



Mahidol University
sustainability



MAHIDOL UNIVERSITY ***SUSTAINABILITY REPORT***



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5Ps OF SUSTAINABLE DEVELOPMENT



PEOPLE

The SDGs declare the world's determination "to end poverty and hunger, in all their forms and dimensions, and to ensure that all human beings can fulfil their potential in dignity and equality and in a healthy environment." Despite some signs of hope, it's clear we need to do better - especially as we face complex challenges like conflict and climate change that directly impact the dignity and well-being of humankind.



PROSPERITY

The SDGs aim to "ensure that all human beings can enjoy prosperous and fulfilling lives and that economic, social, and technological progress occurs in harmony with nature." Inequality is one of the defining issues of this generation and requires a commensurate focus that, to date, has been lacking.



PLANET

The SDGs set a goal to protect the planet from degradation, including through sustainable consumption and production, sustainably managing its natural resources and taking urgent action on climate change, "so it can support the needs of the present and future generations." Nearly every day we are seeing just how connected - and fundamental - climate change is to global development.



PEACE

The SDGs rightly note that "There can be no sustainable development without peace and no peace without sustainable development." Therefore, they set out goals to foster peaceful, just, and inclusive societies which are free from fear and violence.



PARTNERSHIP

The SDGs call for "a spirit of strengthened global solidarity, focused in particular on the needs of the poorest and most vulnerable and with the participation of all countries, all stakeholders and all people." Problems that cross geographies and sectors require collaboration that does as well.

HIGHLIGHTS



Health Service

Total **6.35** million patient services
 Total **29,529** of COVID-19 vaccinated doses for students & staff



Scholarship

10,203 students are supported more than **100** million baht



Education & Research

4,232 research publications
907 million baht of research fund
182,028 hours of HIDEF activities

Environment



5.17 million m³ water consumption (4.10% reduced)
100% recyclable treated wastewater (in Salaya campus)



327.4 million kWh electricity consumption
21.96 kWh solar energy consumption



70% recyclable waste
 Reduce GHGs emission **100%** by 2030



Population

29,077 students
 36.40% Male
 63.60% Female

37,996 staff
 24.19% Male
 75.81% Female

4.88% international student
0.15% disability student



Governance

(A) Rating of Thailand's Integrity and Transparency Assessment



Collaboration

109 MoU/MoA collaboration

INTRODUCTION

Approach to sustainability

Mahidol University strives to be “a leader on sustainability” in responding to the United Nations 2030 Agenda for Sustainable Development. We have been developing our academic activities, research, and people for sustainable community through our passion of “Mahidol for Sustainable Future”. Beyond creating knowledgeable society, Mahidol University further concerns for sustainable development by contributing economic, social and environmental dimensions leading to efficient use of resources, social equity and improved quality of life of faculty, staff, students and the surrounding communities. Therefore, Mahidol University Sustainability Strategy which consists of 4 key areas as the framework was established.

- 1) Research and Innovation for sustainability
- 2) Education for sustainability
- 3) Community and Social engagement for sustainability
- 4) Operations for sustainability

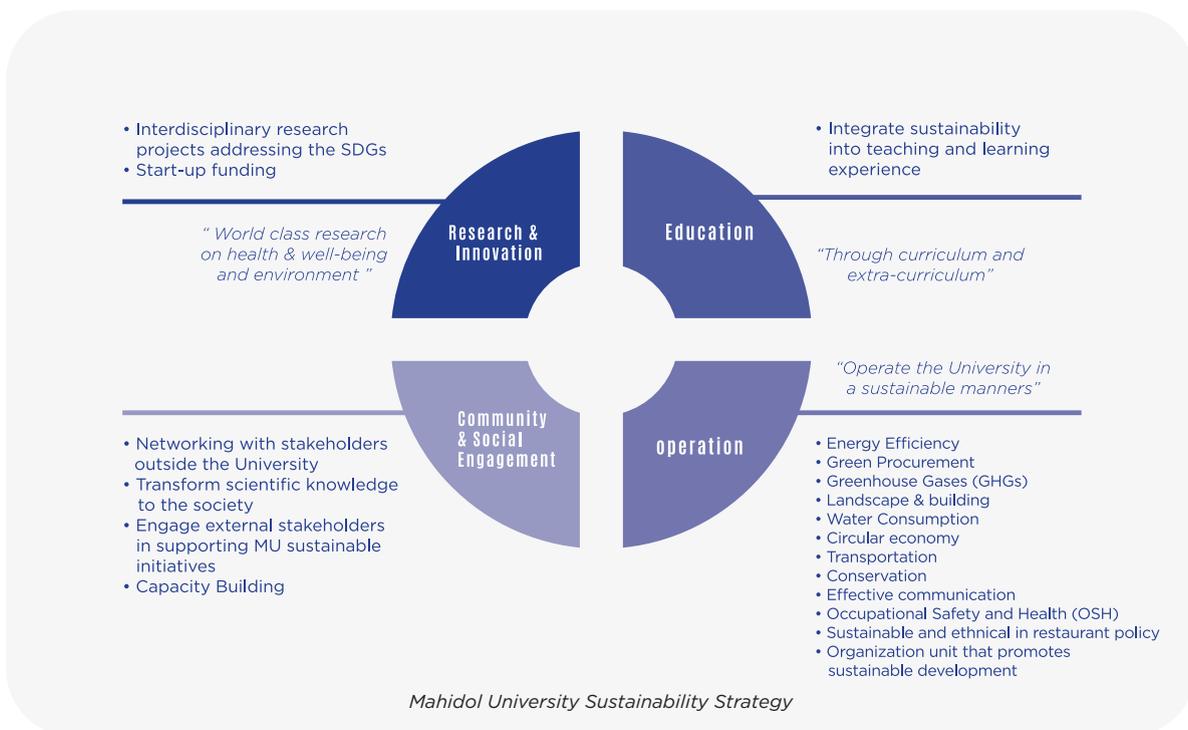
In this report, our active sustainability performance was demonstrated against a broad spectrum of aspects, according to the Mahidol University Sustainability Strategy.

Mahidol University Sustainability strategy

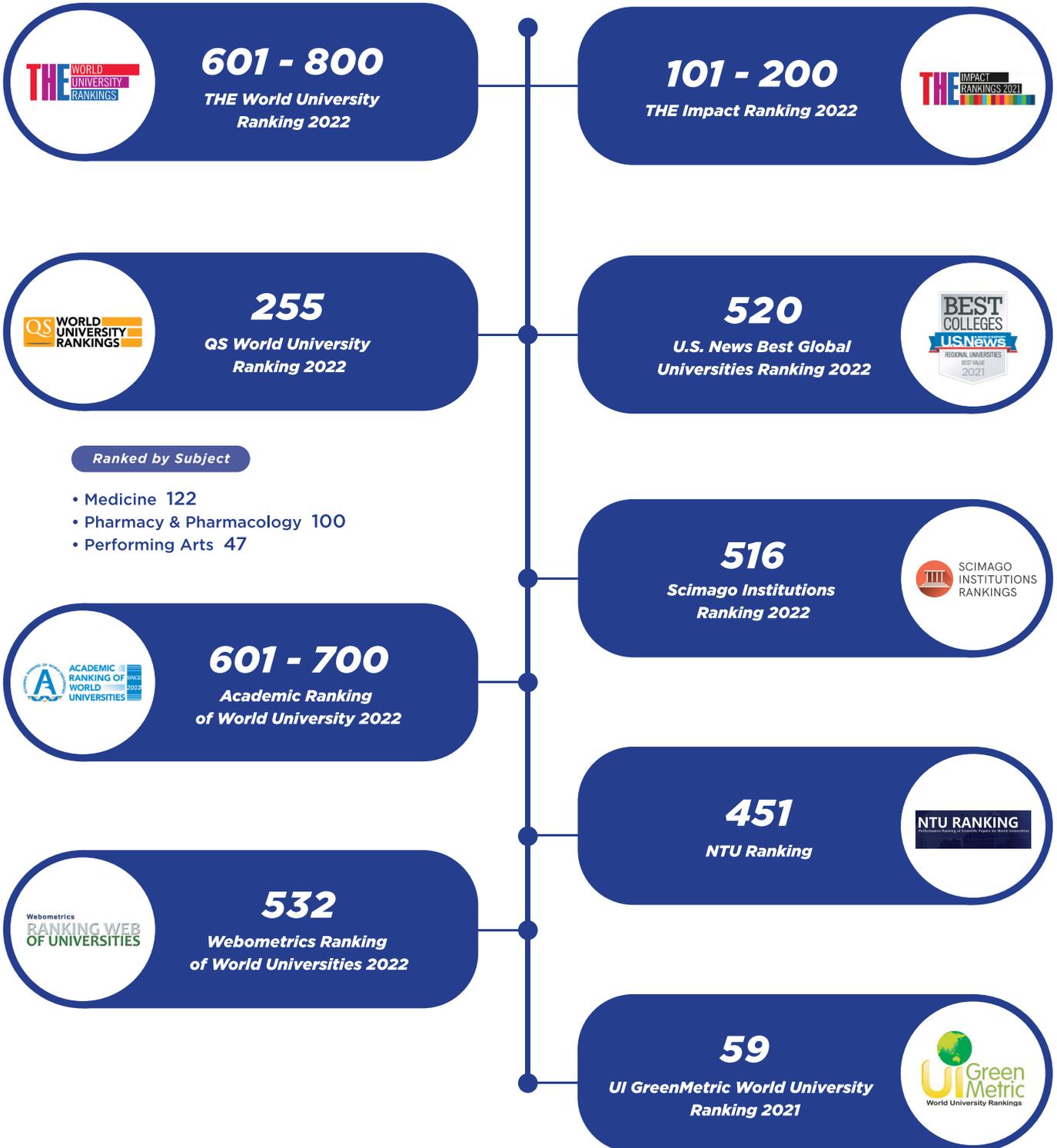
Mahidol University as a leading institution of higher education in Thailand that produces quality graduates in various of fields for society in order to create and develop Thailand to progress on par with those of other countries with the key aspiration of being “Wisdom of the Land”. Therefore, Mahidol University Sustainability Strategy was created under the concept of Sufficiency Economy Philosophy according to the 17 Sustainable Development Goals (17 SDGs) by the United Nations, with 4 objectives;

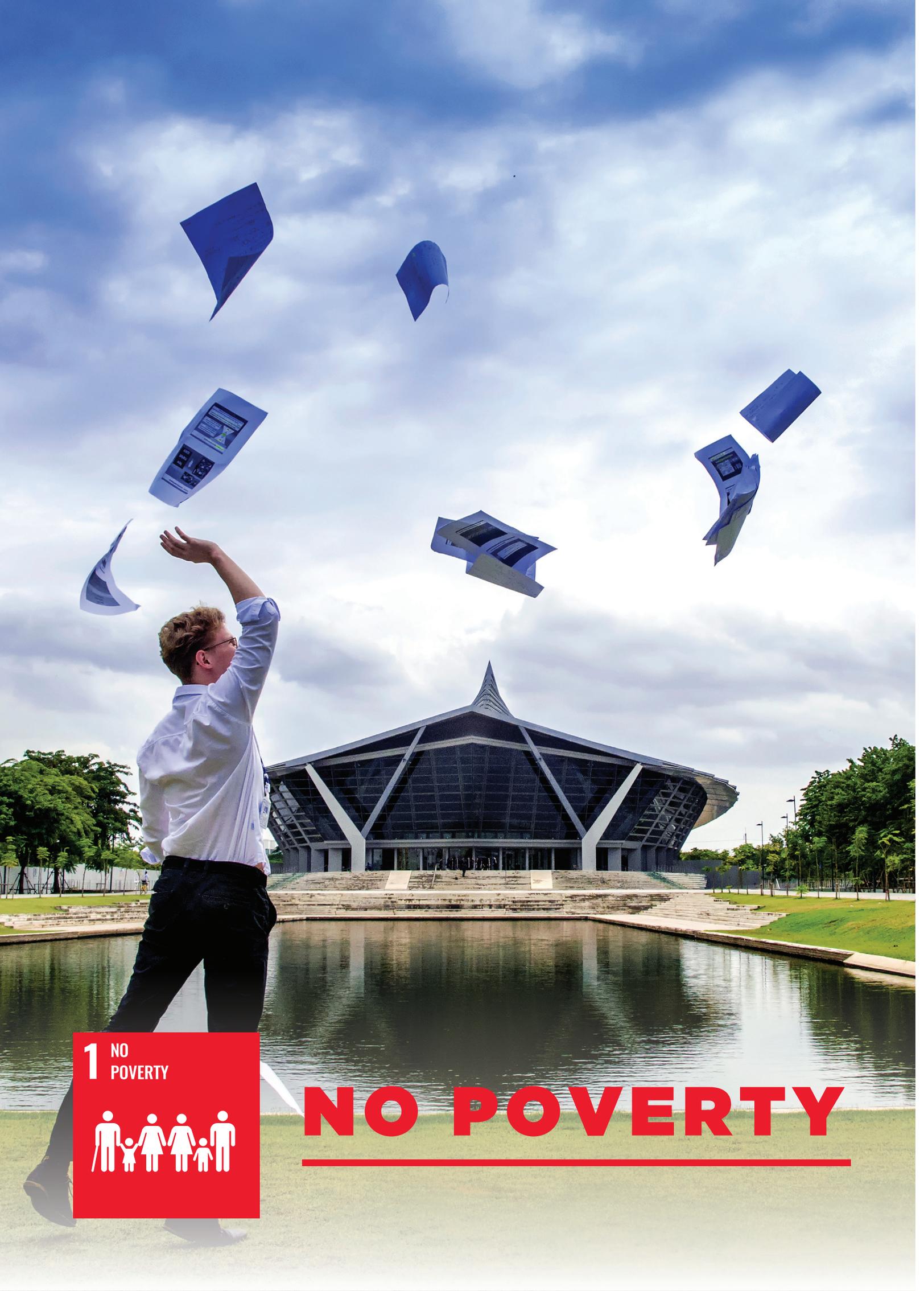
1. MU will educate and shape our staff and students with sustainability mindsets to transform into change agents for sustainable society.
2. MU will address local and global challenges, tackle complex sustainability issues and promote sustainability actions in all research activities.
3. MU will embed continuous improvement of a sustainability operations.
4. MU will embrace a culture of well-being and sustainability throughout the campuses and promote inclusive society.

By building a strong, stable and sustainable foundation through the Mahidol University Sustainability Strategy, the University is ready to drive change in all sectors of the University through 4 key areas as described in the figure.



RANKINGS





1 NO
POVERTY



NO POVERTY



RELATED POLICIES

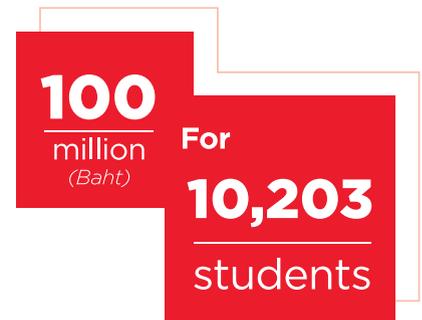
It is the Policy of the University to give out scholarships to a group of disadvantaged students from poor families who have low income or lack financial resources but are of good conduct. They will receive financial aid and equal access to educational resources until graduation. The University allocates its budget for the fund into 4 types as follows:

1. Scholarships Supporting Student's Education
 - Scholarships for Students Lacking Financial Resources
 - Alumni Association Scholarships
 - External Scholarships
 - Disability Scholarships
 - Faculty Scholarships
 - King Bhumibol Scholarships
 - Mahidol Medical Scholars Program
2. Support Grants
 - Student Employment Grants (Mahidol University Foundation)
 - Student Loans (No interest)
 - Emergency Funds
3. Welfare Grants
 - Student Employment Grants
 - Lunch Subsidies
4. Student Loan Funds (SLF and ICL)

Please find additional information, conditions/requirements, application period, and other details at the website of the Division of Student Affairs, Mahidol University.

FINANCIAL SUPPORT

The University granted an approximate total of more than 100 million baht of scholarships and financial assistance to 10,203 students in the academic year 2020, with 4 types of additional financial aid from 4 types of the regular scholarship program given to students affected by the 2019 novel coronavirus disease (COVID-19) pandemic. The University also supported students' efforts to earn an extra income through the University's part-time employment. All wages earned by the students would be paid for their own educational fees, helping to alleviate the burden of their families. These financial aids provided by the University gave students access to a standardized education system throughout their course of study and ensured that they had equal rights to educational resources.



Scholarships	Number of Student
Scholarships Supporting Student's Education	9,581
Support Grants	243
Welfare Grants	208
Scholarships for international students	171
Total	10,203

SERVICE CENTER / UNIT

Mahidol University has established the “Mahidol – SCB Investment Lab”, which is Thailand’s first virtual investment learning laboratory, in cooperation with the Siam Commercial Bank Public Company Limited. The lab’s objective is to become the educational institution’s center of knowledge in finance and investment; to enable lecturers, students, and staff of Mahidol University to cultivate knowledge and understanding about finance and investment; to turn classrooms into investment and finance laboratories; and to introduce financial innovations that are evolving rapidly, with investment experts providing detailed advice on the subject. Consultation and access to services can be requested at Mahidol University Library and Knowledge Center.

The Division of Student Affairs also provides financial literacy training, including debt management, investment, saving, and loan obligations. This allows students to practice financial planning and analyze various related factors to find an investment that is suitable for themselves. Moreover, it encourages students to acquire financial skills in both theoretical and practical ways.

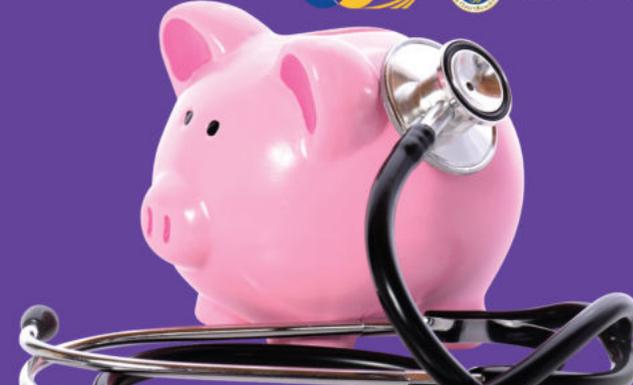


SCB ACADEMY

เงินทอง ไม่ใช่ของนอกกาย
เริ่มต้นหาได้ ตั้งแต่ตอนนี้

บทเรียน
FINANCIAL LITERACY





The University focuses on financial and investment management in order to reduce the problem of students’ fund shortages, to support the financial stability of the student’s family, to provide access to basic academic resources throughout their course of study, and to promote students’ wellbeing according to the Sustainable Development Goal 1 (SDG 1): No Poverty.

PROJECT / RESEARCH / EVENT

The Division of Student Affairs has launched the MU Stock Challenge project, in which students use allocated funds to learn how to manage stocks in a simulated stock market created based on real-world situations. Also, the Division has cooperated with the Siam Commercial Bank Public Company Limited to organize the “Manee Social Commerce” project, enabling students to learn how to operate an online business in a comprehensive way as well as equip themselves with the necessary skills to become entrepreneurs before graduation. Additionally, the Division has future plans to invite speakers with stable careers and success in the path of investment to come lecture and exchange knowledge with the students and the general public via an online platform.

• The Entrepreneurship Development Program

The Research and Academic Service Center of Mahidol University Nakhon Sawan Campus, has carried out the Entrepreneurship Development Program (Early Stage) with budget support from the Office of SMEs Promotion (OSMEP). This project aimed to solve problems for entrepreneurs in the agricultural and general sectors who lack business planning, resulting in debt, substandard products, and low sales. It covered 8 provinces: Nakhon Sawan, Chainat, Uthai Thani, Phichit, Kamphaeng Phet, Sukhothai, Phetchabun, and Loei, and ran from 2017 – 2020, helping new entrepreneurs kickstart their business with a fresh, innovative mindset and progress towards SME 4.0. By incorporating knowledge, management systems, and technology into business practices, they created high value and strengthened local enterprises, contributing to the sustainability of the economic foundation. As a result, relevant knowledge could be applied in the University’s other operations, a partner network could be established, and 5,585 participating entrepreneurs could use their new business mindset to produce, sell, and generate more income. Over four years of operation, the project could reduce poverty and create economic value in these 8 provinces, for a total of 726,400,310 baht.

• Workshop to Know First, Get Rich First with Online

Selling System The 2019 coronavirus disease (COVID-19) outbreak has affected people’s lives and careers in many areas, including Salaya in Phutthamonthon district, Nakhon Pathom province. The impact of the disease is observable through the higher rate of unemployment and revenue decrease. Some households in the area lost both income and reserve funds, and some people lost their jobs because their employers were unable to continue their business. With this in mind, the Faculty of Engineering at Mahidol University launched the “Workshop to Know First, Get Rich First with Online Selling System” project to help people affected by the COVID-19 situation find new sources of income in the new normal era and to increase the community’s capability to adapt and respond to present and future crises. The project helped show the participants gain the opportunities to sell goods and become an online business owner, seize economic opportunities, increase income for local people to match their basic living expenses, and achieve financial stability, thus ending poverty in all its dimensions

มหาวิทยาลัยมหิดล
คณะวิศวกรรมศาสตร์

ESR
Engineering Social Responsibility

Faculty of
ENGINEERING
MAHIDOL UNIVERSITY

ขอเชิญชวนผู้ที่สนใจเข้าร่วมอบรม
โครงการอบรมเชิงปฏิบัติการ
รู้ก่อนรวยก่อน
ด้วยระบบขายสินค้าออนไลน์

วันที่ 22 กรกฎาคม 2564 เวลา 08.30 - 12.45 น.

BUY ONLINE

Meeting number
158 653 2548
ผ่านระบบ
Webex Meetings

อบรมออนไลน์ **ฟรี**

สำนักงานส่งเสริมการค้าในต่างประเทศ
กรุงเทพฯ โทร. 02-1992138 โทร. 02-1992142

สนับสนุนโดย สำนักวิศวกรรมเพื่อความรับผิดชอบต่อสังคม

Workshop “ to Know First, Get Rich First ” with Online Selling System



2 ZERO HUNGER



ZERO HUNGER

2 ZERO HUNGER



ZERO HUNGER



RELATED POLICIES

Food is one of the fundamental necessities of life, and Mahidol University understands the importance of consuming clean and safe food that is free of pesticide residues. The Mahidol University Sustainability Action is established in accordance with the 17 Sustainable Development Goals (SDGs) to ensure sustainable consumption and to push towards food security goals, which include improving nutrition and promoting sustainable agriculture, according to the Mahidol University Notice regarding the Policy to Promote Healthy and Safe Food, B.E. 2564.

COURES

Mahidol University aims to promote education to enhance food security, nutrition, and sustainable agriculture through its courses and disciplines focusing mainly on agriculture and nutrition/food. The agricultural courses focus on the application of science, technology, and relevant local wisdom in order to improve agricultural sustainability, provide stability and self-reliability to farmers, ensure agricultural product safety, maintain the balance in the agricultural ecosystem, and promote growth both in the community and in the industry.



The nutrition/food courses focus on the application of scientific knowledge and innovation in order to improve food production and processing as well as to increase nutritional value and food safety. The courses also promote balanced, and healthy food consumption to help prevent nutritional diseases and illnesses caused by an unbalanced diet behavior.



Courses	Faculties
Bachelor Degree	
• Bachelor of Science Program in Agriculture	Amnat Charoen Campus
• Bachelor of Science Program in Smart SMART Farmer	Nakhon Sawan Campus
• Bachelor of Science Program in Food Technology	Kanchanaburi Campus
• Bachelor of Science Program in Agro-cultural Science	Kanchanaburi Campus
• Bachelor of Science Program in Food Science and Technology (International Courses)	International College
Master degree	
• Master of Science Program in Nutrition	Faculty of Medicine Ramathibodi Hospital in collaboration with Institute of Nutrition
• Master of Science Program in Food Science for Nutrition (International Program)	Institute of Nutrition
• Master of Science Program in Toxicology and Nutrition for Food Safety	Institute of Nutrition
• Master of Science Program in Nutrition and Dietetics (International Program)	Institute of Nutrition
• Master of Arts in Innovation for Community Development	Nakhon Sawan Campus
Doctoral Degree	
• Doctor of Philosophy Program in Nutrition	Faculty of Medicine Ramathibodi Hospital in collaboration with Institute of Nutrition

SERVICE / CENTER / UNIT

Since Mahidol University offers courses on agriculture, food, and nutrition, it applies its knowledge to benefit the community and society. The University has a center for consultation, research, resource and technology services, and analytical services, as well as a learning center that allows students to do hands-on practice activities and use their knowledge for society.

- **The Agritech and Innovation Center (AIC)** is a collaborative effort between the educational sector of Kanchanaburi Campus (Semester), Mahidol University, various agencies from the public and private agricultural sectors, and the community. It is supposed to be a center for learning, training, accumulating, and transferring agricultural technologies, wisdom, and innovations; a service center that facilitates knowledge exchange, as well as technological and innovative collaborations, for maximum benefit to the community and society.



- **The Detection of Contaminants in Food Products:** Faculty of Medical Technology, Mahidol University has launched an analytical laboratory project called “Safe Fruits and Vegetables for the World Kitchen” aiming to improve people’s health by encouraging the consumption of safe food, especially fruits and vegetables without pesticides residue. Furthermore, it has expanded the scope of analysis to cover the detection of heavy metal, microorganisms, and parasites contaminated in fruits and vegetables that may cause disease or affect the consumers’ health. The service centers are located on the 6th Floor of the Science and Medical Technology Building, Salaya Campus, Mahidol University and the 3rd and 5th Floors of the Faculty of Medical Technology Building, Siriraj Hospital.



- **The Institute of Nutrition's Analytical Service**

serves public and private agencies by analyzing food and non-food substances, toxins, contaminants, microorganisms, as well as chemical and physical properties of food based on the Food Act, Ministry of Public Health. This service's laboratory has been recognized by the Food and Drug Administration, Ministry of Health to be capable of analyzing food samples for food registration. Currently, more than 25 types of food can be analyzed by our service for registration according to the Ministry of Public Health's announcement. In addition, the Institute of Nutrition is the first agency in Thailand to provide food nutrition analytical services for preparing full-detail nutrition labels in Thai and United States versions. Its staff organizes training workshops to improve analytical quality on a regular basis, and wield expertise in the development of laboratory's performance and analytical quality. Therefore, the Institute got to research and develop reference food samples for the Laboratory Performance Study or Proficiency Test projects in food analytical laboratories.

- **The Center of Innovation and Reference on Food for Nutrition (CIRFoN)** is under the supervision of the Institute of Nutrition, Mahidol University. It provides an integrated research service on the development of food products for nutritional benefits, with a focus on commercialization. It is the agency of reference in studies of the effectiveness of food products, and it also offers research, creation, and technology integration services to public or private food safety agencies, especially for small and medium-sized industries. Apart from that, it provides other food and nutrition research services that are beneficial to society.



PROJECT / RESEARCH / EVENT

- **Nursing Specialty Training Program on Breastfeeding,**

Faculty of Nursing: Breastfeeding is a way to enhance the country's newborn population's health and quality of life. Breast milk is not just a source of nutrients but a shield; infants who are properly breastfed are immune to diseases, get sick less often, have their chances of contracting chronic diseases as grownups reduced, and have the mother-child relationship strengthened. Breastfeeding also helps build a child's intellect, emotional intelligence, and mental wellbeing. According to the World Health Organization and UNICEF's goal, by 2025, the rate of exclusive breastfeeding in the first 6 months should be 50%. However, the rate of exclusive breastfeeding in the first 6 months is very low, both in Thailand and all over the world.



From this situation, it is necessary to promote and support exclusive breastfeeding from the stage of pregnancy, intrapartum, postpartum, until returning home to help prevent and solve problems and challenges that would prevent breastfeeding. Nurses are crucial to helping mothers with breastfeeding. Therefore, it is vital that they have the knowledge and skills to provide proper support. The Faculty of Nursing recognizes the importance of this matter and has launched the Nursing Specialty Training Program on Breastfeeding to enable nurses to promote and support breastfeeding in healthy and sick mothers effectively. From 2018 to 2021, the faculty has organized several trainings for nurses working on breastfeeding from various hospitals across the country. A post-training survey shows that the rate of exclusive breastfeeding in the first 6 months before the training was increased from 45.24% to 56.00%.

• Smart Technology for Shrimp and Fish Disease

Detection: The Faculty of Science studied the ISKNV-type megalocytivirus, a latent pathogen in tilapia and sea bass, two important aquatic animals in Thailand. This epidemic has continuously caused economic losses in the fish farming industry. The Center of Excellence in Shrimp Molecular Biology and Biotechnology (CENTEX SHRIMP) of the Faculty of Science, Mahidol University, in collaboration with the National Center for Genetic Engineering and Biotechnology (BIOTEC), joined forces with the Faculty of Veterinary Medicine, Chulalongkorn University; the Faculty of Science, Suan Sunandha Rajabhat University; and the Faculty of Science, King Mongkut's University of Technology Thonburi. They discovered a quick and accurate detection method and relayed this technology into a portable device suitable for farmers who need to detect the disease on their own in their farms and hatcheries. This innovation will provide stability in the Thai aquaculture industry and increase the opportunity to extend the research to a commercial field, which would help Thailand maintain its leadership in aquaculture technology in ASEAN and create stability in food production and sustainable agriculture.

PCR detection of Tilapia lake virus (TILV), Infectious spleen and kidney necrosis virus (ISKNV) and Scale drop disease virus (SDDV)



Fish Health Platform @ Centex Shrimp

• Scale Drop Disease Virus (SDDV) and Lates Calcarifer Herpes Virus (LCHV) Detection Method

Development: SDDV and LCHV cause disease in seabass, a brackish water fish of high economic importance to the country. The outbreak of such pathogens has caused severe economic loss to farmers since the number of seabass is decreased. As of now, there is no treatment, and surveillance is one way to mitigate any losses that may occur. SDDV and LCHV assays were thus developed using the qPCR technique and tested for a method of collecting SDDV biopsies from fish samples without killing the fish. This was a joint effort between the Center of Excellence in Shrimp Molecular Biology and Biotechnology (CENTEX SHRIMP), Faculty of Science of Mahidol University, the National Center for Genetic Engineering and Biotechnology (affiliated with NSTDA), Kasetsart University (Kamphaeng Saen), Burapha University (Chanthaburi), Suan Sunandha Rajabhat University, and James Cook University

(Singapore) to spread SDDV and LCHV detection methods to the Department of Fisheries of Thailand, Department of Fisheries of Malaysia, Burapha University, the Agri-Food and Veterinary Authority of Singapore, Kerala University of Fisheries and Ocean Studies (India), and James Cook University (Singapore) in order to increase agricultural productivity, generate more income for farmers, create a sustainable food production system, and create security in terms of food and consumption.

• Development of Microalgae Technology to Produce Double-polynucleotides RNA for Sustainable Shrimp Disease Control:

The Center of Excellence in Shrimp Molecular Biology and Biotechnology (CENTEX SHRIMP), Faculty of Science, Mahidol University, in collaboration with the National Center for Genetic Engineering and Biotechnology (affiliated with NSTDA), the University of Kent (England); University College London (England); and Department of Biochemistry, Faculty of Science, Kasetsart University conducted research to develop the feasibility of producing double-polynucleotidesRNA in chloroplasts of *Chlamydomonas reinhardtii* microalgae, without using antibiotic resistance genes, as food to prevent viral infection in shrimp, to prevent loss to the aquaculture industry. They also organized a seminar to disseminate their learnings from the project to international cooperation networks.

• MUNA SMART FARM:

With the intention of providing its community with safe food sources and enabling local people to be self-reliant according to the King's Philosophy, the Nakhon Sawan Campus, Mahidol University launched the "MUNA SMART FARM" project to support studying and teaching of the Bachelor of Science Program in SMART Farmer and offer the opportunity to learn and experiment with organic farming to the community. The Nakhon Sawan Campus, Mahidol University acted as a networking hub and offered consultations about agriculture and marketing plans. Plus, it certified the community's products that meet organic farming standards with the patented sign "MU ORGANIC". This allowed local farmers to turn self-reliant and continue using sustainable farming methods. In addition to agricultural products such as rice and organic vegetables, the project also has "free-range eggs" from naturally raised hens. The eggs are red and smell like pandan leaves since the hens' food is mixed with them. The most important thing is that these chemical-free eggs have been sold on the campus and in local communities. Hence, the community has safe food available within it, and its people can choose not to go buy eggs outside their community, risking contracting COVID-19.





3 GOOD HEALTH
AND WELL-BEING



**GOOD HEALTH AND
WELL - BEING**

3 GOOD HEALTH AND WELL-BEING



GOOD HEALTHY AND WELL - BEING



RELATED POLICIES

Mahidol University originated from Siriraj Hospital and the founding of the “Siriraj Bhatayakorn School” (School of Siriraj Medical Practitioners), the first medical school in Thailand. Its prominent programs are the Science for Life Program and the Medical Science Program. Moreover, there are several faculties producing a large number of healthcare professionals: doctors, nurses, dentists, pharmacists, and medical technicians. More than half of its research and new initiatives are related to human health and well-being. Mahidol University’s affiliated hospitals include Siriraj Hospital, Ramathibodi Hospital, Hospital for Tropical Diseases, and Maha Chakri Sirindhorn Dental Hospital. There are also health centers offering other services such as physical therapy, pharmacy, etc. All these organizations work together in terms of education, research, and innovation. They also cooperate with public agencies, non-governmental organizations, and international organizations to develop and exchange knowledge and new medical science technologies, to improve the public health system, and to promote health and wellbeing for Thailand and various countries.

SERVICE / CENTER / UNIT

Mahidol University has 9 affiliated certified hospitals with technology and availability to support patients on a national and regional scale. They do not only provide healthcare and treatment, but they also promote the people’s wellness, offer universal healthcare coverage, and develop and update healthcare-related research and innovations. In 2021, there were a total of 5,877,009 patients, comprising 139,349 inpatients and 5,737,660 outpatients, as shown in the table.

Hospital	Number of bed			Number of days that inpatient stayed/Year	Number of outpatient /Year	Number of Inpatient/Year	Bed Occupancy Rate*
	Extra	Normal	Total				
Faculty of Medicine Siriraj Hospital	1,286	1,285	2,571	597,690	3,506,567	94,981	63.69
- Siriraj Hospital	793	1,267	2,060	492,903	2,506,289	70,471	65.55
- Siriraj Piyamaharajkarun Hospital	339	0	339	93,972	640,733	19,105	75.95
- Golden Jubilee Medical Center	154	18	172	10,815	359,545	5,405	17.23
Faculty of Medicine Ramathibodi Hospital	527	564	1,091	298,839	1,947,335	43,123	75.04
- Ramathibodi Hospital	111	457	568	167,589	515,335	22,881	80.84
- Somdech Phra Debaratana Medical Center	233	0	233	51,890	1,160,635	9,466	61.01
- Queen Sirikit Medical Center	61	8	69	24,564	47,132	2,890	97.53
- Chakri Naruebodindra Medical Institute	122	99	221	54,796	224,233	7,886	67.93
Faculty of Tropical Medicine	40	49	89	12,445	163,250	1,245	38.31
- Hospital for Tropical Diseases	40	49	89	12,445	163,250	1,245	38.31
Faculty of Physical Therapy	-	-	-	-	120,508	-	-
Total	1,853	1,898	3,751	908,974	5,737,660	139,349	66.39

Note: * Bed occupancy rate is the percentage of rented or used bed to the total number of bed in that year.



In addition to general treatment services, Mahidol University has 5 affiliated dental service agencies. In 2021, there are 785 dental units, which can treat 453,362 patients, as shown in the table.

<i>Department / Division</i>	<i>Number of Dental Units</i>	<i>Number of Patients</i>	<i>Patients / Dental Unit</i>
Faculty of Medicine Siriraj Hospital	28	16,374	584.79
Siriraj Piyamaharajkarun Hospital	6	12,544	2,090.67
Faculty of Medicine Ramathibodi Hospital / Chakri Naruebodindra Medical Institute	31	25,225	813.71
Faculty of Dentistry	607	278,153	458.24
Maha Chakri Sirindhorn Dental Hospital (Faculty of Dentistry)	113	121,066	1,071.38
Total	785	453,362	577.53

785
dental units

453,362
patients

Mahidol University recognizes the importance of people's oral health. So, in order to provide them with access to qualified dental services and to enable them to apply dental knowledge in their daily lives, it ensured that a total of 2,324 patients received free dental services in 2021.

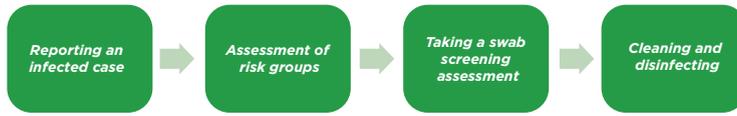
<i>Free Dental Service Unit</i>	<i>Number of Serviced Patients</i>
Faculty of Medicine Siriraj Hospital	117
- Dental services to patients on special occasions	117
Faculty of Dentistry	2,207
- Dental services for the underprivileged	104
- Dental services to patients on special occasions	951
- Dental services in schools	1,152
Total	2,324

2,324

patients received free dental services in 2021.



The University is prepared for emergencies, ensuring continuity in its various missions, and is streamlined to handle crises in a timely manner.



The Criteria for Actions According to the Severity of the Coronavirus 2019 Outbreak in the University

Alert Level	Level 1 Green (Monitored)	Level 2 Yellow (Highly monitored)	Level 3 Orange (Controlled)	Level 4 Red (Highly controlled)
Situation & Trend	No infections cases and signs thereof	Infections in the area: < 5 people, but the situation is likely controlled	More infections in the area: > 5 people, and the outbreak tends to increase	A large number of infections in more than 2 areas
Prevention	D-M-H-T-T-A Universal Prevention	D-M-H-T-T-A Universal Prevention	D-M-H-T-T-A Universal Prevention	D-M-H-T-T-A Universal Prevention
Studying & Teaching	-	Consider switching to online classes to prepare the system as appropriate.	Consider stopping teaching or switching to online classes according to the situation in the area.	Switch to online classes.
Activities	Avoid organizing activities where many people gather.	Avoid organizing activities where many people gather (only required activities should be done).	Avoid organizing all kinds of activities where many people gather.	Do not organize any activity where many people gather.
Operation	-	Work From Home policy applies as appropriate.	Work From Home policy applies for those from the red area.	Work From Home Policy applies in full effect.

In addition, Mahidol University provides Coronavirus 2019 (COVID-19) vaccination services for students and staff of Mahidol University, as well as students and staff affiliated with the Ministry of Higher Education, Science, Research and Innovation (MHESI) at vaccination units in the Prince Mahidol Hall Conference Center (Kanchanapisek Medical Center, Faculty of Medicine Siriraj Hospital), Ramathibodi Hospital, Siriraj Hospital, and Hospital for Tropical Diseases. The aim is to offer universal healthcare to educational personnel so that they can access quality vaccines, reducing the rate of morbidity or mortality from the epidemic.

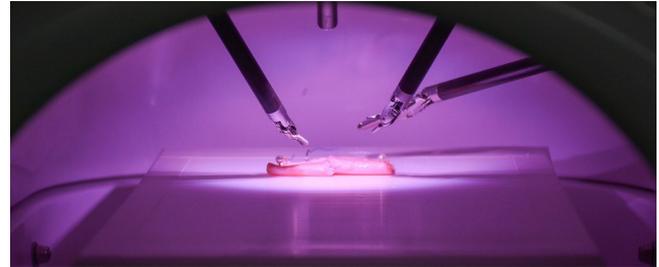
Service for students and staff	Number of person
1 st Dose Vaccine	14,055
2 nd Dose Vaccine	12,914
3 rd Dose Vaccine	2,560
Total	29,529

Service users	Number of person
Mahidol University	29,529
- Students	16,256
- Staff	13,273
Students and Staff in the universities and departments under the Ministry of Higher Education, Science, Research and Innovation	61,972
Grand Total	91,501

PROJECT / RESEARCH / EVENT

• **Advanced Technology of Robotic Surgery and Treatment for 237 Disadvantaged Patients** The Faculty of Medicine Siriraj Hospital, Mahidol University is the first medical school in Thailand to implement robotic surgery technology, starting with the first case of prostate cancer surgery. This is considered the first instance of robot-assisted surgery, which is recognized in terms of the patient's speedy recovery time and few mid-surgery complications. The faculty applied their knowledge to the following surgeries, leading to the establishment of the Center of Excellence in the treatment of prostate cancer. It also extended its robotic surgery capabilities, which is beneficial since it consumes less time, leaves smaller incisions, causes less pain post-surgery, and reduces surgical wound infections, allowing patients to live on with confidence and happiness. However, robotic surgery has one important limitation that makes it inaccessible for some patients: cost. Faculty of Medicine Siriraj Hospital, Mahidol University is aware of this issue. Therefore, it launched the **"Advanced Technology of Robotic Surgery and Treatment for 237 Disadvantaged Patients"** project so that a large number of disadvantaged patients can receive treatments, recover from their disease, and live happily and healthily. A selection criteria was set for

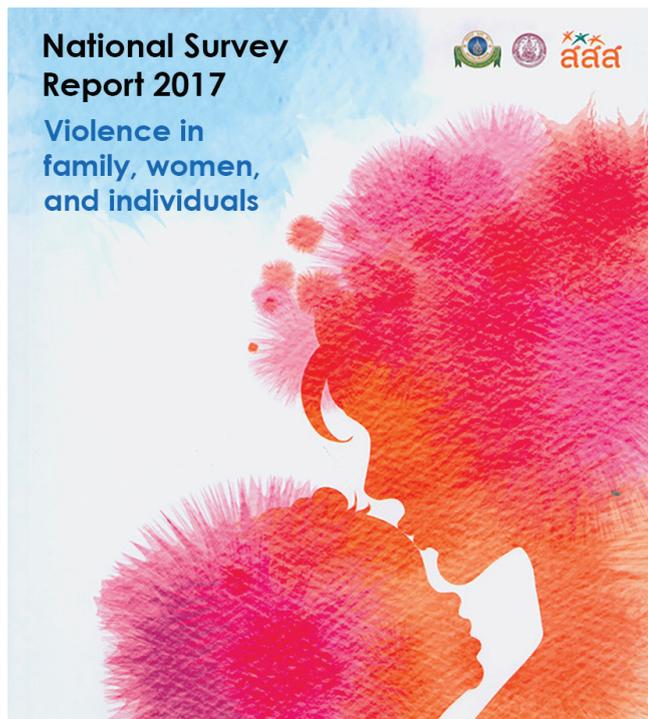
all 237 patients who will be assessed and diagnosed by medical professionals to determine whether robotic surgery is needed for their treatment. Their socioeconomic status was also assessed by Siriraj Hospital's social workers. Then, the participating patients were treated and allowed to stay in the general ward. This project helped reduce premature deaths from non-communicable diseases through prevention and treatment, promote wellbeing, provide universal health coverage, reduce financial risk, and allow access to efficient essential health services.



• **Phase I and II Research on an Inactivated COVID-19 Vaccine in Human:** On 22 March 2021, Faculty of Tropical Medicine, Mahidol University, in collaboration with the Government Pharmaceutical Organization, held a press conference on vaccine research, mentioning the cooperative success between the Government Pharmaceutical Organization (GPO), Ministry of Public Health and the Faculty of Tropical Medicine, Mahidol University, which is affiliated with the Ministry of Higher Education, Science, Research, and Innovation (MHESI). For this research, which aims to develop and produce a COVID-19 vaccine, the GPO worked with the PATH Institute from the United States, which had sent viral inoculum developed by Mount Sinai School of Medicine in New York and the University of Texas over for the sake of vaccine research and development in 2020. The viral inoculum was genetically modified in such a way that a Newcastle Disease Virus contained the spike protein of the COVID-19 virus. It was safe, nonpathogenic, and could increase in numbers in hatchable eggs. This technology has been used by the GPO to produce influenza vaccines. According to toxicity tests in rats in India and the efficacy and immunostimulatory tests in hamsters in the United States, the vaccine developed was safe and effective, and thus was eligible for a clinical trial. As Covid-19 vaccines researched and developed by the GPO needed to be tested with adjuvants, the Vaccine Center, Faculty of Tropical Medicine, Mahidol University conducted Phase I and II clinical trials to assess safety and the immunization capabilities of these vaccines to select only one to undergo Phase III research. In this regard, the MHESI plans to support the human clinical trial in all three phases, providing support in terms of policies, experts, and budget in phases I and II. As for phase III, research may be conducted domestically and internationally to get a sufficient number of volunteers. The Central Research Ethics Committee, through the Yothi Medical Innovation District (YMID), would also help facilitate and expedite the completion of the phase III research.

• **Project to promote Awareness about Violence Against Women and Family Members:**

The project was founded by the cooperation between the Domestic Violence Knowledge Management Center, Faculty of Medicine Ramathibodi Hospital; the Thai Health Promotion Foundation (ThaiHealth); the Provincial Administrative Organization for Social Development and Human Security; and the Department of Women's Affairs and Family Development (DWAFFD), the Ministry of Social Development and Human Security. It included nationwide population-based surveys on violence against women and family members in 9 provinces in different regions of Thailand. This is to identify problems and causes of violence occurring in Thai society and use the information obtained to build a "database" for domestic violence surveillance and warning, which would lead to appropriate management and problem solving. The DWAFFD used the survey results in the database as reference to determine the second metric "percentage of domestic violence against women and family members" in strategy IV of the Family Action Plan B.E. 2563-2565 "promote and support social networks that focus on family development to ensure protection and development from all platforms of social networks".



• **Ribonucleic Acid COVID-19 Vaccine and HexaPro for COVID-19 Vaccines Development Project:**

The project was founded by the collaboration between the Faculty of Science and the Faculty of Medicine Ramathibodi Hospital. They utilized their research knowledge to develop a technique to produce a vaccine from ribonucleic acid or RNA, resulting in the Ribonucleic Acid Covid-19 Vaccine. The vaccine has been submitted for protection as an intellectual property for the first time by the Institute for Technology and Innovation Management (iNT), Mahidol University. In addition, the research team has developed a subunit vaccine, which uses some proteins from the virus to stimulate immunity. The protein they chose to produce the vaccine from is the spike glycoprotein, modified for more stability and renamed as "HexaPro". It is expected to be more effective in boosting immunity than the current vaccines, and it has been presented in the bioRxiv research database. The vaccine development is still at a laboratory level and a clinical trial is yet to be done, but it is hoped to be a development that can expand the production of vaccines against COVID-19, cancer, and other future novel diseases.





4 QUALITY
EDUCATION



QUALITY EDUCATION

4 **QUALITY EDUCATION**



QUALITY EDUCATION

RELATED POLICIES

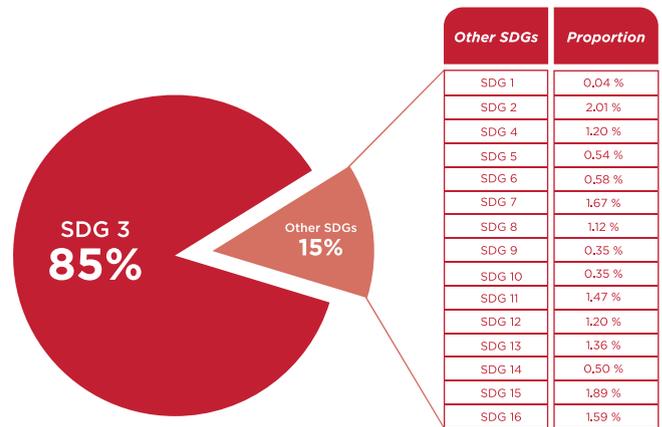
Mahidol University aims to be recognized as the world’s leading university that produces excellent graduates, helps boost the potential of human capital, and elevates the country’s education and research through the means of developing systems that help with resource management, quality of life, the environment, national competitiveness, and social equality by 2037. The University’s strategy on innovative education and authentic learning was put in place to improve the quality and diversity of its courses in accordance with the demands of learners and to equip graduates with global talents.

Currently, the University is using the Flexible Education and Credit Unit Bank System with undergraduates and graduates, enabling them to record their academic performance and learning outcomes from formal, informal, and independent education in the Credit Unit Bank System. Students can choose the duration, time, and learning site, and design their own study plans. This also provides opportunities for learners of diverse ages, education levels, and career backgrounds to be able to take courses for the sake of reskilling and upskilling.

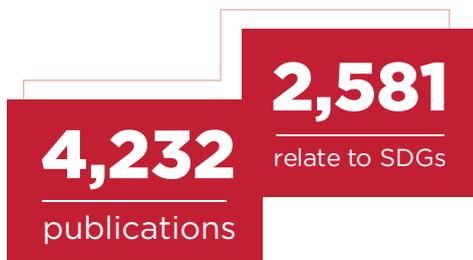


PROJECT / RESEARCH / EVENT

Mahidol University recognizes the importance of sustainable development for the future. Therefore, it encourages everyone to lend a hand and create a sustainable society through research and academic work. In 2021, There were a total of 4,232 publications (according to the Scopus database), 2,581 of which relate to Sustainable Development Goals (SDGs). 85% of the publications are related to Sustainable Development Goal 3 (SDG3): Good Health and Well-being, and about 15% are related to other SDGs. Mahidol University has a large number of faculties /institutes/centers related to medicine, public health, and health sciences, such as the Faculty of Medicine, the Faculty of Dentistry, the Faculty of Medical Technology, the Faculty of Nursing, the Faculty of Pharmacy, the Faculty of Physical Therapy, the Faculty of Public Health, the Faculty of Tropical Medicine, and the ASEAN Institute for Health Development. As a result, the university can produce a large number of medical



Proportion of Mahidol University publication related to each SDG



and public health personnel each year, as well as a significant number of educational and research accomplishments in medicine, public health, and health sciences. Despite such achievements, the University never stops working on other disciplines such as science, technology, engineering, and mathematics, as well as arts, humanities, and social sciences. This is evident from the fact that the number of research grants and projects available for these disciplines is comparable to that for the health sciences.

In 2021, the University received more than 907 million baht of research funding from 850 research projects. 378 are in the subject areas of sciences, technology, engineering, and mathematics; 447 are in the subject areas of medicine, public health, and health sciences; and 571 are in the subject areas of arts, humanities, and social sciences (some research projects are consistent with more than one subject area).

907

million (Baht) of
research funding

850

research projects.

Research by subject area	Number of Projects	Research Fund (Baht)
Science, Technology, Engineering, and Mathematics (STEM)	378	468,028,499
Medicine, Public Health and Health Sciences	447	381,356,108
Arts & Humanities / Social Sciences	571	518,822,114
Total*	850	907,544,729

Note: * That is the unique total number because some research projects are consistent in more than one subject area.

EDUCATION PROGRAM

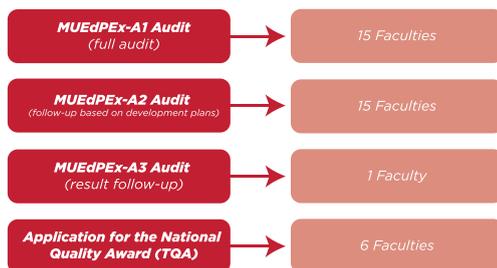
International Standard for Academic service

Mahidol University has set up training workshops for EdPEX and AUN-QA assessors to train them on the criteria and methods of quality assessment. They should be able to score reports and evaluations using the same standards, compile useful feedback reports to relevant departments and courses for improvement, and perform duties as an assessor of the university. The University has a total of 132 EdPEX and AUN-QA assessors.

MU EdPEX

In the academic year 2020, Mahidol University's score according to the Quality of Education for Excellence (EdPEX) criteria is as follows: the score for "processes" is in the range of 261-290 (development level according to MU's Dee grading scale is 4B), and the score for "results" is in the range of 191-210 (development level according to MU's Dee grading scale is 3A).

The results of the quality assessment at a department level according to the EdPEX criteria in fiscal year 2021 are divided into 4 levels as follows:



Mahidol University received Thailand Quality Awards (TQA) 2021 from Thailand Productivity Institute as follows:



MU AUN-QA

Mahidol University has been using the AUN-QA criteria as a tool to improve the quality of education at a curriculum level. Also, its policy requires all courses of the University to be assessed for curriculum-level quality of education according to the AUN-QA criteria of Mahidol University (MU AUN-QA Assessment). From 2017 to 2021, a total of 254 courses have been assessed.

Currently, the University offers 45 internationally certified courses, 27 of which are AUN-QA-certified, and 18 are certified by other international standards (three courses are certified with 2 international standards: AUN-QA and other standards). The courses can be categorized as follows: 24 bachelor's degree programs, 16 master's degree programs, and 5 doctoral programs (3 programs are certified with more than one international quality accreditation).

<i>International Education Standards</i>	<i>Bachelor Degrees</i>	<i>Master Degrees</i>	<i>Doctoral Degrees</i>	<i>Total</i>
1. Association to Advance Collegiate Schools of Business: AACSB	4	3	2	9
2. Asia-Pacific Academic Consortium for Public Health: APACPH	-	1*	-	1
3. ASEAN University Network Quality Assurance: AUN-QA	13	11	3	27
4. Institute and Faculty of Actuaries: IFoA	1	-	-	1
5. International Society for Prosthetics and Orthotics: ISPO	3	-	-	3
6. Music Quality Enhancement: MusiQuE	1	2	-	3
7. United Nations World Tourism Organization: UNWTO.TedQual	1*	-	-	1
8. World Federation For Medical Education: WFME	2	-	-	2
9. World Federation of Occupational Therapists: WFOT	1*	-	-	1

Note: * That course is also certified to AUN-QA standards.

PROJECT / RESEARCH / EVENT

MUx

The University has developed online lessons in the form of SPOCs (Small Private Open Courses) and MOOCs (Massive Open Online Courses) under the Thai MOOC and "Mahidol University Extension (MUx)" projects to accommodate learning styles both within and outside of the classroom. Moreover, it has created an open learning resource that meets the students' needs (as a Global Open Access Learning-University) from which they can learn anytime and anywhere via the implementation of educational technologies and the e-learning system. The e-learning system and online teaching materials were developed through the Learning Management System (LMS). MOOCs provide courses from various faculties/disciplines for students, staff, and the general public, enabling them to learn by themselves digitally without charge. This is to promote lifelong learning according to Sustainable Development Goal 4 (SDG4: Quality Education).

Mahidol HIDEF

Mahidol University encourages students to participate in extracurricular activities of their choice and accumulate non-academic skills that are necessary for future work and life. Students will receive an AT (Activity Transcript), which will be displayed on their transcript upon graduation. The "Mahidol HIDEF" consists of 5 skills as follows:

<i>Mahidol H-I-D-E-F</i>	<i>Number of activity hours in academic year 2020</i>
(H) Health Literacy	28,213 hrs.
(I) Internationalization	20,905 hrs.
(D) Digital Literacy	64,854 hrs.
(E) Environmental Literacy	14,159 hrs.
(F) Financial Literacy	53,897 hrs.
Total	182,028 hrs.

Student Clubs

Clubs are organizations where students can organize activities in accordance with the objectives of each club, ranging from public service, arts and culture exchanges, sports, and academic knowledge-seeking. For each activity, students plan and execute it on their own. Clubs are a way to give back to society and a way for students to gain knowledge and experience. In the academic year 2020, Mahidol University had a total of 24 student clubs, divided into 4 main types as follows:



Lifelong Learning Activities

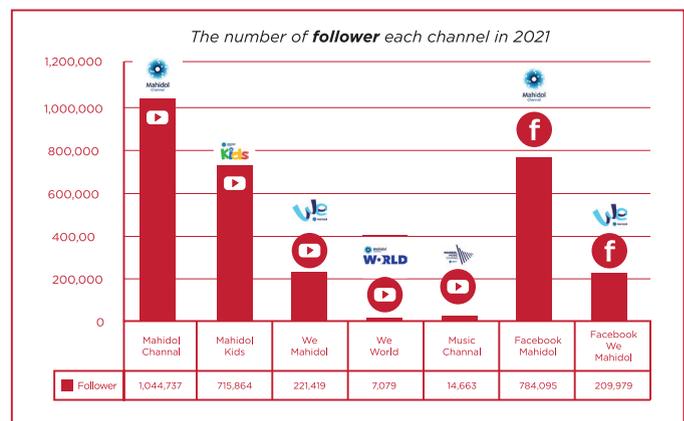
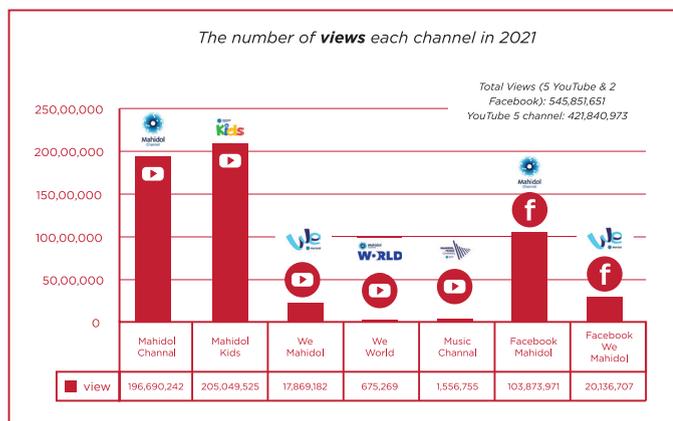
- **Skill Building through LinkedIn Learning:** Mahidol University, in collaboration with LinkedIn Learning, facilitates skills enhancement through online courses on business, technology, and creativity with more than 16,000 courses that will enhance the students' skills (upskilling) and create new skills (reskilling) for them. The aim of this activity is to enhance lifelong learning, build the skills required to work efficiently, prepare important skills for the future, as well as create efficient work networks.

- **Yoga for Health:** This is a practical training which invites yoga experts to train students and staff who are interested. The participants will be guided and get to practice yoga with the right postures from the start. Firstly, all participants will be assessed for body flexibility. Then, the event host will inspect and record each participants' muscles post-training. This is to promote the students' interest and passion for exercise, improve the flexibility of their bodies, offer them a way to spend their time, and help relieve their stress.

- **Zumba for the Body and the Mind:** The Sports Unit, Student Development Section, The Division of Student Affairs organizes the "Zumba for Mental and Physical Health by Kru Toto" project, in which Zumba experts introduce and let participants exercise with various dancing styles every week. It starts with simple choreography and then increases in variety and fun. A 10-minute warmup is followed by a 40-minute rhythmic dance and a 5-to-10-minute cooldown. Each dance session takes about 45 minutes, excluding warmups and cooldowns, and the entire session takes a total of 1 hour. The participants are examined for muscle strength in their arms and legs before and after participating to assess their muscular development. Participants will get to learn Zumba dance moves to develop their bodies and minds, and they can practice on their own at home or even teach others. This activity aims to encourage exercising, give students an active habit, develop their body strength, promote their health, offer them a way to spend their free time, and help relieve their stress through exercise.

Online Education Platform

Mahidol University is determined to provide a hub of various knowledge sources. Therefore, the Mahidol Channel has been launched as a hub and accessibility of information, knowledge, and entertainment for everyone to access. The contents for Mahidol Channel are accessible via 5 online channels on the YouTube and Facebook platforms.



The Mahidol Channel is an online presence that has become popular as one of the top educational institution channels in Thailand. In 2021, it had a total number of views of about 546 million and a total number of followers of about 3 million. From its first launch in 2015, Mahidol University has produced a total of 75 high-quality contents, many of which are optimized to accommodate the present and future trends so that everyone can learn and keep up with the modern world.

546

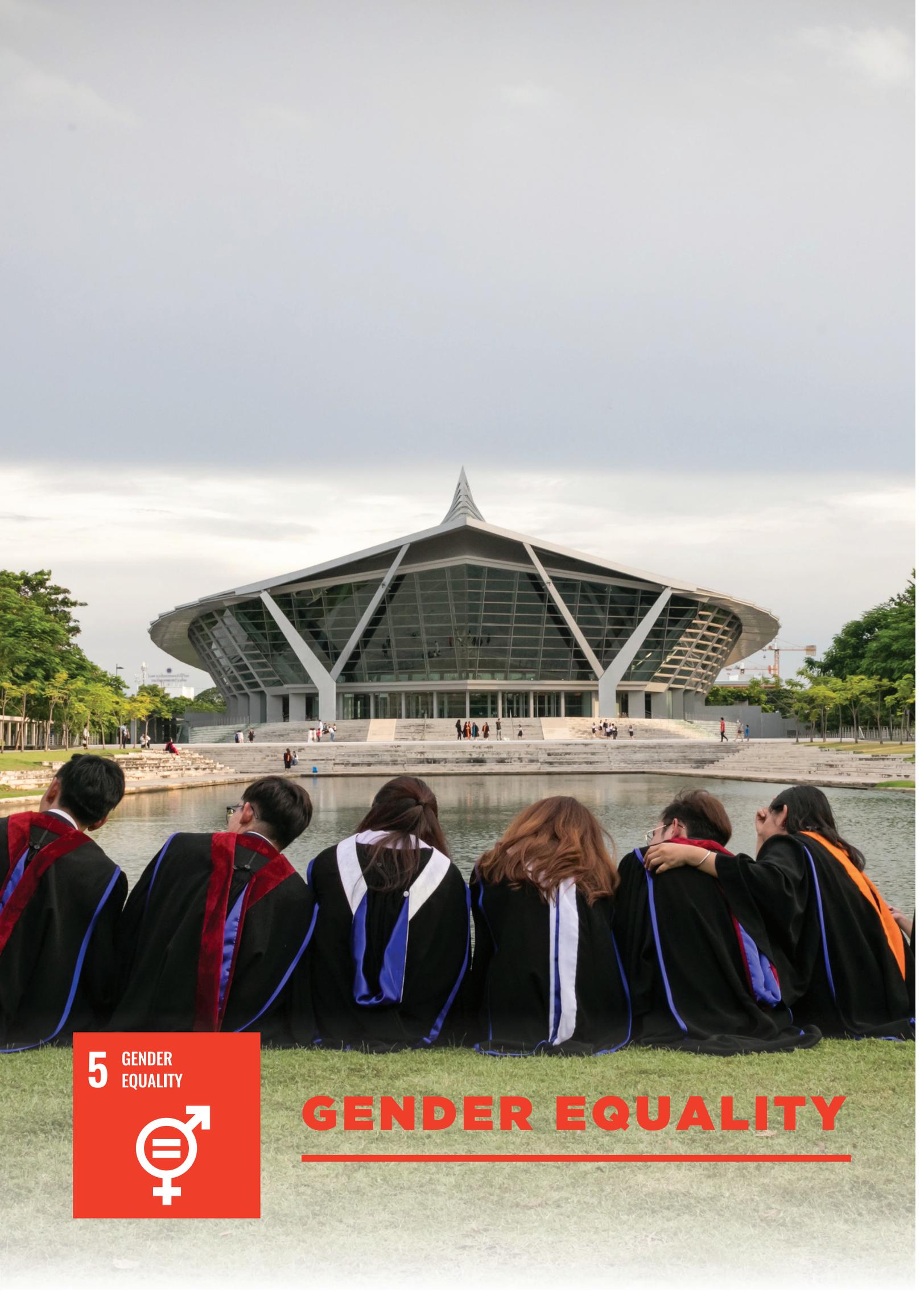
million views

3

million subscribers

Channel	Program
 <p>Mahidol Channel</p>	
 <p>We Mahidol</p>	
 <p>Mahidol Channel W·RLD</p>	
 <p>Mahidol Channel Kids</p>	
 <p>MAHIDOL MUSIC CHANNEL</p>	





5 GENDER
EQUALITY



GENDER EQUALITY



GENDER EQUALITY

RELATED POLICIES

Mahidol University promotes gender equality according to the “guidelines to prevent and solve the problems of violence and sexual harassment in the workplace, and to promote equality and eliminate unfair gender discrimination,” and in accordance with the Gender Equality Act. The University’s efforts cover all staff and relevant parties, such as students and interns, etc.

- The Mahidol University Notice regarding the measures to prevent and solve the problems of violence or sexual harassment in the workplace, B.E. 2558
- The International College Notice regarding the guidelines to prevent and solve the problems of violence and sexual harassment in the workplace, and to promote equality and eliminate unfair gender discrimination for International College staff, B.E. 2562



POPULATION PROPORTION

Student and staff categorized by gender

Mahidol University’s personnel are diverse in terms of job position, gender, or domicile. When recruiting or promoting staff, the University offers everyone an equal opportunity without any gender discrimination. Currently, in 2021, the University has a total of 37,996 staff, 33,990 of which are in supporting staff and 4,006 in academic staff.



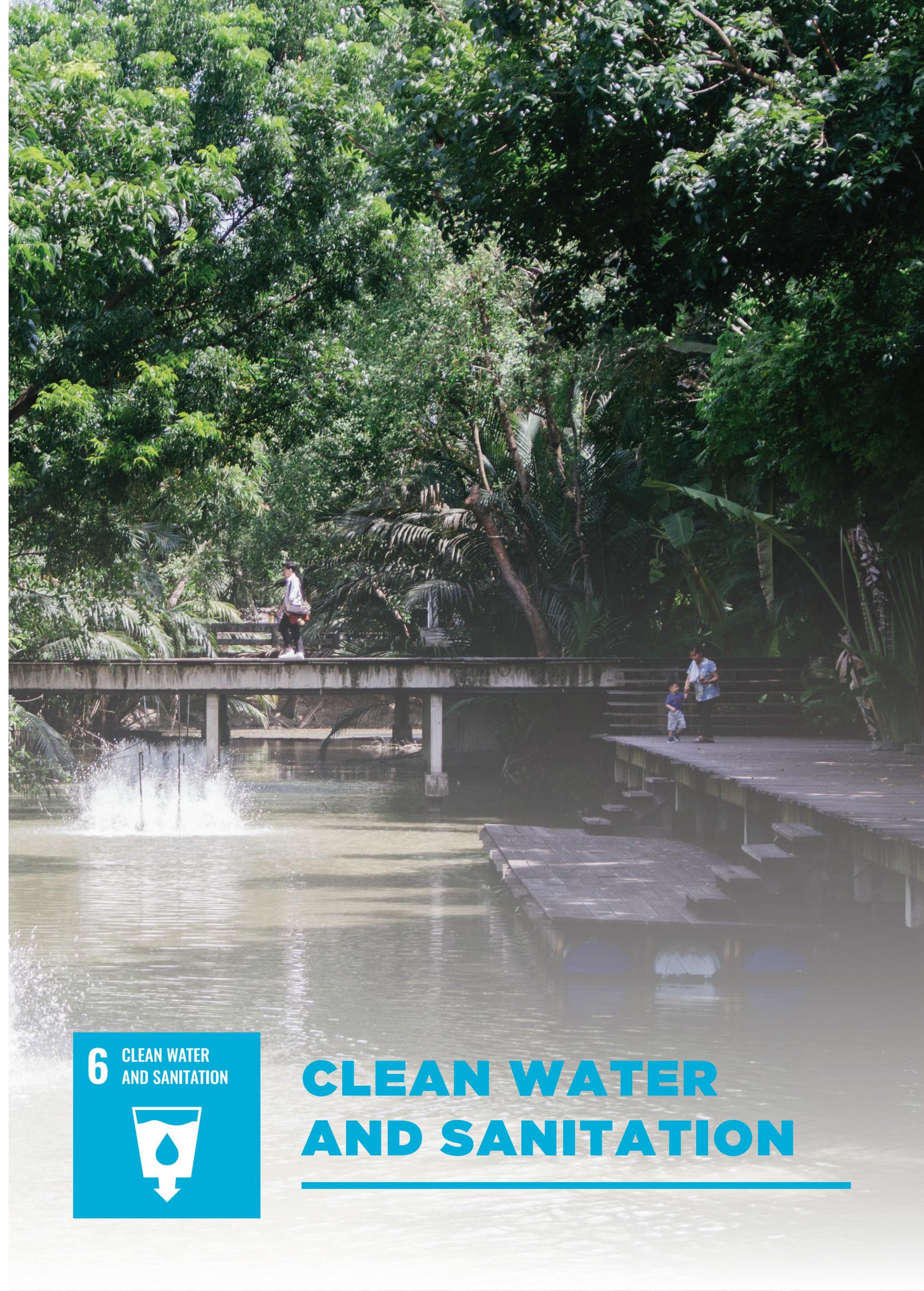
Position	Number of Staff		
	Total	Male	Female
Academic Staff	4,006	1,830	2,176
• Lecturer	1,602	731	871
• Professor	144	76	68
• Associate Professor	1,030	481	549
• Assistant Professor	1,211	537	674
• Researcher	19	5	14
Supporting Staff	33,990	7,704	26,286
• Operational Support Assistant	14,171	4,090	10,081
• Operational Support	4,421	851	3,570
• Academic Support	3,829	1,107	2,722
• Specific Profession Support	11,569	1,656	9,913
Grand Total	37,996	9,534	28,462

PROJECT / RESEARCH / EVENT

• **Seminar to End Violence Against Children and Women:** The United Nations General Assembly has designated November 25 as the International Day for the Elimination of Violence Against Women. In this regard, the Division of Student Affairs, Mahidol University hosted the “Seminar to End Violence Against Children and Women: Sexual Harassment (I can Say)” on 25 November 2020 at the Mahidol Learning Center (MLC), Salaya Campus, Mahidol University. The seminar had brave sexual violence victims share their experience through stories and audio clips, raising awareness among students. There was also a workshop to pinpoint risky areas in Mahidol University so they could be improved in terms of safety. The University sincerely hopes that this activity helped the students of Mahidol University and other participants to understand and become aware of the issues of sexual harassment and women’s safety in urban society, as well as the elimination

in an effort to make Mahidol University a true health university. of gender-based violence. The purpose of these activities is to enhance health literacy according to the AUN-HPN Framework, in an effort to make Mahidol University a true health university.





6

CLEAN WATER
AND SANITATION



CLEAN WATER AND SANITATION

6 CLEAN WATER AND SANITATION



CLEAN WATER AND SANITATION

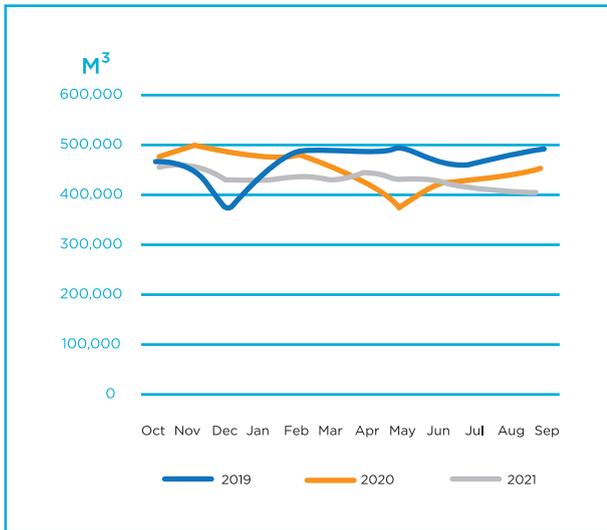
RELATED POLICIES

The University enacted the **Policy regarding the conservation and utilization of biodiversity of water resources, B.E. 2564**, to preserve the watersheds' environmental quality in accordance with environmental standards and maintain a healthy ecosystem. The University devised internal water management plans, controlled the release of wastewater into surface water sources, constantly monitored water quality, and developed water sources to be the most effective for water storage.

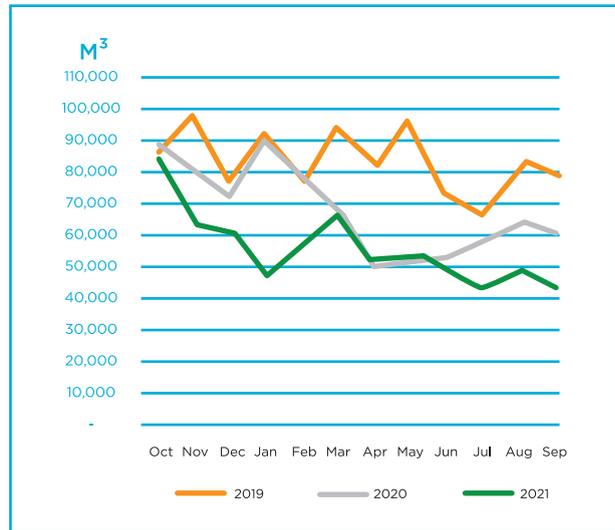
WATER CONSUMPTION & RECYCLE WATER



In 2021, the entire Mahidol University reduced its water consumption by around 4.10 %. A total amount of 5.17 million m³ tap water was supplied for all our 6 campuses. Water consumption per month obviously decreased between July and September 2021. However, we have retained the water recycling from the wastewater treatment system. In case of Salaya campus, the water consumption in 2021 was 668,866 m³. These indicate a reduction of 18.3% compared with 2020 water consumption. It is noteworthy that the water management system on campus is zero discharge or 100% recycled water



Water consumption per month of Mahidol University in fiscal year 2019-2021



Water consumption per month in Salaya campus in fiscal year 2019-2021

Since 2019, the RINGLOOP system was adopted to cover 19 zones of Salaya campus area for increasing efficiency of its irrigation. In 2020, the additional irrigation system was constructed to improve the continuing irrigation. We organize the tap water system with water usage gauge installation in each work unit to ensure that sustainable water management and water accessibility for all. The digital water gauge online monitoring is further conducted and 24 work units' data is available for the administrators who require to check their work unit's tap water system.

WATER CONSUMPTION & RECYCLE WATER

The wastewater treatment in Salaya campus is an aerobic biological treatment process (activated sludge) which can collect the wastewater by approximately 1,000 m³ per day. The wastewater system receiving from 17 work units. The activated sludge comprises: aeration tank and sedimentation tank which aim to accelerate the microorganism's function on organic digestions. After the treatment, this treated water, separate with the bottom sludge, will be added by bio-chlorine for sanitation. While the excess sludge will be used as the composing fertilizer in the campus area. The treated wastewater is reused for many purposes, such as recreation areas improvement, landscape watering, shuttle buses cleaning, and releasing into the internal university's canal to maintain the water level. Furthermore, the treated wastewater and the surface water have been inspected and monitored monthly.

For the surface water and discharge system, the discharge of treated wastewater was entirely released to the rainwater storage canals and circulated for maintaining the recreation landscape in the university area. This can be regarded as **“Zero discharge”** campus. The surface water was monitored for its quality each month to ensure that the surface water reaches a standard quality for other livings as well as the ecosystem surrounding. Besides, the irrigation performance of each canal was biannually checked and restored to be available for water conservation during dry season. We also installed three water pump stations and develop the Mahidol Monitoring System (MMS) and to implement the better water management plan. The measure equipment and tools were installed as for remote monitoring and controlling in the university area.

PROJECT / RESEARCH / EVENT

• Free drinking water

In order to ensure that our people can access clean drinking water, Mahidol University installed free drinking water machines in 4 public areas of Salaya campus in September 2020. The drinking water is analyzed is twice a year to ensure drinking water is safe for people, and is certified according to NSF/ANSI 61 and 372. Free drinking water is available to serve students, staff, and visitors who are living in our area. Additionally, providing free drinking water machines also responds to plastic waste reduction policies since it encourages people to bring their own water containers. In 2021, we found that the project has achieved the reduction of 450 ml plastic bottles as the maximum of 493,619 bottles reduced.

reduced
493,619
plastic bottles

reduced
215 ton CO₂ eq
GHGs emission

• Empowering Bueng Boraphet with a Network (Nakhon Sawan Campus)

This project aims to promote holistic water resource management at all levels to optimize water usage across all sectors and ensure sustainable water usage and storage. This is done to solve water shortage issues, reduce the number of people who suffer from the issue, as well as protect and restore water source-related ecosystems. Bueng Boraphet is a wetland area of global significance. It is the largest freshwater swamp in Thailand with biodiversity in terms of flora and fauna. It is utilized for fishing, and some of its water is taken for agriculture, aquaculture, tourism, and everyday use. However, due to Bueng Boraphet’s dish-like shallowness, it cannot store a lot of water. As a result, many intense conflicts and even disputes brewed in an attempt to procure water.

Over the past 10 years (2011–2021), The Organized Project of Nakhon Sawan Campus Project, Mahidol University has been helping to develop Bueng Boraphet by the means of providing academic data, research, and academic services. A joint development plan for Bueng Boraphet has been formulated to be proposed to the National Reform Council with the objective of creating a balance between the ecosystem and human usage. At present, all parties are working towards this development in formal and informal networks, through flood assessments, area mapping, meetings, and seminars on the development of Bueng Boraphet, etc. The results of these actions are now put into actual use, and parties have come to accept and understand the importance of Bueng Boraphet. As a result, water is allocated for all activities equally, and the balance between ecosystem preservation and human use is achieved. This balance is turned into a policy by the “Bueng Boraphet Management Committee” which utilizes the project’s learning to set water usage guidelines in each area of Bueng Boraphet (allowing, banning, and preserving zones). This collaborative water management model can be applied in other areas with similar contexts as well.

Results

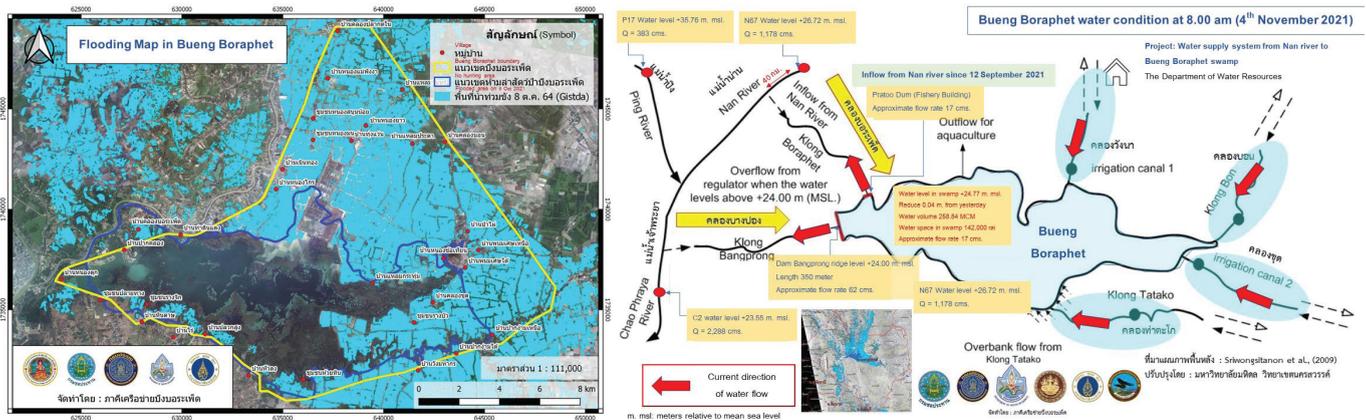
1. People were granted the right to utilize water as proposed to the National Reform Council as they were offered lease agreements for the Ratchaphatsadu Land, registration number N.W. 339 (Bueng Boraphet), Nakhon Sawan province, covering 1,542 plots in total. There are 5,000 people remaining whose lease agreements are under consideration.

2. The project under the proposal of "The Bueng Boraphet Network" was included as part of the 10-year Bueng Boraphet Development and Restoration Master Plan (2020 - 2029). In this project, there are 9 action plans that can be implemented immediately with a 3 year period of action (2020 - 2022) and a budget of 1,513.5 million baht.

3. A total of 6,888 plots in Bueng Boraphet area were defined and occupied, thereby reducing the problem of Bueng Boraphet land invasion.

4. By working together in the Bueng Boraphet Network, conflicts were reduced for all parties.

5. All parties got to participate in the management of Bueng Boraphet.



Research

Mahidol University has several research projects that aim to enhance water management and sanitation. This includes water retention, salt removal, water usage efficiency, wastewater treatment, and water recycling technologies. The example researches are as follows.

• Recycling rice husk for removal of phosphate and nitrate from synthetic and swine wastewater: Adsorption study and nutrient analysis of modified rice husk.

The arsenic speciation, the abundance of arsenite-oxidizing bacteria, and microbial community structures in the groundwater, surface water, and soil from a gold mining area were explored using the PHREEQC model, cloning-ddPCR of the *aioA* gene, and high-throughput sequencing of the 16S rRNA gene, respectively. The analysis of the *aioA* gene showed that arsenite-oxidizing bacteria retrieved from groundwater, surface water, and soil were associated with Alphaproteobacteria, Betaproteobacteria, and Gammaproteobacteria. In groundwaters from the mining area, there were relatively high ratios of *aioA*/total 16S rRNA gene copies and the dominance of As5+, which suggested the presence and activity of arsenite-oxidizing bacteria. Metagenomic analysis revealed that the majority of the soil and surface water microbiomes were Proteobacteria, Actinobacteria, Bacteroidetes, and Chloroflexi, whereas the groundwater microbiomes were dominated exclusively by Betaproteobacteria and Alphaproteobacteria. Geochemical factors influencing the microbial structure in the groundwater were As, residence time, and groundwater flowrate, while those showing a positive correlation to the microbial structure in the surface water were TOC, ORP, and DO. This study provides insights into the groundwater, surface water, and soil microbiomes from a gold mine and expands the current understanding of the diversity and abundance of arsenite-oxidizing bacteria, playing a vital role in global As cycling.

• Development of reactive iron-coated natural filter media for treating antibiotic residual in swine wastewater: Mechanisms, intermediates and toxicity.

Degradation mechanisms, surface phenomena, and the influence of co-existing organic matter on heterogeneous Fenton-like reactions were investigated using low-cost natural materials, to remove three veterinary antibiotics. Zeolite rock, laterite rock, and pumice rock were modified by adding ferric chloride. Fenton-like reactions yielded more than 50 % of antibiotic removal at a neutral pH. The modified zeolite exhibited the highest antibiotic removal efficiency. The heterogeneous Fenton-like reaction could be indicated by the simultaneous detection of Fe(II) and Fe(III) on the surface of the modified zeolite. Leaching iron was also observed to reduce the antibiotics with homogeneous Fenton-like reaction. The co-existing organic matter expressed by the COD below 400 mg/L did not have a considerable adverse impact on antibiotic removal. An H₂O₂ concentration as low as 20 μM was sufficient to react with the modified zeolite and degraded more than 70 % of the antibiotics at a neutral pH. The modified zeolite could be reused at least three times, with a removal efficiency of at least 80 %. The antibiotic degradation efficiencies in real treated swine wastewater were above 75 %. Moreover, the degradation intermediates and bacterial inhibition after treatment were investigated.



7 AFFORDABLE AND
CLEAN ENERGY



AFFORDABLE AND CLEAN ENERGY

7 AFFORDABLE AND CLEAN ENERGY



AFFORDABLE AND CLEAN ENERGY



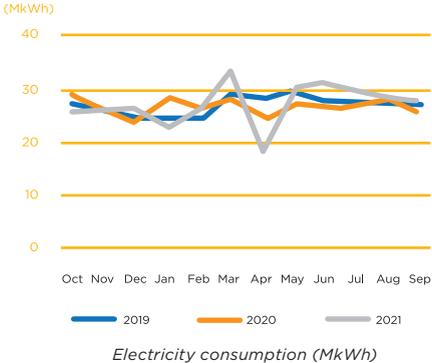
327.4
million kWh
Electricity consumption

RELATED POLICIES

Mahidol University enacted the **Policy regarding energy conservation promotion of Mahidol University, B.E. 2564** to improve its energy management system, formulate an energy conservation plan with the intention of reducing the use of fossil fuels by 5% by 2025, and facilitate the improvement, change, or adoption of modern and environmentally friendly technology to reduce energy consumption by at least 30% by 2025. These efforts would help reduce greenhouse gas emissions and lead to sustainable energy consumption. The University also enacted the **Policy regarding the renovation or construction of buildings, B.E. 2564**, to enhance energy efficiency by planning and controlling the energy use in buildings; encourage building designs or modifications that promote energy saving by making use of the wind direction and sunlight; enhance the cultivation of local plants; arrange for landscapes that accommodate each building; and support energy-saving buildings.

ELECTRICITY CONSUMPTION

In 2021 fiscal year, the electricity consumption of Mahidol University, a total of 327.4 million kWh, was slightly increased by around 1.96% from the previous year. The higher peaks of electricity consumption were apparently found in March October and June when compared to the electricity records of 2019 and 2020.



RENEWABLE ENERGY CONSUMPTION

Mahidol University has adopted the solar cell energy in order to reduce the electricity cost. Since 2015, we operated many activities related to renewable energy by determination of measurement and plan for increasing more renewable energy usage. Therefore, the solar cell system or solar rooftop in Mahidol University were set to be developed and integrated cover all of the university space.

In 2019, we have operated the compact solar cell for application in the building. The Off-Grid system, size 1.3 kW, of solar cell system was integrated to be back up power by using the battery storage. The storage batteries are provided for the students and staffs who come to access at the MU Learning center building and bus terminal for their phone, notebook, and power bank charging. In 2021 fiscal year, our solar cell system can totally provide the electricity 183.6 W consists of the MU Learning Center Building (5.7 W) and bus terminal (177.9 W).

In 2020, we have applied the Solar rooftop project to generate electricity for the wastewater treatment building in Salaya campus. **The On-Grid solar cell system** was adopted for alternate electricity which can switch to the general current when solar energy is not enough providing for the wastewater system usage. The total of 66 solar cell circuits, maximum total generates as 21.78 kW, were installed in the wastewater treatment station. This Solar Rooftop project can feed four air conditioning units, one television, one refrigerator, two water pumps, and 30 LED light bulbs by around 80 - 100 unit per day which can save electricity cost by approximately 10,000 THB.

21.96
kW
Solar ENERGY

SMART CAMPUS

Mahidol University updated its management of buildings and surrounding areas to keep up with the digitalized world that incorporates technology into management and increased its resource efficiency in the following ways:

1. Automatic Meter Reading System

A total of 76 power meters were replaced with automatic ones, and a website was created to display energy usage in the locations where the electricity meters are installed. The data can be analyzed to find a way to reduce electricity consumption and improve energy efficiency.

2. Smart Digital Water Meter System

A total of 24 water meters that were over 8 years old were replaced with digital ones, which could track and monitor water consumption data online.

3. Automatic Water Level Measurement System

Water level measuring devices were installed, and an online water pump station control system was set up. It is then possible to monitor the water level in canals and make forecasts for floods and droughts, enhancing the water management strategy in designated areas.

4. ECO Data Center

The data center serves as a hub that aggregates information from various systems, such as the Energy Management system, the Smart Digital Water Meter system, the Automatic Water Levels Measurement system, the Solar Rooftop system, the Closed-Circuit Television (CCTV) system, etc., allowing the University to manage its facilities with ease.

PROJECT / RESEARCH / EVENT

• Solar Cell System

In order to ensure steady energy consumption, Mahidol University converts solar energy to electricity. By doing this, the amount of renewable energy is increased, sustainable energy consumption is encouraged, and greenhouse gas emissions and environmental effect are reduced in a sustainable way.

In 2022, the solar rooftop and smart electricity development project will be launched in Salaya campus by 15 year-contracted with an external supplier. The solar panel will be installed on 32 rooftops of faculty building, parking lots building, and on the surface of water pond, that will generate at least 13 MW with storage capacity of 500 kWh. Furthermore, the smart electricity system will be implemented in Salaya campus. The electricity supply from solar energy is expected to reduce around 35% of the total electricity utilization from fossil fuel. The program will save the university's budget about approximate 2.4 million Baht per month or 419 million Baht in 15 years.

Research

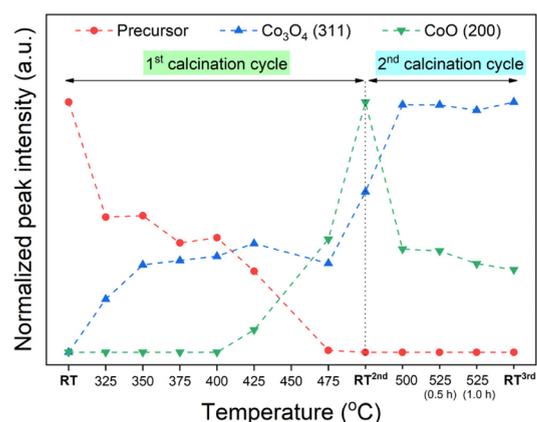
Mahidol University conducted a number of studies to better understand clean energy technologies, renewable energy, energy efficiency, and advanced clean fossil fuel technologies. It also encourages investments in energy infrastructure and clean energy technologies, such as

• A Study of Napier Grass's Potential and its Economic Value in Biogas Power Plant Development in Thailand

This research study the basic information of Napier grass varieties in Thailand, including strains, botanical characteristics, agricultural practices, and cultivation costs, as well as methane production from pig manure and Napier grass, and heating values from Napier grass for use as a source for electricity generation. Moreover, this research study on determination of cost and financial return of Napier grass cultivation for electricity generation in a power generation plant (1 megawatt).

• Oxidative thermal conversion of hydrothermal derived precursors toward the mixed-metal cobaltite spinel oxides ($ZnCo_2O_4$ and $NiCo_2O_4$):

In-situ investigation by synchrotron-radiation XRD and XAS techniques. In-situ investigations of structural transitions during the thermal-oxidative event of mixed-metal spinel oxide precursors, the so-called nickel- (NCO) and zinc-containing (ZCO) cobaltite spinel precursors, were investigated to understand the formations of the derived $NiCo_2O_4$ and $ZnCo_2O_4$ spinel oxides, respectively. In-situ XRD investigation revealed that emerged temperatures for spinel oxide phase were between 325 and 400 °C, depending on the cationic substituent. It indicated that the emerged temperature correlated with the absolute octahedral site preference energy (OSPE) of those cations that participated in the development of the spinel framework. Moreover, the incorporated nickel and zinc in the precursors was beneficial for inhibiting the occurrence of the undesired CoO phase. Time-resolved X-ray absorption spectroscopic (TRXAS) data suggested the local structure rearrangement of nickel and zinc throughout the calcination process, which differed from the behavior of single-metal cobalt system. The essential information reported herein provides a benefit to control the cationic distribution within spinel materials, leading to the tunable physical and chemical properties.





8 DECENT WORK AND
ECONOMIC GROWTH



DECENT WORK AND ECONOMIC GROWTH

8 DECENT WORK AND ECONOMIC GROWTH



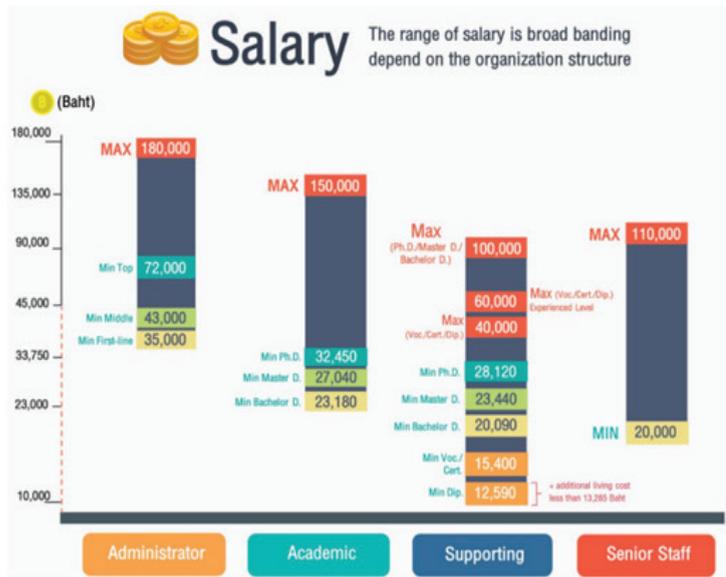
DECENT WORK AND ECONOMIC GROWTH



RELATED POLICIES

Mahidol University promotes effective and diverse employment. It welcomes professionals from all fields to take positions corresponding to each department’s requirements, so that everyone gets a suitable job and achieves optimal working efficiency. Moreover, in full support of safeguarding workers’ rights and ensuring a safe workplace, the University enacted the **Policy and Guidelines for Safety, Occupational Health, and Working Environment, Mahidol University B.E. 2564** to push for workplace improvement, proper facilities, and safety infrastructure. The purpose is to control risks in workplaces, build a safety culture, and maintain a good working environment for staff, students, and people in general.

Additionally, the University prioritizes fair remuneration. Therefore, it uses the broad banding approach to determine its employees’ salary range. Remuneration rates are adjusted to match the country’s economic situation and each job types. The latest payroll revision was done in 2019 in accordance with the Mahidol University’s Notice regarding salary accounts revision and salary criteria for University Staff, B.E. 2562.

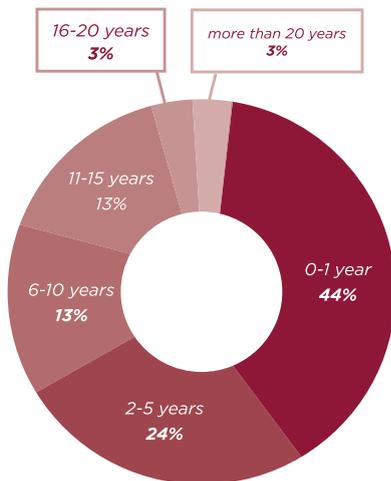


Salary by employee level of Mahidol University’s full-time staff



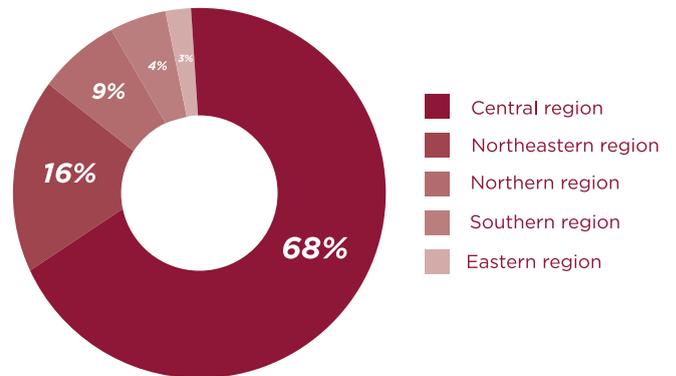
STAFF EMPLOYMENT

The University offers fair employment with accurate job descriptions. As seen in figure the proportion of staff classified by contract period is as follows: the number of staff with less than 1 year contract comes out on top at 44%. However, when looking at contract periods of more than 2 years, which indicates more stability, decent employment, and economic growth, they, altogether, make up a greater proportion at 56%.



Proportion of staff categorized by contract period

In addition, the University offers employment in different areas throughout the country to ensure an even income distribution. Most of its staff have their domiciles in the central region, at 68%, since 5 of the 6 campuses are located in the central region. There are still a number of staff from other regions.



Proportion of staff categorized by domicile

The University's staff are distributed to different faculties/departments according to their corresponding positions and roles. Academic staff are divided into 4 groups, as shown in table with the proportion of staff in the fields of medicine, public health, and health science being the most at 68.85%, followed by staff in the fields of science, technology, engineering, mathematics, arts, humanities, and social sciences, and others, respectively.

Academic Staff	Number of Staff	
	(Persons)	(Percentage)
Science, Technology, Engineering, and Mathematics (STEM)	699	17.45
Medicine, Public Health and Health Sciences	2,758	68.85
Arts & Humanities / Social Sciences	541	13.50
Others	8	0.20
Total	4,006	100.00

STUDENT

Mahidol University allocates some of its budget to employ students during semester breaks or after studying hours. The purpose of this is so that their students spend their free time effectively, get experience, grab opportunities to learn, prepare themselves to be effective workers post-graduation, and gain an extra income that can be used to help their parents pay for their educational expenses. In 2021, the University offered employment for 208 students for a total amount of 597,760 baht, helping to alleviate the burden of their expenses.

employ **208** students
support **597,760** baht

EXPENDITURE

Mahidol University's budget is composed of a government budget and a revenue budget. It is used to improve and support activities related to education, research, innovation, and the creation of economically valuable jobs. In fiscal year 2021, the University received a total budget of 51,859 million baht, which was allocated for personnel management, operation, investment, subsidy, and other purposes as specified in the table.

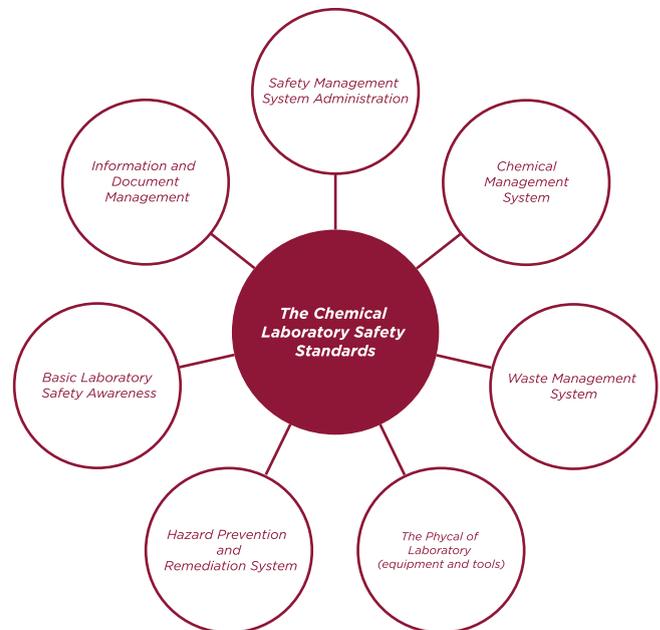
<i>Budget Categories</i>	<i>Amount (Baht)</i>
1. Personnel	16,075,844,700
2. Operations	26,409,539,400
3. Investments	5,607,363,200
4. Subsidies	3,766,679,600
5. Others	8,500
Total	51,859,435,400

PROJECT / RESEARCH / EVENT

• The Chemical Laboratory Safety Standards

Enhancement Project: The University has been working to raise safety standards in research laboratories since 2015 in accordance with the laboratory safety management policy of the National Research Council of Thailand (NRCT). It aims to raise its researchers' concerns about safety, create a pleasant working atmosphere and environment, and enhance its personnel's capabilities so that laboratory safety management constantly improves. The University established a safety management system for chemical laboratories so that they have a safety monitoring system in line with the ESPReL standards.

In 2021, a total of 121 laboratories participated in this safety enhancement project, and all of them were certified. From 2015 until now, 293 of 644 laboratories from 19 departments have been certified by the ESPReL standards, accounting for 45.50%. As a result of this implementation, the University was able to drive and enhance the quality of its laboratories to meet the laboratory safety management system's standards, creating a safe working environment, reducing operational incidents and ensuring the quality of life and promoting welfare for all.



• Roadmap of Research and Technology Development

by Sectors In cooperation with Thailand Science Research and Innovation (TSRI) and TIME Labs, Mahidol University has developed and implemented the Roadmap of Research and Technology Development by Sectors, to Support the Thailand 4.0 Strategy, in which each industry focuses on different aspects of development, since July 2019. To compile this roadmap, research outcomes were analyzed to determine policies, strategies, and plans related to Science, Research, and Innovation (SRI). This roadmap therefore serves as a compass that guides the country's policy on research and innovation. It also contains a wealth of important information and guidelines that are extremely useful to entrepreneurs in each industry. However, to use the roadmap to its full potential and strengthen the country's industries, all sectors must have a mutual understanding of how country's future should look like. They must operate in an SRI network, work to create a mutual understanding between the public and private sectors, and reduce the amount of redundant work. This way, Thailand could become technology and innovation hubs in addition to production bases

Next-Generation Automotive Industry

Food Manufacturing Industry

Digital Industry

Industrial Robotics Industry

Aviation and Logistics Industry

Dual-Use Technology and Security Industry

Tourism Industry

Biofuels and Biochemicals Industry

Smart Electronics Industry

Agriculture and Biotechnology Industry

Medical Hub Industry



• **Community-based tourism** The College of Management, Mahidol University has conducted a research project to study social entrepreneurs and community-based tourism for sustainable development and ways to build adaptability and resilience in response to the spread of COVID-19, with the intention of studying and researching the practices, processes, and models used by tourism social entrepreneurs and community-based tourism, as well as factors that lead to successful sustainable development and adaptability during times of crisis.



ABB

9 INDUSTRY, INNOVATION
AND INFRASTRUCTURE



**INDUSTRY, INNOVATION
AND INFRASTRUCTURE**

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



INDUSTRY, INNOVATION AND INFRASTRUCTURE



RELATED POLICIES

Mahidol University commits to enhancing its education and research systems to drive life-enhancing products, innovation, technology, and achievement; to foster economic growth; to achieve efficient, sustainable use of resources; and to apply knowledge obtained from education and research to solve problems and increase production capacity in industries. For this reason, the University offers research funding for innovative projects and allocates budgets for various others, allowing students to think creatively and use their knowledge for the benefit of society.

INTELLECTUAL PROPERTY

Mahidol University invests in its research studies to breed innovation and solutions to modern world issues. From 2019 to 2021, the University had more than 1,126 research projects registered for intellectual property rights, including Patents, International Patents, Petty Patents, Copyrights, Trademarks, and Trade Secrets. In fiscal year 2021, the University benefited from intellectual property usage totaling over 31 million baht (31,794,197 baht).

31

million (baht)
of intellectual property benefits

Number of registered intellectual property

Type	2019	2020	2021
Patent	3	6	32
International patent	0	0	5
Petty patent	6	10	87
Copyright	48	480	409
Trademark	4	1	26
Trade Secrets	0	0	9

Research Fund

Mahidol University has sponsored more researchers and sought additional external funding in order to conduct more high-quality research. In fiscal year 2021, the University received more than 907 million baht in research funding both from domestic and international sources. 468 million baht was allocated for research in science, technology, engineering, and mathematics; 381 million baht was allocated for research in medical, public health, and health sciences; and 518 million baht was allocated for research in the arts, humanities, and social sciences (some research are associated with more than one discipline).

Research by subject area	Research Fund (Baht)
Science, Technology, Engineering, and Mathematics (STEM)	468,028,499
Medicine, Public Health and Health Sciences	381,356,108
Arts & Humanities / Social Sciences	518,822,114
Total*	907,544,729

Note: * That is the unique total number because some research projects are consistent in more than one subject area.

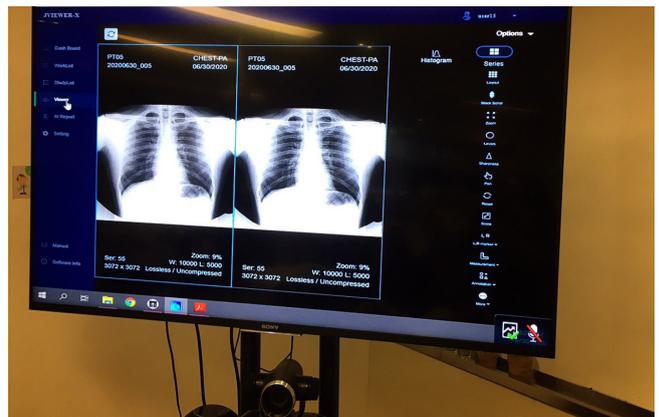
INNOVATION

- Thai Rice Extract Mouthwash for Elderly Patients with Oral Diseases:** The Faculty of Dentistry, Mahidol University conducted research to develop an innovative mouthwash. The mouthwash was developed using the extracts obtained from the color pigments of Thai rice. They are anti-oxidant, anti-bacterial, and able to prevent the development of the oral mucosa. As a result, the mouthwash can prevent and alleviate periodontitis in elderly patients who cannot brush their teeth properly. This is the first time a mouthwash for elderly patients with oral disease problems has been created, and it has already been registered for intellectual property rights. In addition, this mouthwash can hydrate the mouth as well. Its safety can be ensured since it is derived from environmentally-friendly organic Thai rice extracts and certified by the International Federation of Organic Agriculture Movements (IFOAM).



- COVID-19 IgG Antibody Rapid Test Kit:** Faculty of Medicine Siriraj Hospital, Mahidol University developed a COVID-19 antigen rapid test kit based on immunochromatography assay to detect viral-specific proteins in nasopharyngeal samples from patients. The kit alone can provide accurate results within just 15 minutes, with 96% sensitivity and 100% specificity. It can also detect infections in early stages, allowing for timely treatment. In addition, the reagents included in this test kit can kill the virus within 1 minute, preventing the spread of pathogens when used in field hospitals. The test kit has been certified by the Food and Drug Administration (FDA) and has been manufactured in Affinome Company Limited's medical device factories. Patient samples used in this project were collected from COVID patients in Siriraj Hospital and a sample group from the Faculty of Medicine Ramathibodi Hospital. The collection process started in June 2020 and has been in accordance with the FDA standards. The test kit was successfully developed in early 2021.

- Mobile X-Ray AI Technology for COVID-19 Patients:** The medical industry has been trying to integrate AI into their practices to accelerate the screening process. Therefore, a project was founded to develop AI to analyze chest X-ray images. The AI is to be used with the Portable Chest X-Ray or Mobile X-Ray AI imaging devices. The project was carried out by Phyathai Hospital Group and Paolo Hospital Group, in collaboration with Rajavithi Hospital, Center for Medical Genomics; Faculty of Medicine, Ramathibodi Hospital; Mello Company, Limited; and AIS Public Company, Limited in an effort to screen for COVID-19-induced pneumonia more quickly and prevent the disease from spreading, reducing the disease's negative effects on the economy and society, and improving survival rates. Along with detecting COVID-19, the AI can also identify 15 more diseases from chest X-ray scans.



PROJECT / RESEARCH / EVENT

The Institute for Technology and Innovation Management has carried out activities and projects to help with skill development and further research that would result in groundbreaking innovations and technologies that would enhance people's quality of life and increase their economic capacity. In 2021, various programs are organized.

Program	Objective	Grant
Mahidol Startup Incubator	This project supports students and new graduates (not more than 5 years) who are interested in business development, particularly in relation to technology and innovation, and who need funds for business development.	Ideation level 100,000 baht Proof of Concept: POC level 1,500,000 baht
Mahidol Pre-Seed Fund	Working with the private sector, the fund helps convert research projects into businesses.	Maximum 1,500,000 baht / Project
Talent Mobility	The University encourages researchers in higher education institutions to solve problems during their courses of work to increase production capacity for their corresponding industrial sector.	Maximum 30,000 baht / Project

In addition, the Division of Physical Systems and Environment, Mahidol University organized the **Innovation for Campus Sustainability** project, which was a contest of knowledge for Mahidol University students where they submit inventions, technologies, software programs, or group activities that helped reduce environmental pollution and change the world for the better. The students' submission must be balanced in the 3 dimensions of Sustainable Development: Economic, Social, and Environmental. The theme of this year's contest was **SDGs Smart Action**. A total of 8 teams that won the first round of selection received assistance from the Institute of Technology and Innovation Management (iNT) in the Incubation Program, where they developed their skills and built on their innovation/technology. Afterwards, they brought their innovations to work to compete on stage again. The awarded innovations are as follows.

Prize	TEAM	Project
First Prize Winner	Egg e egg egg (Mahidol University International College)	"Salaya Egg" is an egg that resembles a salted egg in texture but is free of sodium and salt. It is a healthy alternative that supports sustainability by making optimal use of regional resources and opening up job opportunities.
Second Prize Winner	NaB Omi (Faculty of Engineering)	"Khong Klang (Talisman)" is an e-commerce application that provides an efficient and secure way to trade household products. With the use of the circular economy model, it seeks to reduce waste in the user's community.
Third Prize Winner	SIRIMONG3KOL (College of Religious Studies, Faculty of Science, and Mahidol University International College)	"Sirimongkol" is a "virtual temple" application that circles around Buddhism and spirituality. It provides text and audio content as well as features that allow users to make merit, meditate, and find out about temples, etc., The application is a tool for mental health and a source of religious information.
Honorable Mention	EcoVision (Faculty of Environment and Resource Studies)	"Green Rooftop" is a concept that helps manage and mitigate urban heat islands by increasing green space while increasing of building construction. Additionally, it intends to increase societal awareness of the pollution problem and the urban heat island effect in order to encourage more people to participate and build "Green Rooftops".



10 REDUCED
INEQUALITIES



REDUCED INEQUALITIES

10 REDUCED INEQUALITIES



REDUCED INEQUALITIES



RELATED POLICIES

Mahidol University provides multidisciplinary education and research opportunities. Its exchange program allows students and staff from various parts of the world to interact and share knowledge, thereby minimizing social inequality and ensuring that everyone has access to the University's resources, opportunities, and services. This is in line with the University's commitment to giving all students an equal chance to achieve their educational goals, create opportunities for advancement for its personnel, and push the organization's standards to a global level.

In order to properly and equally serve and support students with disabilities, the University established a support unit called **"Disability Support Services Mahidol University"** (DSS Mahidol) and issued the Mahidol University Notice regarding student admission policies, criteria, and methods for people with disabilities, B.E. 2565. This way, students with disabilities can receive quality education and access to proper service and facilities. For the benefit of students with impairments, the university has also been working to improve the educational management skills of its instructors and other relevant professionals. In addition, the University enacted the Mahidol University Regulation on the special undergraduate admissions for Non-Thai Citizens, B.E. 2560, to promote international cooperation to enhance education in Thailand and other developing countries. In addition, the Mahidol University Regulation regarding Mahidol University student uniforms, B.E. 2564, was issued to ensure that all students are equally treated, thus reducing discrimination and inequality in the Mahidol society.

NATIONALITY & DISABILITY

Differences in race, religion, or thoughts are possible and happen everywhere. We merely need to acknowledge and understand that difference without limiting the freedom or rights of others. Educational institutions are settings for both practical and theoretical learning, hands-on training, and social interaction. Therefore, it should be open to all groups of people regardless of their ethnicity, religion, or disabilities. As a result, everyone can seize opportunities, learn and develop various skills, and grab social opportunities to acquire a sense of belonging. In this way, inequality is reduced and everyone have equal access to opportunities and resources. In short, Mahidol University provides both education and work opportunities for all groups of people.

Students

In academic year 2020, Mahidol University had a total of 29,077 students, which were 1,420 foreign students, accounting for 4.88%.

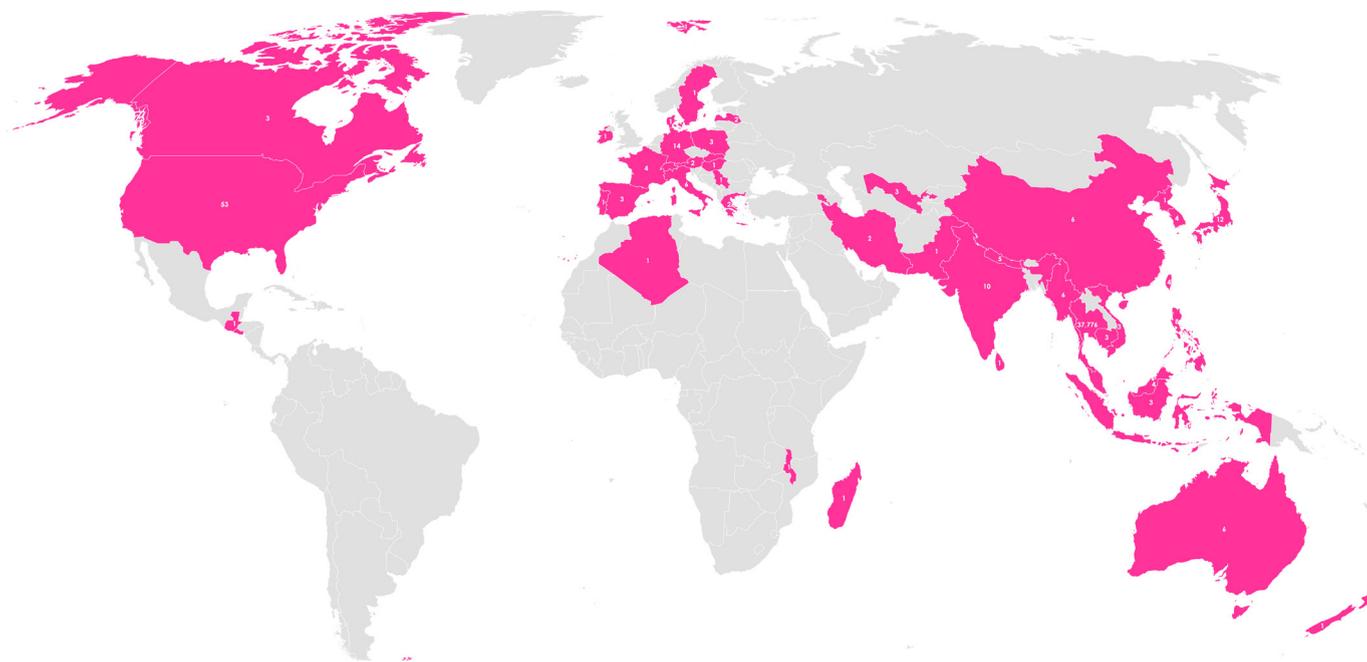
Educational level	Total number of students	Number of international students	Number of students with disabilities
Diploma	613	8	-
Bachelor's degree	20,876	490	21
Graduate Diploma	48	4	-
Master's degree	5,126	585	18
Higher Graduate Diploma	594	1	-
Doctoral degree	1,820	332	5
Grand Total	29,077	1,420	44

The number of students with disabilities in academic year 2020 was 44, accounting for 0.15% of all students. They are all Thai students with one or more disabilities, including visual, auditory, physical disability, autism, or multiple disabilities.

Type of disability	Number of students		
	Male	Female	Total
Vision impairment	8	5	13
Hearing impairment	4	12	16
Physical disability	5	6	11
Autistic person	2	1	3
Multiple disabilities	1	-	1
Total	20	24	44

Staff

Mahidol University's staff are multi-national. However, 99.42% of people are Thai citizens, while 0.58 percent are citizens of other countries, with the top three being the United States, Germany, and Japan. People with disabilities are all Thai, making up 0.07% of the total staff.



Disability Support Services

The Disability Support Services Mahidol University (DSS Mahidol) unit provides assistance to students with disabilities to allow equitable access to the university's teaching and learning system. It provides solutions to problems and offers individualized support to help students with disabilities achieve their academic goals, and fosters a caring university community where everyone lives together regardless of disability.

Educational Support

Mahidol University has a policy to provide equal educational opportunities so that people with disabilities can also access proper educational services and fulfill their educational goals. The University also offer advice to departments so that staff can arrange for a proper form of education services, for instance, the University also provide exam assistance, produce personalized learning materials like braille textbooks, bas-relief media, tools, technologies, and offer various facilities. Students can also receive scholarship advice and help from volunteers to meet their unique requirements.

Scholarships for students with disabilities

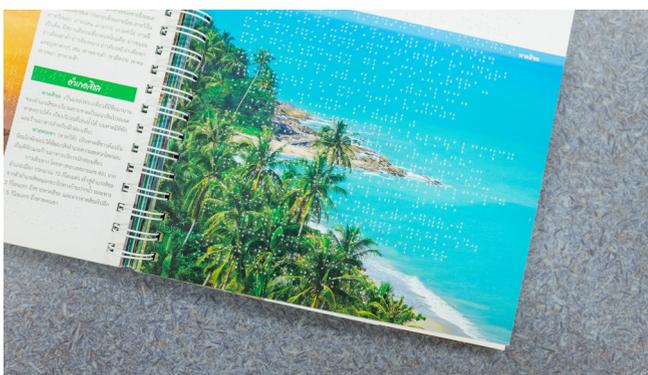
Faculties	Number of students	Amount (Baht)
Faculty of Science	2	110,050
Ratchasuda College	14	567,200
Total	16	677,250

Facilities

The University provides facilities such as wheelchairs, parking spaces, mouse alternatives, portable ramps, braille display screens, screen readers, or enlargers for the visually impaired, etc., and create a productive environment with a universal design that makes it easier for people with disabilities to live their daily live and achieve their education goals.

Accessible Facilities include:

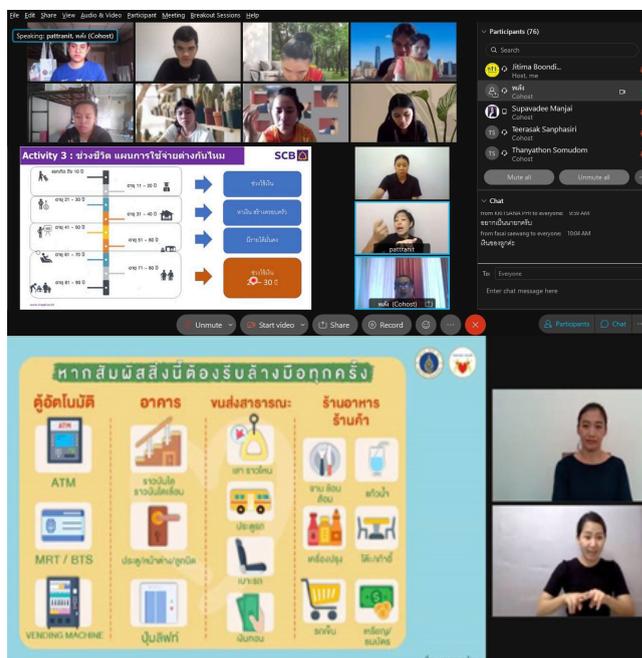
- Screen readers/screen magnifiers for students with visual impairments
- Braille displays for students with visual impairments
- Portable audio recorders and text readers for students with visual impairments
- Reading cameras + scanning and reading software for students with visual impairments
- Braille keyboards for students with visual impairments
- Trackball mice for students with mobility impairments
- USB Switch Interface-Plus + single switch for students with mobility impairments
- Notebooks and headphones with microphone for students with impairments
- Wheelchairs for students with mobility impairments
- Portable ramps for students with mobility impairments



Inclusive society

• **Living with others:** The University hosted an event that encouraged students with disabilities to participate in university activities and build social skills. In the fiscal year 2021, the University organized a training session on first aid and self-care during the COVID-19 pandemic. The session was held on 17 July 2021 and attended by 510 students, 54 of whom had hearing impairments, while the other 456 students did not. This session's goal was to equip the students with the skills they would need to take care of themselves and administer first aid in a safe and effective manner during the COVID-19 pandemic.

Also, on 24 July 2021, the Disability Support Service, Division of Student Affairs organized a financial planning training session for students titled "Saving for the Sake of Giving" to advise students on how to plan their spending and save money. During the session, the 61 hearing-impaired students who participated got to discuss financial knowledge with an expert speaker from Siam Commercial Bank (SCB), Mr. Palang Saesalab.



- **Building a positive attitude towards people with disabilities:** The University organized a training program that tells stories about the lives of people with disabilities, and then created the Mahidol Community Network, where everyone coexists peacefully. In the fiscal year 2021, the University hosted a training session titled "Helping the Disabled" on 24 June 2021 and 2 July 2021 to inform 258 students about people with disabilities, including how to support students who have mobility, vision, hearing impairments, or autism. This training's goal is to prepare its participants to assist their friends or other individuals with disabilities.

- **Applying Universal Design to the Surroundings:** The University improved the facilities around its campus design so that all students could access and use them.

Occupation Promotion

- **Field trips and preparation sessions to point out opportunities:** The University organized field trips and preparation sessions to point out opportunities for students with disabilities, equipping them with the skills of an entrepreneur and helping them fit into society without being discriminated against.

- **Online Mahidol University Job Fair 2021** Preparing and creating job opportunities The Division of Student Affairs partnered with Job BKK Dot Com Recruitment Company Limited and hosted the Online Mahidol University Job Fair 2021 for Mahidol University students and alumni from 21 April to 20 May, 2021. In order to prepare them for successful job applications, special lectures were given to develop various kinds of knowledge and skills, including how to access the labor market and how to apply for a position. Moreover, the fair offers numerous online applying opportunities from more than 60 leading companies. The opportunities offered included full-time work, part-time work, and work for people with disabilities.



PROJECT / RESEARCH / EVENT

- **Self-Compassion:** Since Mahidol University places great importance on mental health care, the MU Friends Counseling Center hosted a project called "Self-Compassion: Can you forgive yourself?" via the Cisco WebEx online system on 1 April 2021 to motivate students to accept and forgive themselves by engaging in self-forgiveness exercises and applying them in their daily lives. Self-forgiveness is an important component of wellbeing since it reduces stress, anxiety, depression, allowing one to be happy and open to learning new things. So, the project's goal was to improve the students' mental health.

- **My Feelings:** On 21 April 2021, the MU Friends Counseling Center launched a project called "My Feelings: These are My Feelings" via the Cisco WebEx online system in order for students to explore, comprehend, and learn to manage their own emotions appropriately. Since emotions affect a person's body, mind, and behavior, and sometimes interaction with others, too, emotional management is a crucial skill that helps one develop essential capabilities and contributes to success and happiness in life.





11 SUSTAINABLE CITIES
AND COMMUNITIES



SUSTAINABLE CITIES AND COMMUNITIES

11 SUSTAINABLE CITIES AND COMMUNITIES



SUSTAINABLE CITIES AND COMMUNITIES



RELATED POLICIES

The Master Plan of Mahidol University, Salaya Campus, B.E. 2551, Issue No. 3, covers a period of 15 years (2008-2023), with a primary focus on landscape development in accordance with the vision to create **“A Promised Place to Live and Learn with Nature”**. It aims to create activity and learning spaces where everyone can learn together by developing the University’s landscape; conserving green areas and ecosystems in each zone to minimize modifications; turning green and unused spaces into areas for sports, recreation, or learning; and creating “Green Ways” that connect each part of the University together, in line with the concept of “Green Campus” and the Policy regarding promotion of environmentally friendly mobility in Mahidol University, B.E. 2564, which encourages people to choose cycling or walking as means to get around, and drives the construction of cycling paths and walkways throughout the campus.

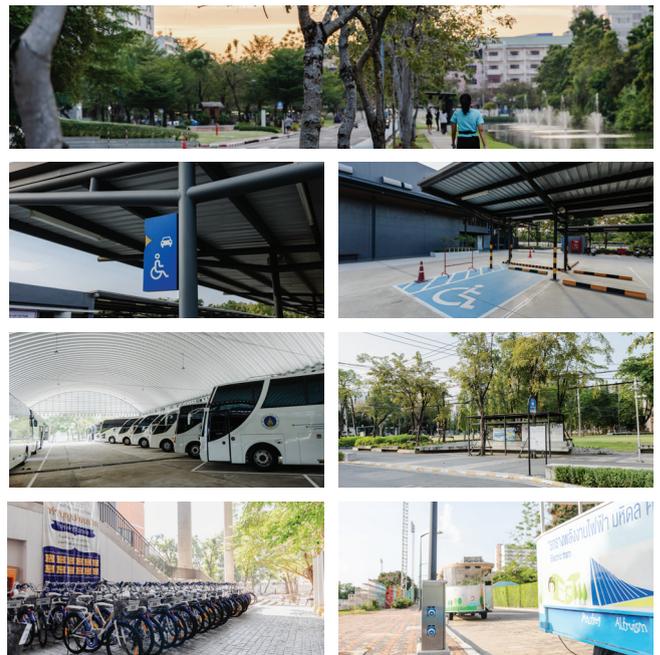


ACCESSIBLE PEDESTRIAN AND COVER WAY

The university has designed and developed its landscape in accordance with the principles of Universal Design in an effort to become a university that truly welcomes pedestrians, cyclists, and general people. The design allows everyone equal access to the University’s fundamental services with plans to improve its road system, parking areas, cycling paths, and walkways, all of which would contribute to building a “Green Campus” that prioritizes safety, tidiness, environmental soundness, and community satisfaction. Firstly, the University developed an interconnecting road system throughout the university, including public electric trams with routes and stops around the entire campus, and set up bus stops and tram stations that serve as an interchange point for the university’s shuttle buses that commute between faculties and departments in Bangkok noi, Phayathai and Salaya campuses. The University also developed safe walking and cycling paths throughout the campus. Currently, the length of all walkways in the university combined would be more than 46.9 kilometers long, all cover ways in education zones combined would be over 4.3 kilometers, and all cycling paths combined would be over 10.3 kilometers. Aside from walking and cycling pathways, it is also crucial that bicycle parking spots offer an easy way to change to other modes of transportation. In Salaya Campus, there are more than 13 bicycle parking spots and a Jakka (bicycle) service center, which is a one-stop bicycle service center that does maintenance, pumps tire, sells replacement parts, and provides more than 306 rental bikes. These facilities would provide transportation that is affordable, sustainable, accessible, and safe for everyone. Also, by 2030, the University plans to enhance its road safety and expand its public transport system with a main focus on the needs of those in vulnerable groups such as women, children, the elderly, and people with disabilities.

Transportation in Salaya

Route	Service point
Pedestrian	-
Bike path	1 Jakka Center
Handicap walkway	40 Handicap parking spaces
Tramway	46 Tram Stops
Car	6 Parking Lots
Shuttle Bus	Bus terminal



PUBLIC TRANSPORTATION

Mahidol University has 17 shuttle buses, each accommodating up to 40 seats, to provide pick-up services for its staff and students who need to commute between faculties in Bangkok noi, Phayathai and Salaya campuses. There are 4 routes in total, and most are free of charge, but on major routes, 30-baht service fee applies for each trip on major routes such as Salaya-Nakhon Pathom. There is also the Salaya Link service, which allows for easy interchange between the Salaya Campus's transportation service and Bang Wa BTS station.

The Public Trams in the campus are powered by electricity. Tram stations are connected to the bus stops, so passengers can easily travel within the campus by public transport.

The Salaya Campus has 15 electric trams running on 4 routes around the university, with 46 stops.

The Kanchanaburi Campus has 2 electric trams running in 3 periods

(morning 07:40-09:40, afternoon 11:50-13:40, and evening 15:40 - 17:00.)

PUBLIC LEARNING CENTER

Presently, the university has 35 libraries and 39 museums and archives, which house the University's historically important documents and serve as a useful source of information that facilitates the pursuit of knowledge for teachers, students, and staff at all levels, as well as anyone who is interested. In addition, there are also online exhibitions such as the "10 Realms of Knowledge: Stories of Places and Buildings in Mahidol University" exhibition and online museum such as the Geoscience Museum and the Buddhist Learning Park. In addition, the university has developed co-working spaces for its students and staff to learn and work on projects.

The Number of Museums and learning spaces, libraries and Co-Working space

Location	Museums and learning	Libraries	Co-Working spaces
Salaya, Nakhon Pathom	15	22	9
Bangkok Noi, Bangkok	11	4	1
Phayathai, Bangkok	10	5	5
Kanchanaburi Campus	3	2	1
Nakhonsawan Campus	0	1	0
Amnatcharoen Campus	0	1	0
Total	39	35	16



PROJECT / RESEARCH / EVENT

• **The “Museum of Surgery” Exhibition at Siriraj Bimuksthan Museum** The exhibition shows the history of surgery in Thailand; the history of the Department of Surgery, which, up until now, is over 104 years long; and the stories of significant medical practitioners who played an important role in laying the foundation for surgery. It also offers an immersive simulation that lets visitors explore realistic operating rooms in different eras and, through actual human organ samples, learn about surgical diseases, from the most common ones to rare occurrences that require complex treatments and advanced surgical techniques. Additionally, visitors can observe a virtual robot-assisted surgery performed using unprecedented, cutting-edge techniques. The exhibition opens every day from 10:00 to 16:30 (and closes on Tuesdays and public holidays).



In addition, Mahidol University has many research projects that promote sustainable tourism and encourage efforts to protect and preserve cultural and natural world heritage, as well as those with the objective of reducing the negative environmental impact per person caused by the growth of urban areas, focusing on air quality and community waste management, as well as other waste, such as



• **IoT-based Innovation for Air Quality** : In the past year, the Phutthamonthon district in Nakhon Pathom province has been suffering from an extremely high level of air pollution (the standard limit is 50 micrograms per cubic meter). The pollution has affected the health of many staff, students, and general people, as well as the image of the Faculty of Engineering and Mahidol University itself. With this concern in mind, Mahidol University, as the country's medical hub and technological pioneer, suggested that the Engineering for Social Responsibility division of the Faculty of Engineering launch the “IoT-based Innovation for Air Quality” project to monitor air pollution and protect the staff and students in the Faculty of Engineering, Mahidol University, as well as people in the Phutthamonthon area. The project was beneficial in several ways:

- 1) It gave the faculty credibility as it helped protect the health of its staff, students, and the general public.
- 2) It ensured a standardized approach of dust and air pollution monitoring.
- 3) It reinforced the Faculty of Engineering's green engineering policy.
- 4) It served as an example case for students who are interested in innovation created by Thai engineers.
- 5) It resulted in preliminary testing of the green innovation, which may later benefit people in other areas.





12 RESPONSIBLE
CONSUMPTION
AND PRODUCTION



**RESPONSIBLE
CONSUMPTION AND
PRODUCTION**

12 RESPONSIBLE CONSUMPTION AND PRODUCTION



RESPONSIBLE CONSUMPTION AND PRODUCTION



RELATED POLICIES

Mahidol University has enacted the Policy regarding ensuring sustainable consumption and production patterns, which covers efficient and sustainable natural resource usage and management, waste and chemical exposure reduction, proper waste management, waste reduction through reusing and recycling, and procurement activities that aim to utilize resources to the fullest while being environmentally friendly. There is also the Policy regarding the promotion of environmentally friendly procurement, B.E. 2564. There are 5 waste management policies that cover waste generated from the University's activities as follows:

1. Mahidol University Policy regarding the Waste Management, B.E. 2564
2. Mahidol University Policy regarding encouragement of plastic use reduction and foam prohibition, B.E. 2564
3. Mahidol University Policy regarding Hazardous Waste Management, B.E. 2563
4. Mahidol University Policy regarding Chemical Waste Management, B.E. 2555
5. Mahidol University Policy regarding Laboratory Hazardous Waste Management, B.E. 2565

WASTE MANAGEMENT

In 2021, general waste generated in Mahidol University was significantly decreased by 19.54% from 2020. That may be caused by pandemic situation resulting in almost 100% of studying and student activities operated via online platforms.

Total waste generated in Mahidol University

Waste Types	2020		2021	
	Tons	Percentage	Tons	Percentage
General Waste	1,007.43	47.85	697.44	28.31
Recyclable Waste	1,060.04	50.35	1,724.40	70.00
Infectious Waste	6.29	0.30	7.38	0.30
Hazardous Waste	25.69	1.22	30.15	1.22
Food Waste	5.99	0.28	4.15	0.17
Total	2,105.44	100.00	2,463.52	100.00

Note: This generated waste excludes hospital waste.

We realized that significant amount of household hazardous waste was generated in many work units, especially medical and science laboratories. The infectious and chemical substances from research and teaching activities were expected to be correctly managed. By these, we provide the essential information and training of hazardous wastes labelling and its sorting for the concerned students and staff. All of hazardous waste was contained in the high-density polyethylene (HDPE) containers with clear sealing and labeling, either in fluid or solid form. Before the downstream management of waste disposal, we assign the landscape unit, Division of Physical Systems and Environment to effectively collect and manage all of hazardous wastes in the university. The landscape unit plays a role in separating and recording amounts of hazardous waste from installed garbage in the campus area

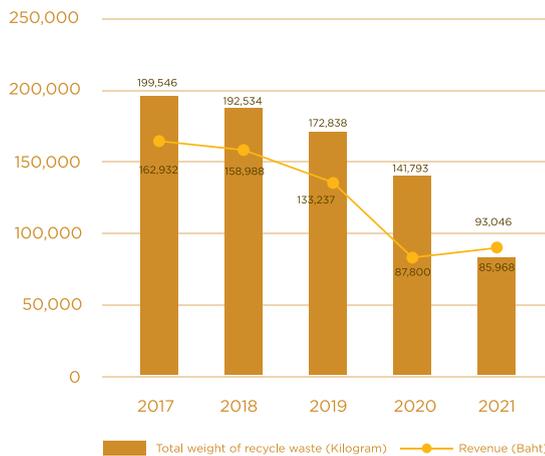
The University collected 13 types of household hazardous waste from 31 faculties in Salaya Campus and sent them to authorized companies for proper storage and disposal. The most common household hazardous waste are dry batteries, fluorescent lightbulbs, and compact fluorescent lightbulbs, as shown in the table. This year, a total of 20,898 pieces of waste (with a total approximate weight of 2,460.65 kg) were sent out to be disposed.

Household Hazardous Waste generated in Salaya Campus in fiscal year 2021

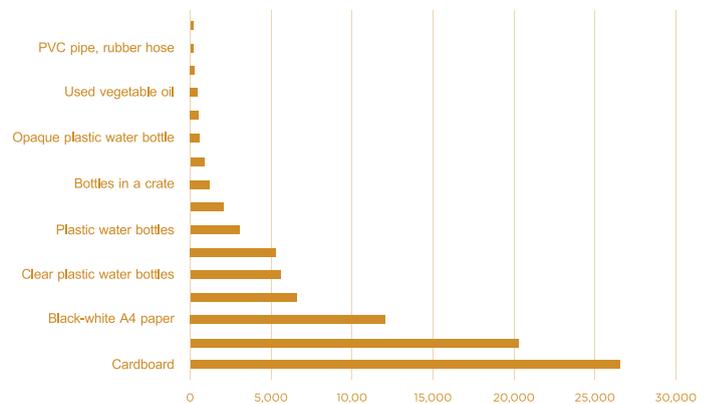
No.	Types	Number of piece
1	Fluorescent lamps	6,468
2	Incandescent	847
3	Compact Fluorescent Lamp	1,525
4	Other lamps	597
5	Dry battery	10,169
6	Mobile phone battery	468
7	Other batteries	49
8	Paint color bucket	14
9	Spray can	536
10	Starter	0
11	CD	52
12	Printer	11
13	Others	162
Total		20,898

The University has been operating the Recycled Waste Bank project since 2009. Currently, there are a total of 2,377 member accounts. In 2021, members brought 85.92 tons of recyclable waste for sale, which could be divided into 16 categories. Of all the categories, paper waste is considered the most common type of waste. Furthermore, it was discovered that during the period 2020-2021, when the project could not be operated normally due to the impact of COVID-19, the amount of recycled waste deposited decreased as a result. Moreover, all biodegradable waste from gardenring including leaves and litters was collected and generated into 34.7 tons (fiscal year 2021) of composting fertilizer for the University's landscape improvement as well as distribution to the local people.

The total weight of recycle waste collected by the waste recycling bank



The weight (Kilogram) each type of recycle waste collected by the waste recycling bank in 2021



Chemical Waste Management of Mahidol University in 2021

Mahidol University has a large number of courses and research projects that involves the use of chemicals, which leads to the problem of chemical waste from scientific laboratories. This problem requires proper management from every faculty in order to prevent hazards to the operators' health and mitigate the impact on the environment and the community. The Center for Occupational Safety, Health and Environment Management (COSHEM) has developed a centralized chemical waste management system for the University. Every faculty has to use this system to record data on chemical waste and formulate a database. Such data is used in safety management and disposal procedures.

In fiscal year 2021, 13 faculties participated in the project, and the total amount of chemical waste disposed of was **27,705 kilograms**. Also, the University has a chemical waste disposal company collect and dispose chemical waste every month (October 2020 - September 2021).

27,705
kilograms
Chemical waste

PROJECT / RESEARCH / EVENT

• Circular Economy

Mahidol University focuses on circular economy which helps with waste reduction. Waste management of Mahidol University starts from consumption, activities, learning by developing knowledge to continuously solve the problems stage-by-stage. Firstly, "Adaptation for Change" in the university starting with waste management in the university brings waste to recycle for reuse purpose. Recyclable waste can be brought to Waste Recycling Bank. Leaf fragments around the university can be made to fertilizer, and organic waste can be made to bio-fermented water. Next, sharing "Knowledge" to society is to pass on knowledge to interested people, to build connection in waste management from household level to provincial level. After that would be upcycling which brings recycled waste to be processed creating new products.

• Eco Town and ThinkCycle Bank projects

Mahidol University has been connected itself to community through activities under "Eco Town" mission. The project on waste recycling bank was distributed to the local area by the University communication. Knowledge of waste management, waste sorting system, and essential equipment were provided to 8 participating schools in Nakhon Pathom province. By collaboration with PTT Global Chemical Public Company Limited, this project was expanded to 22 local schools in Rayong province and 3 schools in Burirum province. Mahidol University has undertaken the recycling waste bank network project called "ThinkCycle Bank" and "Sustainable waste management to schools and communities" to carry out the government's policy in promoting the efficient waste management system. Think cycle Bank project is currently participated by 33 schools which were continuously monitored by Mahidol University.

• Mahidol Organic Rice Producers Network and the MU Organic Standard

The University also has projects that create sustainable production and consumption plans as well as boost the capacity of organic rice production for farmers in the lower northern regions of 4 provinces: Phichit, Kamphaeng Phet, Nakhon Sawan, and Uthai Thani. In this project, a network of rice farmers, a network of organic rice consumers, and a network of relevant agencies are created. They then collaborate to formulate the "Mahidol Organic Rice Standard" for the sake of consistency in their operation. The process includes planting strategy creation, member registration before the start of the planting season, planting notification, and field inspection team allocation. It also includes the process of learning about diseases and pests prevention and elimination through biological methods as well. Throughout the rice cultivation process, everyone in the network must comply with the requirements they have agreed upon. Those who use a certified plating process can send their produce to the laboratory in the Nakhon Sawan Campus, Mahidol University,

reduced production costs

1,500 - 2,000

baht / rai / cycle



and have it tested for organochlorine (OC), pyrethroid (PT), organophosphate (OP) and carbamate (CM) in rice grains using the thin-layer chromatography technique and insecticide detection kits GPO-TM/1 and GPO-TM/2. At present, the network has 344 members and organic farming area for a total of 3,500 rai, which helps generate more income for organic rice farmers at an average of over 35,000 baht per year and reduce production cycle costs by at least 1,500-2,000 baht per rai.

13 CLIMATE ACTION



CLIMATE ACTION



RELATED POLICIES

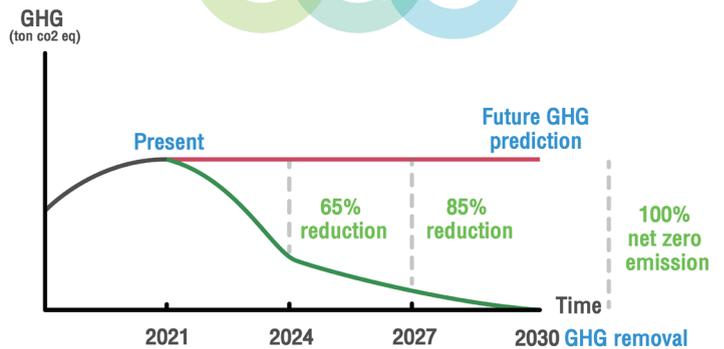
Mahidol University realizes the importance and urgency of climate change that affects the environment and human beings. **This Net Zero Emission Policy** is set to be a part of the climate change effects reduction, and to drive the sustainable development goal SDG 13: Climate Action - Urgent operation to handle climate change and its effects by gathering resources to support developing countries in climate change adaptation and low-carbon development. This should be implemented in conjunction with the integration of disaster risk reduction measures on sustainable natural resource management, human security, and with the national development strategies. Moreover, keeping the global temperature from rising above 2 degrees Celsius necessitates increased political will, investment, technology, and immediate cooperation.

9 to ZERO
9 years left to achieve a net zero emission with 9 principles guide for action

- 01 Renewable Energy
- 02 Resource Efficiency
- 03 Clean Energy for Transportation
- 04 Green Area (Carbon removal)
- 05 Green Procurement
- 06 Research & Technology for a Carbon Capture / Reduction
- 07 Plant-Based Consumption
- 08 Zero Waste to Landfill
- 09 Monitoring & Improvement



The Net-Zero Emission Achievement of Mahidol University in year 2030



“9 to Zero” is therefore Mahidol University’s plan to reduce greenhouse gas emissions within the university to zero within 9 years or by 2030 (B.E. 2573) in line with the effort to achieve zero greenhouse gas emissions. The greenhouse gas reduction target, in comparison with the expected amount of business-as-usual greenhouse gas emissions of the nation, is divided into 3 phases:

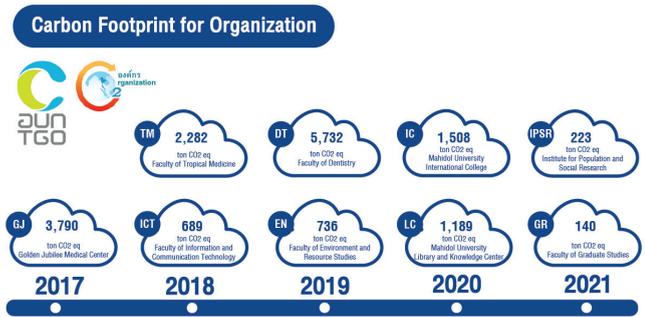
- Reduce greenhouse gas emissions by 65% by 2024
- Reduce greenhouse gas emissions by 85% by 2027
- Reduce greenhouse gas emissions by 100% by 2030



“9 years left to achieve a net zero emission with 9 principles guide for action”

1. Renewable Energy
2. Resource Efficiency
3. Clean Energy for Transportation
4. Green Area (Carbon removal)
5. Green Procurement
6. Research & Technology for a Carbon Capture / Reduction
7. Plant-based
8. Zero waste to landfill
9. Monitor & Improvement

CARBON FOOTPRINT FOR ORGANIZATION



A Carbon Footprint Assessment is one way to reveal data on greenhouse gas emissions and absorption, which would make an organization’s management guidelines to reduce greenhouse gas emissions more effective, as well as help fight against climate change and its impacts. Mahidol University developed MU ECO DATA, a database of greenhouse gas emissions from each faculty, to collect detailed and complex evidence, enabling them to assess greenhouse gas emissions and set reduction targets of the university. The University encourage faculties to collect data and apply for certification of Carbon Footprint for Organization with the Thailand Greenhouse Gas Management Organization (Public Organization) (TGO). From 2017 to date, there have been 9 accredited faculties. Additionally, in 2021, carbon offsetting was implemented for the Faculty of Graduate Studies and the Institute for Population and Social Research, to achieve carbon neutrality.

PROJECT / RESEARCH / EVENT

- Audio Waste Sorting System:** Mahidol University has been developing its educational methods while raising awareness and developing the capabilities to reduce greenhouse gas emissions, adapt to and mitigate climate change, and issue advance warnings. It has a participatory action research project designing innovative waste-sorting bins for everyone. In the past, visually impaired people rarely sorted waste because trash bins were identified by color, which greatly limited people with visual disabilities or impairments. The innovative “audio waste sorting system” helped reduce inequality in society by enabling disabled people to engage in the same activity as the general public. The project also goes in line with the Sustainable Development Goals (SDGs).



- Will a great flood happen in 2021? And how do we prepare for it?:** In addition, the University also strengthened its capacity to adapt to natural hazards and natural disasters through a panel discussion titled “Will a great flood happen in 2021? And how do we prepare for it?” to spread academic information on the water situation in Thailand in 2021 and the risks of flooding and drought, creating awareness and understanding among the people and relevant agencies so that they are prepared for such situations.

กระทรวงการอุดมศึกษา วิทยาศาสตร์ วิจัยและนวัตกรรม
ขอเชิญร่วมฟังเสวนาออนไลน์

2564 จะมีย้ำท่วมใหญ่หรือไม่ เตรียมพร้อมรับมืออย่างไร

ในวันพฤหัสบดีที่ 16 กันยายน 2564 เวลา 10.30 - 12.30 น.

"อ.ว. เตรียมพร้อม รับมือ สถานการณ์น้ำ ด้วยข้อมูลวิจัยและนวัตกรรม"
โดย ศาสตราจารย์พิเศษ ดร.เอนก เหล่าธรรมทัศน์ รัฐมนตรีว่าการกระทรวงการอุดมศึกษา วิทยาศาสตร์ วิจัยและนวัตกรรม

การเสวนา
"2564 จะมีย้ำท่วมใหญ่หรือไม่ เตรียมพร้อมรับมืออย่างไร"
ผู้ร่วมการเสวนา

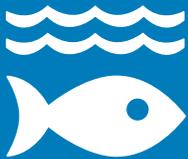
- รองศาสตราจารย์ ดร.สุรจิต อุบลคุณวงศ์ (รองอธิการบดีฝ่ายบริหารและงานทั่วไป มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าธนบุรี)
- ดร.ธีรเดช รัตนกุล (รองอธิการบดีฝ่ายบริหาร มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าธนบุรี)
- ดร.สุทัศน์ ีสุกุล (ผู้อำนวยการศูนย์วิจัยและนวัตกรรมเพื่อความยั่งยืน มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าธนบุรี)
- ดร.อภินันท์ ภูมิพาณิชย์ (รองอธิการบดีฝ่ายบริหารและงานทั่วไป มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าธนบุรี)
- รองศาสตราจารย์ ดร.เสาวดี สุราษฎร์ (รองอธิการบดีฝ่ายบริหาร มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าธนบุรี)
- ดร.สมพันธ์ สมบูรณ์ (ผู้อำนวยการศูนย์วิจัยและนวัตกรรมเพื่อความยั่งยืน มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าธนบุรี)
- ผู้ร่วมการเสวนา ดร.ณภัทริณี สุพรรณิการ์ (รองอธิการบดีฝ่ายบริหารและงานทั่วไป มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าธนบุรี)

จัดการเสวนาโดย สำนักงานการวิจัยแห่งชาติ (วช.)

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14 LIFE
BELOW WATER



LIFE BELOW WATER



LIFE BELOW WATER



RELATED POLICIES

Mahidol University enacted the Policy regarding the conservation and utilization of biodiversity of water resources, B.E. 2564 to maintain environmental and watershed quality at the standards and preserve a rich ecosystem. This is accomplished through water management planning, continuous water quality monitoring, and promotion of biodiversity water resources conservation and efficient utilization. Moreover, it is well known that **wetlands** play a significant role in conserving biodiversity by acting as significant carbon sinks, habitats for living things, and sources of food. However, wetlands are currently being destroyed by human activity all across the planet. Mahidol University recognizes the importance of ecological conservation, so it performed natural wetlands preservation activities in two areas: the northern area of the Institute for Population and Social Research and the southern area of the Sireeruckhachati Nature Learning Park. The two areas have been designated as **“Nature Conservation Areas”** for the sake of education, conservation of original wetland ecosystems, and enhancing the surrounding environment. The use of land for other activities that affect the environment is prohibited.

PROJECT / RESEARCH / EVENT

Mahidol University has research projects that promote, manage, and conserve marine and coastal ecosystems in order to avoid significant negative impacts. To create a healthy and productive ocean, strengthening and recovery efforts are carried out. There are also research projects about aquatic animals for sustainable consumption that focus on ways to prevent diseases in aquatic animals, effective fishery, and stop overfishing, Illegal, Unreported, and Unregulated fishing (IUU) as well as destructive fishing practices. These projects also include the implementation of a science-based management plan to restore fish stocks in order to achieve maximum sustainable yield through sustainable fishing, aquaculture, and tourism management.

• Transsexual Giant Freshwater Prawn: MU1

The giant freshwater prawn is a large freshwater creature. Its high price makes it one of the most important economic aquatic animals, favored among prawn consumers because of the amount of meat it provides and its rich and delicious oily head. However, giant prawn yields are unpredictable due to the creature's low survival rate and a shortage of healthy baby prawns. Moreover, farmers have been losing their sales opportunities because their yields consist of more females and runts, which fetch a lower price than average-sized males. The Center of Applied Shrimp Research and Innovation, Institute of Molecular Biosciences, Mahidol University, tried to breed disease-free shrimps with exceptional quality, a high survival rate, and fast growth. It also developed a sex separation technique in order to achieve an all-male culture, which contributed to desired characteristics such as high survival rate, fast growth, and a shorter farming period. These characteristics help reduce production costs, increase prawn value, and create more opportunities to export giant freshwater prawns to the world market.

The transsexual giant freshwater prawn production process involves the use of biomolecules to induce sex reversal without conducting surgery. Hatcheries can use transsexual female giant freshwater prawns to produce baby male giant freshwater prawns. This way, farmers can produce large giant freshwater prawns that grow faster and fetch a higher price than female ones.

Transsexual Giant Freshwater Prawn MU1



15 LIFE ON LAND



LIFE ON LAND

15 LIFE ON LAND



LIFE ON LAND



RELATED POLICIES

Mahidol University enacted the **Policy regarding the promotion of conservation and utilization of natural resources, B.E. 2564**, to encourage sustainable uses of ecosystems. The policy supports conservation and restoration efforts, reforestation, and biodiversity conservation and protection for all species listed on the IUCN Red List.

GREEN AREA

Mahidol University conducted land development according to the 2008 Mahidol University Master Plan with the concept of creating an “Ideal University” which is “A promise place to Live and Learn with Nature”. This plan prioritizes the “Greens University” strategy, which aims to turn the university into a beautiful, non-polluted place with pleasantly shady surroundings, with a primary focus on using resources efficiently, promoting wellbeing, and achieving harmony with nature, all of which will facilitate recreation, enhance learning activities, and restore deteriorated ecosystem, increasing the diversity of endemic (local) plants and animals. Most importantly, it focuses on being a leader of environmental protection for the local communities, coexistence with nature, and fighting against animal hunting and forest destruction. The University developed and conserved two natural wetlands in Mahidol University, Salaya Campus: the northern area of the Institute for Population and Social Research and the southern area of the Sireeruckhachati Nature Learning Park. The two areas have high ecological diversity in terms of water resources, forests, aquatic plants, and terrestrial and aquatic animals. They also serve as refuge shelters for many protected wildlife species and are excellent places for recreation and relaxation that offer natural trail routes and a natural learning environment for practical study sessions.

PROJECT / RESEARCH / EVENT

• MUKA HERBARIUM: The Plant Museum of the Western Region

The MUKA Herbarium first began collecting plant samples in 2002 by having its conservation biology students collect samples in the Kanchanaburi Campus, an area of approximately 6,300, rai or about 10 square kilometers, with 90% of it being forest. Afterwards, they gathered samples from off-campus, the majority of which are taken from the western forests that covers the areas of Sai Yok National Park, Thong Pha Phum National Park, Erawan National Park, etc. The Kanchanaburi province and the western region of Thailand have rich biodiversity, making their ecosystems are highly deserving of preservation. They serve as massive sources of knowledge about biologically diverse ecosystems, which can be used to formulate a western plant database in accordance with international principles and standards. The areas also allow domestic and international students, professors, and researchers to study the representative plants of the western region without being charged. Upon renovation in 2020 and 2021, technologies such as AR, VR, and simulation were introduced to make storytelling more interesting since representation is

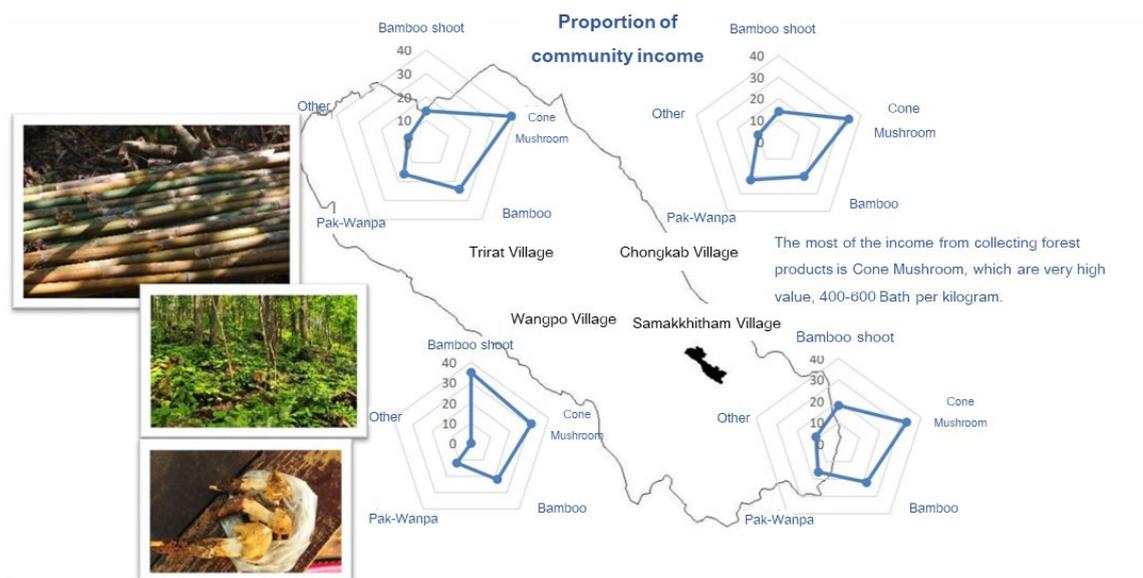
a foundation of knowledge-seeking. Being informed of the diversity of natural resources, one would be able to assess the value of various raw materials that are useful in fields such as pharmacy, agriculture, and industry. This would then enable the sustainable development of natural resources at both local and national levels.



• How is a check dam beneficial?

In 2010, the Kanchanaburi Campus in collaboration with SCGP Wang Sala Plant to study and survey soil erosion around the campus. With the help from SCGP Wang Sala Plant and all sectors in the Sai Yok district, check dams are built in the area of Kanchanaburi Campus every year. Currently, there are a total of 427 check dams in order to slow down the water flow, reduce the force of water runoff to prevent surface soil erosion, and preserve the forest's humidity. The check dams are made from natural, biodegradable materials such as wood chips and stones. They would decay within a year, leaving behind only residual soil, wood grains, and plants washed away by the current. The check dams are not built on water sources at all, so they will not disturb aquatic ecosystems. Moreover, the check dam areas are constantly monitored for their natural resources through various studies, such as the study of the undergrowth plants around the check dam construction line, the study of check dams and their utilization to store and provide water for wildlife (especially small mammals and avian groups), and the study of the locals' awareness of direct and indirect byproducts produced by check dams. The results from such studies helped the Kanchanaburi Campus solve its problems in a more systematic and plausible way. One of the problems that used to occur every year was how the water overflowed from the Kanchanaburi Campus and flooded the area of Sai Yok district since the campus's forest area is mostly composed of rock layers, which could not store water. Rain would wash away the soil, and the water from the mountain would flood communities below, causing them great suffering. After building check dams around the campus, the community experienced fewer floods each year. At present, the Kanchanaburi Campus is still committed to taking responsibility towards its community and society. As a result, the check dams are built and repaired every year to ensure that they remain in great condition in order to create stability and sustainability in preserving the environment of the campus.

The check dam areas are becoming more safe and habitable since, according to camera traps, wild animals have begun to return, especially protected ones that are rarely found outside conservation areas, such as clouded leopards (rare, their distribution data unavailable, and vulnerable to extinction; they are proof of safety and integrity of food sources), leopard cats, foxes (common, threatened/limited habitat; they are proof of safety). As for the direct and indirect byproducts from the construction of check dams, it was found that local people utilize bamboo shoots, bamboo stalks, fungi, and pak-wan vegetables to generate income for the community.



Proportion of community income in addition to by-products of check dam

At least 300-500 people are required to build check dams, allowing local communities, such as the Samakkhitham Village, Sai Yok district, Kanchanaburi, to strengthen their bonds in the process. After a considerable time, the forest became more fertile and villagers began to develop plans to use forest resources sustainably, leading to an increase in the community's income. Aside from that, they began processing forest products to raise their value. For example, the SCGP Wang Sala Plant and Mahidol University, Kanchanaburi Campus helped with product processing and created biodegradable plant pots from scrap materials for the forest community enterprise of the Samakkhitham Village.

• **Ecological data and population of wild elephants (*Elephas maximus*) in Phu Luang Wildlife Sanctuary and Phu Khiao Wildlife Sanctuary (Faculty of Environment and Resource Science):** This project is conducted to assess and compare the population, distribution, and ecological needs of wild elephants. Through the cooperation of the local community and authorities, the data gathered will be used to create management and conservation plans, reduce conflicts between wild elephants and villagers, synthesize communication strategies, and develop educational media to enhance people's understanding and awareness about coexisting with wild elephants. According to the direct surveys regarding the pattern, timing, and location of wild elephant activities, as well as the impact on the area, together with the footage from wildlife camera traps installed at the border lines that separate agricultural areas from Phu Luang Wildlife Sanctuary and Phu Khiao Wildlife Sanctuary, it was found that most wild elephants in Phu Luang Wildlife Sanctuary live in the middle forest area (75%); foraging behavior is found the most between 15:00 and 19:00; the most common mineral discovered in elephant dung piles is calcium (62.81%); and the most common mineral found in their food is iron (Fe) (88.54%). As for the elephants in Phu Khiao Wildlife Sanctuary, they have a rather equal distribution, living in the inner forest area (34%), the middle forest area (30.8%), and the outer forest area (28.6%); activities are found the most between 22:01 and 24:00; and the most common mineral found in their food is nitrogen (N) (56.16%). From 66 logistic regression analyses on Phu Luang Wildlife Sanctuary, it has an extremely suitable area of 169.58 square kilometers (18.62%), which is a flat area at the top of a mountain range; a very suitable area of 425.26 square kilometers (46.69%); and a moderately suitable area of 279.57 square kilometers (30.69%). As for Phu Khiao Wildlife Sanctuary, it has an extremely suitable area of 168.24 square kilometers (6.5%); a very suitable area of 983.62 square kilometers (37.99%); and a moderately suitable area of 704.77 square kilometers (27.22%).

The social research on participatory communication and intention to promote a harmonious coexistence between humans and wild elephants revealed that the problem between humans and wild elephants has existed for a long time and is likely to worsen. The Department of National Parks, Wildlife and Plant Conservation has laid out guidelines for managing and solving conflicts between people and wild elephants, which can be divided into two main parts: management of wild elephants in conservation areas and those outside conservation areas. Various management methods were attempted, such as beehive fences, the elephant food restoration project, the wild elephant surveillance center with early warning system, etc. Also, crop insurance guidelines were established to help the affected farmers reduce potential risks from wild elephants, and community-based sustainable human-elephant conflict management guidelines were created so that local authorities could implement these management guidelines, enabling local people and wild elephants to coexist.

ปรับเปลี่ยน เรียนรู้ อยู่ร่วมกัน
“คน-ช้าง-ป่า”

- 1) เลี่ยงปลูกพืชดึงดูดช้าง
• ถั่วลิสง • ถั่วเขียว
• ถั่วเขียว • ถั่วเขียว
• ถั่วเขียว • ถั่วเขียว
- 2) ปรับเปลี่ยนเวลากรีดยาง
จาก 2:00 น. ถึงช่วงเช้า
จนถึงช่วงบ่าย
- 3) ฝ่าป่าเปลี่ยนเกษตร
ปลูกพืชชนิดอื่น
- 4) รวมกลุ่มจัดอาสา
เผ่าระวังช้าง
- 5) ใช้รั้วลวดหนาม
- 6) รั้วไฟฟ้า จากโซล่าเซลล์
- 7) ไม้ตะแบก ไม้โปงดาไลต์
จากโซล่าเซลล์
- 8) อุปกรณ์ถ่วง
น้ำหนักช้างที่ใกล้ลง-เสียง
- 9) อาชีพเสริม
เลี้ยงหมู
เลี้ยงปลา
ปลูกพืชชนิดอื่น
- 10) ฟื้นฟูแหล่งอาหารช้าง
ปลูกหญ้า
ปลูกพืช

↑ คน...มีรายได้
ช้าง...อยู่รอด
ป่า...เพิ่มขึ้น

SCAN QR CODE. อยู่ร่วมกัน

UWA. มหาวิทยาลัยบูรพา
ศูนย์วิจัยและจัดการปัญหาสิ่งแวดล้อม (Elephas maximus) โดยนักวิจัยและนักวิชาการของมหาวิทยาลัยบูรพา
ศูนย์วิจัยและจัดการปัญหาสิ่งแวดล้อม (Elephas maximus) โดยนักวิจัยและนักวิชาการของมหาวิทยาลัยบูรพา



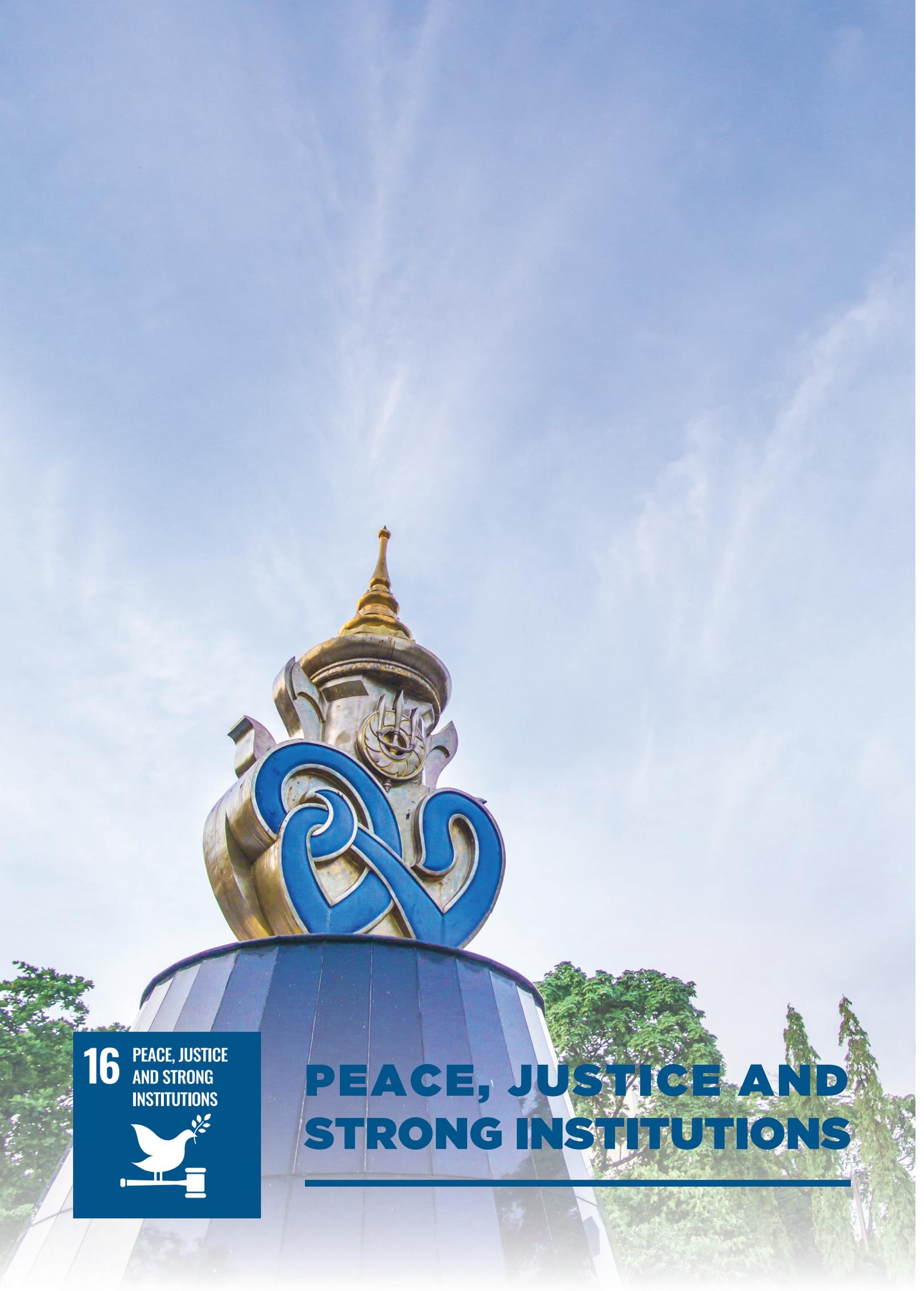
• **Organizing an expert workshop on health, wildlife and livelihoods**

The Monitoring and Surveillance Center for Zoonotic Diseases from Wildlife and Exotic Animals, Faculty of Veterinary Science, Mahidol University is an FAO Reference Center on wildlife and zoonotic disease. Following a meeting between the FAO and wildlife experts, a project to discuss the challenges and solutions to problems relating to human and wild animals' health and way of life, as well as those caused by the COVID-19 pandemic, was formed. Consequently, a workshop was organized, and the information from it were to be compiled as guidelines for the development and restoration of human health, the eradication of poverty, and the utilization of wildlife and the environment, and then published by the FAO. The "Organizing an Expert Workshop on Health, Wildlife and Livelihoods" workshop hosted a conference for numerous wildlife and wildlife health experts from around the world, especially those in the Asia-Pacific region, and One health clinical practitioners to share ideas, exchange questions, and discuss on the potential challenges and opportunities. The workshop was held on 14-18 June 2021 with each session summarized in writing, and small workshops were arranged to go over the written summaries. The content of the document consisted of 6 episodes:

- Section 1: Health, wildlife and livelihoods: context and rationale
- Section 2: Wildlife resource base: status and trends in the region
- Section 3: Livelihoods, poverty reduction, and food and nutrition security
- Section 4: Linkages among One Health, wildlife and livelihoods
- Section 5: Towards enabling green recovery
- Section 6: Epilogue

In this regard, the workshop's discussion summary is now being revised by the experts. A meeting with all relevant parties was also planned for May 2022 to review and revise the summary.





16

PEACE, JUSTICE
AND STRONG
INSTITUTIONS



PEACE, JUSTICE AND STRONG INSTITUTIONS

16 PEACE, JUSTICE AND STRONG INSTITUTIONS



PEACE, JUSTICE AND STRONG INSTITUTIONS



RELATED POLICIES

Mahidol University highly encourages operational integrity and transparency. Transparency, responsibility, non-corruption, moral corporate culture, work ethics, and internal communication are common values that must be upheld by all, as prescribed by the Mahidol University Notice regarding policy on integrity and transparency in operations of Mahidol University. Also, it has declared in good faith to commit to ethical and transparent administration according to the principles of good governance and ensure that its staff uphold these values by demonstrating integrity in their duty, as prescribed by the Mahidol University Notice regarding the good faith to commit to ethical and transparent administration in accordance with the principles of good governance of Mahidol University. Additionally, the university acknowledges the significance of promoting human rights and peace; as a result, it established and supported the Institute of Human Rights and Peace Studies (NHSO), an important organization in terms of academic and practical operations in the fields of peace and human rights that aims to foster a peaceful and inclusive society for sustainable development, provide justice for all, and create effective, responsible, and inclusive institutions at all levels.

GOVERNANCE

Mahidol University is concerned that good governance led to effective work and equality in the institute. The University has substantially reduced corruption and bribery in all forms. Besides, equality among staff was regulated by its support to build resilience in vulnerable situations and reduce the exposure and vulnerability to climate-related crises. Moreover, nondiscriminatory laws and policies have been created to enforce the institute's commitment to system transparency. In all of our 6 campuses, Mahidol University is centrally governed; principally by the Office of President, Mahidol University Council, and the General Board of the Faculties, Department, and Personnel with advice and support from the extensive network of committees, boards, and organizations. We aim to achieve our mission to excel in health, sciences, arts, and innovation with integrity for the betterment of Thai society and the benefit of humankind. To be one of 100 World Class universities, Mahidol University has set its vision to be recognized as a leading University in cultivating competence in human capital and advancing education and research for the country by strengthening the administrative system, quality of life, environment, national competitiveness and equal opportunity of society. Our good governance and organization are driven by the following 4 strategies:



Flagship Projects

Mahidol University has determined strategies and indicators to achieve its goal of becoming a world-class university. Therefore, flagship projects have been set up to drive its academic pursuits and research work in response to the University's implementation of the four strategies. In fiscal year 2021, the flagship projects that achieved their main objectives and key results (OKR) were as follows:

Flagship 1: Strategy I - Global Research and Innovation

1.1 MU-MRC and integrated researchers: The University supported 3 MU-MRC groups and 11 smaller MU-MiniRC groups whose high-quality research were published by the Q1 journal.

1.2 Boosting the Subject Ranking by supporting field-specific research: In an attempt to improve its Subject Ranking in Medicine and Pharmacy & Pharmacology into the world's top 100, the University supported 15 international postdoctoral researchers from four departments, 50 Life Science & Medicine/Pharmacy & Pharmacology research groups, and 3 Joint Unit Phase II operation groups.

1.3 Improving Research Infrastructure to Support New Disciplines: The University prepared its frontier research infrastructures by expanding its campus equipment centers and equipping the Faculty of Science with necessary capabilities. It increased the service area for its Core Facility, increased the Pilot Plant corporation to include 4 internal projects and 7 external projects, and built an ecosystem to support 5 new scientific subjects.

Flagship 2: Strategy II - Innovative Education and Authentic Learning

2.1 Flexible Education & Credit Unit Bank System: The Flexible Education & Credit Unit Bank System allowed 6 other departments in the University to compile 7 flexible courses and 1 pilot flexible course for the Creative Technology Program (International Program), which is a part of the Bachelor of Liberal Arts and Science Program of the International College and is enrolled by 25 students.

2.2 Standardizing Teachers' Potential (based on the Professional Standards Framework (MUPSF)): To help teachers reach their full potential and adapt to various new teaching and learning methodologies, The University established performance quality criteria and evaluation methods based on the Mahidol University Professional Standards Framework.

2.3 Mahidol University Extension (MUx) Platform: The University improved the quality of its online courses to meet international standards. Mahidol University has been certified by ISO 40180:2017 in the field of online teaching management system, with 16 courses certified by the ISO 40180: 2017 standard.

2.4 Career Support Services: To offer more ways to access proper quality labor market and equip students with essential skills, the University created a Career Support Services system which included opening up the Mahidol University Careers Service website and distributing LinkedIn Learning licenses for students and graduates, etc.

Flagship 3: Strategy III - Policy Advocacy and Leaders in Professional / Academic Services

3. MU Social Engagement Platform: The platform helps transform the University's research findings into social policies and encourages the establishment of a university-based standard. It funded 5 projects focused on social policies, established the Healthy University Rating System (HURS) as part of the AUN-HPN Healthy University Framework, and compiled a manual for Sustainable University Standard Assessment in Thailand (SUSA-Thailand). Also, it established a peer-evaluated laboratory accreditation program.

Flagship 4: Strategy IV - Management for Self-Sufficiency and Sustainable Organization

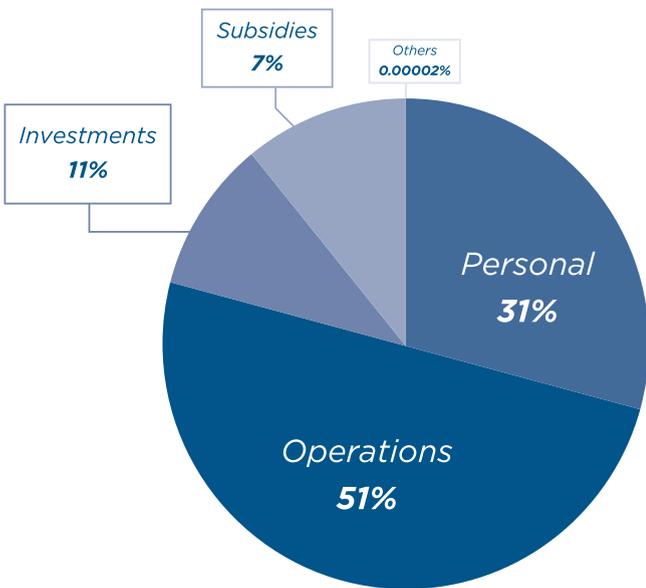
4.1 Building a Global Talent Platform: A platform is created to recruit Global Talents, nurture internal staff to become Global Talents, and scale beyond the fields of research and education. To do this, the platform has been extended to cover 10 other departments, resulting in 8 researchers being produced so far. Additionally, a plan was implemented to select educational MU-Talents to be assessed by the MUPSF criteria, classifying teachers into 4 levels.

4.2 Finance and Branding: To build financial sustainability and brand identity, the University determined its marketing structure, established marketing plans, and plan to conduct 3 sandbox experiments.

BUDGET MANAGEMENT

Mahidol University is a large organization that offers a broad range of services. It understands that ethics, transparency, and integrity in management help boost the efficiency of all education services as well as other ones. In 2021, Mahidol University's budget was around 51,859 million baht, 25.3% of which came from government subsidies and 74.7% from the University's revenue.

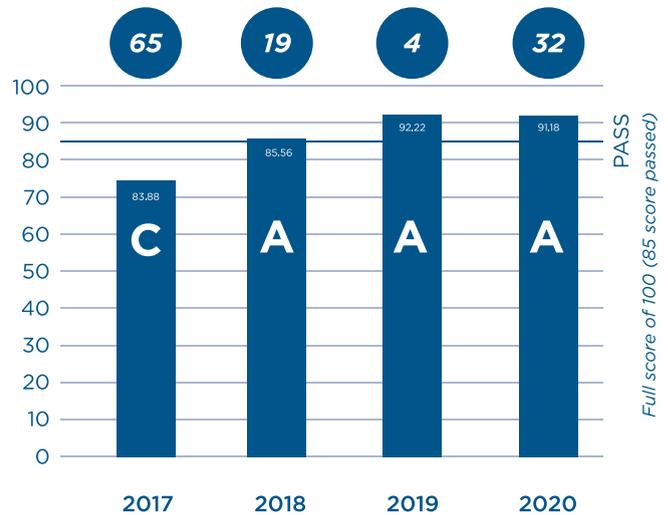
Budget Categories : Million Baht Unit	Personal	Operations	Investments	Subsidies	Others	Total	Percentage
University Income	6,513,2818	26,183,4987	2,857,4580	3,204,2979	0,0085	38,758,5449	74,7%
Government Funds	9,562,5629	226,0407	2,749,9052	562,3817	0	13,100,8905	25,3%
Total	16,075,8447	26,409,5394	5,607,3632	3,766,6796	0,0085	51,859,4354	100%



Integrity and Transparency Assessment (ITA)

Mahidol University recognizes the importance of integrity and transparency, so it implements the Integrity and Transparency Assessment (ITA) under the assessment of the National Anti-Corruption Commission. This assessment includes the Internal Integrity and Transparency Assessment (IIT), the External Integrity and Transparency Assessment (EIT), and the Open Data Integrity and Transparency Assessment (OIT). In 2020, it was certified with an evidence-based approach that Mahidol University's policies and procedures promote integrity, transparency, and objectivity. Its ITA score was 91.18 out of 100, a Category A result. Also, the University continuously improved its operations in many ways. It organized training programs for relevant parties within the University to take IIT assessment conducted by government sectors for the

fiscal year 2021 and educated them on the topics of human resources, laws and regulations, evaluation criteria, etc. This allowed participants to apply the knowledge obtained and complete the IIT form, which was a part of the IIT assessment conducted by government sectors for the fiscal year 2021. These training programs were implemented to help achieve the University's integrity and transparency goals, which could reduce all forms of corruption and bribery, effectively enhance the quality of the University, foster responsibility and transparency at all levels, as well as strengthen any developing country's standpoint in institutions related to global governance.



The number of higher education institutions assessed is over 80 institutions.

● Ranking in each year

The result of integrity and transparency assessment (ITA) in 2017-2020

COMPLAINTS AND APPEALS

Complaint management is integral in order to uphold a policy on developing an efficient organizational management system in line with the principles of good governance, achieve sustainable organizational management, and become a world-class university. With this in mind, Mahidol University appointed the Ombudsman Committee to effectively handle complaints in a way that complies with the principles of good governance and demonstrates transparency, morality, and ethics of Mahidol University. The process adhered to the Mahidol University Notice regarding complaints handling guidelines, B.E. 2560, which outlines a number of methods for submitting complaints, including an online platform, email, a physical comment box, the postal service, or filing in person. The committee also published a statistics report summarizing the number of complaints received from 2018 to 2021 on its website for the general public in an attempt to promote a peaceful and inclusive society that leads to sustainable development; provide justice for everyone; create an institution that is effective, responsible, and inclusive at all levels, which promotes the supremacy of law on a national and international scale; and ensure equal justice for all.

Complaints	Fiscal year 2021												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Officers/Faculties*	0	1	5	1	3	6	4	2	3	5	3	3	36
Service	0	0	0	0	2	1	0	5	0	0	1	1	10
Suggestions/Comments	0	1	0	0	1	0	0	0	0	0	1	0	3

Complaints	Fiscal year 2020												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Officers/Faculties*	6	0	3	0	2	10	5	4	4	7	4	3	48
Service	1	1	1	1	1	0	1	1	1	0	1	1	10
Suggestions/Comments	0	0	0	0	0	0	0	0	0	0	0	0	0

Note: No complaints of corruption

PROJECT / RESEARCH / EVENT

• **The Community Leadership and Mechanism Development Project to Prevent and Reduce Violence Against Women in Southern Border Provinces (with an NGO):** Mahidol University Institute for Population and Social Research (IPSR) received funds from The Thai Health Promotion Foundation (ThaiHealth) to conduct a research project that empowers community leaders to bring about change and reduce domestic and gender-based violence and develop mechanisms and networks that protect and assist those affected by domestic or gender-based violence, seeking to help every woman in troubled communities. The research project was initiated in September 2020 –2021 and employed a participatory feminist action research process to conduct various activities that empower local leaders to tackle domestic and gender-based violence. Various skills development workshops were organized for community leaders, such as ones that taught how to listen for signs of violence, how to communicate properly, how to engage in calming conversations to reduce conflicts in the family, and one that analyzes women's problems. The community leaders also got to participate in various training sessions to further strengthen their relevant capabilities. The activities were organized based on the collected data obtained by the research team, who surveyed and interviewed 400 local women. The data was used to design interventions that could be developed into policy recommendations for other areas in the future. This research project aims to create subdistrict-level mechanisms and networks that empower people to protect, assist, and heal women affected by domestic violence, with its target groups being:

- 1) primary target groups: 30 female Buddhist and Muslim leaders from Thung Phla subdistrict and Khuan Nori subdistrict in Khok Pho district, Pattani province, who were trained as local operation leaders.
- 2) secondary target groups: community leaders, religious leaders, and relevant local government agencies, such as public health agencies and social development and human security agencies.
- 3) beneficiaries: Buddhist and Muslim women and family members of 1,500 households in 2 subdistricts of Khok Pho district, Pattani province (Thung Phla subdistrict and Khuan Nori subdistrict).

The program will help to alleviate all forms of violence, strengthen relevant national institutions, and utilize international cooperation to give people at all levels the tools they need to combat domestic and gender-based violence, especially in developing countries.

• **The Institute of Human Rights and Peace Studies Establishment Project** has continually carried out activities to promote peace in the southern provinces under the “Southern Border Peace Center” project and cooperated with government agencies as well as scholars, politicians, civil society, religious leaders, and those affected by the prolonged unrest and violent groups. The project provided a safe space for community consultations and discussions and established communication channels between the state and society, allowing relevant parties to participate in the problem-solving process. As a result, Mahidol University successfully brought about changes in the southern border provinces in the following ways: 1) promoting the consolidation of Buddhists and 2) facilitating cooperation between civil society and political parties in four southern provinces. The Buddhist consolidation endeavor has been in operation since 2015, when local Buddhists grew dissatisfied with the government’s solution. They invited Buddhists inside and outside the southern border areas to form a group called “Weaving Peace Together” (WPT). The group organized various activities, including discussion forums among Buddhist groups and consultation forums for Buddhists to ease their concerns about Muslim groups in the area. Also, government sectors and delegates held peace talks about anti-state movements on a continuous basis. The Buddhist group is now recognized throughout the civil society, academic, and local government networks. Moreover, 11 members of the WPT group joined the Peace Committee operated by ISOC Region 4 Forward Command as local coordinators. The committee serves as an important means for Buddhists to communicate and submit their proposals to solve problems in the southern border provinces. The program will help strengthen the rule of law at both national and international levels and ensure equal justice for all.





17 PARTNERSHIPS
FOR THE GOALS



PARTNERSHIPS FOR THE GOALS

17 PARTNERSHIPS FOR THE GOALS



PARTNERSHIPS FOR THE GOALS



RELATED POLICIES

Mahidol University strives to be “a leader on sustainability” in responding to the United Nations 2030 Agenda for Sustainable Development. We have been developing our academic activities, research, and people for a sustainable community through our passion for “Mahidol for Sustainable Future”. Beyond creating a knowledgeable society, Mahidol University is further concerned with sustainable development by contributing economic, social, and environmental dimensions leading to efficient use of resources, social equity, and improved quality of life for faculty, staff, students, and the surrounding communities. Therefore, Mahidol University Sustainability Strategy consists of 4 key areas as the framework was established Education Research & Innovation Community & Social Engagement, and Operation. By promoting the upgrading of global cooperation agreements through multisector partnerships for access and sharing of scientific knowledge technology and innovation to support the achievement of the Sustainable Development Goals in all countries, especially in developing countries.

MoU/MoA

Mahidol University entered into numerous Academic Cooperation Agreement (MOU) to conduct learning, teaching, research, technology transfer, academic service, cultural and art exchange, and/or other academic activities with international educational institutions, agencies, and organizations both bilaterally and multilaterally. Currently, the MOUs are being executed with cooperation from various faculties, agencies, and research centers. Also, Mahidol University continues to work towards more great academic achievements from both public and private sectors. There are 1,087 MOUs in total, with 390 being domestic ones, for example, the MOU between Mahidol University and the Office of the Permanent Secretary for Higher Education, Science, Research and Innovation, which requires that the Thailand Academy of Social Sciences, Humanities and Arts (TASSHA) join forces with university networks and agencies to drive development in the fields of social sciences, humanities, and fine arts, leading to the creation of socio-economic arts and culture; the MOU between the Faculty of Science, Mahidol University and the Faculty of Dentistry, Thammasat University to create a network to facilitate research and production of high-quality dental equipment, reducing imports from other countries for the benefit of Thai practitioners; and the innovative intelligent medical information system research and development project operated by Chanwanich Company, Limited to pursue new knowledge in terms of academic, research, innovation, and human resource development, in order to collaborate with others and learn how to effectively utilize intelligent medical information systems. As for international MOUs, there are a total of 697, with 10 of them being signed in 2021, for example, the MOU on an exchange program between Mahidol University and the National University of Singapore, James Cook University, Changwon National University, Tokyo Medical and Dental University, etc.

Number of MoU/MoA Mahidol University with partners between 2019-2021

Partner	Number of MoU/MoA		
	2019	2020	2021
Partner	10	11	10
NGOs	3	6	12
Private company	12	17	49
Government unit	13	23	109

The University values and supports educational exchange programs, which allow students to obtain new knowledge and experiences. In 2021, its Virtual Short-term Exchange and Inbound Program and the Virtual Outbound Mobility Program had 227 and 125 participants respectively. The University provides funding support as well, as seen in the Norwegian Government Scholarship Program, “Capacity Building for Institute in Myanmar” (CBIM), a government project in which the Norwegian Embassy in Thailand grants 20 scholarships to Burmese people to attend graduate programs at Mahidol University; and 11 Royal Scholarships under Her Royal Highness Princess Maha Chakri Sirindhorn Education Project to the Kingdom of Cambodia. These funds, according to their respective agreements, are granted to **promote trilateral cooperation at the regional and international levels, provide access to resources, spread knowledge about science, technology, and innovation, and improve coordination mechanisms at the United Nations level through a world-class technological system.**

COLLABORATION

The Fiscal Year 2021 International Cooperation Development Grant Program (Joint Units) aims to promote cooperation and academic exchange with leading higher education institutions abroad. In the fiscal year 2021, 6 projects were considered for funding:

- The Faculty of Tropical Medicine, in collaboration with the University of Washington in Seattle, USA, worked on the **“Mahidol-UW Malaria Research Unit”** project.

- The Faculty of Nursing, in collaboration with the Faculty of Medicine Siriraj Hospital, Mahidol University and the School of Nursing at Johns Hopkins University, USA, worked on the **“MU-JHU NCD Research Collaborative Center”** project to accumulate knowledge through multidisciplinary research in various areas and improve NCD patient treatment outcomes.

- The Institute of Nutrition, in collaboration with the Swiss Federal Institute of Technology (ETH), Switzerland, worked on the **“MU-ETH Iodine Research and Training Unit”** project, which aims to control iodine deficiency and enhance the practice of monitoring the population’s dietary iodine intake and urinary iodine.

- The Faculty of Medicine Ramathibodi Hospital, in collaboration with Macquarie University, Australia, worked on the **“ASEAN Hearing Hub and Communication Sciences Center Development Project”**.

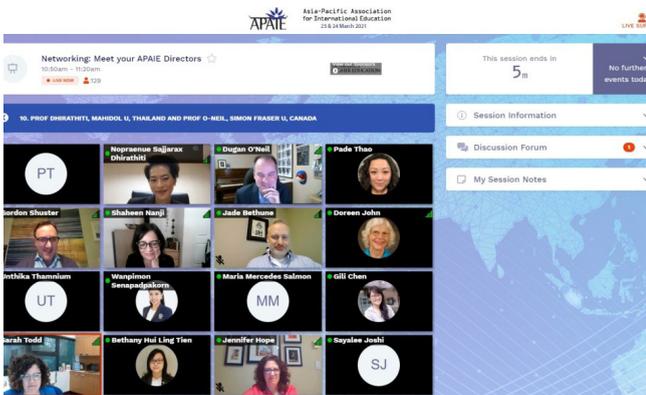
- The Faculty of Information and Communication Technology, the Faculty of Tropical Medicine, the Faculty of Dentistry, the Faculty of Veterinary Medicine, and the Faculty of Medicine Ramathibodi Hospital, in collaboration with Bremen University, Germany, worked on the **“Mahidol-Bremen Medical Informatics Research Unit (MIRU)”** project, which aims to support collaborative research on how to utilize ICT to address pressing issues in the fields of medicine and public health, focusing on the application of existing technologies as well as the development of new technologies.

- The Faculty of Tropical Medicine, in collaboration with the University of Oxford, UK, worked on the **“Collaboration to develop a multidisciplinary approach in epidemiology at the genomic level to protect Thailand from emerging diseases through macroinformatics”** project.



INTERNATIONAL NETWORK

- **The Belt and Road International Medical Education Alliance (BRIMEA) Led by China Medical University** is a network of medical institutions that collaborate to develop and promote medical education and public health professions for the benefit of the people. The network consists of medical institutions in the People's Republic of China and other countries in the Silkroad region. Under the China Medical University's lead, Mahidol University joined 15 universities from China and 49 others from around the world. On 19 June 2021, Mahidol University President attended the 5th International Forum of Higher Medical Education and the 40th Anniversary Celebration of the Institute for International Health Professions Education and Research of China Medical University via an online platform to exchange ideas on medical topics such as cooperation in medical and educational development, clinical professionalism and competence development, and the evolution of medical innovations.



- **The Asia-Pacific Association for International Education (APAIE)** is a network that promotes academic cooperation between tertiary institutions in the Asia-Pacific region. It hosts annual academic conferences and international education exhibitions to showcase academic work and exchange the latest knowledge about tertiary education. It also aims to strengthen international collaboration amongst tertiary institutions around the world. Since joining this network in 2006, Mahidol University has been a part of the Board of Directors (management team) and in 2021, Mahidol University's Vice President for International Relations and Communications joined the abstract reviewer committee for the APAIE 2022 Conference & Exhibition. This gave them an opportunity to participate the APAIE 2021 Virtual Event as an APAIE network committee and inform tertiary institutions about current trends of the international education. The event was attended by local public tertiary institutions and tertiary institutions from around the world, who came together to develop their Asia-Pacific network in the "Networking: Meet Your APAIE Directors" session. The University also announced the APAIE Annual Conference 2023 event, for which Mahidol University has been selected as a host after Simon Fraser University, Canada was selected in 2022

- **The BREMEN Mahidol-Bremen Medical Informatics Research Unit (MIRU)** is a research unit developed by the Faculty of Information and Communication Technology, Mahidol University and the Faculty of Information Technology, the University of Bremen through years of successful research collaboration, student exchange, and course development. This collaboration facilitated a joint study on using information technology to address critical challenges in the fields of medicine and public health. Through the application of existing technologies as well as the development of new ones, they carried out cutting-edge interdisciplinary research. For this research unit, Mahidol University, the University of Bremen, and related national and international partner organizations focused on two main themes: 1) using Big Data and smart sensors to monitor and control vector-borne diseases; and 2) intelligent virtual environment for surgical training. Currently, the MIRU membership extends to 4 faculties of Mahidol University, namely, the Faculty of Information Technology, the Faculty of Tropical Medicine, the Faculty of Veterinary Medicine, the Faculty of Medicine Ramathibodi Hospital, and the Faculty of Dentistry, and includes two faculties at the University of Bremen. The German Academic Exchange Service (DAAD) recognized the Mahidol-Bremen MIRU as one of the top three Thai-German cooperative research centers in Thailand. In 2021, the Faculty of Information and Communication Technology (ICT), Mahidol University and the University of Bremen entered into an MOU for Strategic Partnership Agreement. The MOU aims to develop tertiary education, enhance joint research and innovative capacities in various fields, and broaden their scope of cooperation. This agreement integrated the two universities' long-term strategies and created a committee called the Mahidol-Bremen Board to jointly monitor and track upcoming activities organized by the cooperation network. Also, the MIRU hosted joint a workshop on using information technology to help control the spread of malaria and other animal-borne diseases at the University of Bremen. **This effort helped enhance global cooperation for sustainable development through multi-sector partnerships, which enabled the accumulation and exchange of knowledge, technology, and financial resources to help all countries achieve the Sustainable Development Goals, especially the developing ones.**



PROJECT / RESEARCH / EVENT

• **The ASEAN Centre for Sustainable Development Studies and Dialogue (ACSDSD)** is a cooperative effort for the sustainable development of ASEAN countries. This center will facilitate coordination between various regional and global organizations to drive sustainable development for the ASEAN community; promote research and build on its capacity for sustainable development; serve as a policy negotiation platform among ASEAN member states and between ASEAN and external partners; and develop a coordination network consisting of sustainable development centers within the ASEAN region. Thailand has been an ASEAN coordinator since 2016, liaising and driving the sustainable development of their country and the ASEAN community. The ACSDSD center is managed by the College of Management of Mahidol University, which promotes its operation, serves as a source of management knowledge for the member countries to help them achieve sustainable development goals, and spreads sustainable development knowledge globally. In 2021, the center held a conference to encourage and support the relevant policies in Thailand about the production of quality research on sustainable development that would contribute to a knowledge base for the ASEAN member countries to achieve Sustainable Development Goals, especially ones that tackles on key issues like poverty, sustainable natural resource management, sustainable production and consumption, and economic and social recovery from the COVID-19 crisis. Presently, the ASEAN countries have established a comprehensive approach to their goals with sustainable development as one of the main strategies, and the ACSDSD center will continue to assist and analyze this approach. **The program has enhanced policy coherence for sustainable development, strengthened international support for effective capacity improvement, set objectives for developing countries as part of the national plan to work towards every aspect of the Sustainable Development Goals, and executed tri-lateral collaboration.**



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