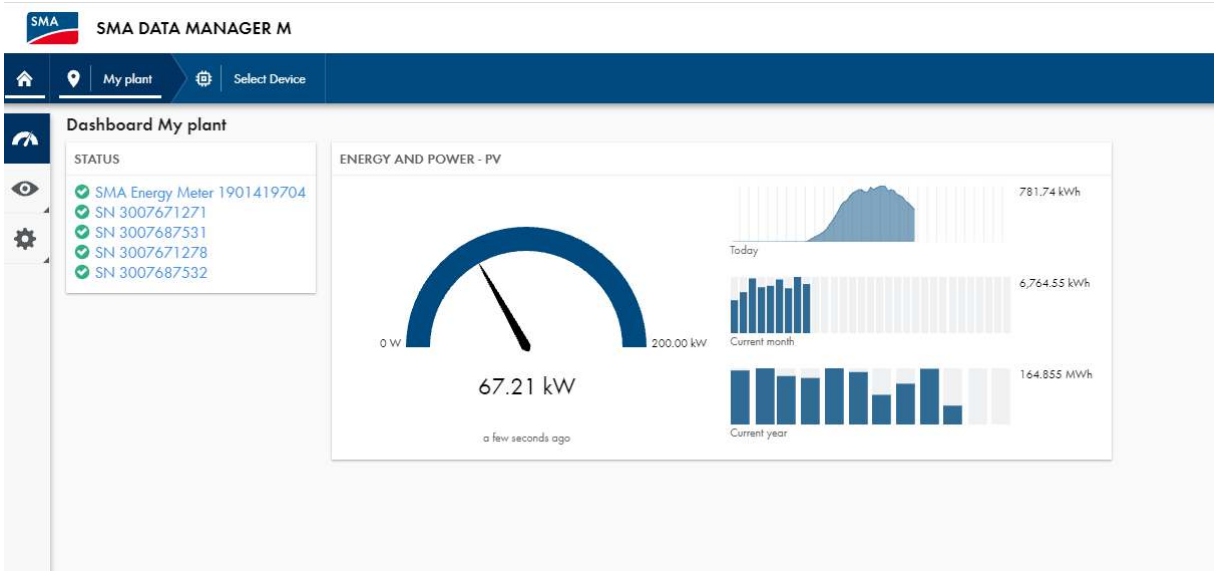



Another Building that the university built this year has been the aquatic farm at the faculty of Fisheries Technology and Aquatic Resources. This building ultimately supports natural ventilation and full day lighting.

The School of Renewable Energy has installed the building energy manager that can monitor both the generation of electricity from solar panels and the energy consumption which are applied at the School of Renewable Energy



Greenhouse gas emission reduction program

Maejo University is a comprehensive agricultural university. So that the greenhouse gas emission programs taking care of the environment are very essential for both the university and nearby communities. Maejo University has willingly proceeded the completed program throughout the year are categorized by greenhouse gas emission sources into 3 scopes.

Scope 1:

- Mobile Combustion
    - Car Free Day: Maejo University has continued to promote Car Free Day project, which encourages students and staffs to utilize bicycles as an alternative mode of transportation for short distances in all departments. In addition, bikes lanes have been created around the campus, and the university has offered bicycles for staffs in using around the campus
      as a supplement to minimize air pollution.

Maejo University has continued to promote Car Free Day project

- Electric Vehicle for Transportations: Since the university have not undertaken much in the way of educational actions as the result of COVID – 19 outbreaks. the institution has proceeded to promote the electric buses at San Sai hospital, which have aided in customers transportation around the hospital.

Electric Vehicle for Transportations

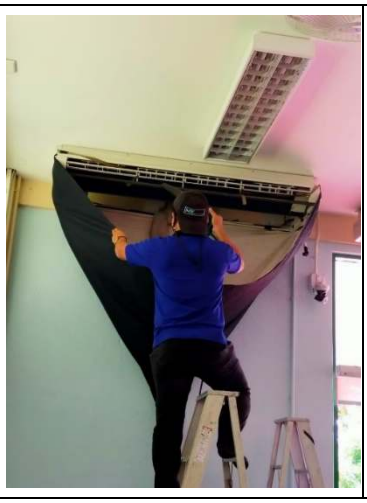
Fugitive Emissions

- Inspecting the condition of air comfort system: The university has proceeded to observe the condition of air comfort system annually that maximizes the system's efficiency and save energy. The university hired third party to inspect and clean air conditioners at the university. Appendix 4 demonstrates the documents of employing a third party to inspect the university's air conditioners status and to cleaning air conditioners in the university.

Inspecting the condition of air comfort system

Scope 2 :

- Purchased Electricity
  - Cleaning Air conditioners: Washing the university's air conditioners is an action which Maejo University has proceeded annually. The university also hired a third party to clean air conditioners throughout the campus this year. Appendix 5 additionally exhibits the report of inspecting and cleaning air conditioners from the employee.



Cleaning Air conditioners

  - Installing additional solar panel: Additional 300 kW capacity solar panels have been installed at Umnuay Yotsuk building.

Installing additional solar panel

Scope 3:

- Waste
  - Making organic Fertilizer from organic wastes, is a project that Maejo University has been working on for the previous year to minimize organic waste incineration. The main ingredient used to create fertilizer from non – rotating fertilizer pile is organic waste. This concept applies layer fertilizer pile with debris like as leaves and small branches, then inserting pipes to distribute air throughout the pile. The process produces very little methane, a greenhouse gas. The fertilizer, on the other hand, creates a fund for the university, allowing to earn another kind of revenue. Appendix z demonstrates the weight of organic waste that is transported to the facility and transformed into fertilizer.

Making organic Fertilizer from organic wastes

- Purchased Waste
    - Using condensed water from air conditioners to water plants: Water is collected in Maejo University's offices from condensed water from air conditioning units. The water is used to water the plants around the offices.

Using condensed water from air conditioners to water plants

Total carbon footprint (CO^2 emission in the last 12 months, in metric tons)

Data : - Electricity usage per year = 9,092,800.74 kWh/year
- Number of cars entering university = 963 cars/day
- Number of shuttle bus in the university = 0
- Number of motorcycles entering university = 883 motorcycles/day
- Number of trips for shuttle bus service each day = 0
- Approximate travel distance of vehicle each day inside campus (car) = 0.85 km/day
- Approximate travel distance of vehicle each day inside campus (shuttle bus) = 0 km/day
- Approximate travel distance of vehicle each day inside campus (motorcycle) = 1.03 km/day

- **Electricity Usage Per Year**

  CO2 emission from electricity
  = (9,092,800.74 / 1000) x 0.84
  = 7,637.95 metric ton

- **Transportation per year (Car)**

  CO2 emission from car
  = (Number of cars entering your University * 2 * approximate travel distance of a vehicle each day inside campus only (in kilometers) * 240/100) * 0.02
  = (963 x 2 x 0.85 x 240/100) x 0.02
  = 78.58 metric ton

- **Transportation per year (shuttle bus)**

  CO2 emission from shuttle bus.
  = (Number of shuttle bus in your University * 2 * approximate travel distance of a vehicle each day inside campus only (in kilometers) * 240/100) * 0.01

= (0 x 2 x 0 x 240/100) x 0.01
= 0 metric ton

- **Transportation per year (Motorcycle)**
  CO2 emission from motorcycle
  = (Number of motorcycles entering your University * 2 * approximate travel distance of a vehicle each day inside campus only (in kilometers) * 240/100) * 0.01
  = (883 x 2 x 1.03 x 240/100) x 0.01
  = 43.66 metric ton

Total Emission per year = 7,637.95 + 78.58 + 0 + 43.66 = 7,760.19 metric ton

The total carbon footprint divided by total campus population (metric ton per person)

The result from 2.11 that was calculated total carbon footprint per population of 0.71 metric ton / person.

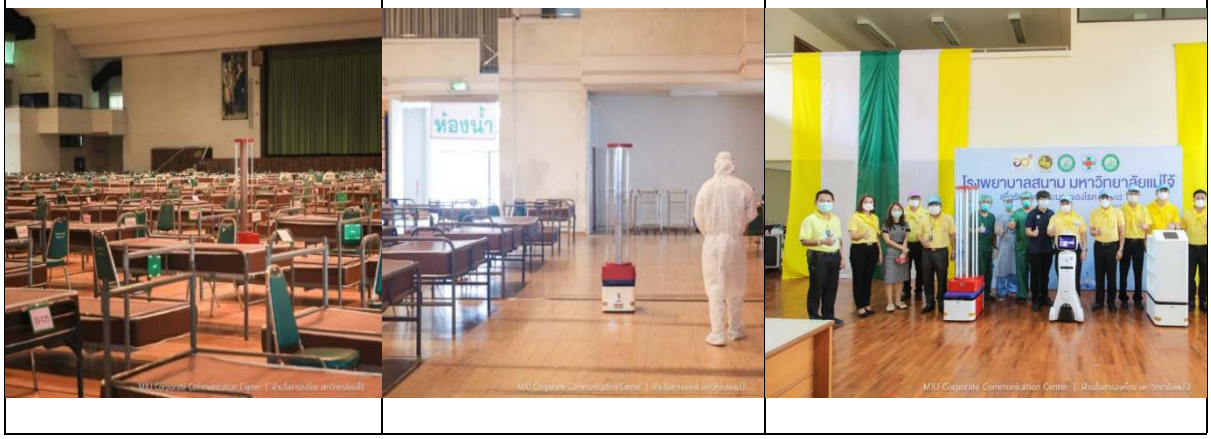
Carbon Footprint Per Year
Total emissions divided total people

Data : - Population in MJU = 10,916 persons
- Total Emission per year = 7,760.19 metric ton

Total Carbon footprint per population = 0.71 metric ton / person

Number of innovative program(s) during Covid-19 pandemic

Since COVID – 19 pandemic has been emerged, the university has ultimately proceeded volunteer activities and built the field hospital and hospitec, for instance, for not only the students and staffs in the university, but also the people in the university's community or the province to relieve the COVID – 19 cases, which has increased over a year. Thus, the innovative programs help the staffs' work more convenient and safety. The first innovation program which the university applied to clean the field hospital is the UVC robot. UVC is ultraviolet radiation with wavelengths between 200 and 290 nanometers. It can apply to eliminate the biological pollutants which makes diseases among the people who are living in the field hospital. The robot roams inside the hospital and stops for a short period to sterilize the area, especially beds. The robot attaches LIDARs, a sensor to detect the obstacles and create a map for the robot to optimize its operating path.



In addition, the university used drones cleaning around the field hospital and hospitec which help the staffs sterilizing the infectious area in the university. The drones contain the chemical, silver nano that produced by the Faculty of Science, cleaning all around the field hospital and hospitec. They are set and controlled by the volunteers who are the professionals approved by the Civil Aviation Authority of Thailand.

Furthermore, Assoc. Prof. Dr. Arunee Kongdee Aldred from the Faculty of Science invented the Teflon nano- coated fabric masks. Teflon nano has the capacity to protect persons wearing masks from dust and pathogens coming in from the outside. Furthermore, because Teflon nano can protect water which deteriorates the mask, it can extend the mask's lifetime. The masks are also recyclable and washable because they are made of natural fabric, which is a significant feature of green products.

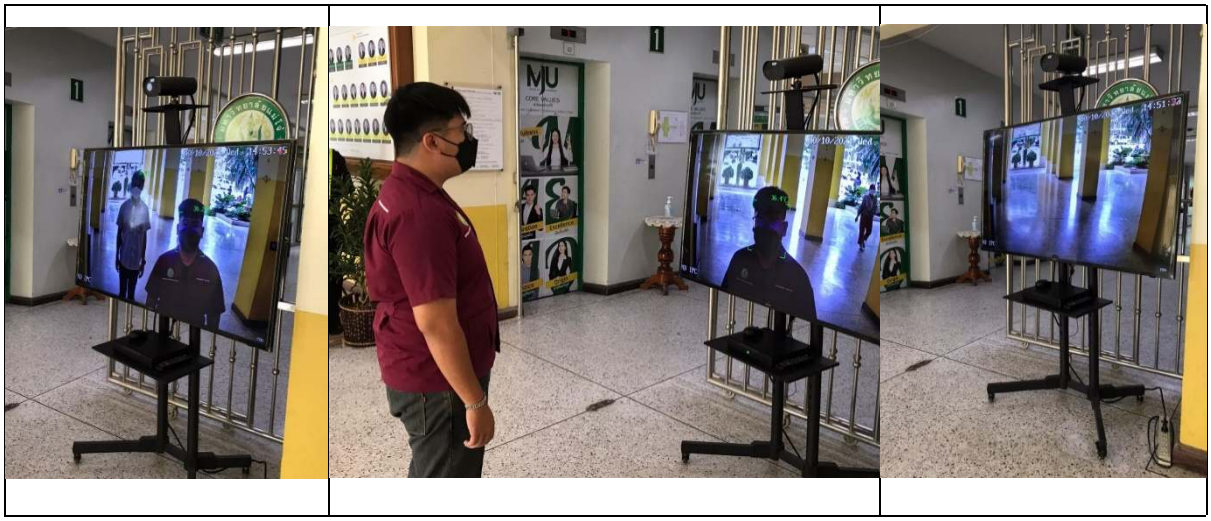
Youtube Link for the news of Teflon nano coated fabric masks from ThaiPBS :
https://www.youtube.com/watch?v=ROhh-OFBxSA

The institution also encourages employees to create their own PM2.5 air purifiers using High-Efficiency Particulate Air Filters. The team is utilizing DIY air filters at the office where they are working. These purifiers can clean the air inside the office of dust and germs, which can make employees unhealthy during working.

The COVID-19 patient room at Sankamphaeng hospital in San Kamphaeng province has also been fitted with an air cleaning system from a collaboration between Maejo University and Chiang Mai University. This system includes HEPA filters to remove pollutants from the air, as well as UVC tubes to destroy diseases including bacteria, virus, and fungus. It also has a negative-pressure blower that creates a negative pressure in the room, allowing the air to flow through HEPA filters and a UVC tube before being released into the atmosphere.

Moreover, the university produces silver nano from the faculty of science to eliminate pathogens and virus including COVID-19, 99.3 % efficacy in 5 minutes contact time. Silver nano is provided to other organizations in Chiang Mai in order to spray all of the contacting surface inside the buildings. Appendix 6 shows the certificate of efficacy of tested silver nano from Mahidol University**.**

The president's office's front door includes a thermal camera that detects visitors' body temperatures. It aids security in determining if visitors are overheated or not as they walk inside the business.



Impactful university program(s) on climate change

Community

Voluntary Renewable Energy Installation at Pleak Vivek Meditation Retreat

The School of Renewable Energy created a voluntary activity for the students, supervised by the teachers, to install renewable appliances such as solar-cell water pump and solar-cell street lights at pleak vivek meditation retreat on Wiang Haeng province, Chiang Mai.



Environmental Conservation Library for Communities

The MJU library exhibit Environmental Conservation Library for Communities to aware the environmental issues and gain knowledge about the importance of environmental conservation at Ban Na Kran School, Mae Jam district, Chiang Mai. The formations of the exhibition are

- Arranging the library and energy and environmental conservation corner for the school.
- Teaching about energy and environmental conservation.
- Waste sorting contest for children


Environmental Conservation Library for Communities

Voluntary Renewable Energy Installation at Wat Phra Trat Doi Saket temple

To attend to religious activities for both monks and civilians who offer merit, the School of Renewable Energy established a voluntary service to construct solar street lights at Wat Phra Trat Doi Saket temple.

Voluntary Renewable Energy Installation at Wat Phra Trat Doi Saket temple

National

Thailand Energy Awards

Thailand Energy Awards presented prizes to the School of Renewable Energy. There are three types of awards that the school has received.

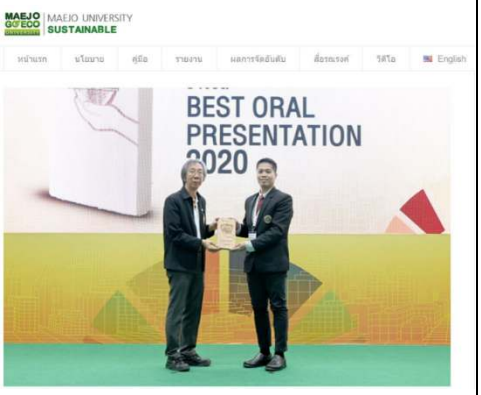
- [Renewable Conservation] Off Grid: Rooftop Photovoltaic Power Plant for Energy Saving of Academic Building => Outstanding Award
- [Renewable Conservation] Innovation on Alternative Energy: Combined Cooling Heating and Power Generation from Cascade Geothermal Energy Technology of Sankamphang Hot Spring => Outstanding Award.

- [Creativity] Institution: Electricity Generation from Medical Waste by Organic Rankine Cycle => Outstanding Award.

Thailand Energy Awards presented prizes to the School of Renewable Energy

<u>Sustainable University Network of Thailand Best Presentation Awards (SUN)</u>

Dr. Sanwasun Yodkom, Lecturer from the Faculty of Engineering and Agro-Industry, received the best oral presentation from SUN academic proceeding with the topic named “Learning platform for non-rotating organic fertilizer generation from agricultural and leaf waste” at King’s Mongkut University of Technology Thonburi, Bangkok, Thailand.



Sustainable University Network of Thailand Best Presentation Awards (SUN)

<u>Weera Panich Awards</u>

Mr. Nakarin Oonta, a second-year student at the Faculty of Architecture and Environmental Design, was awarded the 1st Runners-up prize at the Weera Panich Awards on April 20, 2021. "Creations of habitable working place in the house" is the notion.

Mr. Nakarin Oonta, a second-year student at the Faculty of Architecture and Environmental Design

International

Sustainable solid waste management and policies

The University joins SWAP Project (Sustainable solid waste management and policies), which is collaborated with partners in Vietnam and Cambodia. The project has been doing educational activities to aware the topic of waste management to teachers and staffs, who teach the awareness of waste management especially children and teenagers. The activities of SWAP Project which the institution has cooperated is in the link

Sustainable solid waste management and policies

"ASEAN Energy Awards

Associate Professor Dr. Weerapol Thongma, the President of Maejo University, was represented to receive ASEAN Energy Award. The ceremony was held online in Brunei. There are 2 projects which were got prizes.

- Combined Cooling Heating and Power Generation from Cascade Geothermal Energy Technology of Sankamphang Hot Spring: Winners of Renewable Energy Project Awards
- Rooftop Photovoltaic Power Plant for Energy Saving of Academic Building: 1st Runner-Up of Renewable Energy Project Awards

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<tr><td colspan="2">the President of Maejo University, was represented to receive ASEAN Energy Award</td></tr>
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Voluntary activities with ACTED

At Ban Mai Nai Soi & Ban Mae Surin, Mae Hong Son, Thailand, the School of Renewable Energy collaborated with the Agency for Technical Cooperation and Development (ACTED) to conduct a training of trainers for 18 women refugees on charcoal production and business development entrepreneurship, as well as life skills.

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Voluntary activities with ACTED

[3] Waste (WS)

Recycling Program for University Waste (WS.1)

MJU Recycle plastic (PET) for PPE Production Project

Transportation of recycled PET for PPE

Green Office Award

An example of DIY activities: a DIY bottle cap keychain

DIY bottle cap kit sets were distributed to students and staff




Plastic recycles outputs for Green Road Project such as concrete blocks which are eco-friendly materials as replacements for asphalt etc.

Since Maejo waste management teams set the MJU waste policy and acted for waste recycling and single used plastics reduction, many activities and campaigns have been launched to encourage staff and students to reduce and recycle waste. In recent years, students were not allowed to study onsite due to the COVID-19 pandemic, the total number of solid wastes was decreased. However, a large amount of plastic waste especially food packaging and beverage bottles were increased because of online food delivery and online business. The recycling program for MJU Waste was then targeting plastic waste and other recycling materials such as aluminum cans and papers.

1) MJU served as the host for organizing the collection of PET waste bottles from various faculties, MJU students, staff, and others. They were then sent to an organization called “Less Plastic Thailand” for recycling as PPE kits to fight against the COVID-19 via allies to reduce waste. The first lot of PET bottles was 78.4 kilograms and total was 620 kilograms were transported, and they were used to produce 2,046 sets of PPE kits. Here is the VDO presentation of how to recycle PET to PPE kits: https://drive.google.com/file/d/1rtLB75y-wZHQy_OFyVy96Gj0kdae1NCP/view?usp=sharing and more photos of activities are shown from the link below: https://green.mju.ac.th/?p=5900&lang=en
2) To create a participatory scheme for the students and staff to take part in waste reduction, and waste recycle society, every faculty dean from the dean board forum has admitted and committed to enroll in green office evaluation. By 2022, 100% of all faculty and units in the MJU campus are aimed. In this year, more than 80% of all buildings join green office evaluation. MJU was successful and awarded gold prizes, silver prizes, and bronze prizes from the Department of Environmental Quality Promotion as shown from the links below:

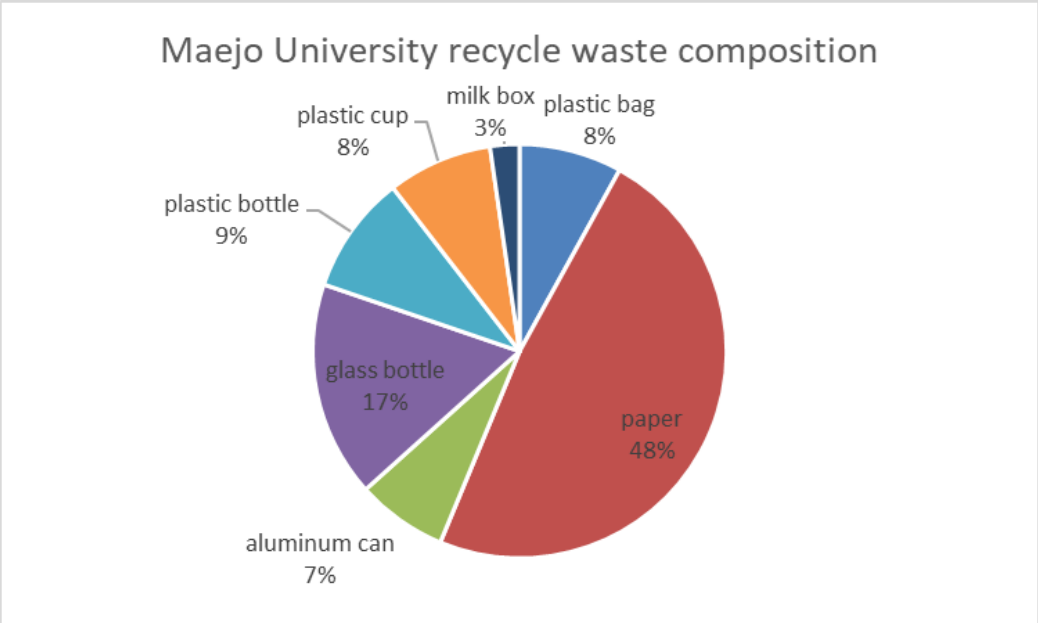
https://erp.mju.ac.th/informationDetail.aspx?newsId=4209&lang
https://library.mju.ac.th/greenlibrary/greenoffice/index.php
https://psdgreenoffice.mju.ac.th/wtms_index.aspx?&lang=th-TH
https://sciencebase.mju.ac.th/scimjugreen

https://infocomm.mju.ac.th/wtms_dashDetail.aspx?dID=249

https://econ.mju.ac.th/greenoffice/index.php?option=com_docman&task=cat_view&gid=4&Itemid=4

https://stugreen.mju.ac.th/wtms_index.aspx?&lang=th-TH
http://www.ba.mju.ac.th/greenoffice/index.php
http://www.as2.mju.ac.th/GreenOffice/GreenOffice_De.aspx
https://renewable.mju.ac.th/?page_id=1848

Once green office procedure and action were conducted, MJU has now developed waste, recycle waste and hazardous waste database; https://greenhouse.mju.ac.th/graphpiegarbage.php. This is useful for MJU to gather information on total solid waste as well as recycled and hazardous wastes in terms of quality and quantity generated on the MJU campus. In 2021, MJU has a total of 3526 kg. of waste to be 100% recycled as shown from the pie graph below:

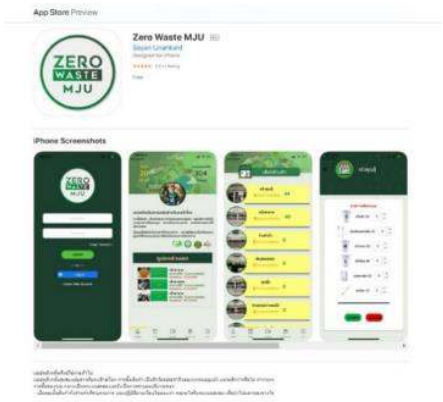


For plastic bottle (PET) was sent to PPE kit production, while other plastics were collected and sent to the green road project by Assi.Prof.Dr.Wechsawan Lakas with the amount of 185 kg.; https://drive.google.com/drive/folders/1LT3TQxXMvUYlZiyvOyZhB4v-oaJ5xEe2?usp=sharing .

Milk boxes and aluminum cans were collected from the main MJU library as the host.

3) Moreover, the DIY workshop project for recycling used and old materials was also organized via an online platform. This year DIY bottle cap keychain activity was performed in the new normal style where 50 DIY set kits were prepared for staff and students to collect to raise their awareness on waste recycling.

Program to Reduce the Use of Papers and Plastics on Campus (WS.2)

	
Zero Waste MJU Mobile Application for single used plastic reduction at the MJU canteen	MJU TOTE Bag Project for plastic reduction
	
NO Plastic Bag Project for all shops, stores, and organic markets on MJU campus	MJU TOTE Bag Project for plastic reduction
	
Use Your Mug and Cup Project for plastic cup reduction	Cost reduction and rewards as an incentive from shops and stores to bring your containers

Paper reduction and using both sides of the paper campaign

Recycle PET for PPE kits

MJU joined the ECOLIFE Project for single-use plastic reduction.

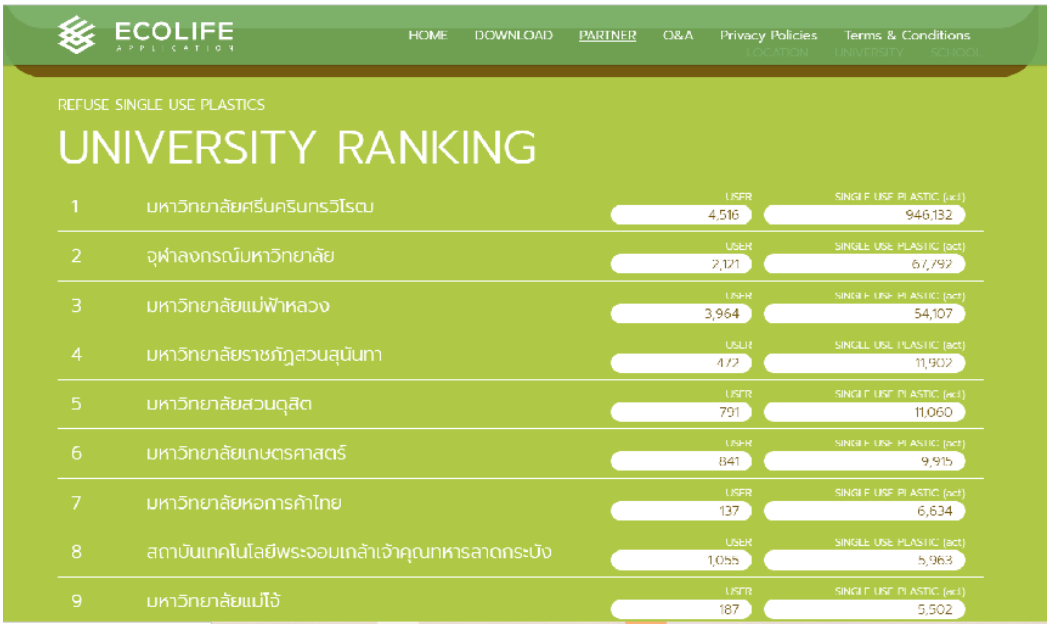
MJU has encouraged staff from all faculties to use electronic documents for e-meeting and other official documents to reduce paper use and create a paperless community. This is the report of the number of paper costs and paper reduction after using E-documents.

	
Recycled plastic for a green road project. These are examples of products from plastic waste	Concrete blocks made from plastic waste

Maejo University has launched, promoted, and proceeded policies and activities for paper and plastic usage reductions to decrease paper and plastic consumptions on the campus. Here are the details;

1. Maejo has launched MJU Zero Waste Mobile Application for every shop at the MJU canteen. Once plastics have been refused and reduced by students and staff who have registered this application, they can collect some reward points for the discount of buying food and drinks. Link for application and activities
   : https://green.mju.ac.th/?p=3799&lang=en
   : https://apps.apple.com/ca/app/zero-waste-mju/id1491921237
   : https://play.google.com/store/apps/details?id=th.ac.mju.zerowaste&hl=th&gl=US

2. After the last year 2020, the Green university waste management team organized a grand opening ceremony using the application called ECOLIFE for reducing single used plastics at the Maejo campus. This application has been promoted and applied to coffee shops and food stores on the campus. This year, 20 more locations have joined this application. Up to 5,502 kg of single used plastics was reduced by MJU (ranking no 9).



9 มหาวิทยาลัยแม่โจ้

		USER	SINGLE USE PLASTIC (act)
		187	5,502
1	คณะวิทยาศาสตร์	1	2,171
2	คณะวิทยาศาสตร์	41	2,171
3	คณะผลิตกรรมการเกษตร	21	453
4	หอสมุดกลาง	9	318
5	คณะศิลปะศาสตร์	28	163
6	สำนักงานอธิการบดี	11	79
7	คณะสถาปัตยกรรมศาสตร์ และการออกแบบสิ่งแวดล้อม	8	65
8	คณะบริหารธุรกิจ	30	60
9	คณะพัฒนาการท่องเที่ยว	15	12
10	วิทยาลัยบริหารศาสตร์	7	7
11	คณะสารสนเทศและการสื่อสาร	2	2
12	กองกิจการนักศึกษา	2	1
13	สำนักงานบริหาร	1	0
14	ศูนย์ภาษา	0	0
15	ผู้บริหารมหาวิทยาลัย	0	0
16	อาจารย์	0	0
17	บุคลากร	0	0
18	วิทยาลัยพลังงานทดแทน	2	0
19	คณะเทคโนโลยีการประมงและทรัพยากรทางน้ำ	1	0
20	คณะวิศวกรรมและอุตสาหกรรมเกษตร	1	0
21	คณะเศรษฐศาสตร์	4	0
22	คณะเศรษฐศาสตร์	1	0
23	บัณฑิตวิทยาลัย	0	0
24	คณะสัตวศาสตร์และเทคโนโลยี	2	0

3. To reduce plastic waste, Maejo University has launched the "Say No to Plastic Bag Project". Tote bags, cloth bags, and reused containers have been promoted for staff, students, and customers to be used when going shopping at shops, stored, and the MJU organic market.
4. The campaign and activities of plastic waste reduction have been promoted and conducted such as bringing your mug and containers and getting discount promotions from food and drinks shops. The production of MJU glasses is for students and staff.
5. Maejo University has set the policy and programs for paper reduction such as using electronic documents, using electronic meetings for all faculties and organizations, using the centered printer to reduce the amount of paper used, printing 2 sides papers, and using reused papers. Moreover, the amount of paper reduction, as well as the reduction of paper costs from each, have been reported on the MJU website. In the year 2021, MJU can save the paper cost up to 10.9 million baht. Here is the link; https://erp.mju.ac.th/documentRptChart2.aspx
6. For PET recycle project, plastic waste (PET) from MJU was 100% recycled for PPE production.
7. Nearly 185 kg. of plastics were collected and sent to recycle for a green road project. Link; https://drive.google.com/drive/folders/1LT3TQxXMvUYlZiyvOyZhB4v-oaJ5xEe2?usp=sharing

Organic Waste Treatment (WS.3)

	
Green cone project for food waste recycle from buildings	Green cone installation
	
IAM ONG Project for converting yard waste into composting products	Composting piles

	
	
MJU compost products	
	
Food waste collection and management using vermicomposting	Earthworms for food treatment

	
	Organic fertilizers and products obtained from vermicomposting of food waste
	
Eco-Packaging Product Project	
	
	MJU Eco-Materials team

Organic waste management

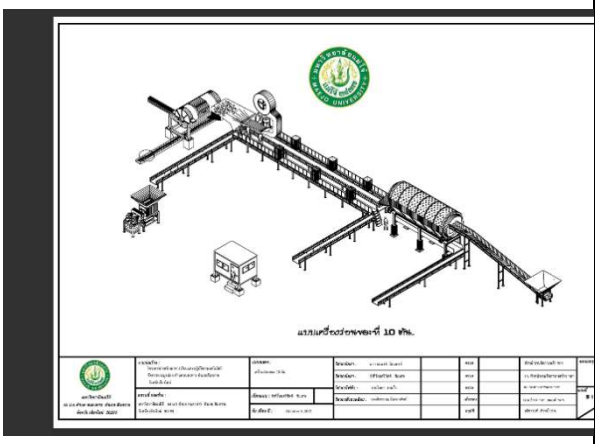
1. Since 2020, Maejo has launched a project called “IAM ONG” for converting yard waste, basically leaves from landscape management (trimming and cutting) from MJU into composting. https://www.facebook.com/CompostClassroom/?fref=photo). Yard waste was then biodegraded using the aerated static pile composting process that has been initiated and developed by Associated Professor Teerapong Sawangpunyangul and teams. In 2021, nearly

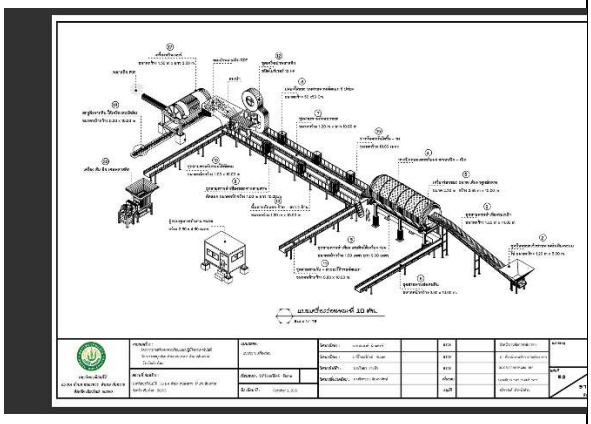
10.5 tons of composts were produced and then used for landscape management on the campus area and distributed to MJU staff members.

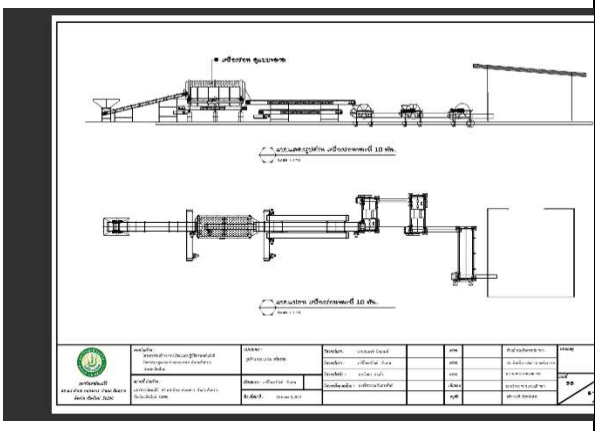
2. For the food waste generated from the canteens on the campus, almost 100% of food waste was separated and collected from each canteen and food shop for treatment. Food waste from the collection points was then transferred to vermicomposting area for fertilizer production. This process has been pioneered by Prof.Dr. Arnat Tancho. https://www.facebook.com/maejonaturalfarming/)
3. Green Cone Project was conducted to encourage staff and students from each faculty to separate food waste from general waste. A total of 10 green cones were installed at 10 faculties. Food waste (100%) that was separated each day from the office and classroom (organic bins) was then added and treated by this green cone which was set nearby each building.
4. MJU has conducted the project to create eco-products from leaves and agricultural waste by the material science research team. This was to develop value-added products which will be further used for shops and stores on the MJU campus.
   Link: https://www.facebook.com/ContentChiangmai/videos/177100221196923/.

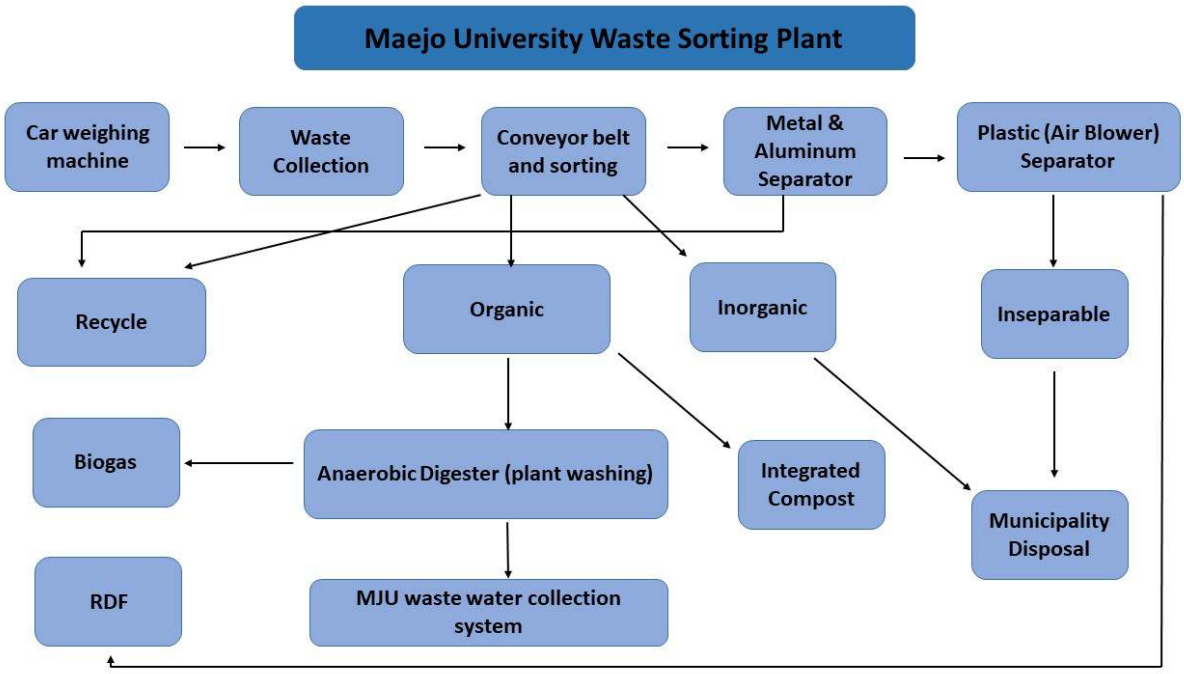
Inorganic Waste Treatment (WS.4)

The master plan of MJU solid waste management and recycling center





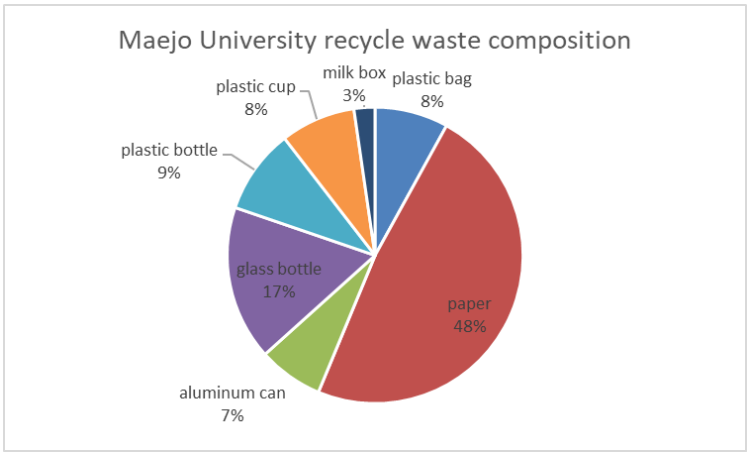




MJU waste sorting concept

	
Donation box collection for stockings, milk cartons, and aluminum rings	Aluminum rings recycled for prosthetic leg production
	

Key Chain DIY Project	No foam campaign for food delivery during the COVID-19 pandemic
	
Old books are separated and collected for recycling	



The proportion of MJU recycled waste from the database

MJU inorganic waste management

Since 2019, the waste management team that is under the green university committee has set the strategy for inorganic waste handling in Maejo University. The majority of inorganic waste generated from the campus was papers followed by other recycling waste such as plastic and aluminum cans that were collected from the recycled bins. In 2021, a total of 3526 kg. of recycled waste were 100% recycled.

The first action for inorganic waste handling was 3Rs and big cleaning projects. For the paper-reduction method, electronic documents and electronic meetings were encouraged. As it can be seen from the picture that MJU could reduce the cost of paper up to 10.9 million baht. Here is the link; https://erp.mju.ac.th/documentRptChart2.aspx .

Moreover, each organization has a policy of using reused paper or two sides printing according to green office procedures. After that, all the used papers were collected for recycling by selling to the local recycling companies. In addition, the old books from the library have been sorted each year and donated to local schools, while the rest were shredded and sold for recycling by a local recycling companies. The money obtained was further used for waste management in the organization.

For plastic waste, 2 projects were struck to recycle 100% of plastic waste from MJU. The first project was PET for PPE kits and the second one was plastic to the green road.

For milk cartons, aluminum rings, and used stocking, MJU central library was a host for this waste collection for donation. In 2021, almost 25 kg of aluminum rings, 15.8 kg of milk cartons, and 1 kg of used stocking were collected.

The long-term strategy was to develop and construct MJU solid waste management and recycling center. The master plan and sorting flow diagram are shown above. This year MJU has the budget for the project and we successfully manage to buy a waste conveyor and an automatic scale.

Toxic Waste Handled (WS.5)

Householsehold hazardous waste collection points

Household hazardous waste collection bin.

Communication campaign for MJU hazardous waste collection points to encourate students and staff.

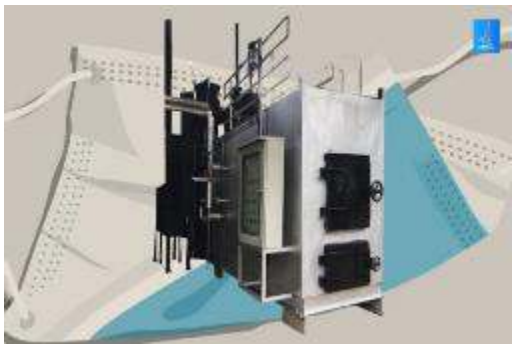
Handling of hazardous waste from each collection point for transferring to Maejo municipality. MJU hazardous waste and Maejo community hazardous waste were transferred to dispose at Wongpanit Recycling Company.

Maejo joins the project with AIS for E-waste bin collections and disposal

MJU E-waste collection points

E-waste collection from each faculty before weighing and sending it to E-waste recycling industry

<table>
<tr><td colspan="2">   </td></tr>
<tr><td colspan="2">Handling of chemical contaminated waste and chemical containers from laboratories. Collection from each building by MJU certified lab technicians.</td></tr>
<tr><td>  </td><td> 
</td></tr>
<tr><td>Transporatation of MJU hazardous waste</td><td>MJU Hazardous waste disposal was transferred to treat and dispose at Recycle Engineering Co.,Ltd.</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Red bin for masks waste handling during the Covid-19 pandemic.</td><td>Collection of masks for disposal</td></tr>
</table>



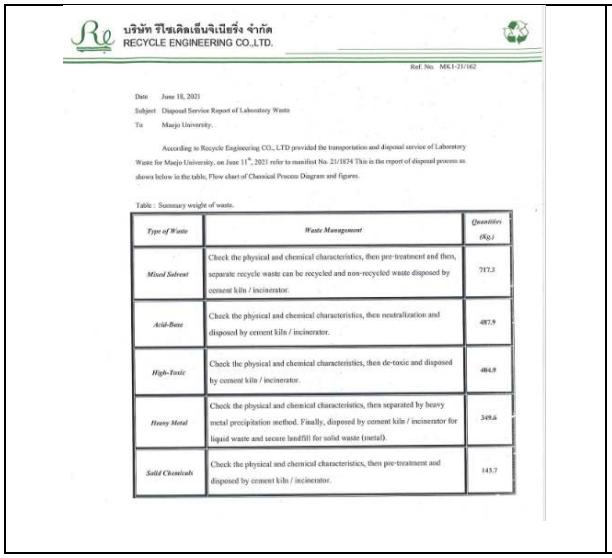
Used masks waste was sent to dispose using the hybrid incineration system developed by Assoc. Prof. Dr.Nattaporn Chaiyat at the School of Renewable Energy.

DesHazardous waste disposal and management at Maejo University.

Maejo University has generated a broad range of hazardous waste such as chemical contaminated waste, broken glasses, sharp items, chemical containers, spray bottles, electronics devices, batteries, and fluorescence light bulbs. To manage and dispose these items efficiently and to promote environmental-friendly waste management, many policies and several procedures have been conducted. The budgets for handling these hazardous wastes were set and trained staff were assigned for waste collection and control.

There are 10 household hazardous waste collection points located on Maejo campus where students and staff can get rid of all hazardous wastes such as light bulbs, broken glasses, spray bottles/cans, batteries, and other household hazardous wastes. In 2021, approximately 2 tons of household hazardous waste were collected and transported to handle by Maejo municipality for disposal at Wongpanit Recycle Company (a certified contract company).

For chemicals contaminated waste, used chemicals and chemical containers from laboratories and research sections, trained lab-technicians who got a certificate of waste management are responsible for handling and setting the procedure of collection and storage of these waste before disposal. In the beginning, all waste will be checked and weighed, labeled, and recorded. Some types of waste are pretreated before storage. All the waste is placed and stored in a safe and isolated area before transferring to dispose by a certified contracted company each year. In the years 2017-2021, the amount of hazardous waste collected and sent for disposal by the recycle engineering company, a certified company, were 1775 kg, 1274 kg, 1826 kg, 2000 kg, and 3,549, respectively. All the items were listed and recorded in the link below:
https://erp.mju.ac.th/openFile.aspx?id=NDc2OTQz&method=inline



บริษัท รีไซเคิลเอ็นจิเนียริ่ง จำกัด
RECYCLE ENGINEERING CO.,LTD.

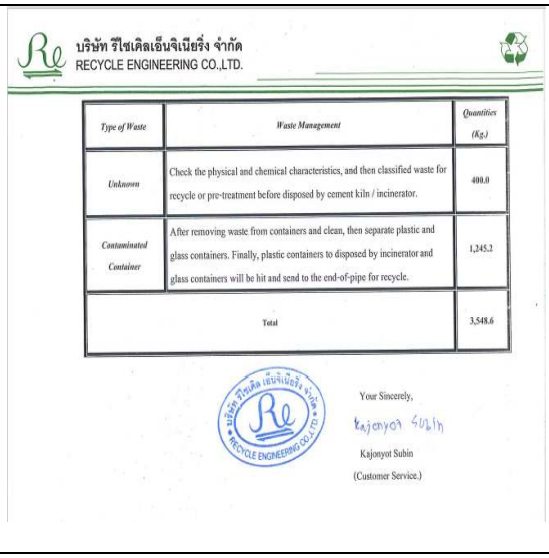
Ref. No. MK1-21/162

Date June 18, 2021
Subject Disposal Service Report of Laboratory Waste
To Maejo University.

According to Recycle Engineering CO., LTD provided the transportation and disposal service of Laboratory Waste for Maejo University, on June 11th, 2021 refer to manifest No. 21/1024 This is the report of disposal process as shown below in the table, Flow chart of Chemical Process Diagram and figures.

Table : Summary weight of waste.

Type of Waste	Waste Management	Quantities (Kg.)
Mixed Solvent	Check the physical and chemical characteristics, then pre-treatment and then, separate recycle waste can be recycled and non-recycled waste disposed by cement kiln / incinerator.	717.3
Acid-Base	Check the physical and chemical characteristics, then neutralization and disposed by cement kiln / incinerator.	497.9
High-Toxic	Check the physical and chemical characteristics, then de-toxic and disposed by cement kiln / incinerator.	404.9
Heavy Metal	Check the physical and chemical characteristics, then separated by heavy metal precipitation method. Finally, disposed by cement kiln / incinerator for liquid waste and secure landfill for solid waste (metal).	349.6
Solid Chemicals	Check the physical and chemical characteristics, then pre-treatment and disposed by cement kiln / incinerator.	143.7



บริษัท รีไซเคิลเอ็นจิเนียริ่ง จำกัด
RECYCLE ENGINEERING CO.,LTD.

Type of Waste	Waste Management	Quantities (Kg.)
Unknown	Check the physical and chemical characteristics, and then classified waste for recycle or pre-treatment before disposed by cement kiln / incinerator.	400.0
Contaminated Container	After removing waste from containers and clean, then separate plastic and glass containers. Finally, plastic containers to disposed by incinerator and glass containers will be hit and send to the end-of-pipe for recycle.	1,245.2
Total		3,548.6

Your Sincerely,
Kajonyot Subin
Kajonyot Subin
(Customer Service.)

Since 2020, Maejo has signed a collaboration with AIS and ECOLIFE for the installation of E-waste bins on the campus. This aimed to collect all the used and broken electronics devices including mobile phones and accessories and IT items for disposal and management. In 2021, approximately 3 kg. of used mobile phones and batteries, 1.8 kg. of headphones and accessories, and 1 kg. of other electronics appliances were collected and sent by post to recycle at E-waste recycle company (under AIS contract).

AIS

ที่ PR 083 / 2563

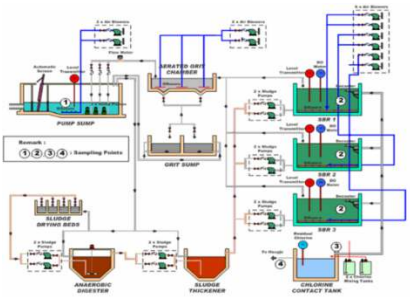
21 ตุลาคม 2563

เรื่อง
เรียน
สิ่งที่ส่งมาด้วย

During the COVID-19 pandemic, the MJU waste management team has set up a mask waste collection bin (red bin) on the campus for staff and students to dispose their used masks. Each month, this disinfected waste was transferred to dispose at the School of Renewable Energy for electricity production using a hybrid incineration system developed by Assoc. Prof. Dr.Nattaporn Chaiyat. This system was also used for disposing infectious waste from MJU field hospital during the outbreak of

Covid-19 at the beginning of the year 2021. The link for the information on the hybrid incineration system is shown below; https://erp.mju.ac.th/openFile.aspx?id=NDc2OTYz&method=inline

Sewerage Disposal (WS.6)

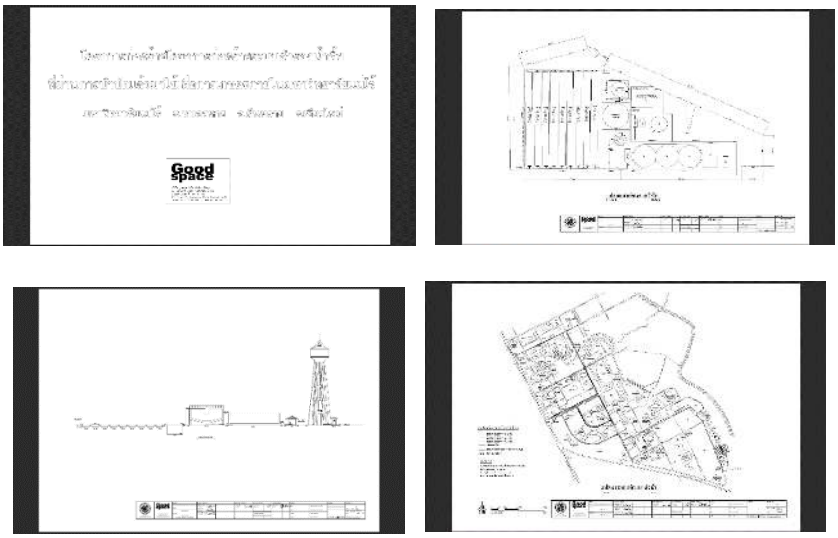


Flow diagram of MJU Biological Wastewater Treatment Plant

Sequencing batch reactor (SBR)

Dried digested sludge was collected for further use as fertilizers for soil amendment and landscape management on the campus

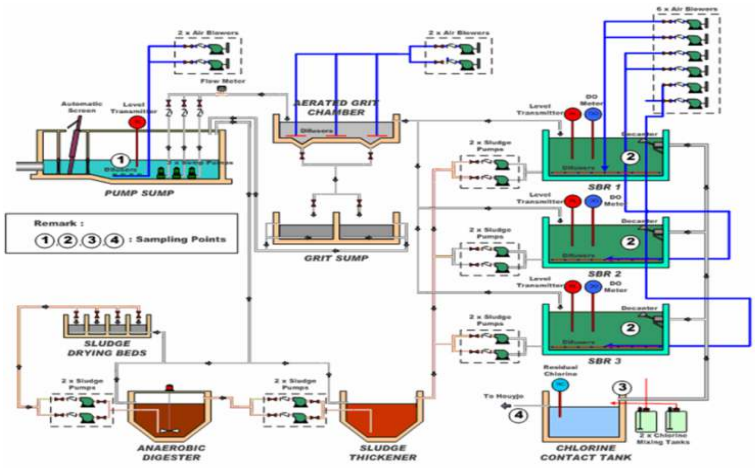
	
The effluent from the wastewater treatment plant was recycled for landscape irrigation on the campus. This is one of the storage ponds.	The piping system for recycling treated wastewater from the MJU Wastewater Treatment Plant for landscape irrigation.
 The Ecological Sanitation Project for reusing greywater for irrigation and landscape management on the campus.	
	
This picture shows the ecological sanitation ware installed and used in the 80-year building	Separated urinate was used for landscape management on the campus



A new project of upcycling treated wastewater for water conservation to be used on the campus is now under construction.

Sewage disposal system and wastewater recycling program

100 % of Greywater and wastewater from all buildings on the Maejo University campus are collected using the separated sewer system and transported through a piping system to treat at the MJU Wastewater Treatment Plant. The flow diagram of a wastewater treatment plant and piping system is shown in the picture and



link:https://erp.mju.ac.th/openFile.aspx?id=NDc3MDM1&method=inline

For the wastewater treatment system, Sequencing Batch Reactors (SBR) have been used to treat approximately 1600 m^3 / d. All routine treatment parameters such as BOD, COD, pH, DO, TKN, SS, etc. were analyzed by technicians. The treatment performances were also confirmed by a certified laboratory. High performance of WWTP was achieved with a treatment efficiency of more than 90%, which is safe to release to the environment. The results of wastewater analysis are reported as followed; https://erp.mju.ac.th/openFile.aspx?id=NDc3MDMw&method=inline

The effluent from the treatment plant is further reused for landscape irrigation and agricultural purposes on the MJU campus. Approximately 1000 m^3 / d. of the effluent or 62.5% was

recycled by transferring through the piping system to storage in the pond. This storage reused water was used for landscape irrigation and horticulture crop during the dry season on the campus through the PVC piping system. Sludge from the treatment plant was stabilized and dried before using as a soil amendment for agricultural and landscape purposes on the campus.

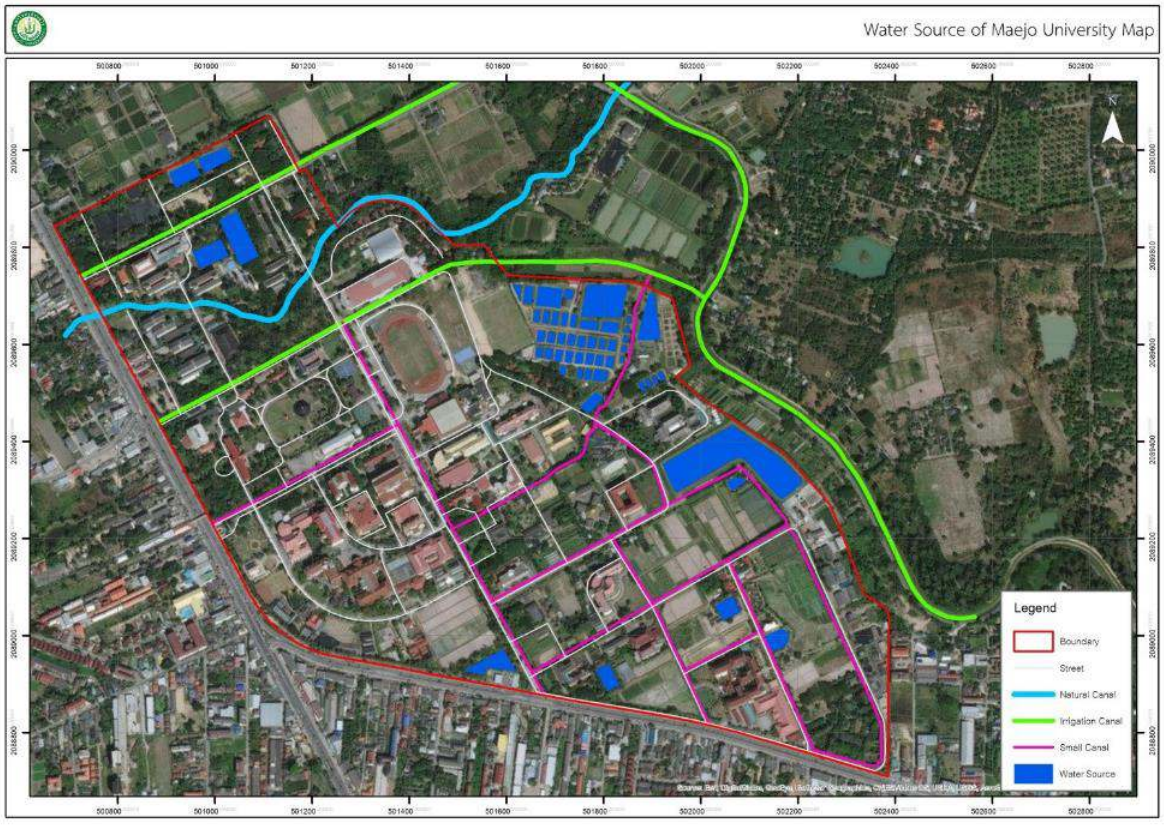
Since the year 2020, MJU has launched a new project of the upcycling water treatment plant to upgrade the effluent from the current wastewater treatment plant with a budget of 18 million baht. It is now in the process of construction which will start up the system by next year. This project aims to upcycle 100% of the effluent for water conservation and agriculture production process.

Moreover, the ecological sanitation or "ecosan" was installed with a total amount of 303 toilets. These covered 7 main buildings including the main canteen, sports complex, the 70-year study center, the 80-year study center, Agricultural Faculty, swimming pool, and Chootiwat Building. Nearly 50 m^3 of urinate was safely reused through piping systems with 5 main springer points for landscape management within the campus.

[4] Water (WR)

[4.1] Water Conservation Program Implementation

Maejo University has a 75,000-cubic meter raw water pond that supplies water for water supply Plant 1; a 20,000-cubic meter pond that provides water for water supply 2; a 32,200-cubic meter pond that supplies water for water supply Plant3; a 60,000-cubic meter pond that is used for agricultural purposes; as well as the Mae Faek-Mae Ngat Somboonshon Operation and Maintenance Project and natural canals running through the university. Currently, there are sufficient surface water sources for both the water supply system and agriculture.



Water source in Maejo University map

Raw water pond that supplies water for water supply Plant 1 2 and 3.

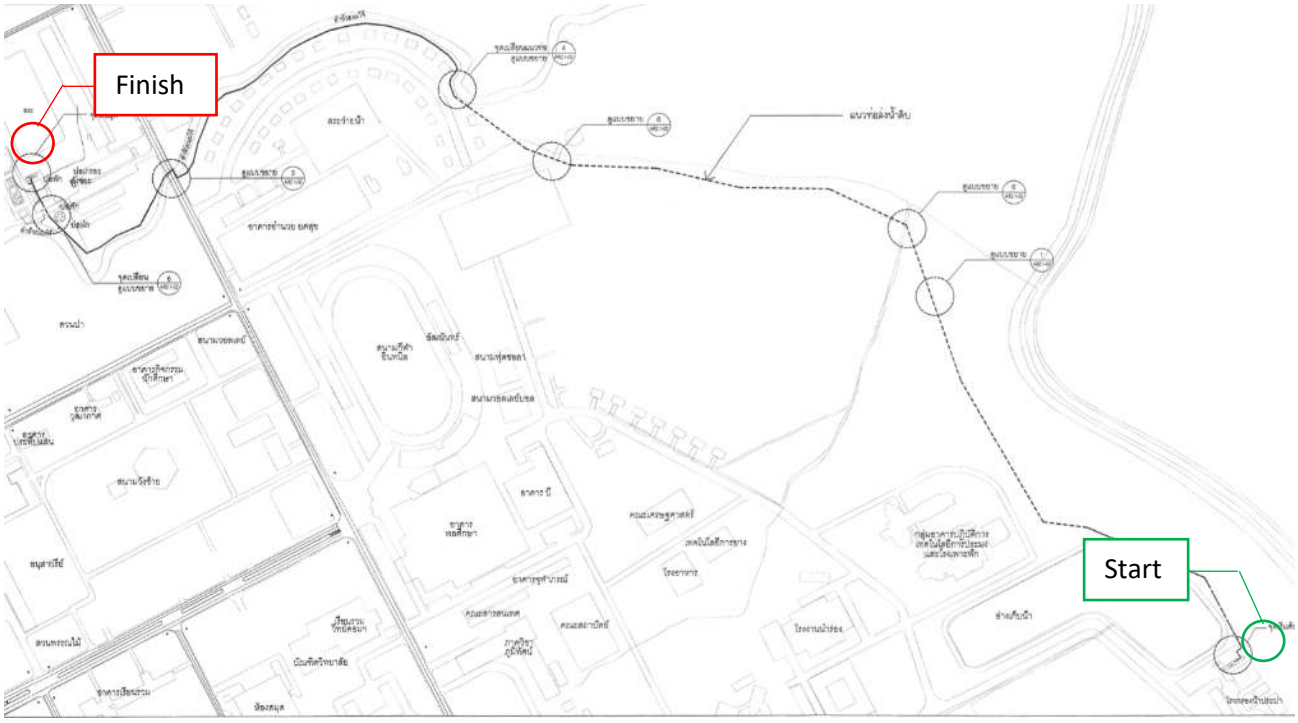
Weir in the natural canal

Water source of Maejo university

No.	Position	Volume (m^3)
1	Lanna agriculture learning center	4,335
2	New theory agriculture learning center	4,470
3	Engineering Laboratory Building Classroom	1,196
4	Thummasakmontri Building 1	2,900
5	PTT Oil Station 1	2,912
6	PTT Oil Station 2	1,372
7	Thummasakmontri Building 2	740
8	Water supply pond	7,560
9	Agricultural area	1,196
10	water supply plant	1,475
11	Fishery Thchnology Laboratory Building	4,302
12	Smithanon Building	73
13	Mekong giant catfish learning center 1	39,495
14	Mekong giant catfish learning center 2	22,824
15	Mekong giant catfish learning center 3	5,902
16	Mekong giant catfish learning center 4	1,528
17	Rest home	1,431
18	70th year maejo building 1	2,457
19	70th year maejo building 2	1,579

No.	Position	Volume (m^3)
20	Production of Ornamental Plants Technology	832
21	Dean office 1	420
22	Dean office 2	800
23	Maejo shirne	240
24	Kaset sanahn pool 1	2,850
25	Kaset sanahn pool 2	2,850
26	Female dormitory 8	9,720
27	Female dormitory 8	17,124
28	Faculty of Animal Science and Technology 1	1,050
29	Faculty of Animal Science and Technology 2	900
30	Faculty of Animal Science and Technology 3	1,350
31	School of Renewable Energy 1	147
32	School of Renewable Energy 2	4,870
33	Cow farm	36,300
Total		**187,200**

At present, Maejo University has a problem diverting water from the irrigation canal into the raw water storage pond of the second water supply plant, which has a relatively small storage capacity and insufficient to produce tap water to supply to water users for consumption. Therefore, there is a project to lay a pipeline to supply water from the raw water storage pond of first tap water plant, which has a larger capacity and storage volume, to the raw water pond of the second water plant. The budget of this project was $260,000. This project can support the water supply system of the second water supply plant to be sufficient for utility and agriculture by two water pumps, that have capacity 16.41 HP and flow rate was 6,667 LPM. Currently, the project is in progress.



Pipelines of supply raw water project




Dredging the raw water storage pond


Water pipe digging

Water Recycling Program Implementation

Maejo University has a pipe system that sends wastewater from all buildings to treatment plants and subsequently sends the treated water 12 distribution points as the illustrated by the R1-R12 dots on the map. Three of the distribution points further move the water to ponds for agricultural reserve, seven points of supply water for usage in glass field agriculture, the university forest garden and one additional point flows to the natural canal.

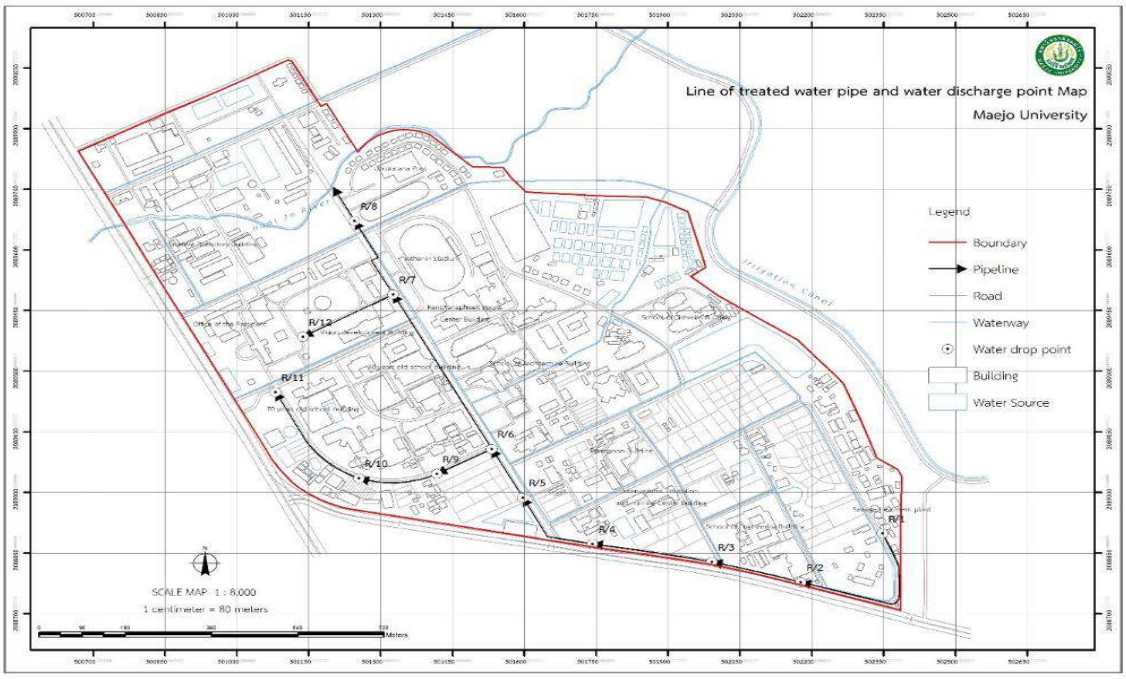
The treated water of Maejo University between October **2020** to September **2021** has a total volume of 417,454**4** m^3**.** All treated water were supply into pipe line for agricultural used, such as landscape vegetable and rice planting, and tractor washing**.**

The data of treated water in Maejo University**.**

Month - Year	**Treated water (m^3)**
Oct-20	38,583
Nov-20	35,518
Dec-20	35,307
Jan-21	35,342
Feb-21	31,543
Mar-21	31,876
Apr-21	35,486
May-21	33,715
Jun-21	34,629
Jul-21	33,539
Aug-21	36,233
Sep-21	35,683
Total	417,454

Maejo university wastewater treatment plant

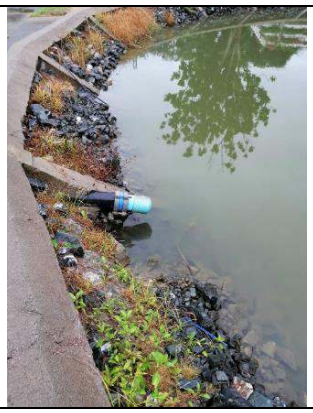
Maejo university water supply plant



The map shows the point of treated wastewater release (R1 – R12)

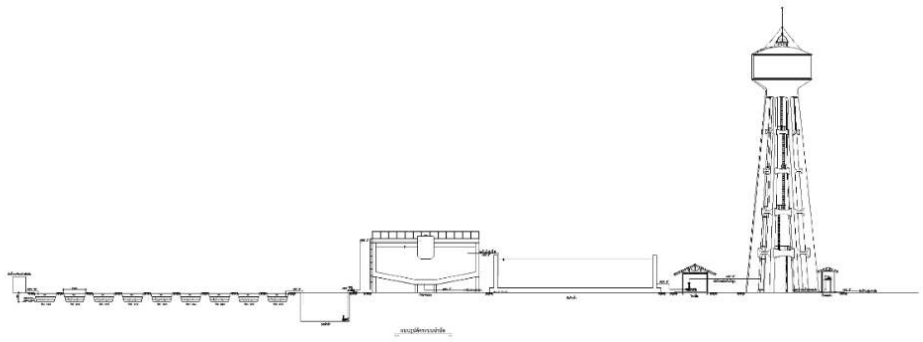
Treated wastewater released to the pond for agricultural on flower cultivated area.

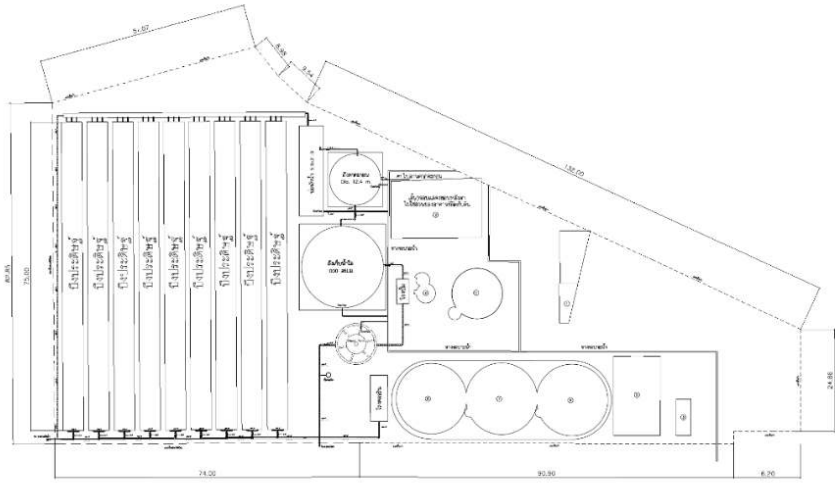
Treated wastewater released to the glass field



Treated wastewater released to pond

At present, Maejo University is in the process of constructing a sewage treatment system for treated water by constructed wetland system**.** The budget of this project was $486,300**.** The system can treat water 1,800 m^3**/**day**.** After that, the treated water will be used throughout the university**.**





Sewage treatment system for treated water by constructed wetland system

The map shows the point of constructed wetland system

Water Efficient Appliances Usage (e.g. hand washing taps, toilet flush, etc.)

Press pop-up handle basin faucet and sensor handle basin faucet

Press pop-up urinal and sensor urinal

Double flush tank toilet

<u>Handle Basin Faucet</u>

Handle Basin Faucet Saving Water	738 pieces (28.59 %)
Handle Basin Faucet Non-saving Water	1,843 pieces (71.41 %)

<u>Urinal</u>

Urinal Saving Water	862 pieces (77.10 %)
Urinal Non-saving Water	256 pieces (22.90 %)

<u>Toilet</u>

Toilet Saving Water	99 pieces (3.93 %)
Toilet Non-saving Water	2,421 pieces (96.07 %)

<u>Conclusion</u>

Saving water sanitary ware	1,699 pieces (27.32 %)
Non-saving water sanitary ware	4,520 pieces (72.68 %)
Total	6,219 pieces

In total, there are 6,219 sanitary ware products, including 1,699 water-saving ones—constituting 27.32 % of the products

The quantity of sanitary

Quantity												
Faculty of Agricultural Production												
Type	Handle Basin Faucet				Toilet				Urinal			
	saving type		non-saving type		saving type	non-saving type			saving type		non-saving type	
	sensor	Press pop-up	cross	single level	double flush	flush valve	single flush	pail flush	sensor	Press pop-up	cross	single level
	10	72	97	36	19	65	139	6	6	118	0	6
Sum	82		133		19	210			124		6	
Faculty of Science												
Type	Handle Basin Faucet				Toilet				Urinal			
	saving type		non-saving type		saving type	non-saving type			saving type		non-saving type	
	sensor	Press pop-up	cross	single level	double flush	flush valve	single flush	pail flush	sensor	Press pop-up	cross	single level
	0	0	157	51	0	132	125	0	66	41	12	2
Sum	0		208		0	257			107		14	
Faculty of Business Administration												
Type	Handle Basin Faucet				Toilet				Urinal			
	saving type		non-saving type		saving type	non-saving type			saving type		non-saving type	
	sensor	Press pop-up	cross	single level	double flush	flush valve	single flush	pail flush	sensor	Press pop-up	cross	single level
	80	0	1	0	0	0	66	0	27	11	0	0
Sum	80		1		0	66			38		0	
Faculty of Fisheries Technology and Aquatic Resources												
Type	Handle Basin Faucet				Toilet				Urinal			
	saving type		non-saving type		saving type	non-saving type			saving type		non-saving type	
	sensor	Press pop-up	cross	single level	double flush	flush valve	single flush	pail flush	sensor	Press pop-up	cross	single level
	10	0	5	27	0	0	52	0	4	16	0	1
Sum	10		32		0	52			20		1	
School of Tourism Development												
Type	Handle Basin Faucet				Toilet				Urinal			
	saving type		non-saving type		saving type	non-saving type			saving type		non-saving type	

	sensor	Press pop-up	cross	single level	double flush	flush valve	single flush	pail flush	sensor	Press pop-up	cross	single level
	15	0	0	6	0	0	23	0	7	3	0	0
Sum	15		6		0	23			10		0	
Faculty of Architecture and Environmental Design												
Type	Handle Basin Faucet				Toilet				Urinal			
	saving type		non-saving type		saving type	non-saving type			saving type		non-saving type	
	sensor	Press pop-up	cross	single level	double flush	flush valve	single flush	pail flush	sensor	Press pop-up	cross	single level
	0	0	0	95	0	0	92	0	0	36	0	5
Sum	0		95		0	92			36		5	
School of Administrative Studies												
Type	Handle Basin Faucet				Toilet				Urinal			
	saving type		non-saving type		saving type	non-saving type			saving type		non-saving type	
	sensor	Press pop-up	cross	single level	double flush	flush valve	single flush	pail flush	sensor	Press pop-up	cross	single level
	25	0	0	25	0	58	0	0	13	18	0	0
Sum	25		25		0	58			31		0	

School of Renewable Energy												
Type	Handle Basin Faucet				Toilet				Urinal			
	saving type		non-saving type		saving type	non-saving type			saving type		non-saving type	
	sensor	Press pop-up	cross	single level	double flush	flush valve	single flush	pail flush	sensor	Press pop-up	cross	single level
	0	0	0	122	0	0	148	0	0	4	21	35
Sum	0		122		0	148			4		56	
Faculty of Engineering and Agro-Industry												
Type	Handle Basin Faucet				Toilet				Urinal			
	saving type		non-saving type		saving type	non-saving type			saving type		non-saving type	
	sensor	Press pop-up	cross	single level	double flush	flush valve	single flush	pail flush	sensor	Press pop-up	cross	single level
	0	1	132	92	7	4	170	1	0	39	3	90

Sum	1	224	7	175	39	93

Faculty of Economics

Type	Handle Basin Faucet				Toilet				Urinal			
	saving type		non-saving type		saving type	non-saving type			saving type		non-saving type	
	sensor	Press pop-up	cross	single level	double flush	flush valve	single flush	pail flush	sensor	Press pop-up	cross	single level
	44	0	0	0	0	0	53	0	26	0	0	2
Sum	44		0		0	53			26		2	

Faculty of Liberal Arts

Type	Handle Basin Faucet				Toilet				Urinal			
	saving type		non-saving type		saving type	non-saving type			saving type		non-saving type	
	sensor	Press pop-up	cross	single level	double flush	flush valve	single flush	pail flush	sensor	Press pop-up	cross	single level
	0	0	15	40	1	10	43	0	0	6	0	19
Sum	0		55		1	53			6		19	

Faculty of Information and Communication Maejo University

Type	Handle Basin Faucet				Toilet				Urinal			
	saving type		non-saving type		saving type	non-saving type			saving type		non-saving type	
	sensor	Press pop-up	cross	single level	double flush	flush valve	single flush	pail flush	sensor	Press pop-up	cross	single level
	22	0	0	0	30	0	0	0	18	0	0	0
Sum	22		0		30	0			18		0	

Faculty of Animal Science and Technology

Type	Handle Basin Faucet				Toilet				Urinal				
	saving type		non-saving type		saving type	non-saving type			saving type		non-saving type		
	sensor	Press pop-up	cross	single level	double flush	flush valve	single flush	pail flush	sensor	Press pop-up	cross	single level	pail flush
	109	0	6	6	0	97	4	3	35	20	2	6	23
Sum	109		12		0	104			55		31		

Maejo Farm												
Type	Handle Basin Faucet				Toilet				Urinal			
	saving type		non-saving type		saving type	non-saving type			saving type		non-saving type	
	sensor	Press pop-up	cross	single level	double flush	flush valve	single flush	pail flush	sensor	Press pop-up	cross	single level
	0	0	9	31	6	0	29	3	0	2	0	12
Sum	0		40		6	32			2		12	

Administrative building												
Type	Handle Basin Faucet				Toilet				Urinal			
	saving type		non-saving type		saving type	non-saving type			saving type		non-saving type	
	sensor	Press pop-up	cross	single level	double flush	flush valve	single flush	pail flush	sensor	Press pop-up	cross	single level
	347	0	61	103	36	19	523	0	244	51	2	15
Sum	347		164		36	542			295		17	

Maejo dormitory												
Type	Handle Basin Faucet				Toilet				Urinal			
	saving type		non-saving type		saving type	non-saving type			saving type		non-saving type	
	sensor	Press pop-up	cross	single level	double flush	flush valve	single flush	pail flush	sensor	Press pop-up	cross	single level
	0	3	285	611	0	188	314	159	0	60	0	0
Sum	3		896		0	661			60		0	

Consumption of treated water

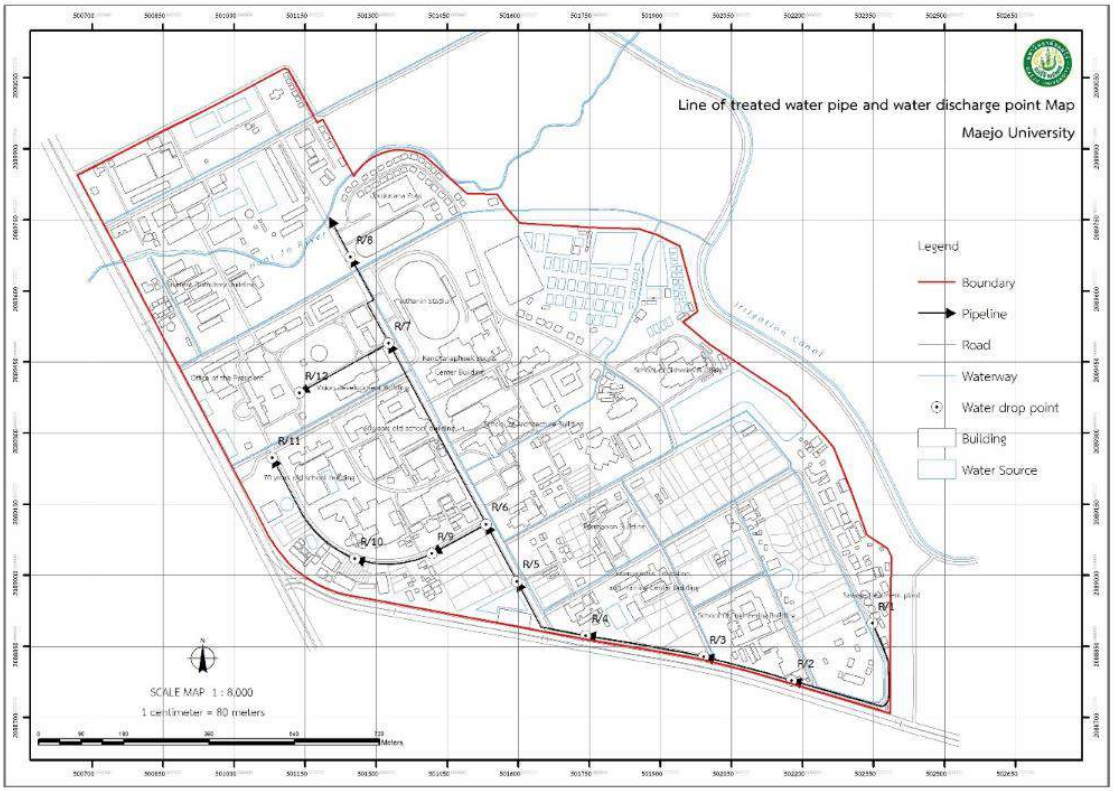
Maejo University has a 75,000-cubic meter raw water pond that supplies water for water supply Plant 1; a 20,000-cubic meter pond that provides water for water supply 2; a 32,200-cubic meter pond that supplies water for water supply Plant3; a 60,000-cubic meter pond that is used for agricultural purposes. All together, the total amount of surface water is 187,200 cubic meter. Meanwhile, Maejo University uses building water supply for 719,604 cubic meter in this year.

The percentage of treated water consumed from water system treatment compared to all water sources was 46.04 %, as shown in the equation below. The treated water of Maejo University between October 2020 to September 2021 has a total volume of 417,4544 m^3. All treated water were supply into pipe line to the 12 points of treated wastewater release throughout the university area for utilization.

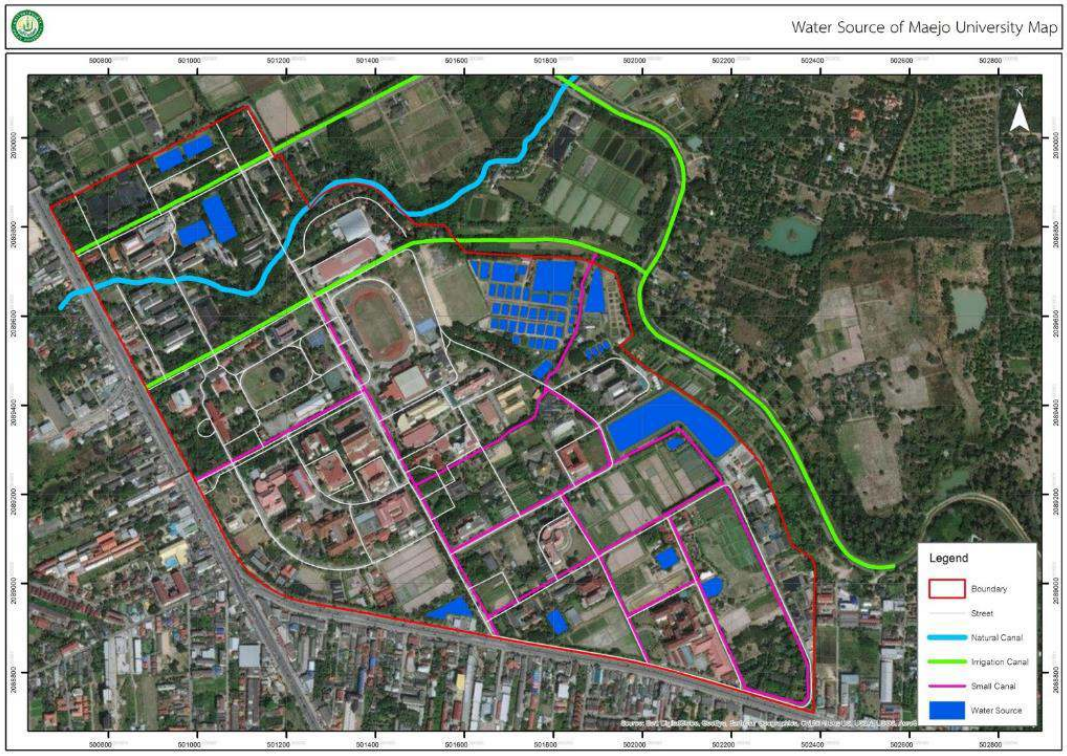
$$\frac{An\ amount\ of\ treated\ water\ consumed\ (417{,}454\ m^3)}{An\ Amount\ of\ tap\ water\ supply\ (719{,}604\ m^3) + \ surfacewater\ sources\ (187{,}200\ m^3)}$$

The data of tap water supply and treated water in Maejo University**.**

Month - Year	Building water supply (m^3)	Treated water (m^3)
Oct-20	75,970	38,583
Nov-20	80,087	35,518
Dec-20	69,712	35,307
Jan-21	54,624	35,342
Feb-21	71,690	31,543
Mar-21	71,862	31,876
Apr-21	52,071	35,486
May-21	64,293	33,715
Jun-21	32,574	34,629
Jul-21	47,793	33,539
Aug-21	46,021	36,233
Sep-21	52,907	35,683
Total	**719,604**	**417,454**



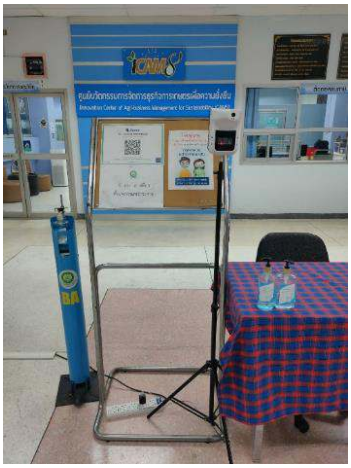
The map shows the point of treated wastewater release (R1 – R12)



Water source of Maejo Unversity map

Percentage of additional handwashing and sanitation facilities during Covid-19 pandemic

Maejo University has set a safety policy against the epidemic of the coronavirus-19 (covid-19) by providing temperature measurement, handwashing, and hand sanitizer service points before entering every building. In addition, inside all building have an alcohol gel hand washing station and liquid soap for washing hands in the bathroom. The percentage of hand washing and sanitation facilities on campus during pandemic was 100% as show in table and picture below.



Temperature measurement, handwashing, and hand sanitizer service points before entering every building

Handwashing facilities before entering building





Alcohol gel hand washing station in building and office room

The hand washing and sanitation facilities of building on campus

Faculty	Building	Quantity	
		Handwashing Facilities	Hand sanitizer
Faculty of Agricultural Production	Academic of Soil Science and Training Center of Advanced Soil and Fertilizer Building		1
	Kumjorn Boonpang Building		1
	200 yaer Rattanakosin Building		1
	Permpool Building		1
	Vegetable Laboratory Building		1
	Ornamental horticulture Laboratory Building		1
	Princess Mother Memorial Building	1	1
Faculty of Science	Saowarat Nityawattana Building		1

	60th year Maejo Building	1	1
	Chulabhorn Building	1	1
Faculty of Business Administration	25th year of Faculty of Business Administration Building	1	1
	Phitthayalongkorn Building		1
Faculty of Fisheries Technology and Aquatic Resources	Fishery Thchnology Laboratory Building		1
School of Tourism Development	Phra Chuwng Krasetsilp Building		1
	Suwanwajokkasikit Building		1

Faculty	**Building**	**Quantity**	
		Handwashing Facilities	**Hand sanitizer**
Faculty of Architecture and Environmental Design	Architecture and Environmental Design Building		1
	Architecture and Environmental Design Building (New)		1
School of Administrative Studies	Thep Pongphanit Building	1	1
School of Renewable Energy	Renewable Energy Calssroom Building		1
	Renewable Energy office Building		1
Faculty of Engineering and Agro-Industry	Smithanon Building		1
	Pilot factory building		1
	Rubber and Polymer Technology Building		1
	Agricultural Produce Packaging Building		1
	Service Building and Showroom		1
	Engineering Laboratory Building		1
	Engineering Laboratory Building Classroom		1
Faculty of Economics	Yangyong Sitthichai Building		1
Faculty of Liberal Arts	Prasert Na Nakorn Building	1	1
Faculty of Information and Communication Maejo University	75th year Maejo Building		1
Faculty of Animal Science and Technology	Faculty of Animal Science and Technology classroom building		1
	Faculty of Animal Science and Technology auditorium building		1

Faculty	Building	Quantity	
		Handwashing Facilities	Hand sanitizer
Administrative building	Dean office 2	1	1
	Dean office 3		1
	Chutiwat Auditorium		1
	Phaephuch Building		1
	Thep Sat Sathit Building		1
	Terdkrasikorn Canteen	1	1
	Princess Maha Chakri Sirindhorn Building	1	1
	70th year maejo building	1	1
	Um Nuay Yotsuk Building	1	1
	Wutthakard Building		1
	80th year maejo building	1	1
	Ubolratana Rajakanya swimmimg pool		1
	Wiphat Boonsri Wangsai Building	1	1
	Maejo University Saving Cooperative limited Building		1
	Inthanin Stadium's Stand		1
	Maejo Alumni Building		1
	Male dormitory 1		1
	Male dormitory 2		1
	Male dormitory 4		1
	Male dormitory 6		1
	Female dormitory 7		1
	Female dormitory 8		1
	Female dormitory 9		1
	Female dormitory 10		1
	Female dormitory 11		1
	Thummasakmontri Building		1
	Thummasakmontri Domitory Building		1
	International Education and Training Center		1
	The Office of Agricultural Research and Extension Maejo University Canteen		1
Total number of facilities		**13**	**61**
Total number of buildings		**61**	**61**
Percentage		**21.67**	**100**

[5] Transportation (TR)

Number of cars actively used and managed by University

Number of cars actively used and managed by University = 89 vehicles

[5.2] Number of cars entering the university daily

ADT = 1,254 PCUs per day (Motorbike = 0.33, Personal Car = 1.00, Bus/Truck = 1.50)

Number of cars = 963 cars

[5.3] Number of motorcycles entering the university daily

ADT = 1,254 PCUs per day (Motorbike = 0.33, Personal Car = 1.00, Bus/Truck = 1.50)

Number of motorcycles = 883 motorcycles

[5.4] The ratio of total vehicles (cars and motorcycles) divided by total campus population (TR.1)

(89+963+883) / 10,916 = 0.177
[3] < 0.5 – 0.125

Shuttle service

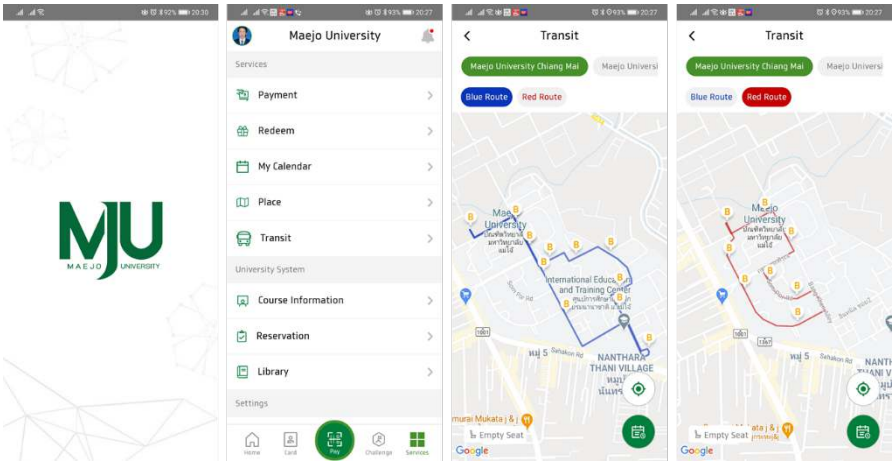
[5] Shuttle service is provided by the university, regular, and zero emission vehicle.

See more: https://erp.mju.ac.th/informationDetail.aspx?newsId=3618

[5.6] Number of shuttles operated in your university
Number of shuttles = 4 Electric Vehicles (2-18 seats EVs and 2-12 seats EVs)

[5.7] Average number of passengers of each shuttle
Average number of passengers of each shuttle = 8

[5.8] Total trips of shuttle services each day
Total trips of shuttle services each day = 126 km



Peak Hour Operation (8:00-10:00, 1200:-13:00, and 15:00-16:00)

Route	Description	Trip	Route Dist (km)	round Trip	Head Way (min)	Travel Speed (km/hr)	Require Bus for Operation		Spare Bus	Total bus
1	ประตูบางเขน-บริหารศาสตร์-ชูติวัตน์-แฟลตอาจารย์	ไป-กลับ	1.2	2.4	10	10	1.4	= 2	1	3
2	ประตูบางเขน-เรียนรวม 70 ปี-วิสัยทัศน์-จุฬาภรณ์ฯ-ประมง-วิศวะ-ประตูบางเขน	ทางเดียว	3.2	3.2	5	10	3.8	= 4	1	5
						Summary		6		8

Off-Peak Hour Operation (8:00-10:00, 1200:-13:00, and 15:00-16:00)

Route	Description	Trip	Route Dist (km)	round Trip	Head Way (min)	Travel Speed (km/hr)	Require Bus for Operation		Spare Bus	Total bus
1	ประตูบางเขน-บริหารศาสตร์-ชูติวัตน์-แฟลตอาจารย์	ไป-กลับ	1.2	2.4	15	10	1.0	= 1	1	2
2	ประตูบางเขน-เรียนรวม 70 ปี-วิสัยทัศน์-จุฬาภรณ์ฯ-ประมง-วิศวะ-ประตูบางเขน	ทางเดียว	3.2	3.2	15	10	1.3	= 2	1	3
						Summary		3		5

Zero Emission Vehicles (ZEV) policy on campus

[5] Zero Emission Vehicles are available and provided by the university free.

Maejo university still provided the free bicycles subsided and operated by own

- In 2020, the university provides new **180** bicycles for free service and distributes to the faculties and offices
- Maejo University plan to provide more free bicycles in the next year

- In addition, the Division of physical systems and Environment also trying to contact the other shared-bicycle service providers that interested to join in the university

[5.10] Average number of Zero Emission Vehicles (ZEV) on campus per day
Average number of ZEVs = 186 ZEVs per day

- 186 ZEVs (free bicycles) operated by the university

[5.11] The rotio of Zero Emission Vehicles (ZEV) divided by total campus population (TR.4)
(186) / (10,916) = 0.0170
[4] > 0.008 to <= 0.02

[5.12] Total parking area (m^2)
Total parking area = 32,041.60 m^2

Parking Types	Area (sq.m.)
1. Softscape with Compacted Soil	1,435.02
2. Softscape with Concrete Block	2,869.13

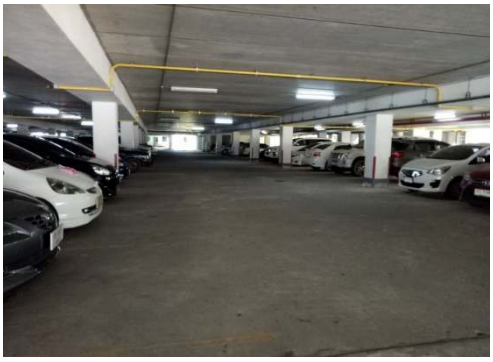
3. Hardscape with Asphalt Pavement	300.00
4. Hardscape with Concrete Pavement	10,144.20
5. In Building Parking or Structure	17,293.25
Total Parking	**32,041.60**


Softscape Parking with Compacted Soil


Softscape Parking with Concrete Block


Hardscape Parking with Asphalt Pavement


Hardscape Parking with Concrete Pavement




In Building Parking or Structure

[5.13] Ratio of parking area to total campus area (TR.5)
(32,041.60) / (3,374,680.54) * 100% = 0.9495 %
[5] < 1%

[5.14] Transportation program designed to limit or decrease parking area on campus over the last 3 years (from 2018 to 2021) (TR.6)
[4] Program resulting in 10% - 30% decrease in parking area between 2018-2021
Total Restrict Parking Area from 2018-2021 = 28.77% decreasing

The committees of Maejo university master plan (2018-2021) approved the parking restriction area around the Office of President as following;

- The parking area ① in the south of the Office of President reduced : 1,200 m^2 (approx. = 3.54%)
- The parking area ② in the south of the Office of President reduced : 2,800 m^2 (approx. = 8.27%)
- The parking area ③ in the south of the Office of President reduced : 1,200 m^2 (approx. = 3.25%)

The restrict parking area (2018-2020)

The committees of Maejo university master plan (2021) approved the parking restriction area around the Office of President as following;

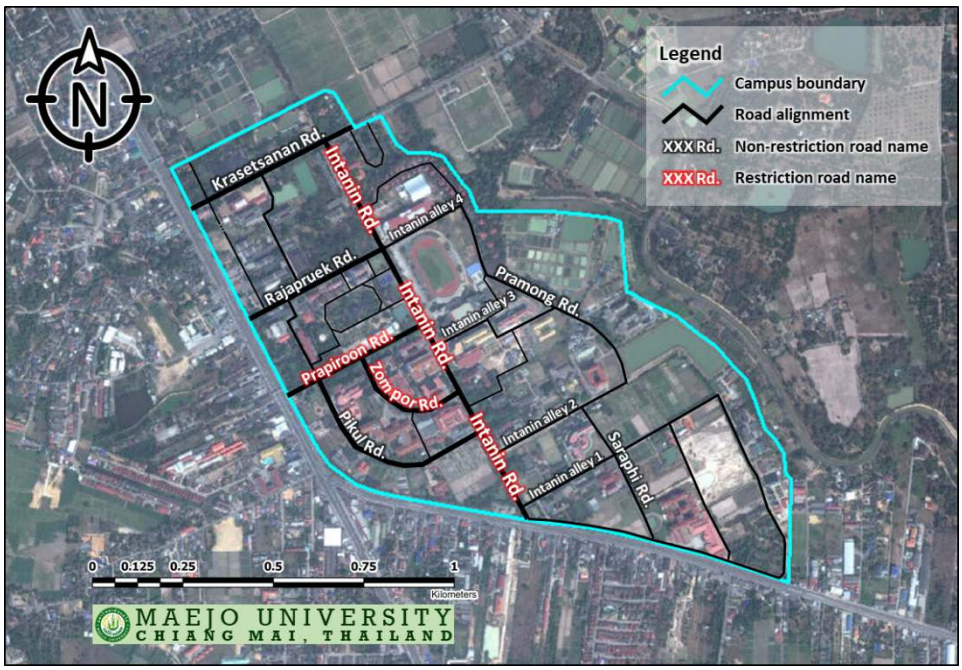
- The parking area ④ in the east of the Main Stadium reduced : 1,800 m^2 (approx. = 4.88%)

The committees of Maejo university master plan (2021) approved the parking restriction area around the Office of President as following;

- The parking area ⑤ in the east of the Main Stadium reduced : 1,820 m^2 (approx. = 4.93%)
- The parking area ⑥ in the east of the Main Stadium reduced : 1,440 m^2 (approx. = 3.90%)

The committees of Maejo university master plan (2018-2021) approved the traffic and parking restriction area to control the number of motor-vehicles traveling in the campus and to reduce the previous on-street parking in Intanin road, Prapiroon road, and Zompor road as shown below;

- The result found that the present parking area reduced : 40,902.43 m^2 to 34,744.03 m^2 (approx. = 15.06%)



Maejo university on-street parking restriction area

On-street parking restriction on Zompor Rd.

On-street parking restriction in front of the main library building and the central academic building
  On-street parking restriction on Intanin Rd.

[5.15] Number of transportation initiatives to decrease private vehicles on campus (TR.7)

[5] > 3 initiatives comprising
Result = 6 transportation initiatives + 3 planning initiatives to decrease private vehicles on campus

(1) free bike service operated and subsidized by the university as detailed in [5.9] and restricted bicycle lane in the main road network in the university

(2) parking restriction area around the Office of President (2018-2020) and parking restriction on on-street parking as detailed in [5.14] aim to reduce vehicle entering to in the central of university (Education Zone)

(3) MJU Transit operated for free inside the university area aim to change travel behavior from private vehicle to public transit in the campus

See more: http://www.green.mju.ac.th/?p=2443 and http://www.green.mju.ac.th/?page_id=2492

(4) MJU Car Free Day (23 September 2021)

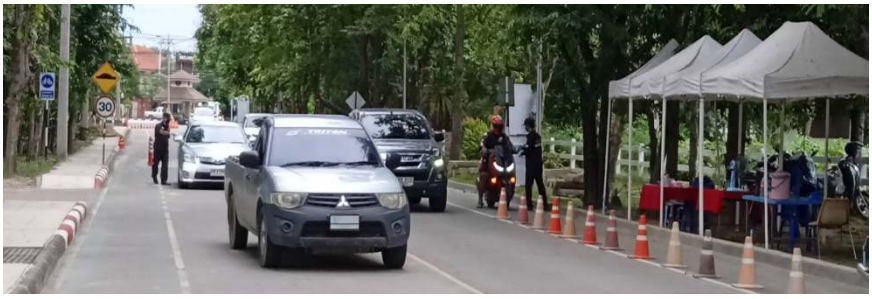
See more: http://www.green.mju.ac.th/?p=1539

(5) MJU Cycling Club (MJUCC) : the community club of cycling society in the university

The previous activities and details as following

https://www.facebook.com/pg/MJU-Cycling-Club-MJUCC-190221161338516/about/?ref=page_internal

(6) Gate Restriction and Control under COVID-19 situation (2020 – 2021)



(7) Smart Gate Project for Traffic Restriction and Control (preparing for 2022)

(8) Smart Parking Project for Traffic Restriction and Control (preparing for 2022)

(9) Smart Bicycle Project for Traffic Restriction and Control (preparing for 2022)

[5.16] Pedestrain path policy on campus (TR.8)

[5] Pedestrian paths are available, designed for safety, convenience, and in some parts provided with disabled-friendly features.

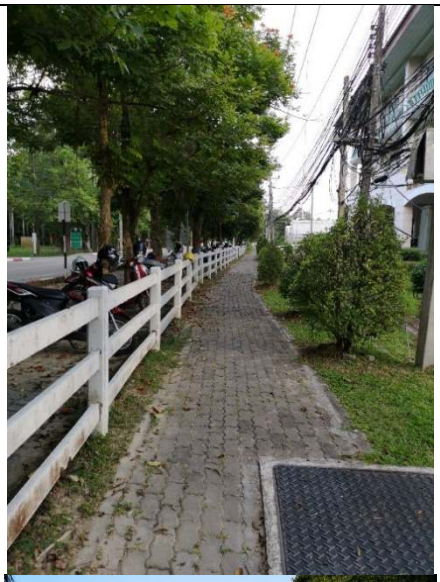
The pedestrian path on the main road of the campus (Intanin Rd.) has separated from road, leveling up platform, enough space, channelized control at intersection, in some path provided with disabled-friendly features, and surrounding with nature.

The most path, Ramps are provided with disabled-friendly features



The most path, Ramps are provided with disabled-friendly features


The pedestrian path on the minor road of the campus has separated from road, leveling up platform, enough space, covered by metal sheet roof structure, and surrounding with nature



The pedestrian path on some area has separated from road with guard rail

Information, direction signs and map installed at major activites area and intersection

[5.17] Approximate daily travel distance of vehicle inside campus only

Approximate VKT in the university = 1,478.90 km/day

Approximate daily travel distance of vehicle (VKT) inside campus was calculated from transportation 4-step model and calibrated with traffic surveying data as following;

Vehicle type	Vehicle Kilometer of Travel (VKT)
Motorbike	707.53 km/day
Personal Car	771.37 km/day
Bus and Truck	0 km/day
Total	**1,478.90 km/day**

[6] Education and research (ED)

[6.1] Number of Courses/Subjects Related to Sustainability Offered








Sample of activities in many courses related to green and sustainability

Number of courses/modules related to environment and sustainability offered in 2021 = **822** courses Number of total course in 2021 = **3624** ;
(http://www.education.mju.ac.th/www/programStructure)

The ratio of sustainability courses to total courses/subjects = $\frac{822 \times 100}{3624}$ = 22.68 %

	COURSECODE	COURSENAME	COURSENAME
1	กษ302	การเกษตรกับสิ่งแวดล้อม	Agriculture and the Environment
2	กษ311	เทคโนโลยีการใช้สารเคมีทางการเกษตรอย่างปลอดภัย	Safety Technology in the Use of Agrochemicals
3	กษ401	การจัดการวัสดุการเกษตรอย่างปลอดภัยและมีประสิทธิภาพ	Safety and Efficient Handling
4	กษ412	การผลิตพืชอาหารปลอดภัย	Safety Practices in Food Crop Production
5	กษ101	สังคมวิทยาเมืองและชนบท	Rural and Urban Sociology
6	กษ201	นิเวศวิทยา สิ่งแวดล้อม กับการพัฒนาชุมชน	Environment Ecology on Community Development
7	กษ204	ระบบเมืองและสภาพแวดล้อมทางกายภาพ	Urban System and Physical Environment
8	กษ212	นโยบายสาธารณะเพื่อการบริหารจัดการชุมชน	Public Policy for Community Administrative Management
9	กษ232	ระบบเมืองและสภาพแวดล้อมทางกายภาพ	Urban System and the Physical Environment
10	กษ251	สิทธิชุมชนในการจัดการทรัพยากรธรรมชาติและสิ่งแวดล้อม	Community Rights in Natural Resources and Environmental Management
11	กษ316	กระบวนการกลายเป็นเมืองและการเปลี่ยนแปลงทางสังคม	Urbanization and Social Change
12	กษ321	เศรษฐกิจพอเพียงและการพัฒนาที่ยั่งยืน	Sufficiency Economy and Sustainable Development
13	กษ323	การจัดการสิ่งแวดล้อมเพื่อชุมชน	Environmental Management for Communities
14	กษ324	ระบบเกษตรทางเลือกเพื่อการพัฒนาชุมชน	Alternative Agriculture System for Community Development
15	กษ326	ธุรกิจและสิ่งแวดล้อม	Business and Environment
16	กษ336	การจัดการท่องเที่ยวในชุมชน	Tourism Management in a Community
17	กษ339	การจัดการท่องเที่ยวในชุมชน	Tourism Management in a Community
18	กษ353	การจัดการทรัพยากรธรรมชาติและสิ่งแวดล้อมชุมชน	Community Natural Resources and Environmental Management
19	กษ355	เกษตรทางเลือกเพื่อพัฒนาชุมชน	Alternative Agriculture for Community Development
20	กษ425	การจัดการที่ดินและทรัพยากรโดยชุมชน	Community Management of Land and Natural Resources
21	กษ461	กฎหมายว่าด้วยการอนุรักษ์ทรัพยากรธรรมชาติ	Laws of Natural Resources Conservation
22	กฎ301	กีฏวิทยาทางการเกษตร	Agricultural Entomology
23	กฎ320	แมลงศัตรูสำคัญทางเศรษฐกิจ	Economic Entomology

35	กษ354	การตลาดเพื่อสังคม	Social Marketing
36	กษ336	กฎหมายอนุรักษ์ธรรมชาติและสิ่งแวดล้อม	Conservation of Nature and Environment Law
37	กษ412	ท้องถิ่นกับการจัดการทรัพยากรธรรมชาติและภัยพิบัติ	Local with Natural Resources Management and Environment
38	กษ510	การจัดการการท่องเที่ยวเชิงบูรณาการ	Integrated Tourism Management
39	กษ511	การจัดการแหล่งท่องเที่ยวเพื่อคุณภาพชีวิต	Wellness Tourism Destination Management
40	กษ512	การจัดการท่องเที่ยวเชิงเกษตรขั้นสูง	Advanced Agro-Tourism Management
41	กษ540	การตลาดท่องเที่ยวสีเขียว	Green Marketing Tourism
42	กษ550	การจัดการทรัพยากรมนุษย์สำหรับงานบริการ	Human Resource Management for Services
43	กษ710	ทฤษฎีการจัดการเชิงกลยุทธ์เพื่อการจัดการการท่องเที่ยว	Strategic Management Theories for Tourism Management
44	กษ712	การจัดการทรัพยากรธรรมชาติและสิ่งแวดล้อมสำหรับการท่องเที่ยว	Environmental and Natural Resources Management for Tourism
45	กบ260	กฎหมายเกี่ยวกับการท่องเที่ยว	Laws for Tourism
46	กบ300	การจัดการทรัพยากรมนุษย์เพื่อการบริการ	Human Resource Management for Services
47	กบ331	การจัดการการท่องเที่ยวอย่างยั่งยืน	Sustainable Tourism Management
48	กบ332	การขนส่งและโลจิสติกส์เพื่อการท่องเที่ยว	Transportation and Logistics for Tourism Industry
49	กบ335	การวางแผนและโครงการจัดการการท่องเที่ยวเชิงบูรณาการ	Planning and Project Management Integrated Tourism
50	กบ432	การดูนกเบื้องต้น	Introduction to Bird Watching
51	กป101	พื้นฐานการเกษตร	Basics of Agriculture
52	กป202	หลักวนวัฒนวิทยา	Principle of Silviculture
53	กป203	นิเวศวิทยาของพืช	Plant Ecology
54	กป211	การจัดการด้านการเกษตร	Agricultural Management
55	กป212	ปฐพีศาสตร์ประยุกต์	Applied Soil Science
56	กป222	ป่าและการป่าไม้	Forest and Forestry
57	กป321	การจัดการระบบเกษตรป่าไม้	Agroforestry System Management
58	กป323	การศึกษาเชิงวิเคราะห์ระบบเกษตรป่าไม้	An Analytical Study of Agroforestry System Conservation
59	กป324	นิเวศวิทยาเกษตรป่าไม้	Ecology of Agroforestry
60	กป325	การจัดการป่าชุมชน	Community Forest Management
61	กป374	การจัดการเกษตรพื้นที่สูง	Highland Agriculture Management

Some of sustainable course offered in 2021

The ratio of sustainability research funding to total research funding

Total research funds dedicated to sustainability research (in US Dollars)

Research fund	**Total research fund** (USD)	**Total research fund dedicated to sustainability research** (USD)
2019	2,472,275.10	1,451,998.27
2020	4,629,135.05	1,753,419.53
2021	4,700,822.50	3,335,958.71
Averaged last 3 years of research fund	**3,934,077.55**	**2,180,458.84**

**1 USD = 31.247 baht (6 October 2020) for 2019 and 2020*

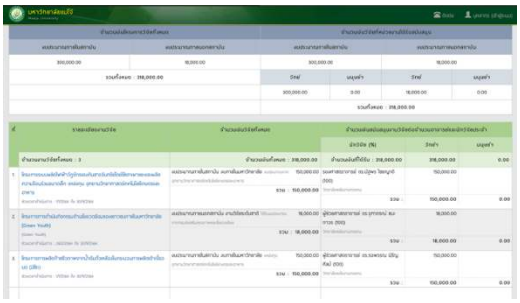
**1 USD = 33.375 bath, (27 October 2021) for 2021*

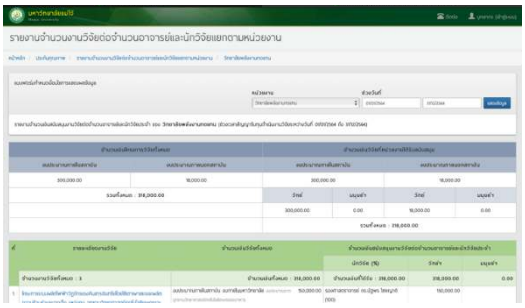
We attend to be green, organic, and eco university; therefore, the strategies of research and academic service trend to be in these lines. The keywords for this are green, sustainable, eco-, ecology, climate change, waste, energy, environment, and organic that found in both titles and keywords of the research. Thus, the ratio of sustainability research funding to total research funding in the last 3 years (2019-2021) is 55.42%.

The ratio of sustainability research funding to total research funding

= (2,180,458.84/3,934,077.55) x 100

= 55.42%





Lists of all research and the budget are available on https://erp.mju.ac.th/researchIndex.aspx)

The titles of green and sustainable research from 2019-2021 are represented as follows;

No.	Title of research (2019)	Budget (USD)
1	A Prototype Intelligent Drying System for Agricultural Processing	47,131.24
2	Application of Internet of Things (IoT) for Economic mushrooms and medicinal Plants.	42,992.29
3	Biological Studies and Optimum Storage Pods and Seeds of Anoectochilus burmanicus Rolfe for the Conservation and Sustainable Use.	10,965.85
4	Community Economic Production of Aquatic Animal for Communities Enterprise Development	110,413.80
5	Developing Maarketing Strategy of Organic Rice for Value-added at Doi Sa Ket District, Chiang Mai Province	30,550.77
6	Development of Golden Dried Longan Community Enterprises to Smart Agro-processing Industry	48,563.06
7	Development of Hill Tribe farmers Potential For Develop Agriculture and Sustainable Self Reliance on Highland in Royal Project Areas	35,341.31

No.	Title of research (2019)	Budget (USD)
8	Development of Modular Pilot Plant of the Insect Natural Enemies for Commercial Biological Control	311,367.49
9	Dynamics of Miang under Climate changed in Northern Thailand.	48,606.91
10	Economic Animal Production for Food Security and Safety	226,247.64
11	Effects of Various Organic Fertilizers to change Soil Nutrients of Organic Riceberry	7,832.75
12	Elicitation of Phytochemical Synthesis in San Pa Tong Rice Variety and Rice Phytochemical and Waste Production	93,927.10
13	Ethanol production from residue obtained from Hom-kaek syrup processing	12,961.24
14	Improving upland rice productivity system by cowpea (Vigna unquiculataL. Walp) and effective microorganisms	10,965.85
15	Increasing Production Potential of Oil Palm in Chumphon Province	32,054.92
16	Innovation for development of functional food and cosmetic from black glutinous rice	43,841.65
17	Innovative Agricultural Management for Sustainable Tourism in Chiang-Mai Province, Thailand	31,042.98
18	Innovative Management from Agricultural Residues towards Sustainable Community Enterprises.	55,230.26
19	Integration of Ancient Monasteries for Sustainable Tourism Promotion in Chiang Saen Ancient Town	37,251.58
20	Learning process for developing Potential management Creative Economy of community enterprise Samoeng District Chiangmai Province	32,036.04
21	Model of Organic innovation Development for improving capability for People with disabilities in Chiangmai	49,976.00
22	The development of Production Planning Recommendation System for Organic Product Case study Chiang Mai Organic Rice Producer group	15,665.50
23	The Study of Potentiality and Ecotourism Management Approach of Kun Satan	18,951.58

No.	Title of research (2019)	Budget (USD)
24	Tourism Activities Management for integrated Organic agriculture in Mae Jedi Sub District, Veiang-pah-pao, Chiangmai	98,080.46
	Total sustainable research fund	**1,753,419.53**

No.	Title of research (2020)	Budget (USD)
1	A Study on the Production Costs and Economic Returns of Insect Natural Enemy Production under the Value Chain System for Commercial Biological Control	16,530.57
2	Comparison of Arthrospira platensis and Wolffia globosa mix feed to produce field crab (Somanniathelphusa spp.) food safety for economic development of upper Northern Community and environment aspect	19,307.70
3	Developing of Advanced Materials for Agriculture and Alternative Energy Development	122,094.75
4	Developing of Advanced Materials for Agriculture and Alternative Energy Development	11,571.40
5	Development and Improvement of Crab Chili Paste Processing for Food Safety	7,075.08
6	Development of Communities Enterprise Toward Organic Tilapia (Oreochromis niloticus) Aquaculture Practices : Case Study Tilapia Farmers at Maekat, Parpai, Sansai, Chiang Mai, Thailand	16,927.30
7	Development of Modular Pilot Plant of the Insect Natural Enemies for Commercial Biological Control	151,419.98
8	Development of Modular Pilot Plant of the Insect Natural Enemies for Commercial Biological Control	105,795.62
9	Development of Monitoring and Evaluation System Management, Marketing and Services for Mass Production of the Insect Natural Enemies for Organic Agriculture	12,893.84
10	Development of pharmaceutical product from essential oils to eliminate lice and mite in indigenous chicken	6,281.61
11	Development of pharmaceutical product from essential oils to eliminate tick in cattle	11,571.40

No.	Title of research (2020)	Budget (USD)
12	Development of smart farm prototype using IoT for high density sea bass farming in closed systems for environmentally-friendly and sustainable	39,673.36
13	Development of waste removal in red tilapia (Oreochromis spp.) biofloc culture ponds by aquaponic system	19,836.68
14	Environment design and Potential development of urban area	85,443.18
15	Estimating species richness under the zero truncated mixed poisson distribution	7,600.75
16	Field crab, Arthrospira, Food safety, Organic, environment Crab chili paste giant freshwater prawn fresh coconut meal long pang kao mak performance fish polyculture aquaponics Fishery Management, Fishery Resource, Kew Lom Dam, Fishing Community, Community Enterprise.	139,846.56
17	Growing Media Production from Biochar by using Maize Residues in Community	10,810.99
18	Growth, Yield and Species Diversity of Teak (Tectona grandis Linn.) Plantation Under Different Age In Khun Mae Khum Mee Plantation, Phrae Province	21,489.73
19	Isolation of rice pathogens and rice endophytic bacteria from organic and chemical rice farms in northern part of Thailand for biological control of organic rice diseases	369,515.19
20	Master Plan Design and Planning of Building and Structure from Heat Radiation Impact to Micro-climate for Energy and Environmental Sustainability: A Case Study of Maejo University	11,573.71
21	Master Plan Design and Planning of Green area Surrounding a Building for Climate Control that is suitable for the Human Comfort : A Case Study of Maejo University	11,521.80
22	Master Plan Design and Planning of Green, Eco, and Smart University for Energy and Environmental Sustainability: A Case Study of Maejo University	51,866.96
23	Master Plan Design and Planning of Smart Transportation for Energy and Environmental Sustainability : A Case Study of Maejo University / Master Plan Design and Planning of Green, Eco, and Smart University for Energy and Environmental Sustainability : A Case Study of Maejo University	11,571.40

No.	Title of research (2020)	Budget (USD)
24	Pharmaceutics from essential oil for killing ectoparasites on dogs	13,812.94
25	Potential of Thai herbs and probiotics on growth and nonspecific immune response in organic Tilapia culture system	12,926.90
26	Potential Survey and Geo-Informatics System Development of Ancient city in the Chiang mai – Lumphun Basin for Spatial Smart City and Sustainable Tourism	15,393.26
27	Production and Health Management of Tilapia to Cope with Climate Uncertainties for Prosperous and Sustainable Business	12,067.31
28	Promoting Public Consciousness of People Utilizing Forest Recources in Khun Mae Kham Mee Plantation, Phrae Province	11,571.40
29	Removal of Odor in Longan after Sulfur Dioxide Fumigation by Activated Carbon from Agricultural Residue by using Microwave-Assisted Method	15,409.13
30	Strategy of local aquatic animal co-culture tilapia sustainable model under aquaponics system for organic communities enterprise developing supports.	32,135.42
31	Study of Efficacy of Garlic Extract Adding Feed in Nile Tilapia Culture for Production of Food Safety	24,233.81
32	Suitable use of fermented fish by-product and snail in diets for fish in aquaponics system to organic aquaculture	239,110.16
33	Suitable use of fermented fish by-product and snail in diets for fish in aquaponics system to organic aquaculture	32,466.03
34	Sustainable management of Teak Plantation in Khun Mae Kham Mee Plantation, Phrae Province	69,028.33
35	The supplemented extract from papaya peel and pineapple peels to increase the productivity of commercial sea bass and channel catfish	19,836.68
36	Using plant functional trait for evaluate carbon storage in Khun Mae Khum Mee Plantation, Phrae province	26,713.39
37	Utilization of the Insect Natural Enemies and their Beneficial Value for Biological Control of Insect Pests: the Case Study of insect pests in Organic Paddy Fields and Cruciferous Crops	12,893.84
38	Wastewater Treatment of Mohom Textile Industry Using Consortia of Microorganism	11,571.40

No.	Title of research (2020)	Budget (USD)
	Total sustainable research fund 2020	**1,451,998.27**

No.	Title of research (2021)	Budget (USD)
	Government source	
1	Enhancement of Thai Herbs Drying by using the Rotary Microwave Dryer System for the community Enterprise	39595.51
2	Adding value of the northern herbs of Ma-Kwaen (Zanthozylum limonella Alston) to the economic plants and the pharmaceutical products development	107865.17
	Project management	8988.76
4	Management and upgrading oil palm biomass as renewable energy for sustainable agricultural and environmental	131044.19
	Project management	6531.84
6	The Bamboo management in Phrae Province	113857.68
	Project management	20074.91
8	Integrative tourism promotion for Chumphon community-based tourism enlargement	128874.91
	Project management	22098.73
9	Product Development and Value-Added Economic Crops in Chumphon Province	74906.37
	Project management	7490.64
10	*Vigna unguiculata* spp. *sesquipedalis*) for Sustainable Organic Agriculture System	74906.37
	Project management	299.63
11	The prototype innovation of agricultural products and tourism service from community based by local wisdom based to the value added of consumer market for upper northern province sector 1	59925.09

No.	Title of research (2021)	Budget (USD)
	Project management	16479.40
12	Assessing the Potential of Building and Environment on the use of the Elderly in Chiang Mai Thammapakorn Elder Aid Centre	7490.64
13	Local Resources Management by Tourism Innovation for Sustainability of Community Based Tourism	66811.84
	Project management	3890.49
14	Caesalpinia sappan and Aloe vera - Derived Teat Sealant as Therapeutic for Mastitis in Dairy Cows	20044.19
	Other sources	
15	Developing a prototype for strawberry production in a closed crop system	11,008.24
16	A small plant for orchid culture, bottling to promote career and conservation of bottling orchids to promote career and orchid conservation of Ban Pong Krai community.	2,397.00
17	Enhancing Green Community in Smart Fish Farming in Chiang Mai Province	113,857.68
18	Technology transfer of Smart NPK application in combination with a portable soil analyzer for soil and fertilizer management for large crops	50,202.25
19	The process of developing innovative media (Production based) to enhance skills in preparing young people for careers in digital communication (Media Lab)	47,211.45
20	Biocatalytic reduction of carbonyl compounds by violet plants	7,490.64
21	Explore creative business information in Chiang Mai area	8,988.76
22	Research and development of antagonistic microorganisms for root rot and leaf spot control of fresh vegetables and technology transfer for biological pest management applications	89,737.83
23	Diversity of aquatic animals, plankton and water quality in Mae Chang Reservoir and Mae Kham Reservoir, EGAT Mae Moh, Lampang Province	63,768.15

No.	Title of research (2021)	Budget (USD)
24	Water management for the development of model communities and clean energy power generation Upper Mae Pae Basin, Ban Pae Subdistrict, Chom Thong District, Chiang Mai Province	100,553.26
25	Prototype production of personal protective clothing for medical personnel to have antimicrobial properties.	8,305.62
26	Improving of Different Factors Affecting on Growth and Quality of Some Ornamental Plants	4,495.10
27	Cucumber seed production in greenhouses using stingless bees (*Tetragonula laevicep*) as a pollinator	13,573.03
28	Development of planting process and natural dyeing with bio-innovation in Phrae Province	25,378.28
29	Low Cost Temporary Submerged Bioreactor Control System for Small Operators	7,490.64
30	Microcapsule antibacterial and insecticidal textile manufacturing process	7,490.64
31	Development of essential oil products to suppress bee mites using atmospheric pressure plasma technology.	7,490.64
32	Intelligent Live Aquatic Movement System	11,835.21
33	Community planning to maintain green areas in the city	104,868.91
34	Water management for the development of model communities and clean energy power generation Upper Mae Pae Basin, Ban Pae Subdistrict, Chom Thong District, Chiang Mai Province	100,553.26
35	Developing a model for food security through innovative aquaculture, crops and solar energy to support future climate change	102,067.66
36	Community business development through agricultural production supply chains To add value to the community economy in the highlands	104,492.04
37	The Effects of Responsible Tourism Management for Businesses, Communities and Visitors	80,299.63
38	Construction of a greenhouse solar drying greenhouse for dried banana blossoms	20,029.06

No.	Title of research (2021)	Budget (USD)
39	Production of fabrics for medical materials containing keratin from chicken feathers to be waterproof and antibacterial.	17,198.50
40	Sustainable Solid Waste Management and Policies (SWAP)	100,360.29
41	A study of the distribution of pollution by height and its application for the design of a vegetation barrier for environmental quality management	7,490.64
42	Project to promote and transfer technology, innovation, economic crop cultivation together with mycorrhiza mushroom cultivation for sustainable development of community economy.	38,451.06
43	Technology development and management for cultivating spirulina with a smart closed tank system	47,672.66
44	A study of industrial vetiver grass production system using transient sinking bioreactor as raw material for product development for root knot nematode control	16,746.04
45	Oxidative stress study as a tool for assessing environmental risks	17,977.53
46	Climate Change Risk Analysis and Success Factors of Climate Index Insurance for Thailand Rice Production	8,988.76
47	Formulation of an integrated science plan Research and Innovation for Sustainable Development in Northern Region	35,655.43
48	Development of a solar incubator with an automatic controlled supplement heating system with IoT technology	52,733.78
49	A study of the reduction of PM2.5 from the reduction of agricultural burning on the hills in the North with an alternative model that creates sustainability and is acceptable to agriculture	2,208.24
50	Cultural capital management in Phrae City to increase the competitiveness of cultural enterprise entrepreneurs	44,943.82
51	Restoration of the degraded watershed areas by planting mixed crops according to the ecological characteristics by cooperating with the local people in a spatial integration	8,988.76
52	Young Smart Farmer 4.0 (YSF 4.0) and modifying the university to create YSE 4.0	898.88
53	The research and development projects to increase the efficiency of hydrangea production, the Royal Project Foundation. Sub-project 5, the study of optimal timing for inducing hydrangea bud formation with potassium chlorate and gibberellic acid	1,836.70

No.	Title of research (2021)	Budget (USD)
54	Big Data Storage, Analysis and Access System (BIGDATA) Project Kit of the Royal Project Foundation Sub-project 3, Environmental and Agricultural Database Management, Royal Project	29,430.41
55	Persistent and Emerging Contaminants in the water Resources of the Ping River Catchment in Northern Thailand	62,545.65
56	A prototype of the development of a water production system for agriculture from the air by using ground cooling and solar energy	30,741.57
57	A small plant factory for cultivating orchids, launches bottles to promote career and orchid conservation, release bottles to promote careers and orchid conservation of Ban Pong Krai community	2,696.63
58	Survey of energy potential and living conditions for sustainable development in Ban Manora Community, Thung Yao Sub-district, Pai District, Mae Hong Son Province (to develop into a model village for tourism for education and renewable energy)	2,996.25
59	Development of ecotourism potential for conservation of upstream forest resources in the upstream reservoir area of the Royal Initiated Reservoir Project, Ban Phu Din, Mae Ho Phra Subdistrict, Chiang Mai Province	3,295.88
60	Approaches to the use of biotechnology and smart farms in farm management for safe and stable tilapia-tilapia production	2,247.19
61	Application of natural mechanism techniques to improve school environment to cope with the problem of fine dust (PM 2.5)	32,659.18
62	A prototype of the development of a water production system for agriculture from the air by using ground cooling and solar energy	30,741.57
63	Survey of energy potential and living conditions for sustainable development in Ban Manora Community, Thung Yao Sub-district, Pai District, Mae Hong Son Province (to develop into a model village for tourism for education and renewable energy)	2,996.25
64	Development of ecotourism potential for conservation of upstream forest resources in the upstream reservoir area of the Royal Initiated Reservoir Project, Ban Phu Din, Mae Ho Phra Subdistrict, Chiang Mai Province	3,295.88
65	Approaches to the use of biotechnology and smart farms in farm management for safe and stable tilapia-tilapia production	2,247.19

No.	Title of research (2021)	Budget (USD)
66	Mae Chaem Safe Nature Project (Mae Pan-San Kiang Model) : Research and development of a model community towards a sustainable community for conserving water, forests and occupations that are environmentally friendly.	59,820.22
67	Combined heat generation system from infectious medical waste	29,962.55
68	Research and development of cannabis strains that provide medicinal cannabinoids	633,369.89
	Total sustainable research fund 2021	**3,335,958.71**

Number of scholarly publications on sustainability

The publication that we selected to the list of sustainability were based on the keywords; green, organic, sustainable, environment, climate, energy and ecology. This year, we used the new method for management in publication database. The number of publication articles comes from three sources as; database of publication on Scopus, Web of Science between January, 1st - August, 31st 2021, and TCI database.

The number of scholarly publications on sustainability (average 3 years) is **121.33**

(44+ 83+237= **364)**

364/3 = 121.33

Number of scholarly publications on sustainability			
2019	2020	2021	**average**
44	83	237	**121.33**

Sample of publication database of 2021. (All articles are presented on https://green.mju.ac.th/?page_id=246)

Orde		Title	Authors with affiliations	Year	Source title	Volume	Issue	Page sta	Page e	DOI
1	Green	(lp1,...,lpn)-Privacy: privac	Riyana, S., Digital Technolog	2021	Journal of Ambient Intelligence and Humanized C	12	10	9713	9729	10.1007/s12652-
2	Green	6-Benzylaminopurine app	Puangkrit, T., Faculty of Agr	2021	Acta Horticulturae	1312		157	164	10.17660/ActaHo
3	Green	A critical review on differe	Ananthi, V., Department of	2021	Science of the Total Environment	780				10.1016/j.scitoter
4	Green	A critical review on produ	Kartik, A., Department of Ch	2021	Bioresource Technology	329				10.1016/j.biortec
5	Green	A detailed scrutinize on p	Ganesan, R., Department of	2021	Science of the Total Environment	777				10.1016/j.scitoter
7	Green	A multigeneration system	Chaiyat, N., School of Renev	2021	Thermal Science and Engineering Progress	21				10.1016/j.tsep.20
8	Green	A New Approach to Hyers	Govindan, V., Department c	2021	Journal of Function Spaces	2021				10.1155/2021/66
9	Green	A novel investigation of m	Kraisittipanit, R., Program o	2021	International Journal of Agricultural Technology	17	4	1363	1372	
12	Green	A simple Analog to Digital	Kongpark, P., Faculty of Sci	2021	2021 Joint 6th International Conference on Digital Arts, Media and Technolog			124	127	10.1109/ECTIDAN
14	Green	Advancement of fermenta	Trejo, M., School of Renewa	2021	Environment, Development and Sustainability					10.1007/s10668-
16	Green	Alternative-Ingredient Rec	Nadee, W., Information Tecl	2021	2021 Joint 6th International Conference on Digital Arts, Media and Technolog			14	17	10.1109/ECTIDAN
19	Green	An exploratory cross-cult	Yeh, C.J., Department of Hu	2021	Early Child Development and Care	191	3	373	388	10.1080/030044
20	Green	An Implementation of Prc	Khoenkaw, P., Faculty of Sci	2021	2021 Joint 6th International Conference on Digital Arts, Media and Technolog			31	36	10.1109/ECTIDAN
21	Green	An in vitro investigation c	Narayanan, M., PG and Res	2021	Process Biochemistry	109		178	185	10.1016/j.procbio
22	Green	Analytical approach of Fe	Humphries, U., Department	2021	International Journal of Engineering, Transactions	34	2	517	527	10.5829/IJE.2021.
24	Green	Antibacterial and antioxid	Ramli, A.N.M., Faculty of Inc	2021	Journal of Food Processing and Preservation	45	1			10.1111/jfpp.149
25	Green	Antidiabetic and renoprot	Boonphang, O., Department	2021	Molecules	26	7			10.3390/molecule
26	Green	Anti-HIV-1 reverse transcı	Choengpanya, K., Program i	2021	Saudi Journal of Biological Sciences	28	5	2807	2815	10.1016/j.sjbs.20
27	Green	Antioxidant activities and	Tandee, K., Faculty of Engin	2021	Food Chemistry	348				10.1016/j.foodch
28	Green	Antioxidative study of pol	Bhuyar, P., Algae Biotechno	2021	SN Applied Sciences	3	4			10.1007/s42452-
29	Green	Appropriateness of waste	Khammee, P., School of Ren	2021	3 Biotech	11	5			10.1007/s13205-
30	Green	Asset Management Syste	Wongarsa, D., Faculty of Sci	2021	2021 Joint 6th International Conference on Digital Arts, Media and Technolog	120	123			10.1109/ECTIDAN
31	Green	Automatic Pencil Sketch L	Khayan, A., Faculty of Scien	2021	2021 Joint 6th International Conference on Digital Arts, Media and Technolog	27	30			10.1109/ECTIDAN
32	Green	Automatic Thermal Stress	Kitpitak, N., Faculty of Scien	2021	2021 Joint 6th International Conference on Digital Arts, Media and Technolog	180	184			10.1109/ECTIDAN
33	Green	Bioactive compounds and	Amornlerdpison, D., Center	2021	Applied Sciences (Switzerland)	11	1	1	8	10.3390/app1101
34	Green	Biodegradation competen	Whangchai, K., Center of Ex	2021	Chemosphere	276				10.1016/j.chemos
35	Green	Biodiesel production thro	Davoodbasha, M., School of	2021	Fuel	300				10.1016/j.fuel.20
36	Green	Biodiversity and spatioter	Yotkham, S., Department of	2021	Insects	12	1	1	13	10.3390/insects1
37	Green	Bioethanol production fro	Mariano, A.P.B., School of R	2021	International Journal of Energy Research	45	6	8140	8150	10.1002/er.5544
38	Green	Biogas production from h	Sonwai, A., Department of E	2021	Journal of Environmental Management	299				10.1016/j.jenvma
39	Green	Biogas production from n	Souvannasouk, V., Master F	2021	International Journal of Innovative Research and S	4	3	174	180	10.53894/ijirss.v4
40	Green	Biomacromolecules of chi	Govindan, P., Department o	2021	Environmental Research	202				10.1016/j.envres.
41	Green	Bio-refinery approaches b	Thangam, K.R., Centre for R	2021	Science of the Total Environment	785				10.1016/j.scitoter

Database of publication on Scopus

database of publication on Web of Science between January, 1st - August, 31st 2021

		Article Title	Author(s) and Affiliation	Source Title	cument	Publisher	lisher A	ISSN	eISSN	al A
2	Green	A critical review on different harvesting techniques for algal bi	[Ananthi, V] PRIST Univ, Dept Microbiol, Ma	SCIENCE OF THE TOTA	Review	ELSEVIER	RADARWI	0048-969	1879-102	SCI
3	Green	A critical review on production of biopolymers from algae biom	[Kartik, Ashokkumar; Akhil, Dilipkumar; Laks	BIORESOURCE TECHN	Review	ELSEVIER SCI LT	THE BOUI	0960-852	1873-297	BIO
4	Green	A detailed scrutinize on panorama of catalysts in biodiesel synt	[Ganesan, Ramya] St Josephs Inst Technol, O	SCIENCE OF THE TOTA	Review	ELSEVIER	RADARWI	0048-969	1879-102	SCI
5	Green	A multigeneration system of combined cooling, heating, and p	[Chaiyat, Nattaporn] Maejo Univ, Sch Renew	THERMAL SCIENCE AN	Article	ELSEVIER	RADARWI	2451-904		TH
10	Green	An in vitro investigation of the antidermatophytic, antioxidant,	[Narayanan, Mathiyazhagan; Jayashree, Tha	PROCESS BIOCHEMIST	Article	ELSEVIER SCI LT	THE BOUI	1359-511	1873-329	PR
12	Green	Antibacterial and antioxidative activity of the essential oil and	[Ramli, Aizi Nor Mazila; Badrulzaman, Sharif	JOURNAL OF FOOD PR	Article	WILEY	111 RIVEF	0145-889	1745-454	J FO
13	Green	Antidiabetic and Renoprotective Effects of Coffea arabica Pulp	[Boonphang, Oranit; Phatsara, Manussabhor	MOLECULES	Article	MDPI	ST ALBAN		1420-304	MO
14	Green	Anti-HIV-1 reverse transcriptase property of some edible mush	[Choengpanya, Khuanjarat] Maejo Univ, Pro	SAUDI JOURNAL OF BI	Article	ELSEVIER	RADARWI	1319-562	2213-710	SAU
15	Green	Antioxidant activities and volatile compounds in longan (Dimoc	[Tandee, Kanokwan] Maejo Univ, Fac Engn &	FOOD CHEMISTRY	Article	ELSEVIER SCI LT	THE BOUI	0308-814	1873-707	FO
17	Green	Appropriateness of waste jasmine flower for bioethanol conve	[Khammee, Phitchaphorn; Ramaraj, Ramesh	3 BIOTECH	Article	SPRINGER HEIDI	TIERGART	2190-572	2190-573	3 B
19	Green	Biodegradation competence of Streptomyces toxytricini D2 iso	[Whangchai, Kanda] Chiang Mai Univ, Ctr Ex	CHEMOSPHERE	Article	PERGAMON-ELS	THE BOUI	0045-653	1879-129	CH
20	Green	Biodiesel production through transesterification of Chlorella vu	[Davoodbasha, MubarakAli] BS Abdur Rahm	FUEL	Article	ELSEVIER SCI LT	THE BOUI	0016-236	1873-715	FU
22	Green	Bioethanol production from coconut pulp residue using hydrotl	[Mariano, Alissandra Pauline B.; Ramaraj, R	INTERNATIONAL JOUR	Article	WILEY	111 RIVEF	0363-907	1099-114	INT
23	Green	Bio-refinery approaches based concomitant microalgal biofuel	[Thangam, K. Rohitha; Santhiya, A.; Sri, S. R.	SCIENCE OF THE TOTA	Article	ELSEVIER	RADARWI	0048-969	1879-102	SCI
25	Green	Co-hydrothermal gasification of microbial sludge and algae Ka	[Jayaraman, Ramesh Sai; Gopinath, Kannapa	INTERNATIONAL JOUR	Article	PERGAMON-ELS	THE BOUI	0360-319	1879-348	INT
26	Green	Comparative effect of Volvariella volvacea-treated rice straw a	[Khonkhaeng, Benjamad; Cherdthong, Anusc	LIVESTOCK SCIENCE	Article	ELSEVIER	RADARWI	1871-141	1878-049	LIV
28	Green	Cunninghamella saisamornae (Cunninghamellaceae, Mucorale	[Suwannarach, N. A. K. A. R. I. N.; Kumla, J. A	PHYTOTAXA	Article	MAGNOLIA PRE	PO BOX 4	1179-315	1179-316	PH
29	Green	Current strategies and prospects in algae for remediation and	[Kandasamy, Sabariswaran; He, Zhixia] Jiang	BIOCATALYSIS AND AG	Review	ELSEVIER	RADARWI		1878-818	BIO
30	Green	Customized yeast cell factories for biopharmaceuticals: from c	[Madhavan, Aravind; Arun, K. B.] Rajiv Gand	MICROBIAL CELL FACT	Review	BMC	CAMPUS,		1475-285	MI
32	Green	Development of a closed-loop control system for microwave fr	[Sujinda, Narathip; Varith, Jaturapatr; Jaturo	JOURNAL OF FOOD EN	Article	ELSEVIER SCI LT	THE BOUI	0260-877	1873-577	J FO
36	Green	Effect of algae (Scenedesmus obliquus) biomass pre-treatment	[Mahima, Jain; Sundaresh, Ramesh Kumar; C	SCIENCE OF THE TOTA	Article	ELSEVIER	RADARWI	0048-969	1879-102	SCI
37	Green	Effect of feeding a pellet diet containing high sulphur with fres	[Prachumchai, Rittikeard; Cherdthong, Anusc	JOURNAL OF ANIMAL I	Article	WILEY	111 RIVEF	0931-243	1439-039	J AI
38	Green	Effect of freshwater fish oil feed supplementation on the repro	[Sattang, Supaporn; Amornlerdpison, Doung	AQUACULTURE REPOF	Article	ELSEVIER	RADARWI	2352-513		AQ
39	Green	Effect of partial substitution of wheat flour with resistant starc	[Petchoo, Jaruneth; Jittinandana, Sitima; Tun	INTERNATIONAL JOUR	Article	WILEY	111 RIVEF	0950-542	1365-262	INT
40	Green	Effect of Pretreatment Processes on Biogenic Amines Content	[Makhamrueang, Netnapa; Chaiyana, Wanti	FOODS	Article	MDPI	ST ALBAN		2304-815	FO
41	Green	Effects of substrate concentration and hydraulic retention time	[Van Giang Tran; Ramaraj, Rameshprabu] M	INTERNATIONAL JOUR	Article	PERGAMON-ELS	THE BOUI	0360-319	1879-348	INT
42	Green	Eggshells biowaste for hydroxyapatite green synthesis using ex	[Umesh, Mridul; Choudhury, Debasree Dutta	ENVIRONMENTAL RES	Article	ACADEMIC PRE	525 B ST,	0013-935	1096-095	EN
43	Green	Energy, exergy, economic, and environmental analysis of an or	[Chaiyat, Nattaporn] Maejo Univ, Sch Renew	THERMAL SCIENCE AN	Article	ELSEVIER	RADARWI	2451-904		TH
44	Green	Enhanced photocatalytic degradation of water pollutants using	[Vasantharaj, Seerangaraj; Senthilkumar, Pa	JOURNAL OF ENVIRON	Article	ELSEVIER SCI LT	THE BOUI		2213-343	J EI
45	Green	Episodically volatile high energy non-cohesive river-floodplain	[Wasson, Robert J.; Lim, Han She] James Coc	GEOMORPHOLOGY	Review	ELSEVIER	RADARWI	0169-555	1872-695	GE
46	Green	Estimating carbon biomass in forests using incomplete data	[Wijedasa, Lahiru Suranga] Natl Univ Singap	BIOTROPICA	Article	WILEY	111 RIVEF	0006-360	1744-742	BIO
47	Green	Evaluation of antibacterial, antioxidant, and nephroprotective	[Narayanan, Mathiyazhagan; Krishnan, Laks	PROCESS BIOCHEMIST	Article	ELSEVIER SCI LT	THE BOUI	1359-511	1873-329	PR
48	Green	Evaluation of microalgal strains and microalgal consortium for	[Arutselvan, Chithirai; Narchonai, Ganesan;	BIORESOURCE TECHN	Article	ELSEVIER SCI LT	THE BOUI	0960-852	1873-297	BIO
49	Green	Evaluation of sacha inchi meal as a novel alternative plant pro	[Khieokhajonkhet, Anurak; Aeksiri, Niran] Na	ANIMAL FEED SCIENCE	Article	ELSEVIER	RADARWI	0377-840	1873-221	AN
51	Green	Fabrication and characterization of in vitro 2D skin model-An a	[Pandiyan, Rajesh] Bharath Inst Higher Educ	PROCESS BIOCHEMIST	Article	ELSEVIER SCI LT	THE BOUI	1359-511	1873-329	PR
52	Green	Filamentous fungi with high paraquat-degrading activity isolat	[Wongputtisin, P.; Supo, C.] Maejo Univ, Fac	LETTERS IN APPLIED M	Article	WILEY	111 RIVEF	0266-825	1472-765	LE

Database of publications on Web of Science

ฐานข้อมูล TCI ข้อมูลระหว่างวันที่ 1 มกราคม - 31 สิงหาคม 2564

No.	Article name	Author	Affiliation	Journal	Volume
1	คุณภาพผลและปริมาณธาตุอาหารในใบของส้มโอพันธุ์ทองดีและแซนด์เลอร์ที่ผลิตนอกฤดูและในฤดู	สาวิกา กอนแสง	คณะผลิตกรรมการเกษ	วารสารเกษตร	37
2	คุณภาพผลและปริมาณธาตุอาหารในใบของส้มโอพันธุ์ทองดีและแซนด์เลอร์ที่ผลิตนอกฤดูและในฤดู	เพ็ญนภา จักรสมศักดิ์	คณะผลิตกรรมการเกษ	วารสารเกษตร	37
3	Determinants of economic practices among elderly urban migrants in khon kaen, thailand	Saowalak Chaytaweep	คณะศิลปศาสตร์	Kasetsart Journal of	42

Database of publications on TCI database

No.	Scholarly publications on sustainability (2020)
1	Self-management process of Ban Mankong Community, Wat Chiang Yuen, Nakornping, Muang Chiang Mai
2	The process of physical transition from community to university city Maejo University Case Study, Chiang Mai
3	A learning process that promotes the design of spatial planning together through real experience.
4	A group of microorganisms featured in the system produces biogas from salads, ponds, and longan shells.
5	Access to organic rice production certified by farmers in Chiang Mai
6	The elimination of bacteria that produce corn cob enzymes to produce as feed raw materials, the sorting of bacteria that produce corn cob digestive enzymes to produce as feed raw materials.
7	Selection of species for the restoration of deciduous forests in the upstream area of Ban Boon Chaem. Rong Kwang District, Phrae Province
8	Energy management of refrigeration systems in the frozen food industry
9	Energy management of refrigeration systems in the frozen food industry
10	Testing for fuel-based vehicles from transverse biomass gas furnaces
11	Consumption of organic products and food of the people in San Sai District, Chiang Mai Province.
12	Engaged water management of Mae Jai River User Group Network Fang District, Chiang Mai Province
13	Evaluation of the life cycle of the organic rankin cycle in conjunction with the centralized drying chamber from geothermal energy.
14	Application of clean technology to reduce loss in the lettuce wrap sorting process.
15	Application of geographic information system to study changes in land utilization in Mae Tom Basin Muang Koi, Chiang Mai
16	Changes in the amorphous structure of the city from the new city bypass road. Case Study of San Phe Saur Municipality and Muang Kaeo Sub-district Municipality, Chiang Mai Province
17	Processing of baking cups from brown rice germination, organic red jasmine.
18	Biodiesel production from used vegetable oils using longan ash as a catalyst

No.	Scholarly publications on sustainability (2020)
19	Electricity generation combined with cooling and heating from San Kamphaeng's stepped geothermal energy technology
20	Development of concrete blocks from aromatic zucchini
21	Development of energy-saving noodle drying machine
22	Developing public policy with clear practices to green localities
23	Web application development for the performance monitoring system of solar power generation system
24	Community-level biogas improvement equipment development
25	Relying on non-wood forest products in ban O community forests Tumbol Bansantakaew, Amphoe Mae Tha, Lampang
26	Community involvement in water management of Klong Rua village Tumbol Paksong, Amphoe Pha to, Chumphon
27	Acceptance of methods of planting under good and appropriate agricultural practices (GAP) of farmers, Luang Mon Wana Project Development Center, Mae Taeng District, Chiang Mai Province.
28	Learning by student discovery, case study subjects, geo-architectural design practices.
29	Analysis of the properties of bio charcoal from husks and corn cob to improve the soil.
30	Analysis of Sustainable Community Development Indicators: Mae Faek Sub-district Municipality Case, San Sai District, Chiang Mai Province
31	Economic analysis of 8 MW solar power plant between fixed installation and solar tracking system in Thailand.
32	Analysis of 8 MW solar power plant economics Between fixed and sun tracking installation in Thailand.
33	Studies of increasing the oil content of tea seeds oil (*Camellia oleifera* Abel.) after harvesting.
34	Study of the strength of the roof frame of the factory building, where solar panels are installed, different distance levels to reduce the temperature under the panels.
35	A feasibility study of Venjury in carbon dioxide filling systems For closed-loop algae culture
36	Feasibility study of electricity generation by wind power in the pan basin area Chiang Mai Lamphun

No.	Scholarly publications on sustainability (2020)
37	Study the physical and chemical characteristics of tea seeds oil (Camellia oleifera Abel.) after harvesting.
38	Study of tourism potential in Chiang Mai Old Town
39	A study of the performance of the solar power generation system and the basic electricity system for a fish pond inflators.
40	Communication for the development of the Chiang Mai environment in a way: Spark U Chiang Mai project implements change
41	The supplementation of the pellet edible Rain tree leaf formula improves the kinetics of gas production, digestion and fermentation processes in vitro.
42	Reinforcing the mass transfer rate of carbon dioxide in the carbonator series for spirulina culture
43	Power sharing system design with time-division multiplexer technique for agricultural water pumps
44	Agricultural Sustainability of Sugarcane Farmers in Udon Thani
45	The relationship of organic carbon by the Permanganate Ossidice Sable and Organic products is an index of the quality of the soil growing laiya and rice-growing soil.
46	Diversity and plant utilization in the conservation forest area of the forest garden. Forest Industry Organization
47	The diversity of species and ecology of wild mushrooms can be eaten in the forest area of Ban Bun Chaem Community, Phrae Province.
48	The quality of arabica coffee beans grown under different forest conditions in the royal project area in Ban Khun Tap area. Tumbol Doi Kaeo, Amphoe Chom Thong, Chiang Mai
49	Energy index of fish pond aeration systems powered by photovoltaic systems combined with basic electrical systems
50	Textbooks, treatments and waste utilization
51	Take off the flood lessons in the sustainable upstream forest conservation process: a case study of Ban Boon Chaem Community Forest
52	Oil extraction techniques and biodiesel production from seed oil
53	Fuel furnace design technology for steaming mushroom cubes Case Study: Ban Luang Farmer, Mae Ai District, Chiang Mai

No.	Scholarly publications on sustainability (2020)
54	Landscape architecture concept to alleviate flooding in sub-municipality Nong Jom, Sansai, Chiang Mai
55	Financial management guidelines using the information system of the organic soy bean producers
56	Guidelines for youth tourism development for sustainable community tourism management Tumbol Kod Chang, Amphoe Mae Taeng, Chiang Mai
57	Modeling the structural equations influencing the decision to produce organic rice in Chiang Mai
58	Biodiesel from Coconut Processing Industry Waste
59	The effectiveness of certain essential oils on the control of *Tropilaelaps mercedesae* mites in bee species (*Apis mellifera* L.)
60	The volume of wood chips after the total cutting of teak wood, aged 37, in Suan Pa Thong Pha Phum, Kanchanaburi Province.
6**1**	Factors affecting the acceptance of organic rice production of farmers in Chiang Mai
62	Solar impact and labor force on the financial value of solar rice mills
63	The effect of moringa leaves on the substitute of soybean meal on gas production kinetics, digestion capacity, and in vitro fermentation processes.
64	The effect of replacing soybean meal with crushed leaves on gas production kinetics In vitro gas production techniques are used to process gas production in vitro.
65	The effect of organic fertilizer on the yield and chemical composition of Napier Pak Chong 1
66	The effect of coffee bean shells and coffee grounds on the properties of fuel. Biomass Pellets
67	The effect of the cassava leaf formula includes the pellets. Gas production kinetics, sub-capacity and fermentation processes using in vitro gas production techniques.
68	Drought and flood risk areas, Mae Tha Basin, Lamphun Province
69	The control system and microcontroller from the PLC main control via the Internet of power generation system with the organic rangkin of San Kamphaeng Hot Springs Business, Mae On District, according to the Royal Initiative.
70	A form of conservation and restoration of folk sailing for ecotourism. Lamae District, Chumphon

No.	Scholarly publications on sustainability (2020)
71	Analyze the differences in decisions to buy organic products between urban and out-of-town consumers in Chiang Mai.
72	Learn the influence of turbine cover on the features of the Savonias wind turbine.
73	Maintaining status and approach to maintaining suburban agricultural land by promoting the role of cultural ecosystem service : San Kamphaeng District Case Study
74	Performance of rice drying system using integrated thermal energy sources
75	Influence of disclosure of sustainability report on business value
76	The influence of the corn cob on the properties of rubber flooring sheets from rubber.
77	Application of Compost Produced from the Wastewater of Mulberry Pulp and Paper Handicrafts on Soil Bioremediation
78	Impact of Climate Change on Oil Palm Production in Southern Thailand
79	Impacts of Climate Change and Adaptation Simulation for Risk Reduction of Rain-fed Rice Production in Central Region
80	Impacts of Migrant Labors on the Economics, Social and Environment on Chiang Mai District, Chiang Mai Province
81	The Impact Assessment of Climate Changes toward People's Healthy in Bangkok Metropolis
82	The Study of Temperature from Heat Transfer through Building Envelopes to Design Guidelines and Renovation High-performance Wall for Thai Lanna Vernacular Houses in Hot-humid Climate
83	Tobacco waste residue as the N-source for composting

No.	Scholarly publications on sustainability (2019)
1	Antibacterial, Antioxidant Properties and Bioactive Compounds of Thai Cultivated Mushroom Extracts against Food-borne Bacterial Strains
2	Dry Anaerobic Digestion of Sweet Corn Waste: Pilot Scale Study
3	Effect of gaseous ozone fumigation on organophosphate pesticide degradation of dried chilies
4	Effect of Plant Shading and Water Consumption on Heat Reduction of Ambient

No.	Scholarly publications on sustainability (2019)
5	Enhanced gas sensing performance of Ru-loaded p-type Co_3O_4 nanoparticles
6	Glucose Biosensors based on Nickel Ferrite Composite materials modified Glassy Carbon Electrode
7	Influence of Longan Biochar on Soil Temperature, Chemical Properties and Plant Growth in Loamy Sand
8	Influence of organic fertilizers on Growth and Yield of Piper sarmoentosum Roxb.
9	Microbial Production of Syrup from Broken Organic Jasmine Rice Grain
10	Microfluidic paper-based devices for arsenic (V) detection in contaminated environmental samples
11	Production of Briquette from agricultural residue
12	Synthesis of Molybdenum Trioxide: Structure Properties and Sensing Film Preparation
13	The Use of Bioreactor System and Aquatic Plants (Water Hyacinth) for Aquaculture Wastewater Treatment
14	The selection and classification of bacteria produces aminocyclopropane-1-carboxylate (acc) deaminase enzymes to help reduce stress conditions in organic plants.
15	The growth and yield of rice under different phosphorus fertilizer levels.
16	Energy consumption for organic riceberry production
17	Heat transfer test of the material sheet made of agricultural waste material with cement as a solder.
18	Vehicle performance testing using fuel from a transverse biomass gas burner
19	High efficiency biomass furnace performance assessment when entering corn cob pellets continuously
20	The application of geopolymer/zirconium oxide mixtures for application in green building structures.
21	Comparison of biomass and nutritional value of algae in the culture of environmentally friendly closed systems.
22	Comparing the equation, the relationship between tree height and trunk diameter and estimating the amount of carbon in the biomass of two areas of Dipterocarp's forest in northern Thailand.

No.	Scholarly publications on sustainability (2019)
23	Electricity generation combined with cooling and heating from San Kamphaeng's stepped geothermal energy technology.
24	Development of biomass fuel from peanut shell fragments
25	Development of web applications for solar power performance monitoring systems
26	Acceptance of the farming system of maize farming by means of not burning debris and overlapping with the legumes of farmers in the area of the Royal Mae Salong High Area Development Project. Mae Fah Luang District, Chiang Rai Province
27	Thermal Analysis of Biochar Products
28	Strengthening the Organic Rice Planting Group of Nong Slap Organic Community Enterprises, Omkoi District, Chiang Mai Province
29	Bio charcoal furnace design
30	Chiang Mai Municipal Park Spatial Development Guidelines for Sustainable Urban Vision
31	Guideline for development and network management of The Organic Vegetable Community Enterprise Group, Chiang Mai
32	Residential and environmental design guidelines using an engaging design approach Ban Phen Den Case Study
33	Guidelines for designing and improving the green pavement system, Maejo University Chiang Mai
34	Guidelines for designing prototype buildings for energy conservation in accordance with green university policy
35	Factors affecting organic rice production, Hat Kruat Sub-district, Uttaradit Province
36	The effects of the use of bio-charcoal in combination with the management of wet, dry water in the soil, planting rice. greenhouse gas emissions and certain properties of the soil. Compared to water management in the water.
37	The impact of temperature and torry factors on agricultural waste properties
38	The effect of triple super phosphate and organic fertilizer management on the change in the chemical properties of the soil in the production of green beans in Kamphaeng Saen varieties. 2
39	The effect of organic fertilizer on the growth and total content of the phenolic compounds of the jingu shia.

No.	Scholarly publications on sustainability (2019)
40	The control system and microcontroller from the PLC main control via the Internet of power generation system with the organic rangkin of San Kamphaeng Hot Springs Business, Mae On District, according to the Royal Initiative.
41	Structural characteristics of the society of wild plants Dipterocarp with wild sweet vegetables. Ban Pong Development Project due to The Royal Initiative Maejo University, Chiang Mai
42	A web application for real-time energy monitoring systems based on NodeJs and AngularJs.
43	Study the release of nitrogen beneficial to soil plants where various types of organic fertilizers are used.
44	Some soil properties and entry into the roots of the fungus *Arbuscura mycorisa* in the aroma coffee plot under different planting patterns.

Number of events related to sustainability

Number of event and projects related to sustainability is 189 projects event from the government budget and others.

Project Summary for The Operation of Green University

Year 2021	Project Name
1	งบประมาณสิ่งก่อสร้างตามมาตรฐานอนุรักษ์สิ่งแวดล้อม (Construction Budget According to Environmental Conservation Standards)
2	โครงการ 1 มหาวิทยาลัย 1 ตำบล (1 University 1 Subdistrict Project)
3	โครงการพัฒนาผู้ประกอบการด้วยเทคโนโลยีและนวัตกรรมการเกษตรสมัยใหม่ (Developing Entrepreneurs with Modern Agricultural Technology and Innovations Project)
4	โครงการพัฒนากายภาพและภูมิทัศน์ (Physical and Landscape Development Project)
5	โครงการเปิดโลกทัศน์นักการสื่อสาร Green Communication สู่เส้นทางวิชาชีพสื่อดิจิทัล (Green Communication Project to the Digital Media Career Path)
6	โครงการเพิ่มระดับ Ranking ในระดับนานาชาติและ Green University (Increasing International Ranking and Green University Project)

Year 2021	Project Name
7	โครงการพัฒนาสำนักบริหารและพัฒนาวิชาการสู่สำนักงานสีเขียว (Green Office) (Developing the Office of Academic Administration and Development to become a Green Office Project)
8	โครงการสนับสนุนยุทธศาสตร์เชิงรุก (Green Office) (Proactive Strategy Support Project)
9	โครงการ “Green & Sustainable Design” การออกแบบเพื่อความยั่งยืนทางพลังงานและสิ่งแวดล้อม (Green & Sustainable Design Project: Designing for Energy and Environmental Sustainability)
10	โครงการสำนักงานสีเขียว (Green Office) (Green Office Project)
11	โครงการสำนักงานสีเขียว (Green Office) สำนักงานมหาวิทยาลัย (Green Office Project: Office of the University)
12	โครงการสำนักงานสีเขียว (Green Office) กองเทคโนโลยีดิจิทัล (Green Office Project: Digital Technology Division)
13	โครงการพัฒนาศูนย์เรียนรู้เกษตรอินทรีย์ต้นแบบ เพื่อขับเคลื่อนยุทธศาสตร์ Green -Organic -Eco University ของมหาวิทยาลัยแม่โจ้ - แพร่ เฉลิมพระเกียรติ (Project to Develop a Prototype Organic Agriculture Learning Center to Drive the Green -Organic -Eco University Strategy of Maejo University - Phrae Chalermprakiet)
14	โครงการ green economy for all (Green Economy for All Project)
15	โครงการพัฒนาอาคารอำนวย ยศสุข สู่สำนักงานสีเขียว (Green Office) (Developing of Amnuayyossuk Building Towards a Green Office Project)
16	โครงการสำนักงานสีเขียว Green office ประจำปีงบประมาณ พ.ศ.2564 (Green Office Project for the Fiscal Year 2021)
17	โครงการคณะสีเขียว (Green office) (Green Faculty Project)
18	โครงการสำนักงานสีเขียว (Green Office) คณะสารสนเทศและการสื่อสาร (Faculty of Information and Communication Green Office Project)
19	โครงการต้นแบบการยกระดับคุณภาพชีวิตแบบมีส่วนร่วมที่เป็นมิตรด้านสิ่งแวดล้อม (Green Farm) เพื่อการพัฒนาที่ยั่งยืนของกลุ่มเกษตรกรฟาร์มกุ้ง (Environmental Friendly Participatory Quality of Life Improvement Model Project (Green Farm) for Sustainable Development of Shrimp Farmers Group)

Year 2021	Project Name
20	โครงการมหาวิทยาลัยแม่โจ้มุ่งสู่มหาวิทยาลัยสีเขียว (Green University) (Maejo University Aims to be a Green University Project)
21	โครงการบริหารจัดการทรัพยากรด้านพลังงานทดแทนเพื่อการหารายได้และใช้ประโยชน์อย่างยั่งยืน (กิจกรรมพัฒนาผลิตภัณฑ์กับภาคเอกชนผู้ประกอบการร่วมกับวิทยาลัยพลังงานทดแทนพัฒนาช่องทางหารายได้ผ่านระบบการค้าออนไลน์) (Renewable Energy Resource Management Project for Earning and Sustainable Use (Product development Activities with the Private Sector, Entrepreneurs, and the School of Renewable Energy to Develop Income Channels Through Online Trading Systems))
22	โครงการบัณฑิตนักพัฒนา มุ่งสร้างคุณค่าแหล่งท่องเที่ยวสู่ความยั่งยืน (Graduate Developers Aim to Create Value for Sustainable Tourism Destinations Project)
23	โครงการ "ตลาดติดเล มาร์เก็ต แม่โจ้ กับการท่องเที่ยวยั่งยืน” ภายใต้ Well-Being at Maejo-Chumpon" (Project "Tid Le Market, Maejo Market and Sustainable Tourism" under Well-Being at Maejo-Chumpon")
24	โครงการ "ตลาดติดเล มาร์เก็ต แม่โจ้ กับการท่องเที่ยวยั่งยืน” ภายใต้ Well-Being at Maejo-Chumpon" (Project "Tid Le Market, Maejo Market and Sustainable Tourism" under Well-Being at Maejo-Chumpon")
25	โครงการอบรมเพื่อพัฒนาทักษะเกษตรด้านการผลิตพืชผักอินทรีย์และพัฒนาสิ่งแวดล้อมอย่างยั่งยืน ภายใต้ศูนย์เรียนรู้ระบบเกษตรธรรมชาติ คณะเศรษฐศาสตร์ (Training Project to Develop Agricultural Skills in Organic Vegetable Production and Sustainable Environmental Development under the Center for Learning Natural Agriculture Systems, Faculty of Economics)
26	โครงการส่งเสริมและพัฒนาการปลูกพืชสมุนไพรพื้นบ้าน เพื่อยกระดับการบริโภคและการสร้างรายได้อย่างยั่งยืนในครัวเรือนของประชาชนในเขตเทศบาลตำบลแม่แฝก อำเภอสันทราย จังหวัดเชียงใหม่ (Project to Promote and Develop the Cultivation of Local Medicinal Plants to Raise the Level of Consumption and Sustainable Income Generation in the Households of the People in the Municipality of Mae Faek Subdistrict, Sansai District, Chiang Mai Province.)
27	โครงการต้นแบบการยกระดับคุณภาพชีวิตแบบมีส่วนร่วมที่เป็นมิตรด้านสิ่งแวดล้อม (Green Farm) เพื่อการพัฒนาที่ยั่งยืนของกลุ่มเกษตรกรฟาร์มกุ้ง (Environmental Friendly Participatory Quality of Life Improvement Model Project (Green Farm) for Sustainable Development of Shrimp Farmers Group)
28	โครงการการฝึกอบรมเชิงปฏิบัติการเทคโนโลยีการผลิตปลาช่อนเชิงเศรษฐกิจเข้าสู่การเลี้ยงสัตว์น้ำอินทรีย์ตามแนวพระราชดำริของการทำเกษตรเชิงนิเวศอย่างพอเพียงและยั่งยืน (Training Project on Technology for Economic Production of Snakehead Fish into Organic Aquaculture according to the Royal Initiative of Sufficiency and Sustainable Ecological Farming)

Year 2021	Project Name
29	โครงการการใช้ประโยชน์จากพืชท้องถิ่นสู่การพัฒนาผลิตภัณฑ์ที่ยั่งยืน (Utilization of Local Plants for Sustainable Product Development Project)
30	โครงการการจัดการเส้นทางท่องเที่ยวอย่างยั่งยืน ประจำปีงบประมาณ 2564 (Sustainable Tourism Route Management Project for Fiscal Year 2021)
31	โครงการการอนุรักษ์และพัฒนาต้นเสม็ดอย่างยั่งยืน (Sustainable Samet Tree Conservation and Development Project)
32	โครงการบูรณาการเรียนการสอนกับการอนุรักษ์สิ่งแวดล้อม: ปลุกจิตสำนึกสีเขียวจากห้องเรียนสู่ครอบครัวและชุมชน (Integrated Teaching and Environmental Conservation Project: Raising Green Awareness from the Classroom to the Family and Community)
33	โครงการเพิ่มสมรรถนะการบริหารจัดการองค์กรให้มีประสิทธิภาพ (กิจกรรมการจัดการความรู้ สำนักงานสีเขียว) (Project to Enhance Organizational Management Efficiency (Green Office Knowledge Management Activities))
34	โครงการเตรียมความพร้อมและประเมินสำนักงานสีเขียว ปี 2564 (Green Office Preparation and Assessment Project in 2021)
35	SAS-64-โครงการเสวนาวิชาการ : การเมืองท้องถิ่นสีเขียว (SAS-64-Academic Project : Green Local Politics)
36	โครงการบูรณาการอนุรักษ์สิ่งแวดล้อมกับการเรียนการสอน: ปลอดการเผาเพื่อลมหายใจสีเขียว (Integrated Environmental Conservation Project with Teaching: No Burning for Green Breath)
37	โครงการการบริหารจัดการห้องสมุดสีเขียว : Enviromentally Library & Sustainability โครงการสำนักงานสีเขียว สำนักหอสมุด (Green Library Management Project : Enviromentally Library & Sustainability Green Office Project, MJU Library)
38	โครงการสังคมสีเขียว (Green Society Project)
39	โครงการสำนักงานสีเขียว (Green Office Project)
40	โครงการอบรมหลักสูตร สำนักงานสีเขียว (Training Program, Green Office)
41	โครงการสำนักวิจัยฯ สีเขียวและสำนักงานสีเขียว (The Office of Agricultural Research and Extension Green Project, Green Office)
42	โครงการพัฒนาผลิตภัณฑ์จากไม้ไผ่และกลยุทธ์การตลาดเพื่อมุ่งสู่ตลาดสีเขียว (Bamboo Product Development and Marketing Strategy for the Green Market Project)

Year 2021	Project Name
43	โครงการบูรณาการเรียนการสอนกับการอนุรักษ์สิ่งแวดล้อม: ปลุกจิตสำนึกสีเขียวจากห้องเรียนสู่ครอบครัวและชุมชน (Integrated Teaching and Environmental Conservation Project: Raising Green Awareness from the Classroom to the Family and Community)
44	SAS-64-โครงการสร้างสำนึกรักษ์ทรัพยากรธรรมชาติและสิ่งแวดล้อมเพื่อวิถีชีวิตที่สมดุลและเป็นสุข (SAS-64-Conservation Natural Resources and Environment Project for a Balanced and Happy Lifestyle)
45	โครงการการประชาสัมพันธ์หลักสูตร สาขาวิชาเศรษฐศาสตร์เกษตรและสิ่งแวดล้อม (Public Relations Program in Agricultural and Environmental Economics Program)
46	โครงการทำนุบำรุงศิลปวัฒนธรรม ภูมิปัญญาท้องถิ่นและสิ่งแวดล้อมที่บูรณาการการเรียนการสอน (Preserving Arts, Culture, Local Wisdom and the Environment that Integrates Teaching and Learning Project)
47	โครงการเตรียมความพร้อมสหกิจศึกษา สาขาวิชาเศรษฐศาสตร์เกษตรและสิ่งแวดล้อม ประจำปีการศึกษา 2564 (Cooperative Education Preparation Program in Agricultural and Environmental Economics for the Academic Year 2021)
48	โครงการประชาสัมพันธ์คณะสถาปัตยกรรมศาสตร์และการออกแบบสิ่งแวดล้อม (Public Relations Project of the Faculty of Architecture and Environmental Design)
49	โครงการสัมมนาสโมสรนักศึกษาคณะสถาปัตยกรรมศาสตร์และการออกแบบสิ่งแวดล้อม ประจำปี 2564 (Student Club Seminar Project of Faculty of Architecture and Environmental Design Year 2021)
50	โครงการพัฒนา ปรับปรุงและวิพากษ์หลักสูตร สาขาวิชาเศรษฐศาสตร์เกษตรและสิ่งแวดล้อม (Development, Improvement and Critique of the Curriculum Department of Agricultural and Environmental Economics Project)
51	โครงการอบรมหลักสูตรการตรวจประเมินการจัดการสิ่งแวดล้อม (Environmental Management Assessment Training Program)
52	โครงการออกแบบพัฒนาพื้นที่ศูนย์เรียนรู้วัฒนธรรมอัตลักษณ์วิถีเกษตร วิถีแม่โจ้ บูรณาการกับการเรียนการสอนรายวิชาของคณะสถาปัตยกรรมศาสตร์และการออกแบบสิ่งแวดล้อม (The Project of Design and Development of the Maejo Agricultural Identity Cultural Learning Center Integrated with the Teaching and Learning of the Courses of the Faculty of Architecture and Environmental Design)
53	โครงการสหกิจศึกษา ศศ 497 สาขาวิชาเศรษฐศาสตร์เกษตรและสิ่งแวดล้อม ประจำปีการศึกษา 2564 (Cooperative Education Program (497) in Agricultural and Environmental Economics for the Academic Year 2021)
54	โครงการเพิ่มศักยภาพการเรียนรู้และส่งเสริมการจัดกิจกรรมของนักศึกษาหลักสูตรการออกแบบและวางแผนสิ่งแวดล้อม (Increasing Learning Potential and Promoting Activities of Students in Environmental Design and Planning Course Project (64-2.1.4))
55 56	โครงการค่ายอนุรักษ์และพัฒนาสิ่งแวดล้อม ประจำปีการศึกษา 2564) (Environmental Conservation and Development Camp Project for Academic Year 2021)
57	โครงการเข้าใจเรา เข้าใจป่า เข้าใจสิ่งแวดล้อม ประจำปีการศึกษา 2564 (Understand us, Understand the Forest, Understand the Environment Project for the Academic Year 2021)

Year 2021	Project Name
58	โครงการศึกษาแนวทางการพัฒนาพื้นที่หนองคาแฝก ตำบลห้วยซ้อ อำเภอเชียงของ จังหวัดเชียงราย ภายใต้โครงการอนุรักษ์พันธุกรรมพืชอันเนื่องมาจากพระราชดำริ สมเด็จพระกนิษฐาธิราชเจ้ากรมสมเด็จพระเทพรัตนราชสุดาฯ สยามบรมราชกุมารี คณะสถาปัตยกรรมศาสตร์และการออกแบบสิ่งแวดล้อม (Project for Studying Development Guidelines in Nong Kha Faek Area, Huai So Sub-District, Chiang Khong District Chiang Rai Province under the Royal Initiative Plant Genetic Conservation Project Her Royal Highness Princess Maha Chakri Sirindhorn Her Royal Highness Princess Maha Chakri Sirindhorn Faculty of Architecture and Environmental Design
59	โครงการวาระครบรอบ 14 ปี วันสถาปนาคณะสถาปัตยกรรมศาสตร์และการออกแบบสิ่งแวดล้อม มหาวิทยาลัยแม่โจ้ (Project on the 14th Anniversary of the Founding Day of the Faculty of Architecture and Environmental Design, Maejo University
60	โครงการฝึกอบรมเชิงปฏิบัติการการเลี้ยงปลาหมอในร่องสวนและแหล่งน้ำในสวนลำไยตามแนวทางการลดต้นทุนและลดผลกระทบต่อสิ่งแวดล้อม เพื่อเข้าสู่ระบบการเลี้ยงสัตว์น้ำอินทรีย์ (Workshop on Cultivating Cichlids in Orchards and Water Sources in Longan Orchards according to Cost Reduction and Environmental Impact Reduction Guidelines to Enter the Organic Aquaculture System)
61	โครงการเลี้ยงปลาเชิงซ้อนร่วมกับการปลูกพืชอควาโปนิกส์ในระบบที่เป็นมิตรกับสิ่งแวดล้อม (Complex Fish Farming Project with Aquaponics Planting in an Environmentally Friendly System)
62	โครงการปรับปรุงและพัฒนาสิ่งแวดล้อม (Environmental Improvement and Development Project)
63	โครงการการจัดการผลกระทบสิ่งแวดล้อมจากการจัดการเรียนการสอนและการบริหารจัดการภายในมหาวิทยาลัยแม่โจ้-ชุมพร (Environmental Impact Management Project from Teaching and Learning Management within Maejo-Chumphon University)
64	โครงการบริหารจัดการทรัพยากรด้านพลังงานทดแทนเพื่อการหารายได้และใช้ประโยชน์อย่างยั่งยืน (กิจกรรมพัฒนาผลิตภัณฑ์กับภาคเอกชนผู้ประกอบการร่วมกับวิทยาลัยพลังงานทดแทนพัฒนาช่องทางหารายได้ผ่านระบบการค้าออนไลน์) (Renewable Energy Resource Management Project for Earning and Sustainable Use (Product Development Activities with the Private Sector, Entrepreneurs, and the School of Renewable Energy to Develop Income Channels through Online Trading Systems))
65	โครงการการจัดการเส้นทางท่องเที่ยวอย่างยั่งยืน ประจำปีงบประมาณ 2564 (Sustainable Tourism Route Management Project for Fiscal Year 2021)
66	การผลิตกัญชาอินทรีย์ทางการแพทย์เชิงอุตสาหกรรม ประจำปีงบประมาณ พ.ศ. 2564 (Industrial Organic Medical Cannabis Production for Fiscal Year 2021)
67	การรวบรวมและถ่ายทอดองค์ความรู้ด้านเกษตรอินทรีย์ (Collection and Transfer of Knowledge on Organic Agriculture)
68	โครงการการใช้สารสกัดเห็ดหลินจืออินทรีย์ในอาหารไก่ไข่ (Project on the use of organic Lingzhi Extract in Laying Hen Diet)

Year 2021	Project Name
69	การต่ออายุใบรับรองมาตรฐานปัจจัยการผลิตอินทรีย์ ACT-IFOAM ของผลิตภัณฑ์จุลินทรีย์ชีวภาพ MMO ตราแม่โจ้ กรีน ประจำปี 2564 (Renewal of ACT-IFOAM Organic Inputs Standard Certificate for Maejo Green MMO Biological Microbial Products Year 2021)
70	โครงการเพิ่มพูนทักษะและประสบการณ์ด้านชีววิทยาและการทำเกษตรอินทรีย์ของนักศึกษาสาขาวิชาชีววิทยาประยุกต์ (Project to Enhance Skills and Experience in Biology and Organic Farming for Students in Applied Biology)
71	โครงการศูนย์กลางความเป็นเลิศด้านเกษตรอินทรีย์ (Center of Excellence in Organic Agriculture Project)
72	โครงการอบรมมาตรฐานการผลิตข้าว GAP และมาตรฐานข้าวอินทรีย์ (GAP Rice Production Standard and Organic Rice Standard Training Program)
73	โครงการศูนย์เรียนรู้ปัจจัยสนับสนุนการผลิตพืชอินทรีย์ (Project for Learning Factors Supporting Organic Crop Production)
74	โครงการฐานเรียนรู้ปุ๋ยมูลไส้เดือน เพื่อการผลิตพืชอินทรีย์ (Earthworm Fertilizer Learning Base Project for the Production of Organic Plants)
75	โครงการการพัฒนาการผลิตสาหร่ายทะเลแบบการเพาะเลี้ยงแบบอินทรีย์เพื่อมุ่งสู่อาหารปลอดภัย (Development of Organic Cultured Seaweed Production towards Food Safety Project)
76	โครงการถ่ายทอดเทคนิคการผลิตผัก ปัจจัยการผลิตและแปลงสาธิตภายใต้ระบบเกษตรอินทรีย์ เพื่อยกระดับรายได้และคุณภาพชีวิตสู่ชุมชน (Project to Transfer Vegetable Production Techniques, Production Factors, and Demonstration Plots under the Organic Farming System to Raise Income and Quality of Life to the Community)
77	โครงการวางแผนต้นทุนทางการเกษตร สำหรับกลุ่มผลิตข้าวอินทรีย์บ้านนาตม อำเภอสูงเม่น จังหวัดแพร่ (Agricultural Cost Planning Project for Ban Natom Organic Rice Production Group, Sung Men District, Phrae Province)
78	โครงการพัฒนาและการแปรรูปผลิตภัณฑ์ข้าวอินทรีย์บ้านนาตมเพื่อเพิ่มมูลค่า (Development and Processing Project of Ban Natom Organic Rice Products for Value Added)
79	โครงการการผลิตอาหารปลานิลอินทรีย์เพื่อเพาะเลี้ยงปลานิลอินทรีย์สู่การผลิตอาหารปลอดภัย (Organic Tilapia Feed Production Project for Cultivating Organic Tilapia towards Safe Food Production)
80	โครงการพัฒนาเศรษฐกิจฐานรากและชุมชนเข้มแข็ง: การผลิตกุ้งก้ามกรามบูรณาการกับสาหร่ายอาร์โธรสไปร่า (สไปรูลิน่า) ปลอดภัยมุ่งสู่อินทรีย์ของกลุ่มเกษตรกรอำเภอสันทราย จังหวัดเชียงใหม่ (สันทรายโมเดล) (Fundamental Economic Development and Strong Community Project: Safe Production of Lobster Integrated with Arthrosspira (Spirulina) for Organic Farmers in Sansai District, Chiang Mai Province (Sansai Model))
81	โครงการพื้นที่อินทรีย์ต้นแบบมหาวิทยาลัยแม่โจ้ (Maejo University Organic Area Prototype Project)

Year 2021	Project Name
82	ฐานเรียนรู้การเลี้ยงไส้เดือนดินกำจัดขยะอินทรีย์ (Learning Base for Raising Earthworms for Using in Organic Waste Disposal)
83	โครงการฐานเรียนรู้ปุ๋ยอินทรีย์แบบไม่กลับกอง (Organic Fertilizer Learning Base Project)
84	โครงการแปรรูปและพัฒนาผลิตภัณฑ์พืชอินทรีย์ในท้องถิ่น (Processing and Development of Local Organic Products)
85	โครงการการพัฒนาวิธีการกลั่นและการสกัดน้ำมันหอมระเหยจากสมุนไพรอินทรีย์ชุมชน (Project on the Development of Distillation and Extraction of Essential Oils from Community Organic Herbs)
86	โครงการฐานเรียนรู้การผลิตพืชในรูปแบบเกษตรอินทรีย์ฟาร์มมหาวิทยาลัย (Project on Learning about the Production of Plants in the Form of Organic Farming, University Farms)
87	โครงการสนับสนุนงานวิจัยที่มุ่งเน้นด้านธุรกิจการเกษตร/เกษตรอินทรีย์ ที่มุ่งสู่ Go, Eco University ที่สามารถนำไปใช้ประโยชน์ ต่อชุมชนและเผยแพร่งานวิจัย งานสร้างสรรค์ ในระดับชาติ นานาชาติ (Supporting Research Focused on Agribusiness/Organic Agriculture towards Go Eco University that can Benefit the Community and Disseminate Research at National and International levels)
88	โครงการผลิตเมล็ดพันธุ์พืชในระบบอินทรีย์ (Organic Seed Production Project)
89	โครงการผลิตเมล็ดพันธุ์ข้าวพันธุ์ดีในระบบเกษตรอินทรีย์ (Project for Producing Good Rice Seeds in Organic Farming System)
90	โครงการแผนธุรกิจเกษตรอินทรีย์สู่ชุมชนเพื่อสร้างทักษะวิชาชีพผู้ประกอบการ (Organic Agriculture Business to Community Project to Build Professional Entrepreneur Skills)
91	โครงการถ่ายทอดเทคโนโลยีการพัฒนาวัสดุเหลือใช้ทางการเกษตรสำหรับประโยชน์ทางการผลิตพืชผักอินทรีย์และปลอดภัย เพื่อยกระดับคุณภาพชีวิตและรายได้ของชุมชน (Technology Transfer Project for the Development of Agricultural Waste for the Benefits of Organic and Safe Vegetable Production to Improve the Quality of Life and Income of the Community)
92	การพัฒนาอุตสาหกรรมอาหารอินทรีย์ 4.0 มหาวิทยาลัยแม่โจ้ (Organic Food Industry Development 4.0, Maejo University)
93	โครงการสร้างเครือข่ายผู้ผลิตเมล็ดพันธุ์ผักอินทรีย์เพื่อมหาวิทยาลัยแม่โจ้สู่การบริหารจัดการเมล็ดพันธุ์ผักอินทรีย์อย่างครบวงจร (Project to Create a Network of Organic Vegetable Seed Producers to lBring Maejo University to a Comprehensive Organic Vegetable Seed Management)
94	โครงการสร้างเครือข่ายเกษตรกรอินทรีย์ภาคเหนือตอนบนเพื่อส่งเสริมระบบการผลิตด้วยเทคโนโลยีที่เหมาะสม (Project to Create a Network of Organic Farmers in the Upper Northern Region to Promote the Production System with Suitable Technology)

Year 2021	Project Name
95	โครงการพัฒนาแหล่งเรียนรู้และการหารายได้จากจากบริการวิชาการด้านพลังงานเพื่อการเกษตร-อุตสาหกรรม (Project to Develop Learning Resources and to Earn Money from Academic Services on Energy for Agriculture - Industry)
96	โครงการพัฒนาหลักสูตรการเรียนรู้ตลอดชีวิต (ด้านเทคโนโลยีเกษตรอัจฉริยะและดิจิทัล) (Lifelong Learning Curriculum Development Project (In the field of Smart Agriculture and Digital Technology)
97	โครงการฝึกอบรมวิชาชีพระยะสั้นฐานสมรรถนะ (Education to Employment) หัวข้อ การประยุกต์ใช้พลังงานทดแทนและเทคโนโลยีสมาร์ทฟาร์มในการทำเกษตรกรรม (Short-term Vocational Training Program on the Basis of Competence (Education to Employment) on the Topic "Applying Renewable Energy and Smart Farm Technology in Agriculture")
98	หมู่บ้านนักพัฒนาการเกษตรดิจิทัล Village of AgTech Makers (VAM) (Village of AgTech Makers (VAM) Digital Agriculture Developer Village)
99	โครงการส่งเสริมและถ่ายทอดเทคโนโลยีทางการเกษตร (ส่งเสริม) (Agricultural Technology Promotion and Transfer Project (Agricultural Development Extension and Communication))
100	โครงการจิตอาสาพัฒนาปรับปรุงภูมิทัศน์เพื่ออำนวยความสะดวกแก่นักศึกษาคณะวิศวกรรมและอุตสาหกรรมเกษตร (Volunteer Project to Improve Landscape to Facilitate Students of the Faculty of Engineering and Agro-Industry)
101	โครงการเตรียมความพร้อมสหกิจศึกษา สาขาวิชาเศรษฐศาสตร์เกษตรและสิ่งแวดล้อม ประจำปีการศึกษา 2564 (Cooperative Education Preparation Program in Agricultural and Environmental Economics for the Academic Year 2021)
102	โครงการพัฒนาผลิตภัณฑ์ด้านการเกษตรและอาหาร (Agricultural and Food Product Development Project)
103	โครงการสนับสนุนทุนการศึกษา คณะผลิตกรรมการเกษตร (Scholarship Support Program, Faculty of Agriculture)
104	โครงการส่งเสริมการผลิตสินค้าทางการเกษตรและพลังงานเพื่อสร้างรายได้ให้กับวิทยาลัยพลังงานทดแทน (Project to Promote the Production of Agricultural Products and Energy to Generate Income for the School of Renewable Energy)
105	โครงการส่งเสริมและพัฒนาเทคโนโลยีเกษตรอัจฉริยะและดิจิทัล โดยใช้พลังงานทดแทน (Project to Promote and Develop Smart and Digital Agricultural Technology Using Renewable Energy)
106	โครงการเกษตรรอบรั้วแม่โจ้ สู่นานาชาติ (Agriculture Project around Maejo Fence to Become international)
107	โครงการการวิเคราะห์ข้อมูลและเผยแพร่บทความคาดการณ์ผลผลิตทางการเกษตรที่สำคัญของประเทศไทย (Project for Analyzing Data and Publishing Articles Forecasting Important Agricultural Products of Thailand)

Year 2021	Project Name
108	โครงการพัฒนา ปรับปรุงและวิพากษ์หลักสูตร สาขาวิชาเศรษฐศาสตร์เกษตรและสิ่งแวดล้อม (Development, Improvement and Critique of the Curriculum Department of Agricultural and Environmental Economics Project)
109	โครงการยกระดับวิสาหกิจชุมชนและผู้ประกอบการใหม่ด้วยเทคโนโลยีและนวัตกรรมการเกษตรสมัยใหม่ (Project to Upgrade Community Enterprises and New Entrepreneurs with Modern Agricultural Technology and Innovations)
110	โครงการความรู้เบื้องต้นเกี่ยวกับความปลอดภัยทางรังสี และการประยุกต์ใช้งานทางการเกษตร (Introduction to Radiation Safety and Agricultural Applications Project)
111	โครงการบรรยายเรื่อง "นโยบายของ อว.สู่ทิศทางของมหาวิทยาลัย ในการพลิกโฉมระบบอุดมศึกษา และการพัฒนาเกษตรไทย" (Lecture Project on the Topic "Policy of the MHESI towards the Direction of the University in Transforming the Higher Education System and the Development of Thai agriculture")
112	โครงการเข้าร่วมประชุมวิชาการโครงงานวิศวกรรมเกษตรแห่งชาติ ครั้งที่ 27 (Project to Attend the 27th National Agricultural Engineering Project Conference)
113	โครงการสัมมนาวิชาการหลักสูตรสหวิทยาการเกษตร (Agricultural Interdisciplinary Program Seminar Project)
114	SAS-64-โครงการการเสริมสร้างความเข้มแข็งของชุมชนโดยอาศัยการท่องเที่ยวเชิงวิถีเกษตร (SAS-64-Strengthening Community Based on Agri-Tourism Project)
115	โครงการศูนย์บริการวิชาการ คณะผลิตกรรมการเกษตร (ศูนย์บริการวิชาการ) (Academic Service Center Project, Faculty of Agricultural Products (Academic Service Center))
116	โครงการ อบรมหลักสูตรการท่องเที่ยวเชิงเกษตรสุขภาวะ (Health Agritourism Training Program)
117	โครงการดำเนินงานสหกิจศึกษาสาขาวิชาวิศวกรรมเกษตรและสาขาวิชาวิศวกรรมอาหาร (Cooperative Education Program in Agricultural Engineering and Food Engineering)
118	โครงการหลักสูตรฝึกอบรมระยะสั้น “การประยุกต์ใช้เกษตรแม่นยำร่วมกับการใช้พลังงานแสงอาทิตย์เพื่อทำเกษตรกรรม 4.0” (Short Course Training Program “Application of Precision Agriculture together with the Use of Solar Energy for Agriculture 4.0”)
119	โครงการสัมนาวิชาชีพ (เกษตรเคมี) (Professional Seminar Project (Agriculture Chemistry))
120	โครงการจัดทำดัชนีความเชื่อมั่นภาคการเกษตร ประจำปี 2564 (Agricultural Confidence Index Project Year 2021)
121	โครงการการเพิ่มศักยภาพทางวิชาการของนักศึกษาสาขาวิชาเกษตรป่าไม้ (Smart Agroforester) สาขาวิชาเกษตรป่าไม้ มหาวิทยาลัยแม่โจ้ – แพร่ เฉลิมพระเกียรติ (Project for Enhancing Academic Potential of Students in the Field of Agriculture and Forestry (Smart Agroforester) in the Field of Agriculture and Forestry Maejo University - Phrae Chaloem Phrakiat)

Year 2021	Project Name
122	โครงการบริการวิชาการออกแบบพื้นที่ศูนย์เรียนรู้วัฒนธรรมอัตลักษณ์วิถีเกษตร วิถีแม่โจ้ (Academic Service Project for Area Design, Cultural Identity Learning Center, Maejo Way of Agriculture)
123	โครงการมอบทุนการศึกษาเพื่อลูกหลานเกษตรกรหรือทำงานเพื่อชุมชนของตนเอง คณะเศรษฐศาสตร์ ประจำปีการศึกษา 2564 (Scholarship Program for Farmers' Children or Working for Their Community, Faculty of Economics Academic year 2021)
124	โครงการจัดทำฐานข้อมูลราคาสินค้าเกษตรเชียงใหม่รายวันเพื่อการพยากรณ์ ประจำปี 2564 (Project to Create a Database of Chiang Mai Agricultural Prices Daily for the Year 2021 Forecast)
125	โครงการแปลงสาธิตเกษตรผสมผสาน (Integrated Agricultural Demonstration Conversion Project)
126	แปลงกัญชาเพื่อรักษาโรค ใหญ่ที่สุดในอาเซียน (ตามรอยพ่อ กษัตริย์เกษตร") (Convert Cannabis for Medicinal Purposes The Largest in ASEAN (Following the Footsteps of the King of Agriculture"))
127	โครงการเปิดฟาร์มมหาวิทยาลัยแม่โจ้ เกษตรทฤษฎีใหม่ หัวใจคนก้าวหน้า (Maejo University Farm Opening Project, New Theory, Progressive People's Heart)
128	โครงการพัฒนาองค์ความรู้ด้านการเกษตร และสร้างศูนย์กลางการจำหน่ายผลผลิตสินค้าเกษตร (Agricultural Knowledge Development Project and Create a Center for Selling Agricultural Products)
129	โครงการนำเสนอผลงานทางวิชาการระดับปริญญาบัณฑิตด้านวิทยาศาสตร์และเทคโนโลยีการเกษตร (RUCA) (Graduate School of Science and Technology (RUCA) Academic Presentation Program)
130	โครงการส่งเสริมการใช้พลังงานไฟฟ้าจากพลังงานทดแทนสำหรับการเพาะเลี้ยงกล้วยไม้ในชุมชนเกษตรกรรม (Project to Promote the Use of Electricity from Renewable Energy for Orchid Cultivation in Agricultural Communities)
131	โครงการเกษตรผสมผสานเพื่อการยังชีพแก่นักศึกษา (Integrated Agriculture for Subsistence Project for Students)
132	โครงการวิศวกรรมและอุตสาหกรรมเกษตรสัมพันธ์ (Engineering and Agro-Industry Relations Project)
133	โครงการการอบรมการเป็นผู้ประกอบการด้านการเกษตรแบบดิจิทัลเชิงสร้างสรรค์ (Creative Digital Agricultural Entrepreneurship Training Program)
134	โครงการพัฒนา/ ปรับปรุงหลักสูตร คณะผลิตกรรมการเกษตร (Curriculum Development/Improvement Project, Faculty of Agricultural Production)
135	โครงการการส่งเสริมการใช้สารสกัดจากสมุนไพรเพื่อสุขภาวะและทางการเกษตร (Project to Promote the Use of Herbal Extracts for Health and Agriculture)

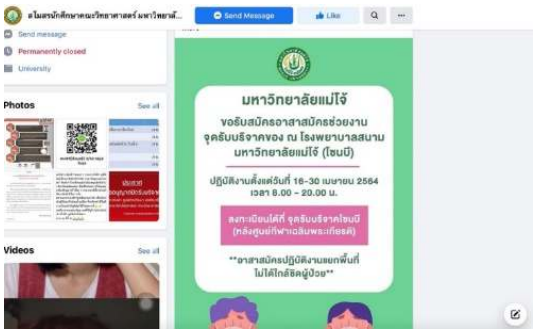
Year 2021	Project Name
136	โครงการจัดนิทรรศการและสาธิตทางการเกษตร (Agricultural Exhibition and Demonstration Project)
137	โครงการคลินิกพืช : การจัดการศัตรูพืชในระบบเกษตรปลอดภัย (Plant Clinic Project : Pest Management in Safe Agriculture System)
138	โครงการการใช้นวัตกรรมการเกษตรอัจฉริยะ (Smart Agriculture) เพื่อยกระดับการเพาะเลี้ยงสัตว์น้ำด้วยวัตถุดิบอาหารในร่องน้ำสวนปาล์มน้ำมันแปลงใหญ่ (Project to Use Innovative Smart Agriculture (Smart Agriculture) to Upgrade Aquaculture with Food Raw Materials in Large Oil Palm Plantation Canals)
139	โครงการประชาสัมพันธ์หลักสูตร คณะวิศวกรรมและอุตสาหกรรมเกษตร (Curriculum Public Relations Project Faculty of Engineering and Agro-Industry)
140	โครงการพัฒนาวารสารวิจัยและส่งเสริมวิชาการเกษตร (Agricultural Research and Promotion Journal Development Project)
141	โครงการศูนย์เรียนรู้วัฒนธรรมเกษตรล้านนา (Lanna Agricultural Cultural Learning Center Project)
142	โครงการสืบสานเกษตรทฤษฎีใหม่ตามพระราชดำริ (Project to Carry on New Agricultural Theory according to the Royal Initiative)
143	โครงการส่งเสริมการเลี้ยงสุกรสู่เกษตรกรรายย่อย (Pig Raising Promotion Project for Small Farmers)
144	โครงการเกษตรล้านนา วิถีแห่งธรรม (Lanna Agriculture Project: The Way of Dharma)
145	ประกันคุณภาพการศึกษา ระดับหลักสูตร คณะวิศวกรรมและอุตสาหกรรมเกษตร ประจำปีการศึกษา 2563 (Quality Assurance of Curriculum Level Education Faculty of Engineering and Agro-Industry, Academic Year 2020)
146	ประกันคุณภาพการศึกษาคณะวิศวกรรมและอุตสาหกรรมเกษตร ประจำปีการศึกษา 2563 (Quality Assurance of the Faculty of Engineering and Agro-Industry for the Academic Year 2020)
147	โครงการเตรียมความพร้อมการจัดงาน 45 ปี คณะผลิตกรรมการเกษตร (45th Anniversary Preparation Project, Faculty of Agricultural Production)
148	โครงการรวบรวมพันธุ์ไม้ผลเพื่อการปรับปรุงพันธุ์และบริการพันธุ์ให้แก่เกษตรกร (Project to Collect Fruit Trees for Breeding and Breeding Services for Farmers)
149	โครงการสื่อสารและสร้างความผูกพันบุคลากร คณะผลิตกรรมการเกษตร ประจำปี 2564 (Personnel Communication and Engagement Project, Faculty of Agricultural Production Year 2021)
150	โครงการ 1 คณะ 1 ผลิตภัณฑ์ (ต้นแบบ ตู้อบแห้งพลังงานพลังงานแสงอาทิตย์ร่วมกับไฟฟ้าแบบแยกส่วน) (Project 1 Board 1 Product (Prototype Drying Cabinet for Solar Energy Combined with Modular Electricity))

Year 2021	Project Name
151	โครงการพัฒนาหลักสูตรวิทยาลัยพลังงานทดแทน (School of Renewable Energy Curriculum Development Project)
152	โครงการวิเคราะห์และติดตามข้อมูล นักศึกษาวิทยาลัยพลังงานทดแทน (Project for Analyzing and Tracking Data of School of Renewable Energy Student)
153	โครงการจัดทำฐานข้อมูล/วารสาร/การประชุมวิชาการด้านพลังงาน (Creating Databases/Journals/Conferences on Energy Project)
154	โครงการสนับสนุนทุนการศึกษา นักศึกษาวิทยาลัยพลังงานทดแทน (Scholarship Support Program for School of Renewable Energy Student)
155	โครงการผลิตบัณฑิตและพัฒนาศักยภาพบัณฑิตและพัฒนาทางด้านพลังงานทดแทนในกลุ่มประเทศอาเซียนระดับบัณฑิตศึกษา (Creation and Development of Graduate Potential and Development in Renewable Energy in ASEAN Countries at the Graduate Level)
156	โครงการปรับพื้นฐานสำหรับนักศึกษาวิทยาลัยพลังงานทดแทน (Foundation Restructuring Program for Renewable Energy College Students)
157	โครงการผลิตบัณฑิตและพัฒนาศักยภาพบัณฑิตทางด้านพลังงานทดแทนในกลุ่มประเทศอาเซียนสำหรับนักศึกษาปริญญาตรี (โครงงาน ทุนยากจน) (Graduate Production and Graduate Potential Development Program in Renewable Energy in ASEAN Countries for Undergraduate Students (Poverty Scholarship Program))
158	โครงการพลังงานอาสาพัฒนาชุมชน (Community Development Volunteer Energy Project)
159	โครงการเตรียมพร้อมและติดตามนักศึกษาวิทยาลัยพลังงานทดแทน (Renewable Energy College Student Preparedness and Tracking Program)
160	โครงการรณรงค์งานด้านอนุรักษ์พลังงาน (Energy Conservation Campaign)
161	โครงการการฝึกอบรมเชิงปฏิบัติการ "การใช้พลังงานแสงอาทิตย์ในการเลี้ยงปลาดุกลูกผสมในระบบอควาโปนิกส์ (Aquaponics)" (Workshop Project "Using Solar Energy in Raising Hybrid Catfish in an Aquaponics System (Aquaponics)")
162	โครงการ เสวนาแลกเปลี่ยนความรู้และประสบการณ์การศึกษาวิจัย “The 1st International Workshop of Agro-ecology and Service Innovations” (“The 1st International Workshop of Agro-ecology and Service Innovations” Seminar Project)
163	โครงการเศรษฐศาสตร์ขยะเหลือศูนย์ (Econ Zero Waste) ปี 3 (Faculty of Economics Zero Waste Project (Econ Zero Waste) Year 3)
164	โครงการประชุมวิชาการเครือข่ายนิเวศวิทยาป่าไม้ประเทศไทย ครั้งที่ 10 (Thai Forest Ecological Research Network Conference; T-FERN#10) (The 10th Thai Forest Ecological Research Network Conference; T-FERN #10)
165	โครงการจัดทำบริษัทนำเที่ยวเชิงนิเวศ(จำลอง)

Year 2021	Project Name
	(Project to Create an Eco-tourism Company (Model))
166	โครงการพัฒนาศักยภาพการวิจัย สำหรับนักศึกษาหลักสูตรศิลปศาสตร์มหาบัณฑิต สาขาวิชาการจัดการสุขภาพชุมชน (Research Potential Development Project For students of the Master of Arts Program in Community Health Management)
167	โครงการนักศึกษาทำนุบำรุงศิลปวัฒนธรรมชุมชน (SCD) "ศิษย์เก่า_วัฒนธรรม_ชุมชน" (Community Arts and Culture Preservation Student Project (SCD) "Alumni_Culture_Community"))
168	โครงการพัฒนาเครือข่ายการท่องเที่ยวโดยชุมชน จังหวัดชุมพร (Community-Based Tourism Network Development Project, Chumphon Province)
169	โครงการหนึ่งหลักสูตรหนึ่งองค์ความรู้สู่ชุมชน (One Curriculum Project One Knowledge to Community)
170	โครงการถ่ายทอดองค์ความรู้ศาสตร์พระราชา (รัชกาลที่ 9) สู่สังคมและชุมชน (Project to Transfer Knowledge of King Rama IX (Rama 9) to Society and Community))
171	โครงการค่ายอาสาพัฒนาชุมชน ประจำปีการศึกษา 2563 (64-2.3.6) (Community Development Volunteer Camp Project Academic Year 2020 (64-2.3.6))
172	โครงการอบรมพัฒนาศักยภาพนักศึกษาด้านศิลปวัฒนธรรมเผยแพร่สู่ชุมชน (Training Project to Develop Student Potential in Arts and Culture Dissemination to the Community)
173	โครงการพัฒนาการเลี้ยงไก่ไข่และปลาในชุมชนอำเภอกัลยาณิวัฒนาเพื่อสร้างความมั่นคงของอาหารโปรตีนในท้องถิ่น (Project to Develop Poultry and Fish Farming in the Community of Kalayani Vadhana District to Build the Stability of Local Protein Food)
174	SAS-64-โครงการการบริการจัดการและพัฒนาชุมชนเข้มแข็งโดยใช้ทุนทางสังคมเป็นฐาน (SAS-64-Society-Based Social Capital Management Service and Development Project)
175	SAS-64-โครงการสร้างแนวกันไฟป่าและฝายชะลอน้ำ อาสาพัฒนาชุมชน ประจำปีการศึกษา 2564 (SAS-64-Project to Build Forest Fire Barriers and Check Dams for Community Development for the Academic Year 2021)
176	โครงการบำเพ็ญประโยชน์ อาสาพัฒนาชุมชน (Community Development Volunteer Service Project)
177	โครงการสร้างฝายชะลอความชุ่มชื่นในป่าชุมชนบ้านแม่ทราย (Project to Build Check Dams in Ban Maesai Community Forest)
178	โครงการพัฒนานักศึกษาและบริการวิชาการเพื่อยกระดับวิสาหกิจชุมชนพื้นที่บ้านแม่ปาน-สันเกี๋ยง อำเภอแม่แจ่ม จังหวัดเชียงใหม่ (Student Development and Academic Services Project for Upgrading Community Enterprises in Ban Maepan-Sankiang Area, Maechaem District, Chiang Mai Province)

Year 2021	Project Name
179	โครงการจัดค่าย อบรม และสัมมนา "โครงการส่งเสริมการแปรรูปอาหารเพื่อสร้างรายได้แก่ชุมชน" (Training Camp and Seminar Project "Project to Promote Food Processing to Generate Income for the Community")
180	โครงการแนวทางการสร้างและสนับสนุนนวัตกรรมในวิสาหกิจชุมชนหนองแหย่ง อำเภอสันทราย จังหวัดเชียงใหม่ (Project Guidelines for Creating and Supporting Innovation in Nongyaeng Community Enterprise, Sansai District, Chiang Mai Province)
181	ยุวชนอาสาเพื่อพัฒนาศักยภาพของกิจกรรมการท่องเที่ยวและบริการการท่องเที่ยวโดยชุมชนสู่การอนุรักษ์ทรัพยากรในพื้นที่อ่างเก็บน้ำโครงการอันเนื่องมาจากพระราชดำริ บ้านภูดิน ตำบลแม่หอพระ อำเภอแม่แตง จังหวัดเชียงใหม่ (Youth Volunteers to Develop the Potential of Tourism Activities and Community-based Tourism Services towards Resource Conservation in the Royal Initiative Reservoir Project, Ban Phudin, Maehophra Subdistrict, Maetaeng District, Chiang Mai Province)
182	โครงการเพิ่มศักยภาพและขีดสมรรถนะของชุมชน (Community Capacity and Capacity Building Project)
183	โครงการพัฒนาชุมชนเชิงพื้นที่แบบองค์รวม ตำบลแม่แฝกใหม่ และตำบลเจดีย์แม่ครัว (Holistic Spatial Community Development Project Maefaekmai Subdistrict and Chedimaekrua Sub-district)
184	โครงการขับเคลื่อนงานบริการวิชาการสู่ชุมชน (Sansai Development Model) (Project to Drive Academic Service to the Community (Sansai Development Model))
185	โครงการเสริมสร้างความเข้มแข็งในการบริหารที่ส่งผลต่อประสิทธิผลของกลุ่มวิสาหกิจชุมชนบ้านนาคูหา (The Project to Strengthen the Management that Affects the Effectiveness of the Bannakhuha Community Enterprise Group)
186	ฐานเรียนรู้นวัตกรรมการจัดการเลี้ยงกุ้งก้ามกรามแบบแยกเพศ (Mono-Sex) เป็นอาหารปลอดภัยเพื่อพัฒนาเศรษฐกิจชุมชนอำเภอสันทราย จังหวัดเชียงใหม่ (Innovation Learning Base for Raising Lobsters Separated by Sex (Mono-Sex) as Safe Food to Develop the Community Economy in Sansai District, Chiang Mai Province)
187	โครงการบัณฑิตจิตอาสา พัฒนาชุมชน ประจำปี 2564 (Community Development Volunteer Graduate Project Year 2021)
188	กิจกรรมพัฒนาชุมชนผู้ตรวจสอบข่าวลวง (Cofact Thailand สัญจรภาคเหนือ) ภายใต้โครงการ "พัฒนากลไกการแก้ไขปัญหาข่าวลวงเพื่อสุขภาวะสังคมดิจิทัล" (Community Development Activities for Detecting Fake News (Cofact Thailand, Roaming the North) under the Project "Developing Mechanisms for Solving Fake News Problems for a Healthy Digital Society")
189	โครงการผลิตต้นพันธุ์เก๊กฮวยเพื่อบริการแก่ชุมชน (Chrysanthemum Production Project for Community Service)

Number of student organizations related to sustainability



There are many student organizations which create activities about green and environment conservation. During normal situation they can do many things to promote except in the period of Covid-19.

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There are 20 student organizations related to sustainability.

No.	Logo	Name of organization	Objectives of organization	Activities
1		องค์การนักศึกษา มหาวิทยาลัยแม่โจ้ Student Union of Maejo University	It is the main organization of students in organizing activities to develop students within the university in accordance with the identity of the university.	Huai Jo Development Volunteer Project
2		สภานักศึกษา มหาวิทยาลัยแม่โจ้ Student Council of Maejo University	It is a student organization to monitor, defend the rights, and present the material necessary for the life of students on campus.	Explore the Impact of COVID 2019 Knowledge of Rights and Student Welfare Program of the Year 2021

No.	Logo	Name of organization	Objectives of organization	Activities
3		สโมสรนักศึกษาคณะเศรษฐศาสตร์ Student Union of Faculty of Economics	Faculty-level student organization that organizes activities for students within the Faculty to become students according to the Faculty's graduate qualities.	Project Activities "Separate, Exchange, Smile"
4		สโมสรนักศึกษาคณะวิทยาศาสตร์ Student Union of Faculty of Science	Faculty-level student organization that organizes activities for students within the Faculty to become students according to the Faculty's graduate qualities.	The Competition Project Poster and Short Video Clip Contest on the Topic "Science all around".
5		สโมสรคณะเทคโนโลยีการประมงและทรัพยากรทางน้ำ Student Union of Faculty of Fisheries Technology and Aquatic Resources	Faculty-level student organization that organizes activities for students within the Faculty to become students according to the Faculty's graduate qualities.	Project for Cultivating Mosquito-Eating Fish to Eliminate Mosquito Larvae.
6		สโมสรวิทยาลัยบริหารศาสตร์ Student Union of School of Administrative Studies	Faculty-level student organization that organizes activities for students within the Faculty to become students according to the Faculty's graduate qualities.	Activity: Build a Water Barrier to Alleviate the Flood Situation.
7		สโมสรนักศึกษาคณะบริหารธุรกิจ Student Union of Faculty of Business Administration	Faculty-level student organization that organizes activities for students within the Faculty to become students according to	The 8th Toeyheet Taamhoi Project

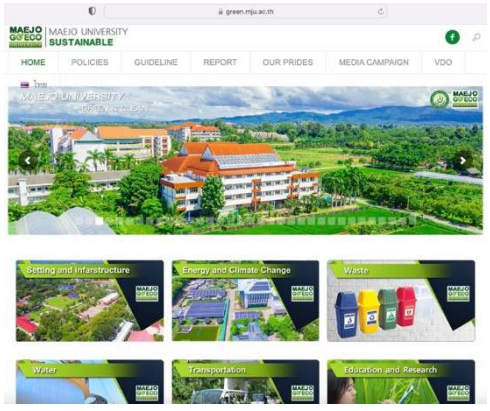
No.	Logo	Name of organization	Objectives of organization	Activities
			the Faculty's graduate qualities.	
8		สโมสรนักศึกษาคณะผลิตกรรมการเกษตร Student Union of Faculty of Agricultural Production	Faculty-level student organization that organizes activities for students within the Faculty to become students according to the Faculty's graduate qualities.	Photo Contest Project on the Topic "The Faculty of Agricultural Production is Definitely Not Infected with COVID" Volunteer Relations Project to Organize Activities under the COVID-19 Measures.
9		สโมสรนักศึกษาคณะศิลปศาสตร์ Student Union of Faculty of Liberal Arts	Faculty-level student organization that organizes activities for students within the Faculty to become students according to the Faculty's graduate qualities.	New Normal Diary Viral Clip
10		สโมสรนักศึกษาคณะวิศวกรรมและอุสาหกรรมเกษตร Student Union of Faculty of Engineering and Agro-industry	Faculty-level student organization that organizes activities for students within the Faculty to become students according to the Faculty's graduate qualities.	
11		สโมสรนักศึกษา คณะสถาปัตยกรรมศาสตร์และการออกแบบสิ่งแวดล้อม Student Union of Faculty of	Faculty-level student organization that organizes activities for students within the Faculty to become students according to	Siam Association of Alatus-Senna (SAAS) together with the Faculty of Architecture and

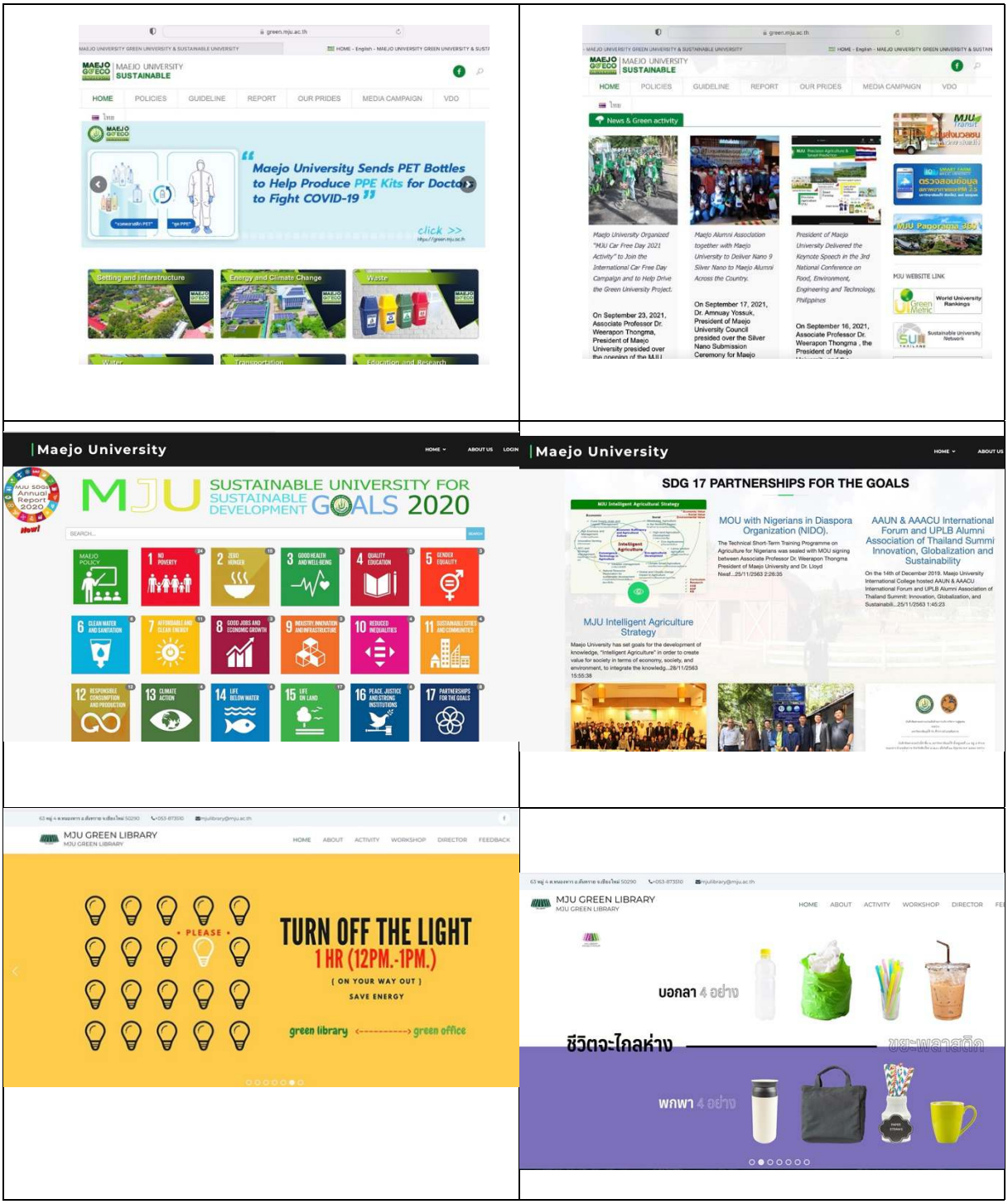
No.	Logo	Name of organization	Objectives of organization	Activities
		Architecture and Environmental Design	the Faculty's graduate qualities.	Environmental Design Club Maejo University Invites Everyone to Submit the Design of the Yang Na Tree Sign.
12		สโมสรนักศึกษาคณะสัตวศาสตร์และเทคโนโลยี Student Union of Faculty of Animal science and Technology	Faculty-level student organization that organizes activities for students within the Faculty to become students according to the Faculty's graduate qualities.	The Project to Improve the Landscape for the School and Build the Animal House for the Community.
13		สโมสรนักศึกษาคณะสารสนเทศและการสื่อสาร Student Union of Faculty of Information and Communication	Faculty-level student organization that organizes activities for students within the Faculty to become students according to the Faculty's graduate qualities.	Faculty Development Volunteer Activities.
14		สโมสรนักศึกษาคณะพัฒนาการท่องเที่ยว Student Union of School of Tourism Development	Faculty-level student organization that organizes activities for students within the Faculty to become students according to the Faculty's graduate qualities.	The Dream Sharing Project for the Year 2021 at Agape Foundation, Nongjom Subdistrict, Sansai District, Chiang Mai Province.
15		สโมสรนักศึกษาวิทยาลัยพลังงานทดแทน Student Union of	Faculty-level student organization that organizes activities for students within the Faculty to become	Volunteer Camp Project to Build Check Dams (Live Check Dams)

No.	Logo	Name of organization	Objectives of organization	Activities
		School of Renewable Energy	students according to the Faculty's graduate qualities.	
16		ชมรมนกเสรี Freedom Bird Club	To develop creative competence and problem solving in the public mind towards helping the community and society.	Help build a road to the Ban Nong Krisu Child Development Center in Bokaew Subdistrict Community at Bokaew Subdistrict, Samoeng District, Chiang Mai Province.
				Paint and Renovate Samoeng Hospital, Samoeng District, Chiang Mai Province.
17		ชมรมรากดินแม่โจ้ Maejo's Rakdin Club (RMC)	To encourage students to have a public mind to help the community and society.	"Ban Chuen Juen Jai Or" Activity
18		ชมรมศิลปวัฒนธรรมชาวไทยภูเขา Ethnic Arts and Culture Club	For students to transfer, exchange, and learn about the cultural diversity of the hill tribes to the general students.	Thai hill tribe art and culture volunteer camp

No.	Logo	Name of organization	Objectives of organization	Activities
19		ชมรมอนุรักษ์ณ์ธรรมชาติและสิ่งแวดล้อม Nature and Environmental Conservation Club	To enable students who are interested in environmental conservation to participate in activities and benefits.	Organic Waste Application Activities.
20		ชมรมยุวเกษตรกร Young Farmers Club	To foster the attitude of young agricultural group members to be proud of the value of agriculture and to accept agriculture as a profession	The Project to Strengthen and Develop the Capacity of the Young Farmers Group Knowledge Transfer Training Activities and Basic Agricultural Entrepreneurship Skills.

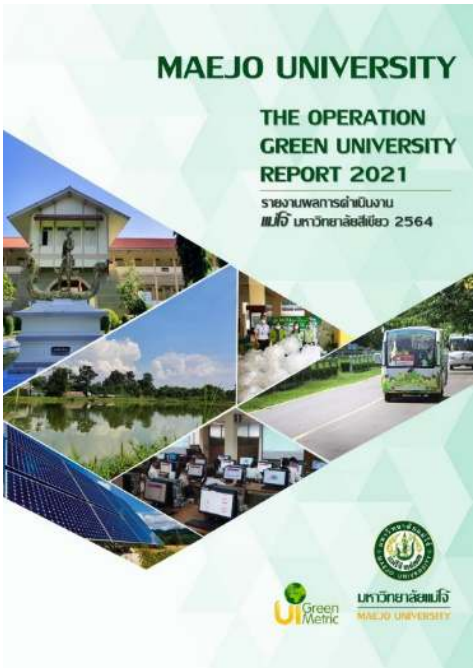
University-run sustainability website

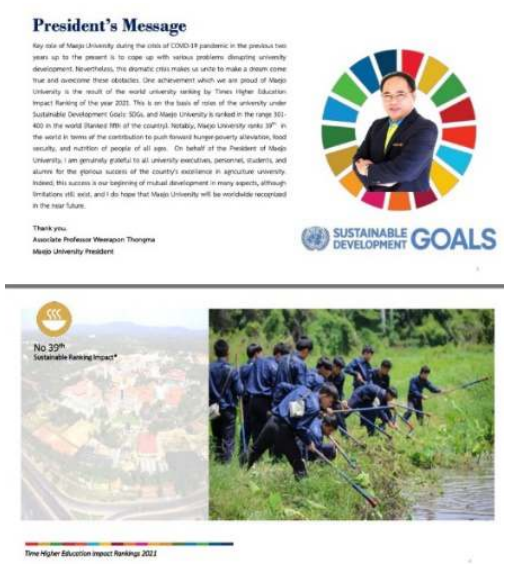
	



University sustainability website is available at http://www.green.mju.ac.th as bilingual description which consist of university's policy and strategies in green and sustainability. The information of green university issue, news and activities in both our staff and students were published on website. In addition, we also operate activities of SDGs (https://sdg.mju.ac.th) and green office that linked on university's website. Our website is available, accessible and updated regularly.

Sustainability report





The sustainability report of Maejo university is available and updated annually. We operate both in UI Green metric and SDGs report that available on website https://green.mju.ac.th/?page_id=3289&lang=en and https://sdg.mju.ac.th

Number of cultural activities on campus (e.g.Cultural Festival) including virtual activities (if any)

Worship ceremony of Maejo Shrine

Sacred ceremony to indoctrinate the students

Ceremony to offer Buddhist candle

	
Water-pouring ceremony for the President and the respected seniors	

The **cultural activities on campus** organized by the University: more than 3 **events**

- Maejo University with Maejo Alumni Association made an offering to the Maejo Shrine in order to prepare to improve the landscape under the project, "Decorating a Garden for Mother". On Thursday, October 28th, 2021 at 08.09 a.m. Associate Professor Dr. Weerapon Thongma, President of Maejo University presided over the worshiping ceremony of Maejo Shrine for auspiciousness before starting the landscape improvement project " Decorating a Garden for Mother " at Maejo Shrine which is a project that Maejo University together with Maejo Alumni Association and a network of Maejo alumni across the country organized.

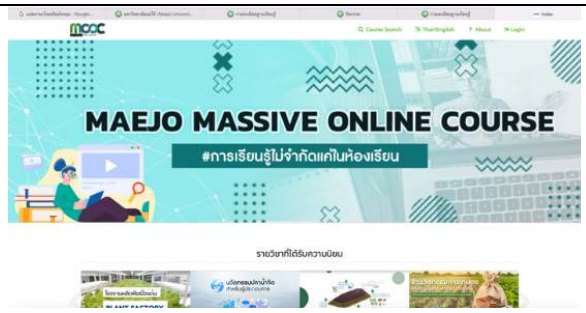
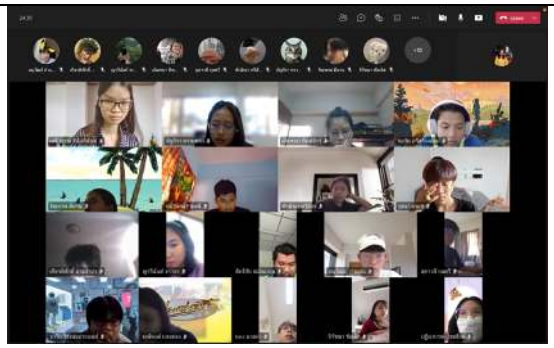
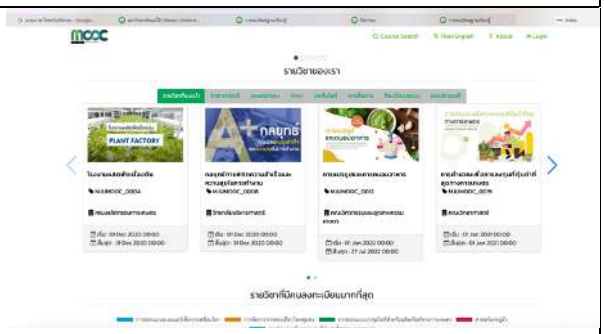
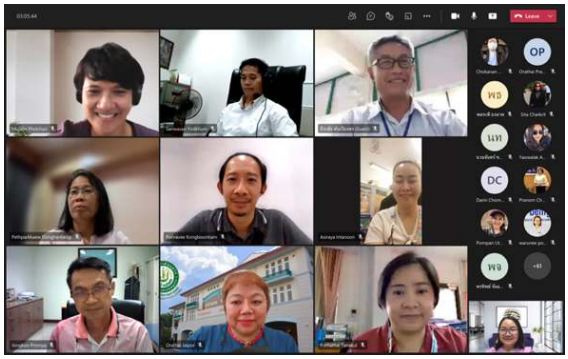
- On August 26th, 2021, the Faculty of Architecture and Environmental Design organized the ceremony "Krob Kru Kin Or (Sacred ceremony to indoctrinate the students):Integrated Arts 2021" in order to cultivate professional ethics, build morale in education as well as create unity among the group and show their gratitude to the teachers who have been practicing education. The religious ceremonies were carried out by the monks of the New Agricultural Meditation Office. There was also a Bai Sri Su Kwan ceremony for the Lanna art teacher. During the pandemic situation of Covid-19, the ceremony war organized in an online platform.

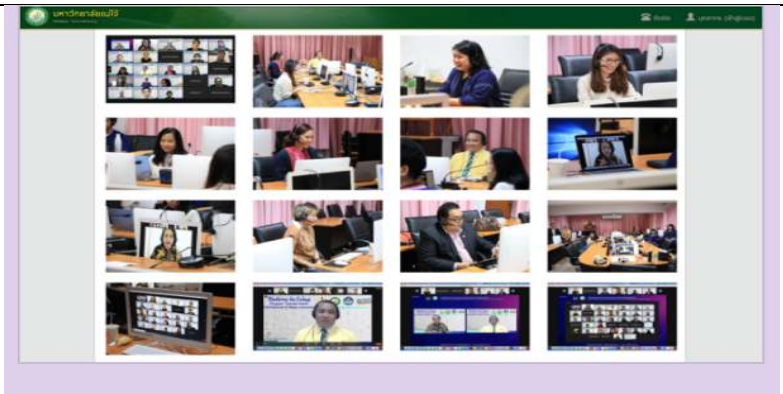
- On Friday July 23rd, 2021 Associate Professor Dr. Weerapol Thongma, President of Maejo University presided over the candle offering ceremony for the year 2021, leading the executive members, faculty, and staff to join the ceremony, offering candles, rain bathing cloth and Thai Dharma items for monks at Maejo Temple, Wivewanaram Temple, Pa Muet Temple, Thung Muen Noi Temple and Wat Huai Kiang in order to preserve Buddhism and carry on the tradition of the Buddhist Lent.

- On Friday, April 9th, 2021 Maejo University organized a water-pouring ceremony for the President and the respected seniors for the year 2021 to continue the tradition of the Lanna's New Year. This ceremony has been held annually by the Art and Cultural Center. The ceremony aims at asking for forgiveness and salute the seniors and is a continuation of the Lanna's New Year tradition or Thai New Year traditions during Songkran Festival.

References: https://erp.mju.ac.th/informationIndex.aspx?tid=7

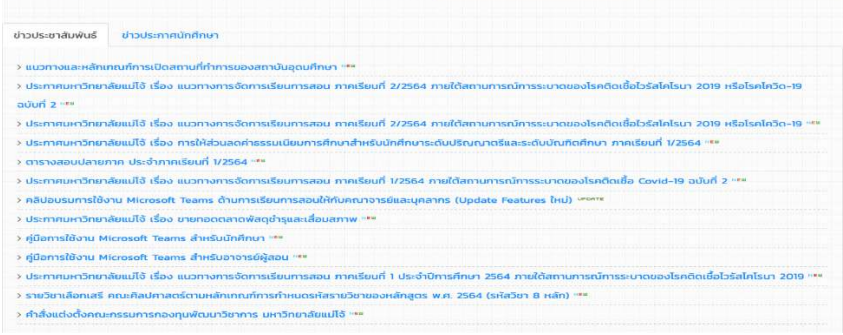
Number of university program(s) to cope with Covid-19 pandemic

	
Helpdesk for E-Learning	MJU Mooc
	
Online learning	MJU Mooc
	
Online meeting	MJU executive members congratulated the President for receiving UPLB Presidential Award and Outstanding UPLB Alumni, Philippines.



International Symposium on Disruptive Learning Pathways

Faculty of Liberal Arts held a meeting with Universitas PGRI Adi Buana Suana Surabaya (Indonesia) to summarize the project implementation of International Credit Transfer (ICT) that covers student exchange along with English language training services for Indonesian students.



Online Teaching Methods

For student;
http://www.education.mju.ac.th/1stYearStudent/regManual/MS%20Teams%20for%20Student%20V1.0.pdf

For teacher;
http://www.education.mju.ac.th/1stYearStudent/regManual/MS%20Teams%20for%20Teacher%20V1.0.pdf

Helpdesk group for E-Learning

Switching to E-Learning. This mission has as objective to maintain the relationship with the students locked down home and reassure them as well as their families about the fate of the courses and the diplomas. Nevertheless, professors were not ready to switch to total distance learning and some were completely not familiar with eLearning platforms and or software.

For this, the Pedagogic Innovation Cell of the university of Sousse worked very hard to identify the needs very quickly and to organise distance lectures to professors for eLearning discovering and

mastering. A Facebook group (Helpdesk for E-Learning) has been created, see Fig. 2, to ensure un quick interaction with professors. Also, no software was imposed to professors (Moodle, Microsoft Team, social media, etc) to reduce technological constraints or teachers/ students apprehension.

Virtual Workshop

International Symposium on Disruptive Learning Pathways

The world of higher education is changing in profound ways and not only in the wake of the COVID-19-related health crisis that is accelerating the digital transition of Higher Education. It is also faced with the challenge of responding to the urgency of climate change and more broadly to the need for learners to develop new and highly specific skills to move towards reaching the 17 Sustainable Development Goals. As such, this silent revolution is underway in higher education institutions worldwide. These fundamental trends are changing not only what should be taught, but also how best to teach it. From the wide range of changes such as active learning, inclusive pedagogies, online and hybrid courses, and green skills, institutions are building on their core strengths while challenging long-held assumptions about how teaching and learning take place. We believe it is important to reflect and exchange on the experiences and challenges that we all face in the volatile international context of Higher Education. This goal of this symposium is to identify ways of ensuring that our students receive the highest possible quality learning experiences. Experts from industry and academia from all over the world will share their experiences and discuss the latest innovations in disruptive learning pathways for fostering success in education.

Online Teaching

(https://pjj.ui.ac.id/panduan-pemula/)

Regarding the Covid-19 Pandemic, the Rector of UI has mandated that the teaching and learning at UI be held virtualy until the end of the 2019/2020 school year. This website contains guidelines for the operation and various related information. This page will be updated regularly.

Additional evidence link (e.g. for videos, more images, or other files that are not included in this file):

On Saturday, October 16th, 2021 Faculty of Liberal Arts held a meeting with Universitas PGRI Adi Buana Suana Surabaya (Indonesia) to summarize the project implementation, International Credit Transfer (ICT) that covers student exchange along with English language training services for Indonesian students. In this regard, Dr. Sutkhet Sakunthong, Assistant to the President, representative of the President along with Asst. Prof. Dr. Chanaporn Khantabudr, Dean of the Faculty of Liberal Arts said thanks on behalf of the University and exchanged results with the executives, faculty members and students from Universitas PGRI Adi Buana Suana Surabaya (Indonesia) at the 404 meeting room, Faculty of Liberal Arts via online platform.

Number of sustainablity community services project organised and/or involving students

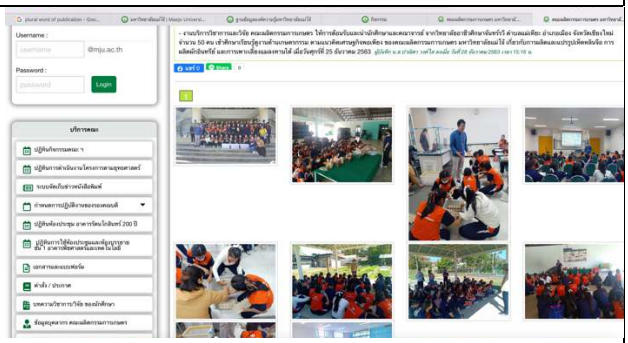
With the covid-19 pandemic, only some project of community services was operated onsite, most of the them were done online.

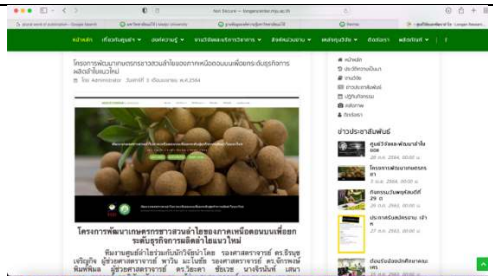
Project name	Project duration	Project area
โครงการแปลงกัญชาเพื่อรักษาโรค ใหญ่ที่สุดอาเซี่ยน ตามรอยพ่อ "กษัตริย์เกษตร"**Cannabis cultivation project for medicinal purposes; The largest ASEAN, following in the footsteps of the father "King of Agriculture"**	Longterm	SI
โครงการเปิดฟาร์มมหาวิทยาลัยแม่โจ้ **(Maejo Open Farm 2021)Maejo University Open Farm Project (Maejo Open Farm 2021)**	Every year	SI
โครงการฐานเรียนรู้การผลิตพืชในรูปแบบเกษตรอินทรีย์สำนักฟาร์มมหาวิทยาลัย **Project of learning base on plant production in the way of organic agriculture, University Farm Office**	Every year	SI
โครงการการฝึกอบรมเชิงปฏิบัติการ **“**การใช้พลังงานแสงอาทิตย์ในการเลี้ยงปลาดุกลูกผสมในระบบอควาโปนิกส์**(Aquaponics)”** **Workshop project “Using Solar Power for Breeding Hybrid Catfish in Aquaponics System”**	1 year	EC
โครงการมหัศจรรย์พันธุ์ไม้ฟอกอากาศ **Air purifier miracle project**	1 year	EC
ศูนย์เรียนรู้เทคโนโลยีการควบคุมศัตรูพืชโดยชีววิธีมหาวิทยาลัยแม่โจ้ **Maejo University Biological Pest Control Technology Learning Center**	Every year	EC
ฐานเรียนรู้ปุ๋ยอินทรีย์แบบไม่กลับกอง **Organic Fertilizer Learning Base**	Every year	WS
ฐานเรียนรู้การเลี้ยงไส้เดือนดินกำจัดขยะอินทรีย์ **Learning base for raising earthworms to get rid of organic waste**	Every year	WS
โครงการ การถ่ายทอดเทคโนโลยีการใช้สารสกัดแทนนินจากเปลือกกล้วยหอมทองดิบเพื่อการลดของเสียและตะกอนจากน้ำทิ้งจากการเพาะเลี้ยงสัตว์น้ำ **Project of technology transfer on the use of tannin extract from raw golden banana peels for the reduction of waste and sludge from effluents from aquaculture**	1 year	WS
โครงการต้นแบบการยกระดับคุณภาพชีวิตแบบมีส่วนร่วมที่เป็นมิตรด้านสิ่งแวดล้อม **(Green farm)** เพื่อการพัฒนาที่ยั่งยืนของกลุ่มเกษตรกรฟาร์มกุ้ง **A model project for enhancing the quality of life with participative environmental friendliness (Green farm) for sustainable development of shrimp farming groups.**	1 year	WS
โครงการฝึกอบรมเชิงปฏิบัติการการเลี้ยงปลาหมอในร่องสวนและแหล่งน้ำในสวนลำไยตามแนวทางการลดต้นทุนและลดผลกระทบต่อสิ่งแวดล้อม เพื่อเข้าสู่ระบบการเลี้ยงสัตว์น้ำอินทรีย์	Every year	WR

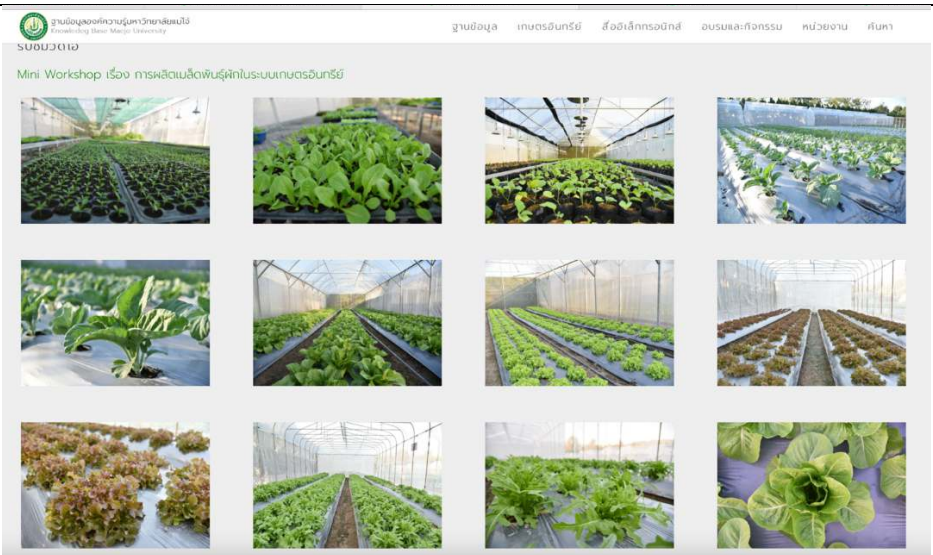
Project name	Project duration	Project area
Workshop on cultivating cichlids in orchards and water sources in longan orchards according to cost reduction and environmental impact reduction guidelines to enter the organic aquaculture system		
โครงการการเลี้ยงปลาเชิงซ้อนร่วมกับการปลูกพืชอควาโปนิกส์ในระบบที่เป็นมิตรกับสิ่งแวดล้อม **Complex Fish Farming Project with Aquaponics Planting in an Eco-Friendly System**	1 year	WR
โครงการพัฒนาชุมชนเชิงพื้นที่แบบองค์รวม ตำบลแม่แฝก และตำบลเจดีย์แม่ครัว **Holistic Community Development Project in Mae Faek Subdistrict and Chedi Mae Krua Subdistrict**	1 year	TR
ฐานเรียนรู้การผลิตปลากะพงขาวน้ำจืดด้วยนวัตกรรมการเลี้ยงในระบบปิดน้ำหมุนเวียนสมัยใหม่ **(Smart Recirculation Aquaculture System, SRAS)** **A learning base for freshwater seabass production with innovative aquaculture innovations in modern closed circulating water systems (Smart Recirculation Aquaculture System (SRAS)**	Every year	ED
โครงการ การฝึกอบรมเชิงปฏิบัติการของเยาวชน เรื่อง การอนุรักษ์ความหลากหลายทางชีวภาพและทรัพยากรประมงกับการใช้เทคโนโลยีสารสนเทศเพื่อเผยแพร่เพื่อเป็นรากฐานการบูรณาการองค์ความรู้ทางการประมง ณ อำเภอสันทราย จังหวัดเชียงใหม่ **Youth Workshop on Conservation of Biodiversity and Fishery Resources and the Use of Information Technology for Dissemination as a Foundation for Integrating Fisheries Knowledge at San Sai District, Chiang Mai Province**	1 year	ED
โครงการพัฒนาคุณภาพชีวิตผู้สูงอายุในชุมชนเขตอำเภอสันทราย เพื่อสร้างรายได้จากงานหัตถศิลป์ล้านนา **Project to improve the quality of life for the elderly in communities in San Sai District to generate income from Lanna handicrafts**	1 year	ED
ศูนย์เรียนรู้วัฒนธรรมเกษตรล้านนา **Lanna Agricultural Culture Learning Center**	Every year	ED

The knowledge base of our campus was operated both onsite visiting and in the media that participants can access via online. Such as

Academic services project of Maejo university;	https://erp.mju.ac.th/projectPlanLst.aspx?pid=2
Maejo Open Farm 2021	https://youtu.be/GlkimU69v1o
The knowledge base of Air purification plant	https://kb.mju.ac.th/learningBase.aspx?id=1350
Cannabis cultivation project for medicinal purposes; The largest ASEAN, following in the footsteps of the father "King of Agriculture"	https://youtu.be/ssBM3GgfTy8
Lanna Agricultural Culture Learning Center	https://youtu.be/JZkygCAzhLE



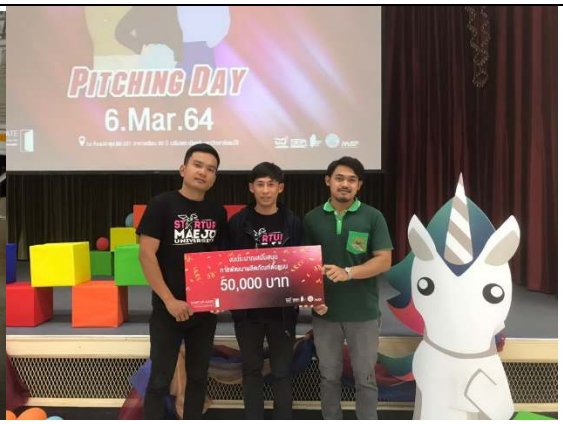




Number of sustainability-related startups

No.	Information
1	**Startup name:** Thiva Innovate (PhD student Faculty of Engineering and Agro-Industry) **Startup area in UI Greenmetric questionnaire (SI, EC, WS, WR, TR, ED):** ED **URL:** https://www.thivainnovate.com/ **Description:** Tiwa Innovate Co., Ltd. is the number one commercial innovation company in the northern region with a guaranteed award from the Northern Science Park (NSP Innovation award 2019). By driving business through Deep-Tech Innovation in agriculture that focuses on developing technology for plant production in closed systems (Plant Factory) with all types of planting methods, such as hydroponics. Organic farming, planting materials, etc., as well as other agricultural technologies to create business strengths and sustainability for agricultural customers who apply the technology during the changing global situation. It also provides consulting services for planning, designing, and installing Plant factory systems for full-scale commercial plant production. At present, the company is supported by many national agencies for continuous development and research in the fields of agricultural IOT technology products, agricultural processing products, environmental control technology for crops and products. For growing crops such as precision organic fertilizers. Therefore, in an era where technology in all dimensions is growing rapidly exponentially, Tiwa Innovate Co., Ltd. focuses on raising the level of agricultural sector to grow forward with modern technology relentlessly such as together to allow Thai agricultural technology to keep pace with the world's agricultural technology.

	Photos:
	 
	 
	
2	**Startup name:** Smart Mush (Master's degree student, School of Renewable Energy) **Startup area in UI Greenmetric questionnaire (SI, EC, WS, WR, TR, ED):** ED **URL:** https://www.facebook.com/SMART-MUSH-107868851022258 **Description:** Smart Mush...Smart renewable energy Greenhouse for straw mushroom Environmental control system to facilitate the production of straw mushrooms. In the system, there are devices to control temperature, humidity, and carbon dioxide to the appropriate values because these parameters are the main factors for mushroom quality. The products are subdivided into 2 forms. The first model is for farmers who already have

	greenhouses to install the system. The second model is that there are both greenhouses and systems, which are suitable for farmers who have been growing mushrooms for a long time and want to increase their productivity as well as those who are interested in growing mushrooms. **Photos:**
	 
	 
3	**Startup name:** ไร่ผู้ใหญ่มูล (Phuyai Moon Garden) (Alumni of School of Administrative Studies) **Startup area in UI Greenmetric questionnaire (SI, EC, WS, WR, TR, ED):** ED **URL:** https://www.facebook.com/phuyaimoon/ **Description:** Phuyai Moon Garden started from the group has a marketing survey found that the soil in the general tree market is cheap, low quality, and poor soil structure, making it difficult to grow when used for cultivation. However, users need to find fertilizers to increase the efficiency of the soil in order for the plants to grow more efficiently or grow better. The team saw this problem and decided that an efficient and environmentally friendly, non-toxic ready-to-plant soil should be produced where any type of crop could be grown and yield thriving, pest-free crops. Therefore, the Phuyai Moon Garden team has planned to collect information and formulate a soil formula that is high quality and rich in nutrients that plants need to grow. The Phuyai Moon Garden team has surveyed and gathered raw materials for making the soil by choosing non-toxic raw materials such as chopped coconut claw leaves. In this regard, the soil has been examined with scientific methods by using an operating lab from a reputable university in agriculture, Maejo

	University, to analyze and inspect the chemicals every time and every production cycle before it comes into production to make sure that the soil is ready for planting in mature farm. **Photos:**
	 
	

มหาวิทยาลัยแม่โจ้

MAEJO UNIVERSITY

63 หมู่ 4 ตำบลหนองหาร อำเภอสันทราย จังหวัดเชียงใหม่ รหัสไปรษณีย์ 50290