Phranakhon Si Ayutthaya Rajabhat University
Environmental Statement Report
2022

Thailand

http://green.aru.ac.th

Phranakhon Si Ayutthaya Rajabhat University (ARU) is committed to sustainable development. The university is developing to create a balance between environmental, social, and economic dimensions so the university can be a model for students, staff and community around university to be aware of the environmental changes and to maintain a suitable environment for future generations especially neutral carbon community. The University development for sustainability consists of 6 areas which are;

1. Setting and Infrastructure (SI)
2. Energy and Climate Change (EC)
3. Waste (WS)
4. Water (WR)
5. Transportation (TR)
6. Education and Research [ED]

The sustainability development of ARU reveals better environmental, class activity, and university member habits. This success is due to the cooperation of everyone in the university. We try to give them a chance to express their inspiration and let them create a great place for living together even with animals, and plants. The campaign slogan is "ARU TOGETHER GREEN".

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[1] Setting and Infrastructure (SI)

[1.3] Number of Campus Sites

View of Campus and Some Academic Area (ARU, Thailand)

Description:

Phranakhon Si Ayutthaya Rajabhat University (ARU) consists of 1 campus covering a total area of 267,324 m^2. It was founded for the purpose of training teachers in 1905 and became a higher education institute in 1992. It is located amidst the historic greenery and ruins of the old capital of Ayutthaya, which was designated as a UNESCO World Heritage Site in December 1991. ARU focuses on developing and strengthening the capacity of local communities through 4 faculties for Bachelor's degrees and 1 demonstration school. Furthermore, since being designated a World Heritage Site, ARU has become a center for cultural tourism management given its unique position in the center of Ayutthaya. In addition to education and tourism, ARU is a leading university in health science and environmental studies.

Additional evidence link:

History, Protection and management requirements of Ayutthaya Historical Park (https://whc.unesco.org/en/list/576/)

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[1] Setting and Infrastructure (SI)

[1.4] Campus Setting

Urban Campus Setting (ARU, Thailand)

Description:

Phranakhon Si Ayutthaya Rajabhat University is located in the center of the Ayutthaya UNESCO World Heritage Site. Given its location, the university buildings are limited in height in order to comply with building regulations in the World Heritage Site. The architectural style of the university incorporates the historic Ayutthaya designs seen in the surrounding ruins. The university makes use of all available land while preserving the trees located on campus which provide shade for the faculty and students. ARU belongs to Phranakhon Si Ayutthaya district which is located near the city center of the Phranakhon Si Ayutthaya Province. The Phranakhon Si Ayutthaya district has a total area of 130.60 km² and a total population of 136,467.00. This means a median population density of 1,053.13 inhabitants per km².

Additional evidence link:

Population and area (https://en.wikipedia.org/wiki/Phra_Nakhon_Si_Ayutthaya_District)

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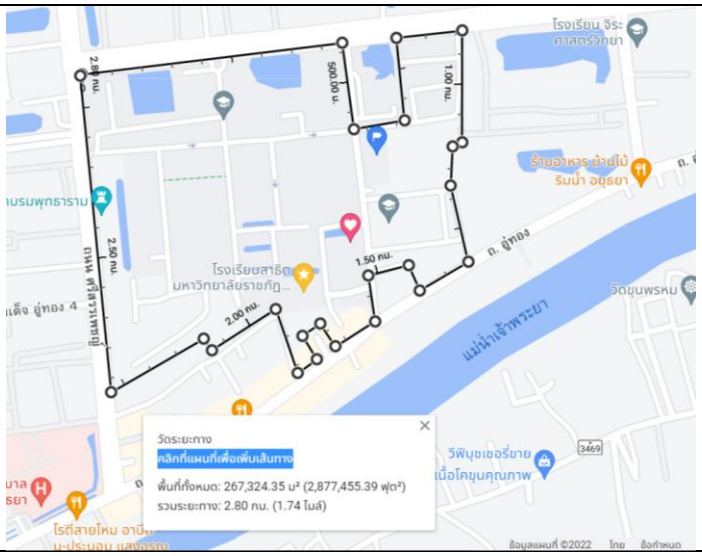
[1] Setting and Infrastructure (SI)

[1.5] Total Campus Area (meter^2)



Total Campus Area (ARU, Thailand)

Description:

The marked area on the map is the academic area of higher education including two primary and one secondary schools. The marked area includes the classrooms, lecture halls, administration buildings, the cafeteria, parking lots, and the forest.

Total area: 267,324 m^2
Total distance/circumference: 2.80 km = 2,800 m

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[1] Setting and Infrastructure (SI)

[1.7] Total Campus Building Area (m^2)

Building No.	Name (Thai)	Ground Floor Area	No. of Floor	Total Building Area	Unit
1	อาคารป่าดินสอ	914.00	3	2,742.00	sqm
2	อาคารป่าตอง	914.00	3	2,742.00	sqm
3	กองนโยบายและแผน	411.00	3	1,233.00	sqm
4	อาคารคณะวิทยาการจัดการ	614.00	3	1,842.00	sqm
5	คณะวิทยาศาสตร์	814.00	3	2,442.00	sqm
6	คณะครุศาสตร์	595.00	3	1,785.00	sqm
7	คณะครุศาสตร์	495.00	3	1,485.00	sqm
12	อาคาร ปฏิบัติการเทคโนโลยี	205.00	2	410.00	sqm
13	อาคารสาขาดนตรี	392.00	3	1,176.00	sqm
15	อาคารสำนักวิทยบริการ	1,054.00	2	2,108.00	sqm
18	โรงยิม 1	945.00	1	945.00	sqm
19	โรงยิม 2	763.00	1	763.00	sqm
20	อาคารโรงอาหาร(เก่า)	770.00	1	770.00	sqm
21	อาคาร หอประชุม	1,131.00	1	1,131.00	sqm
24	อาคารศูนย์วิทยาศาสตร์	972.00	3	2,916.00	sqm
30	อาคารบัณฑิตวิทยาลัย	1,055.00	3	3,165.00	sqm
31	อาคาร 100 ปี	5,579.00	2	11,158.00	sqm
35	อาคารท้องฟ้าจำลอง	616.00	2	1,232.00	sqm
36	อาคารศูนย์การศึกษาพิเศษ	903.00	2	1,806.00	sqm
37	กองพัฒนานักศึกษา	559.00	2	1,118.00	sqm
41	คณะวิทยาการจัดการ	1,064.00	2	2,128.00	sqm
42	อาคารเทคโนโลยีอุตสาหกรรม	1,658.00	2	3,316.00	sqm
43	อาคารคณะมนุษยศาสตร์ฯ	1,039.00	2	2,078.00	sqm
44	อาคารสำนักงานอธิการบดี	947.00	2	1,894.00	sqm
45	อาคารบ้านพลูหลวง	2,688.00	2	5,376.00	sqm
46	อาคารครุศาสตร์	935.00	2	1,870.00	sqm
47	อาคารสวนหลวงค้างคาว	2,089.00	2	4,178.00	sqm
48	อาคารเรียนมัธยม 1	935.00	4	3740.00	sqm
49	อาคารเรียนมัธยม 2	900.00	2	1800.00	sqm
50	โรงยิมมัธยม	200.00	1	200.00	sqm
51	อาคารเรียนประถม	700.00	2	1400.00	sqm
52	โรงยิมประถม	100.00	1	100.00	sqm
53	กลุ่มอาคารเรียนปฐมวัย	500.00	2	1000.00	sqm
	Total	**33,456.00**		**72,049.00**	sqm

Description:

Total campus building ground area: **33,456.00** (m^2)

Total campus building area: **72,049.00** (m^2)

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[1] Setting and Infrastructure (SI)

[1.8] The Ratio of Open Space to Total Area.


Open Space (ARU, Thailand)

Description:

Formula: ((1.5-1.6/1.5) * 100%)
((267,324 (m^2) - 33,456 (m^2))/ 267,324 (m^2))*100%

The ratio of open space to total area: 87 %

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[1] Setting and Infrastructure (SI)

[1.9] Total Area on Campus Covered in Forest Vegetation (meter^2)

Example of Total Forest Vegetation Area (ARU, Thailand)

Description:

Most of the trees covering the area of the Borom Phuttaram temple are Golden Fig trees (*Ficus Benjamina* L.). The area is also shaded by some Bamboo and Fig trees (*Ficus carica*). The trees are home to a number of birds, squirrels, and insects. The trees are conserved and a canal with water all year round provides the perfect conditions for insect diversity. These trees shade the area and help reduce the heat during the day. Therefore, various annual events organized by the university are frequently held underneath these Golden Fig trees.

Total area: 10,485.54 m^2 (5.26%)
Total distance/circumference: 0.01 km

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[1] Setting and Infrastructure (SI)

[1.10] Total Area on Campus Covered in Planted Vegetation

Planted Vegetation (ARU, Thailand)

Description:

The vegetation in the university consists mostly of trees (5-20 meter-high) along the roadside, ornamental plants for decoration, herbs and spices for food coloring, and some vertical gardens.

Total area on campus covered in planted vegetation: 32,097 m^2 (12.00 %)

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[1] Setting and Infrastructure (SI)

[1.11] Total Area of Campus for Water Absorption besides Forest and Planted Vegetation

Water Absorption Area (ARU, Thailand)

Description:

Total area on campus for water absorption besides forest and planted vegetation is 29,000 m^2.

The ratio of open space to total area: 11 %

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[1] Setting and Infrastructure (SI)

[1.17] University's Budget for Sustainability Effort (in US Dollars)

Strategic	2017	2018	2019	2020	2021	Strategic	2022
Primary-Secondary School Teacher Development	599,001	371,634	599,989	68,690	405,546	Educational research and Innovation	1,877,595
Innovation, Research, Health-Science, and Environment	589,342	1,164,172	1,435,237	970,129	1,155,890	-	-
Eco-Tourism in the World Heritage Site	52,644	-	-	-	-	Cultural Research and innovation	89,770
Green University	-	26,666	64,666	56,666	50,806	Green University	34,464
Area-Based Development	-	395,139	502,616	1,049,362	819,264	Area-Based Sustainable Development	675,805
Management System	-	6,917,326	7,654,458	12,412,918	14,308,776	Management System	3,282,153
						Other	8,521,740
Total	641,986	8,874,937	10,256,966	14,557,765	16,740,282	-	14,481,527
% Sustainable budget							41.15

Description:

The total university budget for the sustainability effort in 2021 is 5,959,787 $ from total budget of 14,481,527 $ which calculated as 41.15 %

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[1] Setting and Infrastructure (SI)

[1.20] Percentage of building operation and maintenance activities in a one year period

 	 
Building Renovation (ARU, Thailand)	Building Renovation (ARU, Thailand)

Description:

All buildings have underwent operation and maintenance in major and minor activity to keep the usage at the high performance.

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[1] Setting and Infrastructure (SI)

[1.21] Campus facliities for the disabled, special needs and maternity care

Wheelchair Ramp (ARU, Thailand)

Description:

All buildings in ARU are equipped with special facilities for the disabled, people with special needs and maternity care.

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[1] Setting and Infrastructure (SI)

[1.22] Security and Safety Facilites

	
CCTV (ARU, Thailand)	Fire Hydrant (ARU, Thailand)
	
Fire Extinguisher (ARU, Thailand)	

Description:

1. CCTV cameras are located at the university entrances, building entrances, inside the buildings, on the main roads of the university.
2. Fire hydrants were installed in the buildings after year 2000, however a fire extinguishers are equipped in the older buildings without the fire hydrant.

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[1] Setting and Infrastructure (SI)

[1.23] Health Infrastructure Facilities for Students, Academics and Administrative Staff Wellbeing

	
First Aid Room (ARU, Thailand)	Covid-19 ATK Check for Student (ARU, Thailand)

Description:

1. The first aid room supplies health services for students and lecturers. In case of severe symptoms or any accidents or injuries, the case will be transferred to the provincial hospital which is situated next to the university.
2. ARU Provided both indoor gym and outdoor exercise tools for staff and student.

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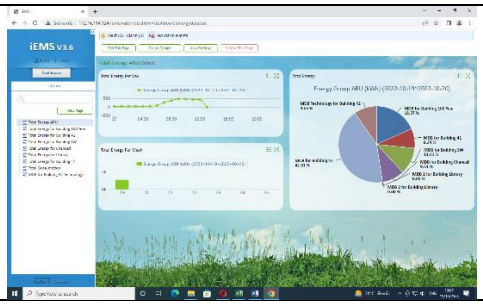
[2] Energy and Climate Change (EC)

[2.1] Energy Efficient Appliance Usage


LED Lighting and Temperature Detection System (ARU, Thailand)

Automate Door for Air-Conditioned Building (ARU, Thailand)

Realtime Energy Consumption (ARU, Thailand)

Description:

ARU intends to realize further energy savings by paying close attention to energy management and using high-efficiency appliance, such as LED lighting and an inverter cooling system. The real-time energy consumption monitoring system would monitor the peak of energy usage which is able to be used for the energy reduction program. Each building can assess its own energy consumption and realize its own energy usage.

Number Energy Efficient Appliances

Appliance	Total Number	Total Number Energy Efficient Appliances
LED Lamp	46,000	12,408
Inverter Cooling system	400	182
total	46,400	12,590
	Percentage	**26.97**

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[2] Energy and Climate Change (EC)

[2.3] Smart Building Implementation

***Min. at least five requirements for each building**

No.	Name	Place	Automation		Safety				Energy		Water		Indoor Environment				Lighting				Building Area (m^2)
			B1	B2	S1	S2	S3	S4	E1	E2	A1	A2	I1	I2	I3	I4	L1	L2	L3	L4	
1	Building No.47 อาคารสวนหลวงค้างคาว (Lecture room and cafeteria)	Phranakhon Si Ayutthaya, Thailand	X			x	x		x							x	x			x	4,178
2	Library Building	Phranakhon Si Ayutthaya, Thailand	X			x	x		x					x	x		x	x		x	2,108
3	Building No.4 คณะวิทยาการจัดการ	Phranakhon Si Ayutthaya, Thailand				x	x										x			x	2,520
	Total																				**8,806**

Smart building implementation

(8806 m^2/x100%)/63,809.00 m^2
Smart building implementation is 13.8 %

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[2] Energy and Climate Change (EC)

[2.5] Renewable Energy Sources on Campus

Wind Power Module (ARU, Thailand)

Solar PV Power for Electricity in a Waste Bank (ARU, Thailand)

Description:

Two solar PV power modules were installed (6773 kWh) in ARU. The modules consist of a Mono Crystalline PV module and an Amorphous PV module, which are able to generate 3999.97 kWh and 2773.2 kWh per year, respectively. Wind power is also installed at ARU to demonstrate the benefit of wind as a tool for learning experience. This wind power generates about 800 kWh per year. Furthermore, some electronic devices also use their own individual solar power.

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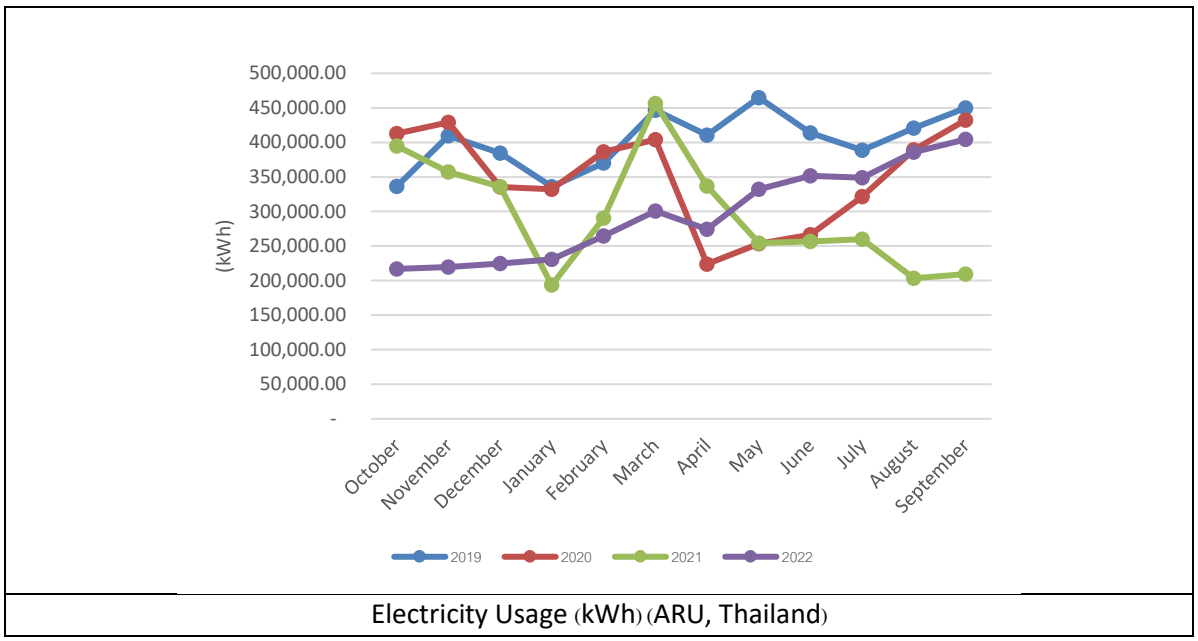
[2] Energy and Climate Change (EC)

[2.6] Electricity Usage Per Year (in Kilowatt hour)



Electricity Usage (kWh) (ARU, Thailand)

	Electricity Usage (kWh)												
Year	1	2	3	4	5	6	7	8	9	10	11	12	Total
2019	336,574.40	409,531.00	384,434.14	336,020.50	370,218.59	446,558.86	410,555.40	464,837.70	413,852.12	388,515.78	420,604.10	449,739.09	**4,831,441.68**
2020	412,988.09	428,805.66	335,303.50	332,171.53	386,595.73	403,901.01	223,938.42	253,579.03	266,607.16	321,354.61	389,287.23	432,335.39	**4,186,867.36**
2021	394,611.93	357,029.69	335,968.41	193,466.11	290,559.06	456,245.25	336,772.17	254,415.02	256,607.11	259,883.24	203,393.57	209,364.72	**3,548,316.28**
2022	216,969.66	219,762.45	224,812.31	230,974.93	264,585.23	300,915.99	274,345.95	332,344.53	351,690.39	348,964.64	385,783.66	404,306.18	**3,555,455.92**

Description:

The total electricity usage of ARU in 2022 was 3,555,455.92 kWh. ARU electricity is used for lighting and cooling, mostly in the classrooms and for some laboratory appliances. In 2021, during the COVID-19 Pandemic, most classrooms were not used regularly, and the energy consumption was reduced. However, in 2022, most of the classes were launched as regular, which increased the use of higher electricity usage. The programs for the reduction of electricity usage were launched and the light bulbs were continually changed to LED bulbs and the old cooling systems were replaced with new cooling systems every year. The electricity usage slightly decreased in the last two quarters of 2021.

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[2] Energy and Climate Change (EC)

[2.7] Ratio of Renewable Energy Production Divided by Total Energy Usage Per Year


Solar PV Power Module and wind turbine module (ARU, Thailand)

Description:

There are two sources of Renewable Energy Production in ARU.

No	Renewable Energy	Production (in kWh)
1	Solar panel	6700
2	Wind turbine	800
	Total	7,500

7500 of total usage 3555455 (Electricity usage) = 0.21 %

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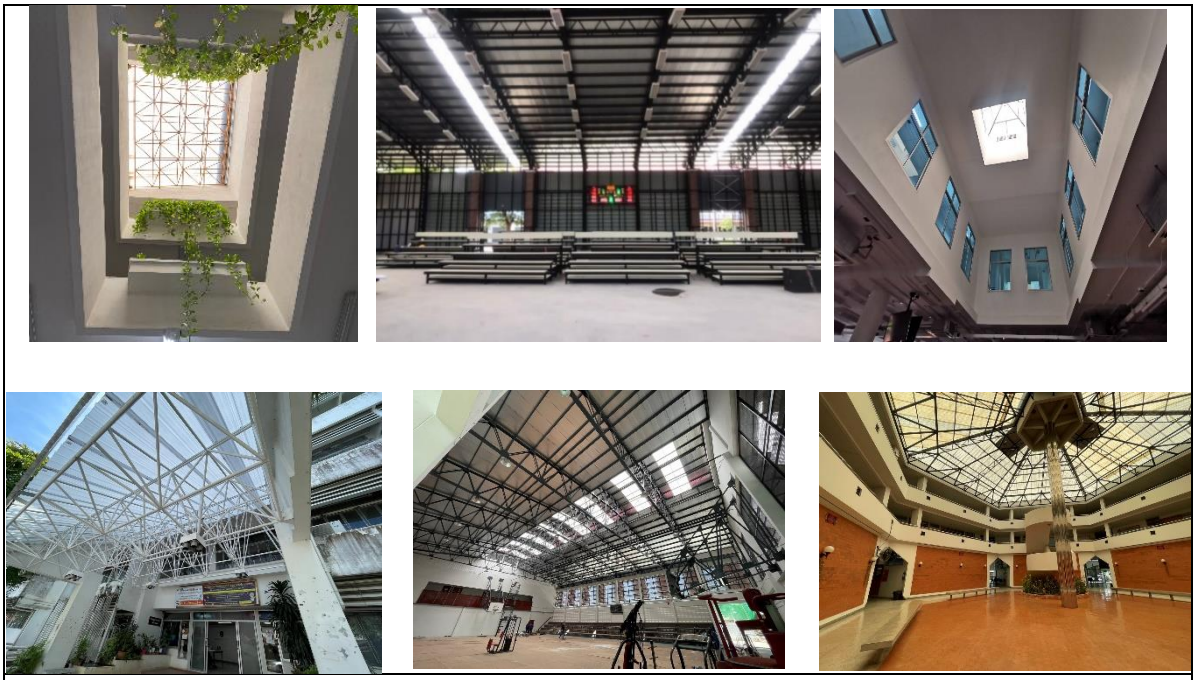
[2] Energy and Climate Change (EC)

[2.9] Elements of Green Building Implementation as Reflected in All Construction and Renovation Policies



Transparent Roof and Light Control Panel (ARU, Thailand)

Visual Comfort Using Natural Light Design (ARU, Thailand)

Description:

The policy of construction and renovation of the ARU Buildings Department is to maximize the use of natural light by using glass windows with light control film and a light-shaded panel to control the penetration of heat from outside the buildings.

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[2] Energy and Climate Change (EC)

[2.10] Greenhouse Gas Emission Reduction Program

1. Renewable Energy (ARU, Thailand)

2. Walk and Ride App (ARU, Thailand)

3. Waste Bank (ARU, Thailand)

Description:
(*Please describe the elements of green building implementation on your campus. The following is an example of the description. You can describe more related items if needed*.)

1. Planning for Available Parking lot sensor to reduce car travelling distance
2. Using renewable energy for electricity reduces the amount of electricity purchased.
3. 'ARU workout' app to promote walking, running, and cycling on campus instead of using cars.
4. 'ARU waste exchange' waste bank to promote 3Rs which reduce greenhouse gas emissions.
5. Using Power Management (PM) to optimize the use of electricity in all departments.
6. The preparation of a carbon-neutral community in which the tree canopy size measurement is in the planning stage.

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[2] Energy and Climate Change (EC)

[2.11] Please Provide the Total Carbon Footprint (CO_2 emission in the last 12 months, in metric tons)

Option 2: Recommended by UI GreenMetric

CO_2 (electricity)

$= (\text{electricity usage per year in kWh}/1000) \times 0.84$

$= \frac{3555455}{1000} \times 0.84$

$= 2{,}986$ metric tons

CO_2 (bus)

(Number of the shuttle buses at your university x total trips for shuttle bus service each day x approximate travel distance of a vehicle each day inside campus only (in kilometers) x 240/100) x 0.01

$= \frac{3 \times 20 \times 3 \times 240}{100} \times 0.01$

$= 4.32$ metric tons

CO_2 (cars)

$= \frac{\text{number of cars entering your university} \times 2 \times \text{approximate travel distance of vehicle each day inside campus only (KM)} \times 240}{100} \times 0{,}02$

$= \frac{404 \times 2 \times 3 \times 240}{100} \times 0.02$

$= 116$ metric tons

CO_2 (motorcycle)

$= \frac{\text{number of motorcycle entering your university} \times 2 \times \text{approximate travel distance of vehicle each day inside campus only (KM)} \times 240}{100} \times 0{,}01$

$= \frac{357 \times 2 \times 3 \times 240}{100} \times 0.01$

$= 51$ metric tons

CO_2 (total)

$= 2986 + 4.23 + 116 + 51$

$= 3{,}157$ metric tons

Carbon footprint in 2020-2021 = 3,157 metric tons

Description:

The carbon footprint of an organization from activities within the campus in 2022 is 3,157 metric tons of CO2 per year. The largest emission source was from electricity consumption (2986 metric tons of CO2 per year). The net carbon footprint of ARU may be less than the calculated value, as the campus has further contributed to reducing and offsetting its carbon footprint through adapting to intensify the eco-friendly activities and available natural forest and newly planted trees within the campus.

year	Carbon footprint	Carbon footprint/person	Remarks
2020	3456	0.5	2-month Covid-19 situation
2021	2236	0.75	8-month Covid-19 situation
2022	3157	0.63	Fully operated after covid-19 situation

Carbon footprint (metric tons) /Total population = 3157/5000 = 0.63 metric tons /person

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[2] Energy and Climate Change (EC)

[2.13] Number of innovative program(s) in energy and climate change


Innovative Program for energy and climate change (ARU, Thailand)

Description:

1. Using energy from solar panels to improve water quality by means of a plant filtering system.
2. Producing Automate Trash collecting machine to promote the ease of recycling trash.
3. Automated door at the entrance of the buildings to reduce the loss of air conditioning.
4. Real-time energy consumption management to collect data for analyzing programs to reduce the use of energy.

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[2] Energy and Climate Change (EC)

[2.14] Impactful University Program(s) on Climate Change


In the TV program "Food Work" on the Thai PBS channel, there was a story broadcast to share the knowledge and skill of making food containers from banana leaves.

Description:

There was a story broadcast on the TV program "Food work" Thai PBS channel to share the knowledge and skill of making food containers from banana leaves. By putting Thai desserts in biodegradable packaging, it also adds value to Thai desserts. This was broadcast on December 19, 2021 and via the YouTube channel : http://www.thaipbs.or.th/Foodwork.

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[3] Waste (WS)

[3.1] Recycling Program for the University's Waste

Recycling Program for the University's Waste (ARU, Thailand)

Description:

'ARU Waste Exchange', is the example program that promotes and raises awareness for the faculty, staff, and students in the university on the separation of waste before discarding and waste reduction in the university.

ARU Waste Exchange system was introduced to ARU in 2020 to create a waste separation process and create added value to the waste including plastic, paper, metal and glass. In these activities, the students with their ID card can deposit the trash then get a reward. In 2021, The ARU Waste Exchange is upgrading to an automatic point and record system which hopes to be able to collect more trash and increase number of users.

The ARU Waste Exchange combined with other efforts of separation activities aims to put recycled waste into the recycling process up to 60 percent in 2020 and 90 percent in 2025.

Year	2020	2021	2022
% recycle of plastic, paper, grass, aluminum	60	80	85

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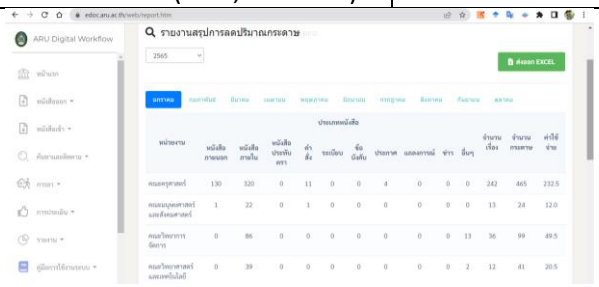
[3] Waste (WS)

[3.2] Program to Reduce the Use of Paper and Plastic on Campus

ECOLIFE Game (ARU, Thailand)

Campaign to Reduce the Trash (ARU, Thailand)



Edocument interface (ARU, Thailand)

Topics raised in classes about reduction of paper and plastic (ARU, Thailand)

Description:

Pharnakhon Si Ayutthaya Rajabhat University has policies to control the use of Styrofoam in the cafeterias, a Green Library, and activities to reduce the use of plastic, paper and foam. These activities encourage the efficient use of resources, for example, to reuse paper or reuse plastic bags in various program as follows.

1. Spread awareness of the dangers of using plastic and foam that affect the environment and society through public relations media. It is important for students and personnel to be aware and change their behavior to reduce the use of plastic or foam. Steps encouraged by the university include: carrying a glass, tube and cloth bag to reduce the use of plastic bags from stores.

2. Encourage students to play the Eco life game to inspire them to reject plastic tubes, plastic spoons, and foam. By participating in the activities, the students will be able to collect points to exchange for prizes.
3. Teach and learn 3Rs in courses, for example, in Textile and Clothing course, the lecturer provides information about problems and raise the students' awareness to encourage them to think about how to be able to reduce the amount of waste.
4. Use E-document to reduce the use of paper. In 2021, there are 169,275 sheets of paper reduced and accounting for reduction of 84,637 THB.

Year	**2021**
Page reduced	169275
Cost (THB) reduced	84637.5

All of the above activities emphasize the importance of environmental problems and motivate people to focus on preventing the destruction of the environment to build the green community of the university through teaching and technology.

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[3] Waste (WS)

[3.3] Organic Waste Treatment

Green Towers/Green Cones (ARU, Thailand)

Description:

Phranakhon Si Ayutthaya Rajabhat University's project installed green cones and garden towers in front of all faculty buildings and along the bins on the main streets. The students and staff were interested and joined the program. The food scraps were put into the green cones and garden towers to decompose the waste then it was digested to form a fertilizer by earthworms.

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[3] Waste (WS)

[3.4] Inorganic Waste Treatment

Electronic Waste (E-Waste) Collector Unit (ARU, Thailand)

Description:

The inorganic waste treatment has run year round. The clear acrylic collectors for hazardous waste disposal were placed in front of the Office of the Dean of all four faculties. Hazardous waste was collected monthly. The amount of the collected hazardous waste in 2021 was 17 kilograms. The collected hazardous waste composed of flash lights and smart phone batteries, old mobile phones, laptops, used ink cartridges, HDMI and LAN cables, chemical pens, AC adapter chargers, and computer accessories. The amount of the collected hazardous waste was lower than expected due to the COVID-19 pandemic. The collected hazardous waste was transferred and diminished by the Prototyping Center for Waste Management of Phranakhon Si Ayutthaya Province.

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[3] Waste (WS)

[3.5] Toxic Waste Treatment

Example of Toxic Waste Treatment (ARU, Thailand)

Description:

Phranakhon Si Ayutthaya Rajabhat University (ARU) places emphasis on hazardous waste management due to the public health and environmental impact. Hazardous waste from laboratory experiments were separated and organized into groups which makes disposal easier, safer and reduces the cost of waste disposal as well. It is collected into appropriate containers based on the classification of waste according to safety and hazardous regulations and then labeled to differentiate the type of waste. Moreover, the broken laboratory glassware and contaminated containers are put in disposal boxes. Afterwards, technicians from the authorized company receive and dispose the hazardous waste.

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[3] Waste (WS)

[3.6] Sewage Disposal

Aeration Lagoon (ARU, Thailand)

Water Quality Check and Anaerobic Filter System (underground) (ARU, Thailand)

Description:

Sewage treatment in ARU was divided into two systems.

1) The wastewater with low lipids from the academic and administration buildings was filtered by an anaerobic filter system then drained into the aerated lagoon. The aerated water was used for watering lawns and plants.
2) The wastewater with high lipids from the canteen was filtered by the anaerobic filter system before being disposed to the city sewage treatment system.

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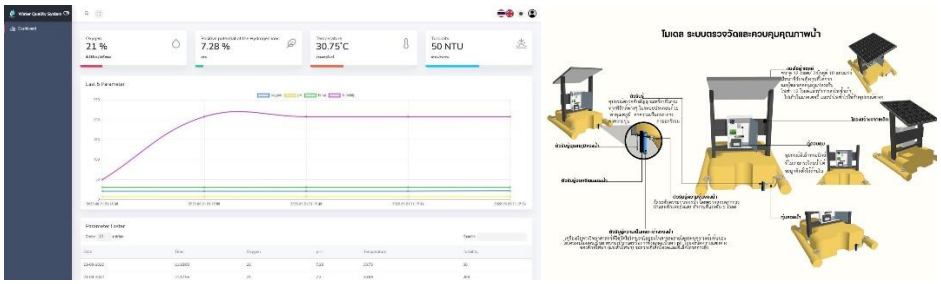
[4] Water (WR)

[4.1] Water Conservation Program Implementation



IoTs were used for water quality monitoring in main lagoons. (ARU, Thailand)

Description:

Rain water is collected from the roofs of the buildings and is then discharged into the local ponds and canals around the buildings. The university also has buildings where all the rainwater is collected for watering the plants inside the buildings. In addition, we collect rainwater from the roofs, parking areas and discharge this in the ponds and canals at the campus. IoTs were used for monitoring water quality and turning on the air pump system automatically depending on the water quality status.

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[4] Water (WR)

[4.2] Water Recycling Program Implementation

Consumption of Treated Water (ARU, Thailand)

Description:

Treated water was used for garden sprinkler system.

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[4] Water (WR)

[4.3] Water Efficient Appliance Usage (e.g. hand washing taps, flushing toilet, etc.)

Water Efficient Appliance Usage (ARU, Thailand)

Description:

Some examples of efficient appliances in ARU include automatic taps at the basins and urinals.

Appliance	Total Number	Total Number of Water Efficient Appliances	Percentage
Basin	609	32	5.25
Urinal	409	95	23.22
		Average Percentage	**12.73%**

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[4] Water (WR)

[4.5] Water pollution control in campus area

Water quality sampling and monitoring (ARU, Thailand)

Description:

Wastewater Treatment

Water having any hazardous or highly toxic chemical were treated by an outsourced company. The origin of the waste was collected to notify the class/person when the next gathering round is ready.

Water containing non-hazardous chemicals, such as, fertilizer, soap, and organic compound, was filtered using biomedia and then released to the lagoon. The lagoon was then treated by plant filtration.

Guideline standard

ARU has water quality standards and guidelines for water discharges. Thanks to the ARU library for sharing the guidelines with other faculties in ARU.

Monitoring and Evaluation

Automation monitoring system in main lagoon was used to report the water state every day. However, human validation was done by the students from Faculty of Science studying water condition class. Monitoring and evaluation reports were done regularly every 6 months.

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[5] Transportation (TR)

[5.4] The total number of vehicles (cars and motorcycles) divided by total campus' population

1	Car managed by the university	10
2	Cars entering the university	404
3	Motorcycles entering the university	357
	Total	771

771 / 5000 (population) = 0.15

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[5] Transportation (TR)

[5.5] Shuttle Services

Shuttle Services in The University (ARU, Thailand)

Description:

Nowadays, the university has a total of 3 shuttle buses. These are the zero-emission vehicles (ZEVs) to use for environmentally-friendly transportation of students and academic staff. The shuttle service is free and runs about 20 trips per day throughout the working time for a total of approximately 300–400 people, especially in the rush hour from 7.30 a.m. to 9 a.m. and 11 a.m. to 1 p.m.

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[5] Transportation (TR)

[5.9] Zero Emission Vehicles (ZEV) Policy on Campus


Rent Free Bicycle and Shuttle Bus Service (Phranakhon Si Ayutthaya Rajabhat University, Thailand)

Description:

Phranakhon Si Ayutthaya Rajabhat University has shuttle service and is pedestrian-friendly. The university has several shuttle buses, which are zero emission vehicles (ZEVs) to use for environmentally-friendly transportation of students and academic staff. The shuttle buses are free and always run during rush hours. We found that the zero-emission vehicle policy at the university must be improved. Therefore, green vehicles such as electric vehicles and bicycles can be substituted for cars and motorcycles in the future.

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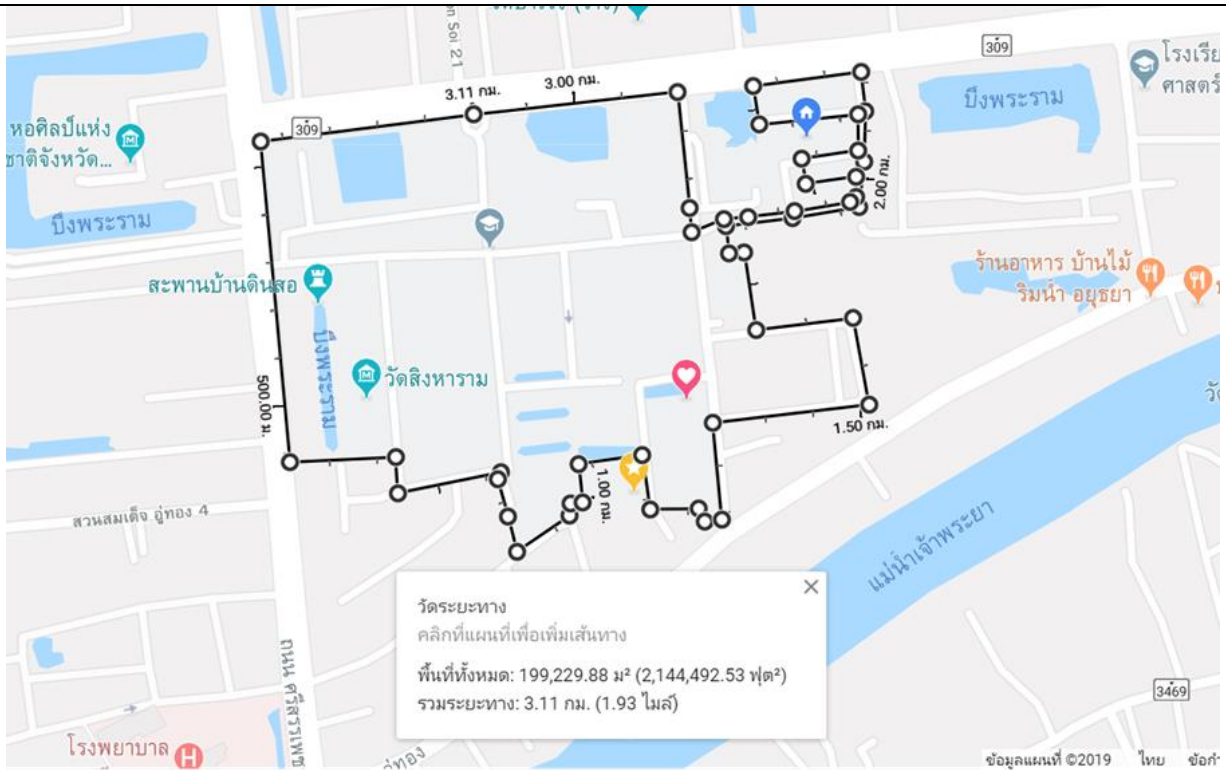
[5] Transportation (TR)

[5.13] Ratio of Parking Area to Total Campus Area



The parking area to total campus area (Phranakhon Si Ayutthaya Rajabhat University, Thailand)

Examples of the area for motorcycles parking on campus

Description:

Nowadays, ARU has been reducing total spaces for car and motorcycle parking from 419 to 404 spaces and 382 to 357 spaces. Due to several spaces being transformed into bicycle lanes, handicapped parking areas, and bicycle parking areas. Therefore, the area for parking has slightly decreased, from 2.7 to 2.6 percent of the total area of the campus. We found that the parking area is adequate for vehicles on the working days of the university, except for the flea market on Saturday and Sunday. In addition, the university focused on the limitation and re-zoning of the parking area for cars in the future to support the policies on environmental-friendly transportation on campus.

Total main campus area: 199,229.88 m^2
Total parking area = 5,160.08 m^2 (404 spaces*11.50 m^2 per space for car and 357 spaces*1.44 m^2 per space for motorcycle).
Ratio = 0.026

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[5] Transportation (TR)

[5.15] The transportation program is designed to limit or decrease the parking area on campus for the last 3 years (from 2018 to 2020)

			
Shuttle services on campus (ARU, Thailand)	Rent-free bicycles on campus (ARU, Thailand)	Replace parking lot with bicycle lane (ARU, Thailand)	Replace parking lot with tree (ARU)

Description:

There are four transportation programs designed to limit or decrease the parking area on campus for the last 3 years (from 2020 to 2022)

1. Shuttle services on campus
2. Rent-free bicycles on campus
3. Replace the parking lot with a bicycle lane
4. Replace parking lot with tree

Due to an extremely limited parking lot in ARU, less than 10% decrease during 2022.

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[5] Transportation (TR)

[5.15] The Number of Transportation Initiatives to Decrease Private Vehicles on Campus

		
Shuttle services on campus (ARU, Thailand)	Rent-free bicycles on campus (ARU, Thailand)	Bicycle lane (ARU, Thailand)

Description:

This year, Phranakhon Si Ayutthaya Rajabhat University has a new environmentally-friendly transportation initiative; a bicycle lane on campus. Consequently, the university will be increasing transportation initiatives to total 3 initiatives to decrease the number of private vehicles on campus; (i) the shuttle service; (ii) the rent-free bicycles on campus; and (iii) the bicycle lane. Therefore, the use of bicycles in the campus area has significantly grown nowadays. However, the shuttle service and walking are still the main methods for transportation on campus. Since the university has a rather small area, the transportation for students and academic staff is effortless. Accordingly, ARU must be improving the other transportation Initiatives for supported these policies in the future for instance:

1. Increasing the number and/or operating times of free ZEV shuttle buses on campus.
2. Link of the car parking from the outside area to the inside area by the shuttle car for free.
3. Changing of the other vehicles such as bus, van, pick-up or car to ZEV vehicles.

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[5] Transportation (TR)

[5.16] Pedestrian Path Policy on Campus

	
Pedestrian path (Phra Nakhon Si Ayutthaya Rajabhat University, Thailand)	Pedestrian path (Phra Nakhon Si Ayutthaya Rajabhat University, Thailand)

Description:

Currently, the main pedestrian paths on campus are built on either side of the bicycle lane and between the buildings, which are covered by the roofs. Thus, the routes were designed for more safety and more convenience than previously. Furthermore, the sidewalks were provided as disabled-friendly features. In the future, it may be developed into a solar-roof top to generate electricity for the power areas. Nowadays, the attributes of the pedestrian paths on campus are as follow:

1. Slope and guiding blocks that have been designed for the path have physical disabilities.
2. Uplighter for pedestrians at night

University : Phranakhon Si Ayutthaya Rajabhat University
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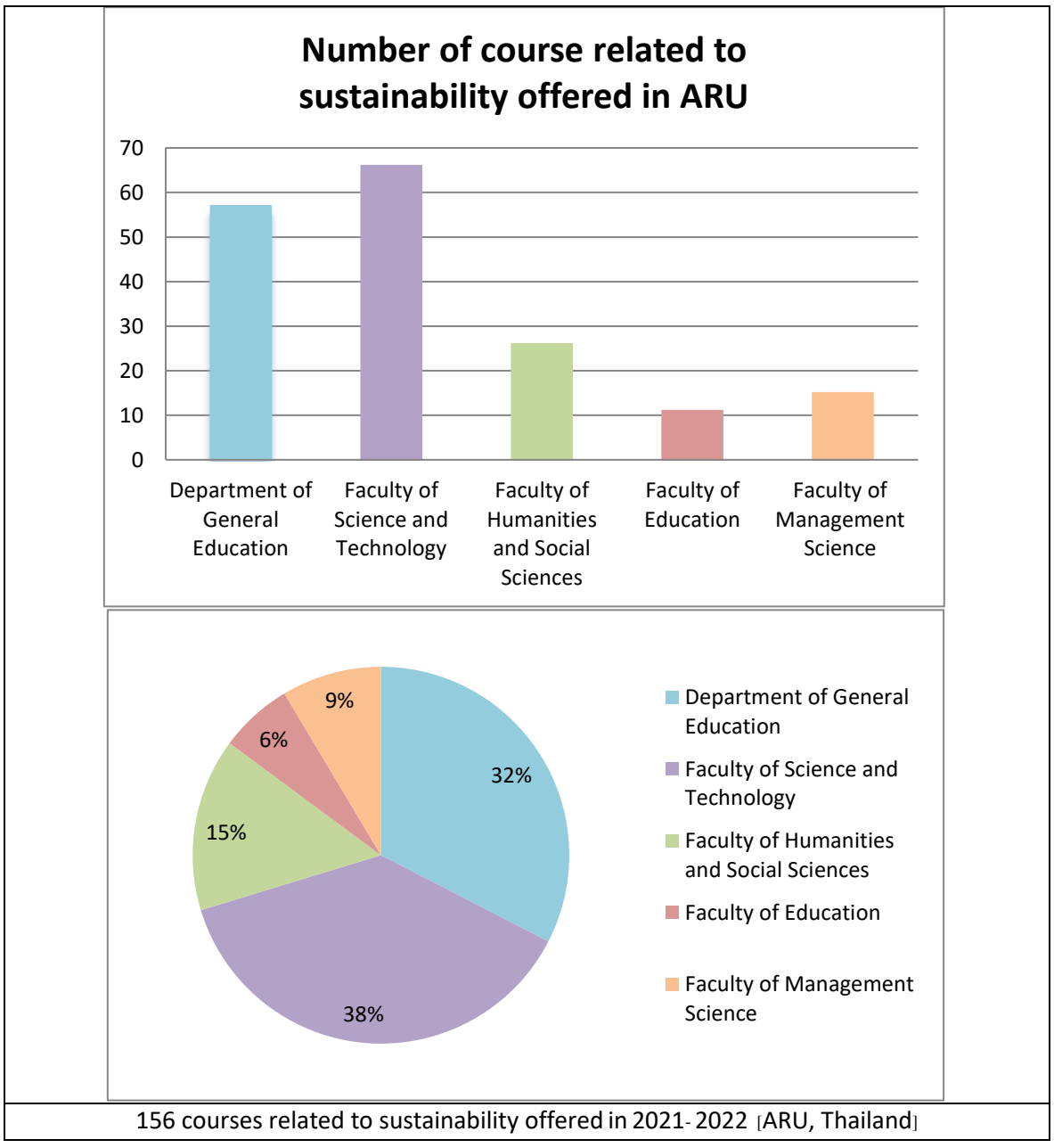
[6] Education and Research [ED]

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



156 courses related to sustainability offered in 2021- 2022 [ARU, Thailand]

Description:

In order to achieve the sustainability goal, the university provides 156 out of 2025 courses related to sustainability. As part of the core curriculum, the related courses have been distributed among 4 faculties and 1 department. These courses include 58 courses [38%] from the Faculty of Science and Technology; 26 courses [15%] from the Faculty of Humanities and Social Sciences; 15 courses [9%] from the Faculty of Management Science, 11 courses [6%] from the Faculty of Education; and 57 courses [32%] from the Department of General Education. All related courses aim to encourage our students to be aware of environmental issues and sustainable development.

List of courses related to sustainability offered in Academic year 2022

	Faculty of Science and Technology
1	Ecology and Environment
2	Energy Management and Clean Technology
3	Community Participation in Environmental Management
4	Solid and Hazardous Waste Management Technology
5	Soil Pollution Control
6	Air and Noise Pollution Control
7	Waste water Treatment Technology
8	Environmental Impact Assessment
9	Natural Resources and Environmental Management in the World Heritage Area
10	Industrial Environmental Management
11	Microprocessors and Microcontroller
12	Technologies base on Royal Initiatives Management
13	Energy Management system in Industry
14	Industrial Pollution
15	Management of Agriculture Residue and Agriculture Waste
16	Energy Field Crops
17	New Theory Farming
18	Soil and Water Conservation
19	Soil Pollution and Its Management
20	Pest Management Technology
21	Soil and Soil Fertility
22	Sufficiency Economy for Agribusiness Management
23	Innovation and Utilization of Local Plants
24	Innovation and Smart Farming
25	Vegetable Crops Production Technology
26	Smart Greenhouse Management
27	Smart Greenhouse Management
28	Biotechnology for Soil Improvement
29	Plant Pathology and Climate Change
30	Plant Production Technology in Organic Agriculture System
31	Clean Technology for Agricultural Waste Utilization
32	Mental Health
33	Public Health Nutrition
34	Family Health
35	Health Education and Health Behavior

36	Occupational Health and Safety
37	Environmental Health
38	First Aid
39	Ethics and Law in Public Health
40	Prevention and Disease Control
41	Practice in Primary Health Care Service
42	Public Health Administration
43	Consumer Protection
44	Communicable and Non-communicable Diseases
45	Counseling for Public Health
46	Application of Epidemiology for Public Health
47	Primary Care and Curative Medicine
48	Health Impact Assessment
49	Introduction to Pharmacology
50	School Health
51	Research Methodology for Public Health
52	Public Health Economics
53	Program Planning and Evaluation for Public Health Project
54	Community Health
55	Preparation for Professional Experience for Public Health
56	Field Experience for Public Health
57	Environmental Health
58	Energy Conservation

	Faculty of Humanity and Social science
1	Public Mindset and Social Work
2	Urban Management
3	Interdisciplinary Studies of Public Administration and
4	World Heritage Management
5	English for Eco-Tourism
6	English for Local Tour Guides
7	Theories and Principles of Community Development
8	Community Study
9	Social Development
10	Royal Project Studies for Development
11	Ayutthaya and World Heritage Development
12	Social Entrepreneurs and Community Enterprises
13	Analysis and Development for Planning

14	Volunteer for Local Development Work
15	Public Policy and Development
16	Dynamic of Rural and Urban Development
17	Seminar on Issue of Community and Social Development
18	The Sufficiency Economy and Development
19	Social Problems
20	Social Network and Social Organization Development
21	World Civil Society and Development
22	Local Resource Development
23	Sustainable Development in Thai Society
24	Knowledge Management for Development
25	Law of Environmental and Natural Resources
26	Law on World Heritage

	Faculty of Education
1	Office Application for Advance
2	ICT System Development for Education
3	Application for School Administration
4	STEM Education Learning Management
5	Mathematics Learning Management in Elementary School
6	Occupations and Technology for Elementary Education Teachers
7	Biological Science
8	Environmental Science
9	Electricity and Energy
11	Environment and Population Studies

	Faculty of Management Science
1	Production and Operations Management
2	Quality Management
3	Innovation Management for Business Opportunity
4	Management and Corporate Social Responsibility
5	Entrepreneurship for Modern Trade Business
6	Product and Service Innovation
7	E-Retailing Business
8	Modern Trade Business Management
9	Food Product Management for Modern Trade Business
10	Transport and Environment
11	Event Marketing and Public Relations

12	Social and Environment Marketing
13	Human Resource Management
14	Sustainable Tourism
15	Sustainable Business Development

	Department of General Education
1	Ayutthaya Studies
2	Thai Language for Communication
3	English for Standardized Tests
4	English Speaking and Listening Skills
5	Life and Morality
6	Philosophy and Life
7	Thinking and Personal Growth
8	Personality Development
9	Information Literacy
10	Meditation in Daily Life
11	The Charm and Style in Service
12	Aesthetics for Life
13	21st Century Skills for Living and Occupations
14	Tourism for Learning
15	Human, Society, and Environment
16	Law in Daily Life
17	Economy in Daily Life
18	Thai Studies
19	Muslim Ways of Life
20	Mass Media and Society
21	Contemporary Business Management
22	Thai and ASEAN Geography
23	Asian Studies
24	The Global Ways
25	Green Economy
26	Hospitality
27	Potential Citizen
28	The King's Philosophy for Local Development
29	Smart by Tax
30	Safety in every Trip
31	Game Theory
32	Youngster with Good Heart

33	Citizenship and Democracy
34	Global Cultural Diversity
35	Business Simulations
36	Digital Business
37	Community Business
38	Saving and Investment in Intelligent Style
39	Monetary Wealth Creation
40	Exercise for Health
41	Recreation Leadership
42	Recreation in Conservation of Nature and Environment
43	Information Technology for Learning
44	Science for Quality of Life
45	Mathematics in Daily Life
46	Sexuality Education and Reproductive Health
47	Food for Health and Life
48	Safety in Daily Life
49	Biotechnology and Life
50	Science and Modern Life
51	Wellness Promotion and Care
52	Digital Citizens
53	Green Citizens and Sustainable Development
54	Science and Technology in Life
55	Global Care
56	Technology in Modern Life
57	Art of Healthy Living

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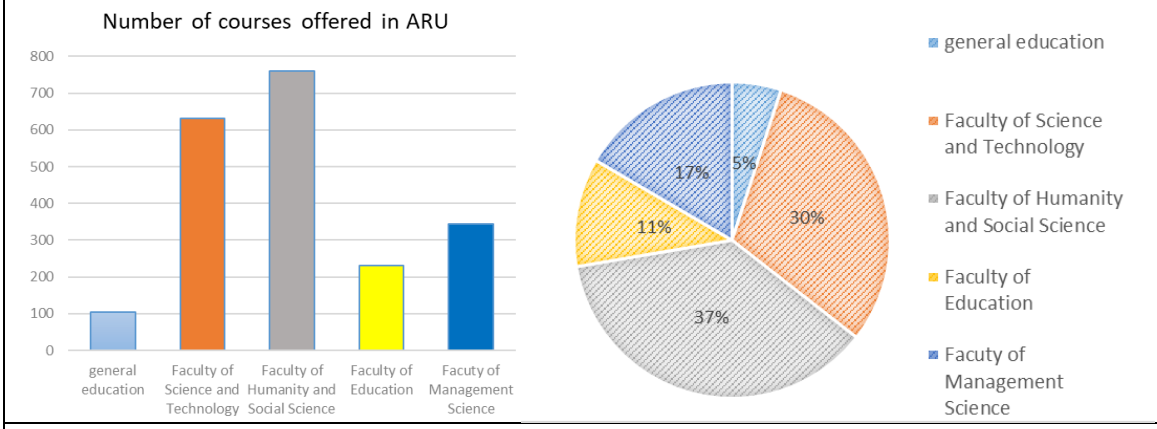
[6] Education and Research [ED]

[6.2] Total Number of Courses/Subjects Offered



Total Courses Offered in academic year 2022 [ARU, Thailand]

Description:

The total number of courses offered in the academic year 2022 is 2025 courses [non-modules].

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[6] Education and research (ED)

[6.4] Total research funds dedicated to sustainability research (in US Dollars)

In the budget year of 2022, the university supported 28 sustainability research projects with a total budget of $ 88,660 from the university's total research budget of $ 99,710. Therefore, 89 % of the internal budget is sustainability research projects.

Lists of research funds dedicated to sustainability research (in us dollars)

Index	Research paper	Budget **($)**
1	Forms of Silicon in Soil and Optimum Rate of Silicon Fertilizer for Increasing the Yield of Hom Pathum Rice Grown in Soil of Phranakhon Si Ayutthaya Province	1,040
2	QR Code Developed for Forklift Safety System In Warehouse Phra Nakhon Si Ayutthaya Province	780
3	Innovative product development of avocado salad dressing supplemented with carotenoids from Sesbania flower extracted with green extraction technology for commercial value added	1,040
4	Product Development of Reduced Fat Coconut Milk Ice Cream From Coconut Sugar for Health	1,040
5	Strengthening in Social Participation of the Elderly by using the Local Government Organizations as a Development Base: A Case Study in Semi-Rural Area in Wiset Chai Chan District, Ang Thong Province	780
6	A model for enhancing physical and mental health of the elderly to reduce the stress from the epidemic situation of coronavirus disease 2019 by the principle of A-Na(d)tayaSati	650
7	The Development of an English Instructional Model Based on Blended Learning Using QAR Strategy with the STAD Cooperation Technique for Promoting Reading Competence of Sixth Grade Students in Phranakhon Si Ayutthaya	780
8	Coding Program for Problem Solving in Young Children	650
9	Enhancing the Potential of Crown of Thorns community enterprise to develop variety which increases commercial value by gamma ray	7,150
10	Digital platform development innovation to add value to the commercial product business, Wang Noi District, Phra Nakhon Si Ayutthaya Province	23,400
11	Model Mechanism for Capacity Building for Aging Informal Labor Health Facilitation Development of Local Government Phra Nakhon Si Ayutthaya Province	5,720
12	Thai way of tourism for Silver Age : Innovation and Potential Development of Health Tourism in World Heritage Cities for Silver Age Travelers (Phra Nakhon Si Ayutthaya District)	20,540
13	The development of a trip planner system in Ayutthaya historical park	6,890
14	Genetic diversity and the potential of the production of bioactive compound of Actinomycetes isolated from soil of Phanom Rung Historical Park, Buriram Province	6,890
15	Phosphorus adsorption and desorption characteristic in paddy soils of Phranakhon Si Ayutthaya province with influenced by lime material for soil improvement	1,040
16	Development of cannabis transdermal patch for pain relief in patient with arthritis in Suan Prik sub-district, Phranakhon Si Ayutthaya district, Phranakhon Si Ayutthaya province	1,040
17	Product Development of ready-to-drink cannabis beverage using stevia extract as a sugar substitute to promote the potential of community enterprises in medical cannabis cultivation in Phranakhon Si Ayutthaya province	1,040

Index	Research paper	Budget **($)**
18	Innovative product development of bread products from fragrant taro that are degraded and leftover from the sale of farmers in Saraburi province with science, technology and innovation for commercial value added	1,040
19	Bankruptcy prediction model using machine learning technique base on imbalanced dataset	780
20	A Model of English Training Course Development for Local Government Tourism Officers in Phranakhon Si Ayutthaya Province	650
21	Media Consumption in Phranakhon Si Ayutthaya during Covid-19 outbreak	780
22	The survey of Environmental Changes and Historic Building “Five months among the Ayutthaya Ruins”, NORNAPAKNAM: Thung Keaw, Ayutthaya	520
23	The Development of Cartoon Animations in Gamification Learning Environment to Promote Creative Problem Solving for Secondary School Students, Phra Nakhon Si Ayutthaya Province	780
24	The Development of Competency Based Learning Model to enhance innovation research competency for student teachers	650
25	The development of a curriculum to promote career society through local wisdom activity practice “carve a banana stalk pith” for students in Phranakorn Si Ayuthaya	780
26	Development of a Competency-based Enrichment Curriculum based on Phenomenon-based Learning and Service Learning Approaches to Enhance Global Competence of Student Teachers	910
27	Developing Board Games to Promote Executive Function in primary school	650
28	Guidelines for the development of homestays for promoting creative cultural tourism businesses Ban Koh Rien community Koh Rien Subdistrict Phra Nakhon Si Ayutthaya District	650
	total	**88,660**

Template for Evidence(s)
UI GreenMetric Questionnaire

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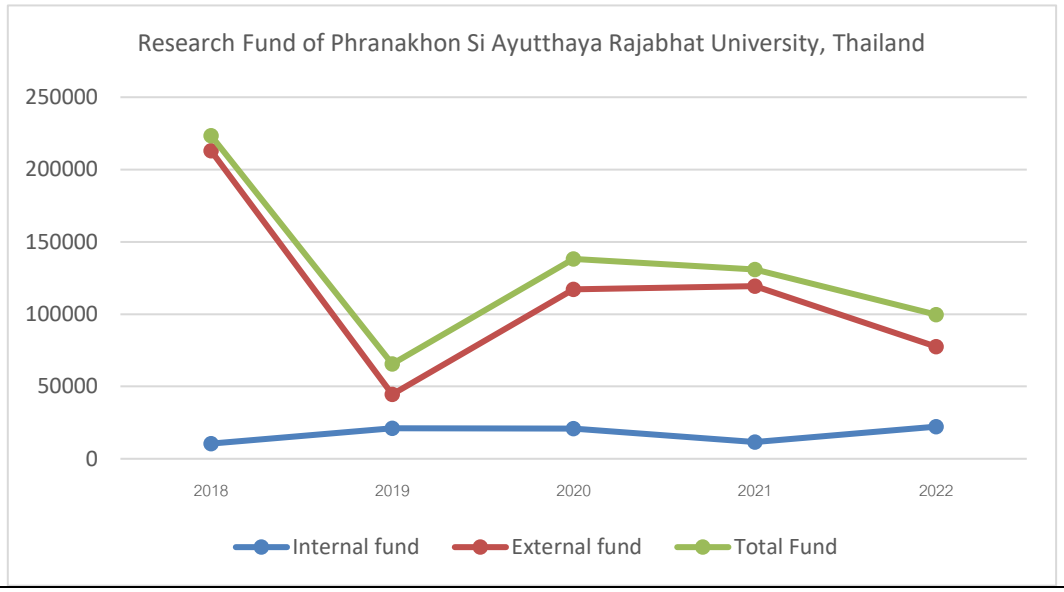
[6] Education and research (ED)

[6.5] Total research funds (in US Dollars)



Research Fund during 2018-2022 (US Dollas)
(Phranakhon Si Ayutthaya Rajabhat University, Thailand)

Budget Year	Internal Fund	External Fund	Total Fund
2018	10491.60	212958.63	223450.23
2019	21013.18	44544.36	65557.55
2020	20983.21	117236.21	138219.42
2021	11630.70	119304.60	130935.30
2022	22,230.00	77,480.00	99,710.00

Description:
Total research fund in 2018 = 223,450 US Dollars
Total research fund in 2019 = 65,558 US Dollars
Total research fund in 2020 = 138,219 US Dollars
Total research fund in 2021= 130,935 US Dollars
Total research fund in 2022= 99,710.00 US Dollars
The averaged last 3 years of research fund (2020-2022) = 122954.90 US Dollars

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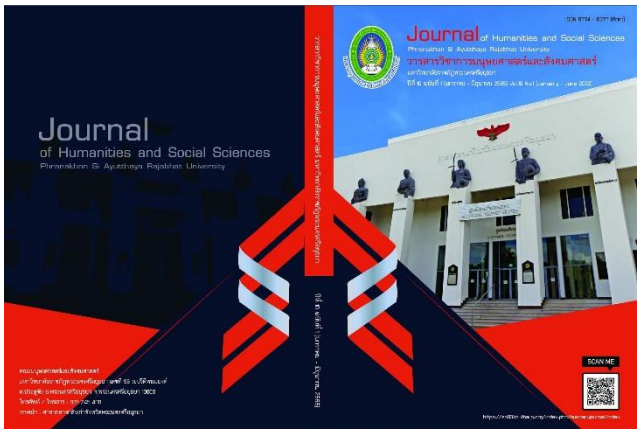
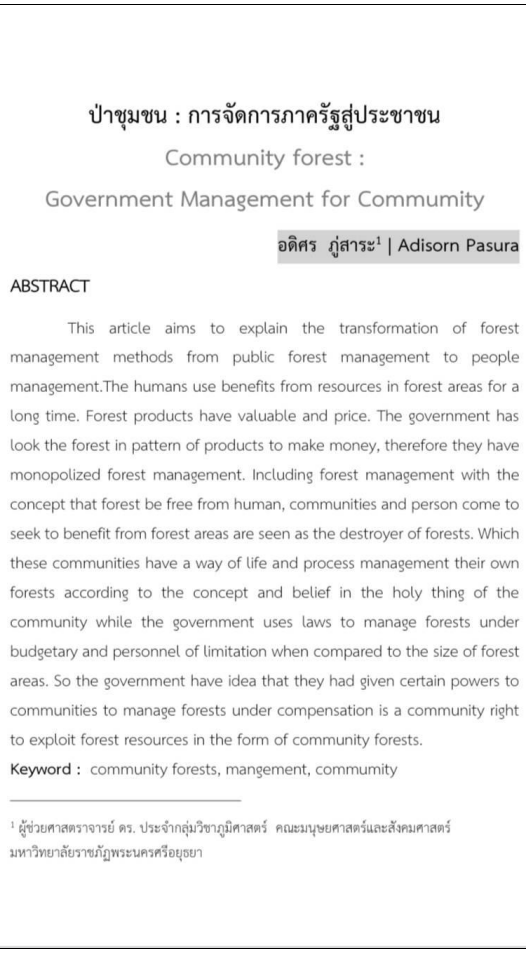
[6] Education and Research (ED)

[6.7] Number of Scholarly Publications on Sustainability





ป่าชุมชน : การจัดการภาครัฐสู่ประชาชน

Community forest :

Government Management for Commumity

อดิศร ภู่สาระ[1] | Adisorn Pasura

ABSTRACT

This article aims to explain the transformation of forest management methods from public forest management to people management.The humans use benefits from resources in forest areas for a long time. Forest products have valuable and price. The government has look the forest in pattern of products to make money, therefore they have monopolized forest management. Including forest management with the concept that forest be free from human, communities and person come to seek to benefit from forest areas are seen as the destroyer of forests. Which these communities have a way of life and process management their own forests according to the concept and belief in the holy thing of the community while the government uses laws to manage forests under budgetary and personnel of limitation when compared to the size of forest areas. So the government have idea that they had given certain powers to communities to manage forests under compensation is a community right to exploit forest resources in the form of community forests.

Keyword : community forests, mangement, commumity

[1] ผู้ช่วยศาสตราจารย์ ดร. ประจำกลุ่มวิชาภูมิศาสตร์ คณะมนุษยศาสตร์และสังคมศาสตร์
มหาวิทยาลัยราชภัฏพระนครศรีอยุธยา

Scholarly Publications on Sustainability in the Journal of Humanities and Social Sciences (ARU, Thailand)

Description:

In 2022, twelve scholarly publications on sustainability were written by ARU staff and published in the Journal of Humanities and Social Sciences.

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

Journal of Humanities and Social Sciences, Phranakhon Si Ayutthaya Rajabhat University
https://so03.tci-thaijo.org/index.php/husoarujournal/index

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[6] Education and research (ED)

[6.8] Number of Events Related to Sustainability

Sustainability projects and event (ARU, Thailand)

Description:

These estimated 84 events are examples of events related to sustainability.

No.	Project / activity	Estimated Number of Event
1	The Startup project is run by the Green University Committee/UBI of ARU	8
2	The U2T Project is in 15 areas of Phranakhon Si Ayutthaya province	30
3	Social Engineer, Student work and joining local area improvement project	6
4	Projects from 4 faculty in improving local problem	30
5	Class activity cooperating with local problem management	10
	total	**84**

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[6.9] Number of student organizations related to sustainability

Description:

There are 23 student organizations that conduct activities related to sustainability;

Organizations which have activities related to sustainability	
1. Environmental protection	13. English Club
2. We love the countryside	14. Share Smile
3. Islamic Ethics	15. SE UBI Club
4. English for Kids	16. Arts and Culture
5. How dare you	17. Love from brother to younger brother
6. Volunteers share love	18. Dance
7. ARU GREEN HEART	19. Volunteer development for children
8. Create arts in Krungsri	20. We love arts.
9. Volunteer for social development	21. Evolution Club
10. Hope Giver	22. Brothers and sisters
11. Conservation of amulets, worshiping ARU	23. Astronomy club
12. Teacher Krung Kao	

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[6] Education and Research (ED)

[6.12] Sustainability Report

Sustainability Report (ARU, Thailand)

Description:
Complete text of Environmental Statement Report 2022 available on this link: http://green.aru.ac.th/

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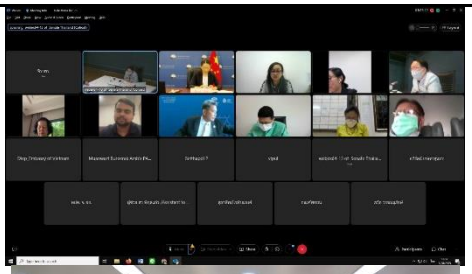
[6.13] Number of Cultural Activities on Campus (e.g. Cultural Festival (Including Virtual Activities (If Any)

	 
Demonstration of how to cook local dessert, food, and making basketry. (โครงการสานใจไทยสู่ใจใต้ รุ่นที่ ๓๙ โดยได้รับมอบหมายในการจัดกิจกรรมฐานการเรียนรู้ จำนวน ๔ ฐาน ได้แก่ ๑) สาธิตการทำโรตีสายไหม ๒) สาธิตการสานปลาตะเพียน ๓) สาธิตการทำขนมไทย ๔) สาธิตการทำอาหารพื้นบ้านของชาวจังหวัดพระนครศรีอยุธยา)	Meeting on Build relationships between countries in Ayutthaya period' ประชุมคณะทำงานฟื้นฟูความสัมพันธ์อยุธยา – นานาชาติ ในคณะกรรมาธิการวิสามัญการพิทักษ์และเทิดทูนสถาบันพระมหากษัตริย์ ครั้งที่ ๒/๒๕๖๕
	
Seminar on Art of cloth กิจกรรมสัมมนาอยุธยาศึกษาวิชาการเฉลิมพระเกียรติ เนื่องในโอกาสมหามงคล เฉลิมพระชนมพรรษา ๘๐ พรรษา "อัครราภิรักษ์ศิลปิน สืบสานสรรค์ศิลป์ภูษาแห่งสยาม"	Demonstration of how to making basketry. กิจกรรมเปิดเวทีเพื่อการถ่ายทอดและเผยแพร่องค์ความรู้ภูมิปัญญาท้องถิ่น โดยสถาบันอยุธยาศึกษาได้เข้าร่วมแสดงผลงานเครื่องแขวนปลาตะเพียนใบลาน และถ่ายทอดองค์ความรู้ในการสานปลาตะเพียนใบลานให้กับนักศึกษาและผู้สนใจ ณ หอประชุมมหาวิทยาลัยราชภัฏพระนครศรีอยุธยา

National events

University anniversary

Description:

Cultural activities on campus were organized by the Ayutthaya Studies Institute, ARU ASI. This institute is a part of ARU, whose major role is conducting studies, publicizing knowledge about Ayutthaya, and building relationships between countries that used to trade in the Ayutthaya period, the ancient capital where local and Thai culture originated.

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[6] Education and Research (ED)

[6.14] Number of university program(s) to improve teaching and learning

<table>
<tr><td> 
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<tr><td>Seminar on Learning Society
(ARU, Thailand)</td><td>MOU for Class Activity with Company
(ARU, Thailand)</td></tr>
<tr><td> 
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</td></tr>
<tr><td>Short Course for Basic Knowledge in Science
(ARU, Thailand)</td><td>The lecturer learned how to update Course Specification (ARU, Thailand)</td></tr>
<tr><td> 
</td><td></td></tr>
<tr><td>Meeting with Guidance teacher
(ARU, Thailand)</td><td></td></tr>
</table>

Description:

In 2022, ARU improve teaching and learning quality in various ways to student, lecturer, and in curriculum level.

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[6] Education & Research

[6.15] Number of Sustainability Community Service Projects Organized by or Involving Students

Projects Run by the Students (ARU, Thailand)

Project name	Faculty	Participants	Project duration	Project area
โครงการพัฒนาและส่งเสริมการสร้างอัตลักษณ์และเอกลักษณ์สินค้าเกษตร ของดีมหาราชสู่ตลาดดิจิตัล ของสาขาเกษตรศาสตร์ คณะวิทยาศาสตร์และเทคโนโลยี Agricultural product development	Science and Technology	30	3 months	ED
โครงการ “สาน” ใจชุมชน ต.บ้านโพธิ์ อ.เสนา จ.พระนครศรีอยุธยา ของสโมสร นักศึกษา คณะวิทยาการจัดการ Wicker business development	Management science	20	8 months	ED, WS

โครงการ “ชากระท่อม” ต.ทับน้ำ อ.บางปะหัน จ. พระนครศรีอยุธยา ของสโมสรนักศึกษา คณะวิทยาศาสตร์และเทคโนโลยี Kratom Tea production	Science and Technology	10	7 months	ED
โครงการพัฒนาและส่งเสริมธุรกิจชุมชน “เกาะเกิดพัฒนา” เพื่อการเรียนรู้ในยุคดิจิตัล ชุมชนเกาะเกิด อ.บางปะอิน จ.พระนครศรีอยุธยา ของสโมสรนักศึกษา คณะมนุษย์ศาสตร์และสังคมศาสตร์ Digital literacy for Community Enterprise	Humanity and Social Science	15	3 months	ED
โครงการแนวคิดและทักษะวิศวกรสังคมสู่การลงพื้นที่ชุมชนในการแก้ไขปัญหาและพัฒนาชุมชน “ขนมไทยบ้านป้าแมว” ชุมชนวัดจุฬามณี ต.บ้านกุ่ม อ.บางบาล จ.พระนครศรีอยุธยา ของสโมสรนักศึกษา คณะครุศาสตร์ Thai dessert product development	Education	30	4 months	ED
โครงการ “ชาดอกโสน” ชุมชนบ้านต้นสะตือ 3 ต้น ต.เกาะเรียน อ.บางปะอิน จ.พระนครศรีอยุธยา Tea production from Flower symbol of Province ‘Sa-now’	Student affair	30	3 months	ED
U2T Project in 15 area of Phranakhon Si Ayutthaya province	4 faculties and 3 Institute	83	1 year	ED, EC

Description:

In 2022, there will be 21 groups of students running 21 different projects. These projects were under two main projects: the Social Engineer and the U2T Project. In these projects, the students take part in building a better society. They visit local communities to create new innovations for solving problems together with people in the community.

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[6.16] Number of sustainability-related startups

No.	Information
1	**Startup name:** organic soap **Startup area in UI Greenmetric questionnaire (SI, EC, WS, WR, TR, ED): ED** **URL:** **Description:** organic soap sold through an online platform **Photos**:  
No.	**Information**
2	**Startup name:** plant products **Startup area in UI Greenmetric questionnaire (SI, EC, WS, WR, TR, ED):** WS, ED **URL: https://www.facebook.com/groups/1622126231329478** **Description:** Students sell plants using recycled boxes collected within the university. **Photos:** 
3	**Startup name:** Bio soil **Startup area in UI Greenmetric questionnaire (SI, EC, WS, WR, TR, ED): WS**, ED **URL:** **Description:** Students use their scientific knowledge to turn organic waste into soil for growing plants. **Photos:**  

No.	Information
4	**Startup name:** Kaset Act **Startup area in UI Greenmetric questionnaire (SI, EC, WS, WR, TR, ED): ED** **URL:** **Description:** Students apply their knowledge of vegetative propagation of ornamental plants with aseptic techniques and sell through online platform. **Photos:** 
5	**Startup name:** Benjarong Pork **Startup area in UI Greenmetric questionnaire (SI, EC, WS, WR, TR, ED):** EC, WS **URL:** **Description:** Students apply class knowledge to produce fermented pork with mushroom and sell at market. **Photos:** 
6	**Startup name:** Kratom Kun **Startup area in UI Greenmetric questionnaire (SI, EC, WS, WR, TR, ED):** EC, WS **URL:** **Description:** Students sell Kratom plantlets in the market using their class knowledge. **Photos:**