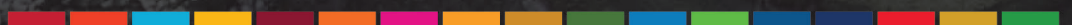




# Chulalongkorn University Sustainability Report 2022-2023







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# Message from the President

Chulalongkorn University has since 2013 actively engaged with the Sustainable Development Goals (SDGs), also known as the Global Goals, which are officially adopted by the United Nations in 2015 as a universal call to action to end poverty, and enhance better environment for people's lives on the planet.

Chulalongkorn University's dedication to addressing global challenges and contributing to a better future is widely commendable. The university has continued its efforts towards the SDGs despite the unprecedented challenges posed by the COVID-19 pandemic, digital transformation, and environmental events over the past years. This resilience and adaptability demonstrate how much the university has committed to making a positive impact on society and the world.

It is also notable that the university has received recognition in various objectives of the SDGs such as quality education, economic growth, social inequality, innovation and sustainable communities. The university has planned to work not only within the Thai society, but also to collaborate more with other partners, regionally and globally.

Being ranked no. 1 in Thailand by both QS (Quacquarelli Symonds) and THE (Times Higher Education) World University Ranking 2024 is a testament to the university's excellence in education and research. The university is also recognized globally, according to the THE Impact Ranking which focuses on SDG no. 4, 8, 9, 15, 16 and 17.

Chulalongkorn University is still gearing towards the key missions to become a "Research University That Teaches" with an emphasis on entrepreneurship development, critical thinking, innovative research, and sustainable communities. This aligns well with the SDGs and the evolving needs for future leaders of the 21st century.

This year's Sustainability Report showcases the university's ongoing efforts and achievements in supporting the UN's Global Goals. Chulalongkorn University does hope that such progress and initiatives can help inspire others to take action and contribute to a more sustainable and equitable world.



**Prof. Bundhit Eua-arporn, Ph.D.**  
President

Professor Bundhit Eua-arporn, Ph.D.

A handwritten signature in blue ink, appearing to read 'B. Eua-arporn', followed by a long horizontal flourish.









# About Chulalongkorn University

Chulalongkorn University was founded in March 1917 by King Vajiravudh (King Rama VI), as a tribute to his father, King Chulalongkorn (King Rama V). As Thailand's leading university, Chulalongkorn has since committed itself to contribute to the national higher education development by disseminating academic knowledge and know-how, and empowering all students with necessary skills to help serve society after graduation.

The university focuses on three key missions:

1. Preparing future leaders with creativity, analytical thinking, and morality;
2. Developing impactful research and innovations;
3. Promoting sustainability development for society

Located in the central district of Bangkok, the university currently has 19 faculties, and 24 schools, colleges, and institutes, and 7,996 faculty members. According to the Office of Strategy Management and Budgeting, Academic Year 2022, there are over 41,262 students. This includes 28,457 students for Bachelor's degree, 8,855 students for Master's, 3,059 students for Doctoral degree, 829 students for higher graduate and 62 for Diploma and Graduate Diploma. Among these numbers, over 1,300 are international students from around the world.

The university recognizes the growing importance of innovation and research for sustainable communities. As a result, for academic year between 2020-2023, Chulalongkorn University focused its research funds on sustainability-related projects. In

2022 alone, there were as many as 1,289 projects on the issue with an emphasis on promoting the following SDG Goals:

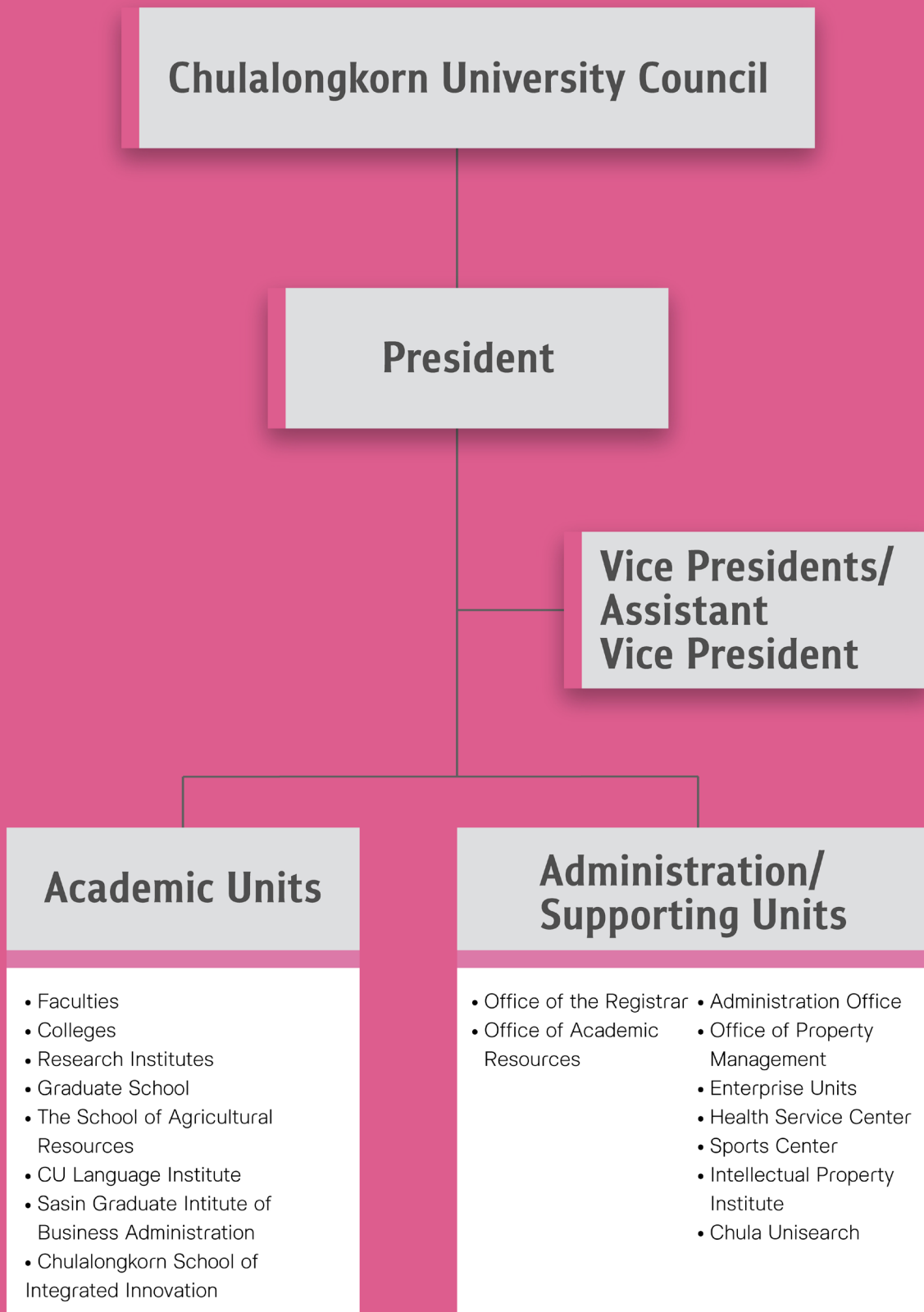
- SDG 3 : Good Health and Wellbeing
- SDG 4 : Quality Education
- SDG 5 : Gender Equality
- SDG 7 : Affordable and Clean Energy
- SDG 8 : Decent Work and Economic Growth
- SDG 9 : Industry, Innovation and Infrastructure
- SDG 11 : Sustainable Cities and Communities
- SDG 12 : Responsible Consumption and Production
- SDG 13 : Climate Action
- SDG 14 : Life Below Water
- SDG 15 : Life on Land
- SDG 16 : Peace, Justice and Strong Institutions

This year the university is also recognized by the QS World University Rankings 2024 held by QS Quacquarelli Symonds as the 211th among nearly 3,000 universities worldwide. Such recognition reflects Chulalongkorn University's progress toward being a world-class university in terms of SDG Impact.

Chulalongkorn University aims to become a "Research University That Teaches" by focusing on creating knowledge and innovations to improve the quality of life for the Thai people as well as global communities through sustainable development.



# Chulalongkorn University Organization Structure





# Chula at a Glance



Number of Students  
and Staff

**49,257**

Students 41,262  
Staff 7,995



Sustainability efforts  
budget and research  
funds

**74** million USD



Energy Usage

**58.9**  
kWh/m<sup>2</sup>/yr



Water Usage

**1.14** million  
m<sup>3</sup>/yr



Carbon Footprint

**0.99** tCO<sub>2</sub>eq/  
capital/yr



Number of passengers  
taking sustainable  
transportation

**>800,000**  
passengers



Total Waste

**2,424**  
tonnes/yr



Recycled Food Waste

**95** tonnes/yr



# Sustainability at Chulalongkorn University

In the 2022-2023 academic year, Chulalongkorn University continued its commitment to sustainability through the CU Global Challenge. The CU Global Challenge is an initiative that brings together students, staff, and faculty to make a positive impact on society. In this period, the project expanded its reach to the Saraburi province. Here, students engaged in rice farming activities aimed at enhancing food security within the Saraburi campus area. Moreover, the CU Volunteer Hub, comprising both Thai and international student volunteers, supported by the Student Affairs Office, played an essential role in collaborating with local communities to learn about local lifestyles, rice farming, and tree planting activities in the Saraburi region. Chulalongkorn University's overarching goal is to foster international collaborations in activities that create sustainable and lasting positive impacts on communities.

Furthermore, Chulalongkorn University partnered with the Universiti Sains Malaysia to establish the SDG Integrated Project and Young Leader Exchange. This initiative involves student leaders from the CU Volunteer Hub and dormitory leaders. The project focuses on promoting sustainability within the university by developing bicycle infrastructure and engaging with surrounding communities to improve the quality of life for local residents. These initiatives are set to continue into the 2023-2024 academic year.

In addition, Chulalongkorn University recognizes the importance of creating a shared understanding among its staff regarding the United Nations' 17 Sustainable Development Goals (SDGs). To address this, the university initiated the Chula SDG: Beyond Leading Change project during the 2022-2023 academic year. The project's objective is to build teams capable of inspiring staff to develop projects that contribute to sustainable development. The goal is to empower staff with the knowledge and skills needed to foster sustainable development and promote the long-term well-being of both the university and society. This initiative began in the 2022-2023 academic year with the formation of three teams and is set to continue in the 2024-2025 academic year.

In September 2022, Chulalongkorn University made a significant commitment by declaring its intention to reduce greenhouse gas emissions. The primary objectives are to achieve "Carbon Neutrality" by 2040 (B.E. 2583), which means offsetting the same amount of carbon dioxide (CO<sub>2</sub>) emissions produced by planting trees or through other methods, and reaching "Net Zero Greenhouse Gas Emissions" by 2050 (B.E. 2593). This declaration was made during the Chula Sustainability Fest 2022, which took place from September 2nd to 4th, 2022 at the Chulalongkorn University Centenary Park. The event served as a platform for knowledge exchange, inspiration, and awareness of the importance of sustainable living. It was co-organized by the Office of Physical Resources Management together with Center for Safety, Health and Environment of Chulalongkorn University (SHECU), the Office of Student Affairs, Communication Center and partner networks.

Chulalongkorn University remains steadfast in its commitment to these ambitious sustainability and development goals, aiming to make a positive and lasting impact on its community, environment, and society as a whole.



**Prof. Narin Hiransuthikul,  
M.D., Ph.D.**

Vice President for Strategic  
Monitoring and Assessment,  
Planning, Budgeting and Well-  
being

This is the sixth sustainability report to be published by the university. Covered within this report are the projects implemented between 2022-2023. The reporting encompasses all units of Chulalongkorn University, except the Chulalongkorn University Demonstration Primary School, Chulalongkorn University Demonstration Secondary School and the King Chulalongkorn Memorial Hospital.

Professor Narin Hiransuthikul,  
M.D., Ph.D.

A handwritten signature in black ink, appearing to read 'Narin', followed by a stylized flourish.



# Integrating Sustainability in General Education



The General Education Center at Chulalongkorn University, also known as GenEd Chula, is committed to the development and promotion of general education and lifelong learning initiatives that align with the United Nations Sustainable Development Goals (SDGs). GenEd Chula offers a diverse range of courses and activities aimed at fostering sustainable development and enhancing the quality of education. GenEd Chula has structured its courses into seven groups, covering various aspects of sustainable development, including global leadership, community engagement, understanding Thai culture, innovation for rural development, royal teachings, education for sustainable development, and agricultural natural resources and environmental management.

GenEd Chula has adopted blended learning approaches, enhancing learning flexibility, and established the Chula Neuron platform for online courses, including partnerships with various organizations, enabling learners to acquire credits transferable to Chulalongkorn University degree programs. Their programs cater to students, alumni, staff, school students, and the general public.

The listed courses exemplify their commitment to sustainable development and the SDGs. They include courses like “Introduction to Sustainable Development,” “Innovation for Sustainable Rural Development,” “King Bhumibol’s Royal Teachings,” “Education for Sustainable Development,” and “Agricultural Natural Resources and Environmental Management.” These courses cover a wide range of topics, from the fundamentals of sustainable development to innovative solutions for rural development and the teachings of King Bhumibol, aimed at community development. The focus is on developing a global mindset, enhancing understanding of emerging issues, promoting sustainable development alternatives, and nurturing active citizens with democratic values to transform and develop sustainable societies in line with the SDGs.





# Research & Development towards CU Sustainovation

Since the 2020 fiscal year, Chulalongkorn University has implemented a research and development management strategy with clear plans to enhance human resources and reduce budget redundancy in support of innovative research and development activities led by university staff. Additionally, resources within partner research organizations both within and outside the country have undergone revitalization.

In the 2022 fiscal year, Chulalongkorn University Council introduced an essential policy aiming to progress the university as a leader in research with three primary directions: High Impact research, research focused on creating practical innovations, and research aimed at revolutionizing teaching through originality.

The “High Impact” research emphasizes dedicated faculty units or specialist centers within the university, with autonomy to advance research strategies in the Science of Health, Technology, Social Sciences, and Humanities. They aim to produce original research published in internationally recognized academic journals, meeting the global community’s standards.

As of September 2023, Chulalongkorn University has formed 218 research groups or specialist centers with the capability to cover the four branches of science: Health Sciences, Technology, Social Sciences, and Humanities. Their numerous contributions align with the Sustainable Development Goals (SDGs).

Under the research strategy, a mechanism called Research and Innovation Platforms (RIIP) has been established to expand the impact of research. These platforms are oriented towards key beneficiary groups and have been set up with initial technology readiness levels (TRLs) at stages 4-5. Their outputs are evaluated in terms of Social Returns on Investment (SROI).

The average social returns for these projects are 1.38, with an average 3-year potential SROI of 2.97.

The SROI evaluation of these projects supported by the Research and Innovation Platforms (RIIPs) does not aim to assess the potential of research and innovation outcomes for real-sector impact. Instead, it focuses on measuring outcomes to enhance the University’s research and innovation capacity for sustainable development.

In the 2024 fiscal year, the research and innovation platform’s mechanism will be aligned with the Research Pathway tool, which will be an integral part of the university’s research development efforts. The tool’s methodology is being adapted for assessing SDG-aligned research impacts, including ES(G)-ROI, Sustainability Evaluation, and System Evaluation.

This comprehensive strategy places Chulalongkorn University at the forefront of research and innovation, contributing to both the academic community and sustainable development initiatives in various fields.



## Cumulative Publications by SDGs 2020-2023

218 Research Excellence Groups  
Faculties & Institutes from Chulalongkorn University

### Health Science

58 - Faculty of Medicine  
16 - Faculty of Veterinary Science  
12 - Faculty of Allied Health Sciences  
10 - Faculty of Pharmaceutical Science  
9 - Faculty of Dentistry  
3 - Faculty of Sports Science

### Science & Technology

29 - Faculty of Engineering  
28 - Faculty of Science  
2 - Faculty of Nursing  
2 - The Petroleum and Petrochemical College  
1 - Environmental Research Institute  
1 - Metallurgy and Materials Science Research Institute  
1 - The Institute of Biotechnology and Genetic Engineering

### Social Science

9 - Faculty of Education  
7 - Institute of Asian Studies  
5 - Faculty of Architecture  
4 - Social Research Institute  
3 - Sasri Graduate Institute of Business Administration of Chulalongkorn University  
2 - Faculty of Communication Arts  
1 - Faculty of Psychology  
1 - Faculty of Economics  
1 - Faculty of Political Science  
1 - College of Public Health Sciences  
1 - School of Agricultural Resources

### Humanities

8 - Faculty of Arts  
3 - Faculty of Fine and Applied Arts



The Office of Research Affairs, Chulalongkorn University

Last updated: 22 SEP 2023



# SDGs Leading Change

The capacity building program has been recognized as a process of strengthening the stakeholders' skills. For students and academic staff, necessary skills have been embedded within the coursework and extra-curricular activities. Each of the Sustainable Development Goals (SDGs) was emphasized based on the area of expertise in related academic programs. For non-academic staff, the crucial consists of data collection and analysis, policy framework, governance, promotion of action as well as SDGs inclusion. Realizing the importance of capacity building, Chulalongkorn University Sustainability Taskforce and the Office of Human Resource Management (HRM) teamed up to develop the program which was first launched in August 2021

As education for sustainable development demands a profound change in paradigms, the underlying principle for the program was developed based on reflective practices and the acquisition of skills and tools that will allow the participants to develop their own sustainability philosophy. The project-based learning was chosen as the learning approach. Project-based learning started with a real-world problem, research the issue, investigate different perspectives, explore solutions from a variety of angles and provide a comprehensive plan to solve the problem. Furthermore, collaboration with community members and sharing the final product with general audience were encouraged. The final program consists of three modules. The first aims to provide general SDGs knowledge and raise awareness on the local and global challenges. Examples of current campus initiatives were displayed. The second module focuses on the design thinking process in which participants were asked to empathize, define, ideate potential solutions to

sustainability problems. The last module utilizes the project-based learning approach in which the skills were developed through engaging projects set around real-world problems.

Due to COVID-19 outbreak, the first and second modules were offered as online courses and consulting sessions. The third module was conducted as face-to-face activities where participants were divided into groups of 6-8 people. Each group was asked to think about a real-world problem on campus, pair it with one of the 17 SDGs and to come up with a pilot project that help solve the problem. Thus far, 70 staff from various units across campus completed the program. Although the project period was short (~3 months) and only a limited numbers of SDGs were explored, participants were given opportunity to gain experience and practice their skills on researching problems in relation to SDGs, data collection and analysis, and propose solutions with real-world limitations. In addition, participants were equipped with competencies require in the future including social competencies, methodological competencies, personal competencies, and domain competencies. It is expected that the interplay of the key competencies will not only enable the supporting staff to solve sustainability problem in their daily operational practices but also raise the productivity and create a healthier and happier working environment.





# Health Promotion 2023

In the pursuit of personal and academic success, health and well-being are often relegated to secondary concerns. However, Chulalongkorn University, a leading educational institution, takes a comprehensive approach to address this neglect. Recognizing that good health transcends physical fitness and includes emotional, mental, and social well-being, Chula University has adopted a multifaceted strategy to promote health and well-being among its students and staff. This essay delves into Chula University's innovative programs and initiatives aimed at creating a community of healthy and thriving individuals.

## Annual Health Check-Ups

Chulalongkorn University's commitment to well-being begins with its annual health check-up program. This initiative serves as a foundational pillar for disease prevention and early intervention. These check-ups act as a baseline assessment, identifying risk factors and potential health issues, thus laying the groundwork for strategies to enhance well-being. The "Chula Healthy Report," generated by the Faculty of Public Health Sciences, plays a pivotal role in analyzing individual and collective health data. The insights gleaned from this report drive the university's health promotion strategies, fostering interdisciplinary collaboration and ensuring a holistic approach to well-being. This data-driven approach serves as a testament to Chula University's dedication to addressing health concerns on multiple fronts.

## Mental Health Immunity

Chulalongkorn University goes a step further by recognizing the critical role of mental health in overall well-being. The university's program "Journey Here: Building Mental Health Immunity" underscores the significance of psychological resilience. Through the active involvement of subject matter experts and community members, this program equips individuals with the tools to build mental health immunity. In an era marked by heightened stress and psychological challenges, such initiatives are indispensable. By fostering mental health strength, Chula University is enhancing its community's ability to face life's challenges head-on.

## Chula Healthy Day

The university takes its commitment to well-being beyond clinical check-ups and mental health support. Chula Healthy Day is a remarkable event that serves as a platform for spreading sustainable health awareness. This event features a range of activities, including information booths, workshops, and exhibitions, all geared towards educating and

encouraging participation in health initiatives. By engaging students and staff in this multifaceted event, Chula University is creating a culture of health that extends beyond the individual to the community.

## Lifelong Learning

Chulalongkorn University acknowledges that true well-being requires continuous learning. To this end, the Faculty of Psychology has initiated training programs in psychology and counseling. These programs empower participants to apply their knowledge effectively in various life situations. In a forward-looking move, the faculty plans to introduce short courses with credit transfer options. This allows participants to further their studies and pursue a deeper understanding of psychology and counseling. The introduction of lifelong learning opportunities ensures that Chula University's commitment to well-being extends throughout an individual's lifetime.

By providing annual health check-ups, fostering mental health immunity, hosting Chula Healthy Day, and offering lifelong learning opportunities, the university not only safeguards the health of its community but also empowers individuals to lead healthier and more fulfilling lives. The commitment to addressing health across various dimensions underscores the university's mission to enhance the overall well-being of its students and staff.

In conclusion, Chulalongkorn University proves that an institution's responsibility transcends the realm of academic development—it extends to nurturing a healthy and well-rounded community that can confront life's challenges with resilience and vigor.





# Chula Race to Zero 2023

Five Key Strategies (Chula 2050 Net-Zero Transition)

1. **Energy Transition:** Chulalongkorn University is shifting from traditional energy sources to zero-carbon energy systems. A notable collaboration is with the Metropolitan Electricity Authority (MEA) for installing solar photovoltaic (PV) systems on various university buildings (Solar Rooftop). This initiative targets to install these systems on 65 buildings across the university, with 14 already in operation. Upon completion, it's expected to contribute to 25% of the university's electricity needs.

2. **Improving Energy System Resilience:** The university conducts periodic evaluations of its electrical systems' efficiency, replacing outdated equipment with energy-efficient alternatives. Additionally, building energy management systems (CU BEMs) have been implemented to optimize energy usage.

3. **Creating Green Growth:** Chulalongkorn University supports green research and technology development at the national and international levels. The Bio-Circular-Green economy Technology & Engineering Center at the Faculty of Engineering collaborates with public and private sectors to develop carbon-neutral technologies. The Thailand CCUS Consortium, involving various stakeholders, focuses on carbon capture, utilization, and storage (CCUS) to transform CO<sub>2</sub> from a pollutant into a commercial resource.

4. **Lifestyle Transition:** The university promotes low-carbon transportation options within its campus, including electric buses, bicycles, electric tuk-tuks, and electric scooters. Additionally, pedestrian walkways have been enhanced to facilitate convenient and eco-friendly commuting. The Chula Zero Waste initiative manages waste efficiently to minimize its impact on the environment.

5. **Social Transition Social Support System:** Chulalongkorn University actively engages its community, faculty, staff, and students in initiatives to reduce greenhouse gas emissions. This involves online platforms for communication, awareness campaigns, and activities to encourage sustainable practices.

**Future Initiatives:** The next phase involves a detailed analysis of the university's potential for reducing greenhouse gas emissions and the formulation of a comprehensive strategy that aligns with the university's mission. Five key strategies, encompassing energy efficiency, alternative energy, waste management, transportation, and green agriculture and forestry, will be explored. Notably, existing technologies with a proven track record will be prioritized. Potential measures will be carefully assessed considering their technological feasibility, economic viability, and environmental implications. The goal is to develop a sustainable and integrated approach for the university's continued development.

The Chula Race to Zero project is a forward-looking, multi-faceted initiative to transform Chulalongkorn University into a sustainability exemplar. It emphasizes a holistic approach encompassing technology, economics, and environmental considerations while seeking input and collaboration from various stakeholders. The project is set to define the future course of the university towards a sustainable and eco-conscious institution.





# The Chula Zero Waste Initiative: A Remarkable Journey Towards Sustainable Tomorrow



In 2017, the seeds of transformation were sown as Chulalongkorn University took an unprecedented step towards a more sustainable future with the launch of the Chula Zero Waste Initiative led by Chulalongkorn University's Environmental Research Institute and the Physical Resources Management Office. At the heart, this initiative lies a bold aspiration: to reduce the amount of waste destined for landfills.

The first phase of the initiative, spanning from its inception until 2021, set an ambitious target: to reduce 30% of waste generated on the university campus. This endeavor was not only about reducing waste but also about reshaping attitudes and behaviors towards consumption and disposal. A pivotal step in achieving the target was the 2018 announcement on Measures to Reduce Single-Use Plastic Waste in the University



Since then, all shops on campus are obliged to refrain from styrofoam containers and oxo-degradable plastic bags. Its strategic move to no longer provide free plastic bags to customers is both an economic instrument and a nudge towards behavioral change, marking a significant departure from conventional practices. Through policies, education, awareness campaigns, and the establishment of efficient waste separation systems, Chula had exceeded its initial goal and paved the way for a more conscientious approach to waste generation.

As the initiative transitioned into its second phase from 2021 to 2024, the overarching goal now encompassed a substantial increase to 75% in the waste diversion rate by 2025. To realize this goal, there is an effort to get students and staff involved and expand knowledge to the surrounding communities. It also creates a good for Chula students, shops and university personnel as well as bringing experiences and knowledge sets to introduce to the school, university, and other organization to drive society.

Looking into the future, as collaboration has been a key factor driving the success of the initiative, Chula envisions more collaborative endeavors with its student body, the City of Bangkok, and intergovernmental organizations like the United Nations Environment Programme (UNEP). This collaboration not only lends credibility to Chula's efforts but also amplifies its impact on a broader scale. In 2023, for the first time, The Student Government of Chulalongkorn University (SGCU) has set up a Sustainability division. Together with the Chula Zero Waste initiative, more joint workshops and training sessions for student club leaders, members, and interested individuals are planned to foster a culture of mindful consumption and raise awareness on our ecological impacts from the grassroots level. Scaling up to the city level, the initiative has set its sights on a new frontier—extending its impact beyond the university grounds to neighboring communities: to collaborate with 9 building and offices, 4 local schools and a temple under the project called “Pathum Wan Zero Waste”, partnering with the Bangkok Metropolitan Administration, the Thai Health Promotion Foundation and other

influential organizations. By offering expertise and guidance, Chula aims to serve as a trainer and catalyst for positive change in waste management practices. This endeavor aligns perfectly with the initiative's ethos of sharing knowledge, making a social impact and fostering a sense of environmental responsibility. The initiative has not only garnered attention locally but has also set an inspiring example on a global scale, the project has become a model for other regions aspiring to embrace sustainability. Visitors and participants of prominent international events, such as the Prince Mahidol Award Conference, have been drawn to Chula to witness firsthand the positive transformations. The initiative's collaboration with the United Nations Environment Programme (UNEP) on the international day of Zero Waste has further elevated its global recognition. The UNEP's expertise and global reach bolster collaborative efforts between regions, enabling us to exchange valuable insights and best practices from across the globe

In conclusion, the Chula Zero Waste Initiative exemplifies the power of vision, partnership, and collective action. From its inception in 2017 to its current efforts in fostering waste diversion, partnering with influential organizations and community engagement, the initiative embodies a commitment to shaping a sustainable tomorrow. With its eyes set on a horizon of social transformation, Chula leads the way in demonstrating that change is not just possible—it is within our grasp.





# Student Affair and sustainable green development

Chulalongkorn University has embarked on a remarkable journey to align itself with sustainable development goals. One of the latest initiatives is a remarkable project set in the picturesque Nan Province. This project, aptly named the “Sustainable Green Initiative,” aims to restore and revitalize an ecologically important area while fostering environmental consciousness among students and engaging with local communities.

Nan Province holds a strategic place in Chulalongkorn University’s sustainability strategy. The province hosts the Center of Learning Network for the Region (CLNR), making it integral to the university’s community outreach and research. However, despite its significance, the region faces formidable environmental challenges. Activities like large-scale corn farming have contributed to the release of substantial carbon dioxide (CO<sub>2</sub>) emissions and air pollution.

The vast corn fields are easily recognized as a significant contributor to environmental degradation in the region. The most common method for disposing of corn stubble is by burning it, which not only releases CO<sub>2</sub> but also contributes to the annual problem of PM 2.5 air pollution. The region’s agricultural areas include over 550,000 rai (approximately 220,000 acres) of corn fields, 331,398 rai of rice paddies, and 277,260 rai of rubber plantations. This situation is a significant concern not only for environmentalists but also for local communities affected by air pollution.

To combat these ecological challenges, Chulalongkorn University has launched a multifaceted initiative aimed at restoring and revitalizing the environment while enhancing student engagement and experiential learning.

**Reforestation with Dipterocarpus Trees:** The heart of this initiative is the reforestation of the region with Dipterocarpus trees. These trees are well-suited for restoring ecosystems and sequestering carbon, thus providing a sustainable solution to the CO<sub>2</sub> emissions.

**Innovative Techniques:** The project employs innovative methods like “Mycorrhiza” for enhancing tree growth and “Polymer” to improve soil moisture retention. These techniques contribute to the long-term ecological restoration of the area.

**Five-Level Forest Planting:** A distinctive feature of this initiative is a five-level forest planting approach. This includes tall, medium, short, ground cover, and subterranean plants to maximize ecological benefits and restore a biodiverse ecosystem.

**Community Involvement:** What sets this project apart is its engagement with the local community. Residents have generously offered a portion of their land to plant trees, further demonstrating the commitment to reforestation.

This initiative’s importance transcends ecological restoration. It aims to create a lasting impact on both the environment and the university’s students. Chulalongkorn University’s objectives for this project include:

- **Fostering Environmental Awareness:** By engaging students in activities that involve ecological restoration, the project aims to cultivate sustainable environmental awareness among the student body.

- **Community Collaboration:** The project encourages collaboration between students, alumni, and the local community. It’s an exemplary case of how an academic institution can be an active participant in community development.

- **Ecosystem Restoration:** The primary goal is to restore the ecosystem, mitigate CO<sub>2</sub> emissions, and combat land degradation. This creates an equilibrium within the local ecology and contributes to a healthier planet.

- **Experiential Learning:** The initiative offers students an opportunity to engage with the community and the environment, translating theory into practice. It is a hands-on education that goes beyond the confines of a classroom.

- **Cultural Learning:** The project also promotes an understanding of the region’s history and culture. It adds a layer of cultural richness to the academic experience and demonstrates how ecological sustainability is intertwined with cultural heritage.

Chulalongkorn University’s “Sustainable Green Initiative” is not just a project; it’s the institution’s commitment to sustainability, community engagement, and nurturing a sense of environmental responsibility among its students and the wider community. By combining education, community development, and ecological restoration, this initiative encapsulates the very essence of what modern universities should aspire to achieve in the age of sustainability.











## Paving the Way for Sustainable Recovery: Chulalongkorn University's BCG Economy Project

In the wake of the global COVID-19 pandemic, Chulalongkorn University is taking significant strides towards Sustainable Development Goal 1 - the eradication of poverty. One remarkable initiative, spearheaded by Assistant Professor Yupin Patarapongsant, Ph.D., Sasin School of Management, Chulalongkorn University is the "Driving Economic and Social Recovery Post-COVID-19 with the BCG Economy" project.

This project is not just a response to the challenges brought forth by the pandemic but a continuation of the university's commitment to sustainable development. It stems from the "University to Tambon (Integrated Sub-district Economic and Social Upgrading Project) at Sasin," and it brings fresh perspectives on recovery.

At the heart of this endeavor lies the invaluable Thailand Community Big Data (TCD). Gathered during the previous initiative, this data serves as a treasure trove of insights. It unveils the region's potential, resource readiness, and the rich biological and cultural diversity within the area. These factors are not just statistics but the building blocks for local development.

The driving force behind this project is the BCG Economy - Bio-Circular-Green. It's a visionary economic strategy that harnesses the power of sustainability. It's about doing business in a way that nurtures and respects the environment, supports local communities, and ensures economic growth.

Crucially, this project is not just about theories and strategies. It's about real, tangible impact. It's about increasing employment opportunities for graduates and residents in the region, at a time when these opportunities are crucial for recovery.

The importance of this project cannot be overstated. It takes a holistic approach, drawing upon the knowledge, technology, and innovation that already exist. It fosters collaboration with local government organizations and engages various stakeholders. Together, they tackle the challenges the community faces, with poverty alleviation as the ultimate goal.

## ขจัดความยากจน NO POVERTY

### Retirement Readiness Index

Teaming up with the Government Pension Fund of Thailand, Professor Wilert Puriwat, D.Phil. (Oxon), Dean of Faculty of Commerce and Accountancy at Chulalongkorn Business School has undertaken a mission to empower individuals with a vital weapon: financial literacy. The project is to provide people, especially those with financial challenges, with the knowledge and tools they need to break free from poverty.

Through dynamic workshops, accessible digital resources, and community engagement, the project imparts essential skills. From prudent budgeting to shrewd investment decisions, participants learn to navigate the complex financial landscape, securing their future and laying the foundation for sustainable livelihoods.

What sets this initiative apart is its holistic approach, reaching deep into communities and addressing the root causes of poverty. By arming individuals with knowledge, Chulalongkorn University is championing the spirit of SDG 1 – eradicating poverty in all its forms. This project is a testament to the university's commitment to creating lasting impact and shaping a brighter future for all.

### Bridging the Income Gap with Innovative Strategies for Retired Workers

In alignment with Sustainable Development Goal 1, the College of Population Studies proudly spearheads the groundbreaking "Innovation Project to Enhance Livelihoods and Income Opportunities for the Elderly and Retired Workforce through Digital Platforms." This visionary initiative, under Associate Professor Ruttiya Bhula-Or, Ph.D., Deputy Dean of College of Population Studies, Chulalongkorn University, sets out to elevate and safeguard the economic prospects of Thailand's elderly and retired population, effectively promoting economic inclusivity while systematically reducing long-standing disparities.

As the swift transformation of labor landscapes is catalyzed by the advent of the internet, machinery, and artificial intelligence, it becomes clear that adaptability is the key to sustained livelihoods across all age brackets. However, a considerable segment of elderly and retired workforce, encompassing individuals aged 45 to 59 (pre-retirement) and those aged 60 and beyond, encounters significant challenges in keeping pace with these changes. These challenges manifest primarily in terms of their access to and proficient use of digital technologies. To compound matters, there has been an unfortunate dearth of research and development endeavors aimed at fostering new employment opportunities for this demographic while effectively harnessing the transformative potential of digital technologies.

The platform caters to two primary target groups: firstly, the elderly and retired citizens aged 50 and above, who stand to benefit significantly from the post-retirement livelihood support and opportunities, and secondly, the broader community. This inclusive approach invites active participation from the youth and the general public alike, forging a sense of shared responsibility toward the creation of a more equitable and economically vibrant society.

This transformative project aspires to cultivate an entire ecosystem wherein the elderly and retired citizens can adapt and thrive. Operating within the framework of the Sufficiency Economy philosophy, the project holds a twofold objective: to provide essential economic stability and enhance the income of our elder citizens, thereby contributing substantially to the overarching goal of poverty reduction.

Moreover, the innovative strategies conceived here hold the potential to serve as pioneering models for comprehensive plans aimed at promoting lifelong learning. These models, in turn, can empower the target group to perpetually upskill and reskill throughout their lives, thereby serving as potent agents for local and societal growth.





## Unlocking Sustainable Development: Empowering Beef Cattle Farming in Nan Province

The project titled “Enhancing the Capacity of Livestock Farmers, Collaborative Mechanisms, and Sustainable Beef Market Expansion in Nan Province,” led by Assistant Professor Kaewlamun, D.V.M, Ph.D., Deputy Dean of School of Agricultural Resources, Chulalongkorn University, embodies a commitment to alleviate poverty through community-driven and sustainable agricultural practices.

Nestled in the northern region of Thailand, Nan Province has received generous financial support from the Provincial Livestock Office and provincial budget groups. A pivotal moment arrived in 2020 when the initiative to establish mixed beef cattle systems for small-scale farmers was launched, thanks to the support from the Bureau of Agricultural Economics.

However, it's important to understand that this project transcends cattle farming; it's about fostering collaboration and nurturing a robust ecosystem. The approach taken involves forging a network of stakeholders, including educational institutions, government agencies, and local farmers. Together, this collective aims to tackle several pressing challenges that have hindered sustainable beef farming in the province.

One of the standout challenges has been the absence of strong collaboration mechanisms, a deficiency that this project seeks to rectify. Furthermore, issues such as the disparity between beef quantity and quality concerning market demands have led to missed opportunities. There's also significant room for improvement in terms of production efficiency. Additionally, many farmers lack the requisite knowledge and skills for effective production planning. Lastly, a gap exists in terms of accurate and up-to-date data to guide the collaborative development of the beef industry in Nan Province.

The impact of this project radiates in multiple directions. Economically, it empowers local communities by providing interest-free loans that fund group activities. On the social front, the project cultivates through during on-site activities and raises awareness among farmers. Moreover, government agencies are increasingly prioritising the development of the beef industry, which presents opportunities to enhance farmers' income.

## Alleviating Poverty Through Innovative Cassava Farming

This initiative led by Assistant Professor Numpon Insin, Ph.D., Faculty of Science, Chulalongkorn University, exemplifies the university's commitment to driving positive change by addressing local challenges with innovative solutions. The project's focal point is to elevate the quality of life for cassava farmers in Na Khom Sub-district, Nakhon Sawan Province, an area marked by persistently low incomes despite the potential for high cassava yields.

The heart of the project lies in its holistic approach to tackling multifaceted challenges that perpetuate poverty among cassava growers. By introducing a novel approach to cassava production, the project aims to create a transformative impact on the socio-economic landscape of the region. Through the identification and cultivation of suitable cassava varieties for the local context, the project seeks to enhance yields and quality, empowering farmers to command better prices for their produce. Moreover, the project ventures into innovative cassava processing techniques. By establishing a cassava processing facility equipped with modern technology, farmers can add value to their produce and tap into higher-value markets. This strategic move not only boosts farmers' earnings but also contributes to the creation of a sustainable value chain, generating employment opportunities and fostering economic growth within the community. Furthermore, Chulalongkorn University empowers local farmers with the skills needed to implement modern agricultural practices effectively. This capacity building enhances crop productivity and builds resilience against environmental challenges, further securing farmers' livelihoods.







## จัดความหิว ZERO HUNGER

### Supporting the establishment of the National Food Bank of Thailand

The Scholars of Sustenance Foundation (SoS), a distinguished food rescue organization in Thailand, is taking a remarkable step towards bolstering the nation's food security with a groundbreaking proposal – the National Food Bank Policy. This visionary project by Assistant Professor Numpon Insin, Ph.D., Faculty of Science, Chulalongkorn University, carries a dual purpose: to showcase the significant contributions and unwavering reliability of the SoS Foundation and, concurrently, advocate for the imperative need for a comprehensive national food bank policy.

In pursuit of these goals, a series of interviews were conducted with representatives from various organizations. These discussions delved into the current food rescue operations spearheaded by SoS and the expectations that stakeholders harbor regarding a potential food bank policy. The insights gleaned from these dialogues have been nothing short of enlightening.

The findings now stand as a valuable resource, equipping the SoS Foundation with indispensable information to fine-tune and amplify its food rescue initiatives. Moreover, the outcomes of these interviews paint a compelling picture, illustrating the pressing necessity for government support and the formulation of a national food bank policy.

As Thailand grapples with the challenges of food security and sustainable resource utilization, the SoS Foundation's initiative takes center stage, reinforcing the country's commitment to the Sustainable Development Goals (SDGs) and a hunger-free future for all.







## The development of small ruminant production model for small-scale farmers to transform the farmers into smart farmers.

The School of Agricultural Resources (SAR) by Sarawanee Khunmanee, D.V.M., Ph.D. has spearheaded an innovative initiative, shifting from monoculture plantation to goat and sheep production. Collaborating with School of Agricultural Resources, Chulalongkorn University, and the Nan Provincial Livestock Office, SAR embarked on a transformative project titled "The development of small ruminant production model for small-scale farmers to transform the farmers into smart farmers." This endeavor, spanning from March 2020 to April 2023, aimed to replace feed corn production in the highlands of Nan, benefiting farmers in 10 sub-districts across 7 districts of the province.

Traditionally, unsuitable areas were exploited for feed corn production, wreaking havoc on the environment with deforestation, soil erosion, and the burning of agricultural raw materials. This unsustainable practice resulted in soaring production costs and meager incomes, compelling farmers to seek alternative livelihoods. Enter goat and sheep rearing, offering a manageable and versatile solution that thrived on diverse feed sources.

This project, executed in collaboration with ten organizations, empowered farmers with essential knowledge and skills in breeding, feeding, hygiene management, and efficient production planning for goats and sheep. Moreover, it fostered the establishment of a well-structured market channel for these small ruminants.

With 58 participating farmers, including 18 community innovators, the project has not only transformed livelihoods but also provided a sustainable alternative to traditional feed corn cultivation. Nan's agricultural landscape has evolved, ushering in increased income and an improved quality of life for its farmers, heralding a brighter future for the region's agricultural sector.



## Establishment of Research and Technology Transfer Center for Dairy Farming in Humid Regions, Saraburi Province.

This initiative, under the leadership of Associate Professor Kittisak Ajariyakhajorn, Ph.D., Faculty of Veterinary Science, Chulalongkorn University, the promise of transforming dairy farming in humid regions.

At its core, this project aspires to create a dynamic platform that bolsters research, education, and academic services within the faculty. However, it goes beyond academia; it's about forging powerful collaborations that bring together dairy farmers, government agencies, and academic institutions, fostering an environment conducive to learning and progress.

The geographical focus of this endeavor is Saraburi Province, a region characterized by its humid climate. Here, dairy farming faces unique challenges and opportunities, and this project aims to leverage both. By sharing insights, research findings, and technological innovations directly with dairy farming communities in Saraburi, Lopburi, and Nakhon Ratchasima provinces, the initiative seeks to elevate the industry.

The impact is multifaceted. It's about transferring knowledge and research technology. With access to cutting-edge research and technology, these farmers can enhance their production efficiency and refine their processes, leading to an increase in the quality and quantity of dairy products.

Crucially, the beneficiaries are the dairy farming communities. By providing them with the tools and knowledge to thrive in their profession, this project empowers individuals at the grassroots level, contributing directly to the eradication of hunger.





## สุขภาพและความเป็นอยู่ที่ดี **GOOD HEALTH AND WELL-BEING**

### Community Health Advancements: The Chula Health House

Initiative Led by Professor Chitlada Areesantichai, Ph.D., Dean of the College of Public Health Science, Chulalongkorn University, the Chula Health House conducts critical research in medical and public health sciences, serving as a hub for graduate and postgraduate students.

The Chula Health House has a threefold impact. Firstly, it delivers essential healthcare services to the community. Secondly, it employs community health data to reduce health risks and enhance healthcare knowledge through academic research. Lastly, it engages local residents in health program design and execution through collaboration with Chulalongkorn University and its network.

This approach aligns with Sustainable Development Goal 3 (SDG 3) - Good Health and Well-being, focusing on essential healthcare and public health while emphasizing community involvement, research, and knowledge dissemination for better health and well-being, locally and globally.

### Expanding Access to Eye and Muscle-Related Eye Treatment for Children in Remote Areas

Led by Worawalun Honglertnapakul, M.D., Department of Ophthalmology, Faculty of Medicine, Chulalongkorn University, in collaboration with Sisaket Hospital. Its primary goal was to provide comprehensive medical examinations and surgeries for children suffering from eye diseases and muscle-related eye conditions in remote provinces of Thailand. These areas often lacked access to specialized pediatric ophthalmologists, making this initiative crucial in ensuring these young patients received appropriate and timely treatment. The ultimate aim was to enhance their vision, quality of life, and the ability to lead normal lives.

The medical services established at various hospitals across different provinces, commencing in Sisaket Province. A dedicated team of pediatric ophthalmologists, comprising specialists and alumni, performed these critical medical interventions. The quantity of medical professionals and patients served varied depending on appointments and the specific needs of the children.

This project makes a significant contribution to SDG 3 (Good Health and Well-being) by directly addressing the healthcare requirements of children in remote areas. It provides specialized medical services that are vital for enhancing their health and overall well-being. Moreover, it underscores the importance of ensuring equitable access to healthcare services, especially for vulnerable populations residing in underserved regions.

### Innovative Brain Training to Combat Cognitive Decline for Seniors

In an aging world, cognitive impairment, particularly Mild Cognitive Impairment (MCI), emerges as a significant health challenge. MCI is a transitional stage between normal cognitive aging and severe conditions like dementia, impacting memory and thinking abilities. The critical concern lies in its potential progression to more severe cognitive impairments, affecting daily life and diminishing quality of life. To combat this concern, Associate Professor Solaphat Hemrungronj, M.D., Ph.D., in collaboration with the Faculty of Medicine, Chulalongkorn University, National Electronics and Computer Technology Center (NECTEC), and the Faculty of Engineering at Chulalongkorn University, initiated an innovative brain training program for the elderly.

The primary focus of this program is on early intervention and prevention, aiming to delay or mitigate cognitive decline.

A noteworthy achievement of this project is the significant delay in cognitive decline among its participants. Through tailored brain training exercises, over 300 elderly individuals have experienced notable improvements in their cognitive abilities. This not only enhances their quality of life but also lightens the load on caregivers and families.

Additionally, the project has a broader impact. Thirty experts underwent specialized training in the program, contributing to its sustainability and scalability. This multiplier effect ensures that the benefits extend to a wider audience of elderly individuals at risk of MCI.

This initiative, aligned with SDG 3 (Good Health and Well-being), exemplifies how advanced research and collaboration can address critical healthcare concerns and promote healthy aging, ultimately fostering a society where well-being in old age is a shared reality.





## Mental Health for All: The Online Service Network

The “Development of Online Mental Health Consultation and Mental Health Service Referral Network” project was initiated by Assistant Professor Nattasuda Taephant, Ph.D., Dean of Faculty of Psychology, Chulalongkorn University, in response to concerning mental health statistics in Thailand. The data revealed high suicide rates and an increasing prevalence of depression, partially attributed to inadequate or discontinuous mental health care for individuals with mental health issues. Additionally, the overall happiness of the Thai population had been decreasing.

Despite an increase in mental health services offered by both public and private sectors in Thailand, these services remain insufficient, leading to unmet needs and an inability to reach all individuals in need of mental health care. This gap in mental health care access stems from financial constraints, resource limitations, and an incomplete health coverage system.

The project aims to develop a comprehensive online mental health consultation service (Mental Health Online Service: MOS) that encompasses information provision, psychological counseling, and service referrals. It also seeks to establish a standardized mental health service database for various agencies, including governmental, civil society, and private organizations.

The project strongly aligns with Sustainable Development Goal 3, “Good Health and Well-Being,” through the following key aspects:

Universal Healthcare Access,  
Mental Health Promotion and Prevention,  
Health Workforce Development,  
Community-Based Care,  
and Enhanced Access for Vulnerable Groups.

The Outcomes and Impact of the project include:

- The MOS service has significantly improved the life satisfaction of users, as evident from statistical analysis.
- Proper referrals have been made to 691 individuals who required mental health services, out of which 428 received appropriate referral services based on their needs.
- An online mental health service database has been established, enabling organizations to access standardized mental health services.
- Mental health promotion activities have been conducted to raise awareness and provide psychological support, with participants expressing high satisfaction with the program.
- Advocacy and policy promotion efforts have reached a wide audience through social media channels, with 493,290 accesses to the project’s Facebook page and 3,750 shares of project-related information.

This project is contributing significantly to the improvement of mental health and the well-being of the Thai population, addressing mental health issues in alignment with SDG 3. It also sets a model for utilizing digital technologies and community networks to provide accessible mental health care.



## Teledentistry for Enhanced Oral Health Access

Aligned with the National 20-Year Strategy (2020-2039), this project by Professor Pornchai Jansisyanont, D.D.S., M.S., Ph.D., Dean of Faculty of Dentistry, Chulalongkorn University, uses digital technology on high-speed networks to enhance oral healthcare access. The focus is on underserved populations in remote areas the Nan and Saraburi provinces is the project’s focal points particularly.

Objectives of the project are:

- Expand access to oral health screening using intraoral cameras.
- Enable prosthetic dental services through intraoral scanning.
- Establish a real-time consultation platform between local and specialized dentists.
- Focus on disadvantaged groups, reducing healthcare disparities.
- Enhance the skills of local dental professionals.

Key Activities include:

- Planning and monitoring in Nan and Saraburi.
- Training for local healthcare professionals.
- Oral health screening at the community level.
- Delivery of prosthetic dental services.
- Development of “Thai Teledentistry” app.

The Outcomes and Impact of the project include:

- 6,778 individuals received teledentistry services.
- 2,564 received oral healthcare services.
- 18 individuals received prosthetic dental care.
- The “Thai Teledentistry” app facilitates real-time communication.

The project enhances healthcare access, especially for marginalized populations, aligning with SDG 3’s goal of good health and well-being. Digital technology and teledentistry improve healthcare delivery, supporting SDG 3’s broader objectives.



## Germguard: A Game-Changer in Wound Care for Thailand's Healthier Future

The development of a novel wound dressing material, Germguard, infused with natural extracts in Thailand exemplifies a significant advancement in healthcare aligning with Sustainable Development Goal 3 (SDG 3) - Good Health and Well-being. In response to the Thailand 4.0 policy's call for technological innovation and economic growth in the medical sector, the collaboration between the government and private agencies has been crucial. This initiative addresses the high cost of imported medical supplies while enhancing local communities' economic opportunities.

Leveraging the abundance of locally available natural extracts with medicinal properties, such as mangosteen peel extract rich in antibacterial components, Professor Pitt Supaphol, Ph.D. at the Petroleum and Petrochemical College, Chulalongkorn University, has developed an innovative wound dressing material. This dressing, known as "Xanfoam," combines Germguard technology for extended material life and increased antimicrobial efficacy. It effectively addresses previous concerns regarding adsorption, antimicrobial resistance, pressure resistance, and longevity.

Collaborative research efforts, including sterilization tests and clinical trials involving faculty from Chulalongkorn University, validate the product's potential for bacterial suppression and enhanced wound recovery. Prototype products have been successfully deployed in hospitals, with patients experiencing faster wound healing and reduced infection-related biofilm formation. The project's achievements have been recognized through government awards, reflecting its significant contribution to the long-term growth of the medical industry while promoting better health and well-being in Thailand and beyond.



## "46 Food Recipes to Train Swallowing" – A Lifeline for Seniors and Patients with Swallowing Difficulties

Lecturer Varanya Techasukthavorn from Chulalongkorn University's Faculty of Allied Health Sciences, in partnership with the Thai Dietetic Association, has embarked on a mission that transcends culinary innovation, with the objective to develop a collection of 46 nourishing recipes designed for the elderly and patients who grapple with the challenge of chewing and swallowing their food.

These recipes are not just culinary delights; they are lifelines for those who face the often-overlooked struggle of swallowing difficulties. The endeavor is rooted in the principles of the International Dysphagia Diet Standardization Initiative (IDDSI), ensuring that each dish serves as a means of not only sustenance but also a path to enhanced well-being.

While food may be rich in taste and nutrition, it loses its significance if individuals cannot enjoy it due to swallowing issues. This is a prevalent concern, especially among the elderly, and it can result in a loss of appetite, malnutrition, and a decline in overall health and quality of life.

Lecturer Varanya Techasukthavorn highlights the critical nature of this issue. She points out that improper swallowing can lead to severe consequences, including food entering the windpipe, potentially causing lung damage or even fatal incidents.

To address these challenges, professionals employ various assessment methods, from bedside tests to sophisticated videofluoroscopic swallow studies. Additionally, innovative devices have been developed to test the suitability of food and drinks for those with chewing or swallowing difficulties.

One such test is the "Fork Pressure Test," a novel approach to determine if food meets IDDSI standards. By assessing the texture's suitability for chewing and swallowing, it aids in crafting meals that are both safe and appetizing for individuals with swallowing difficulties.

The Thai Dietetic Association has compiled a recipe book titled "46 Recipes to Train Swallowing." This groundbreaking cookbook aligns with IDDSI standards and is a pioneering effort to provide meals specifically tailored to the needs of those with swallowing difficulties.

These recipes, ranging from Palo Egg Stew to Hainanese Chicken Rice, have been crafted with precision. They meet essential criteria, including texture, viscosity, nutritional value, and visual appeal, ensuring they are both nourishing and enticing for patients. The recipes have undergone rigorous testing in hospitals across Bangkok and various provinces.

In a future extension of this research, semi-processed high-protein foods and desserts designed for easier swallowing are on the horizon. These innovations promise not only sustenance but also the restoration of the joy of eating for seniors and individuals facing the challenge of swallowing difficulties.



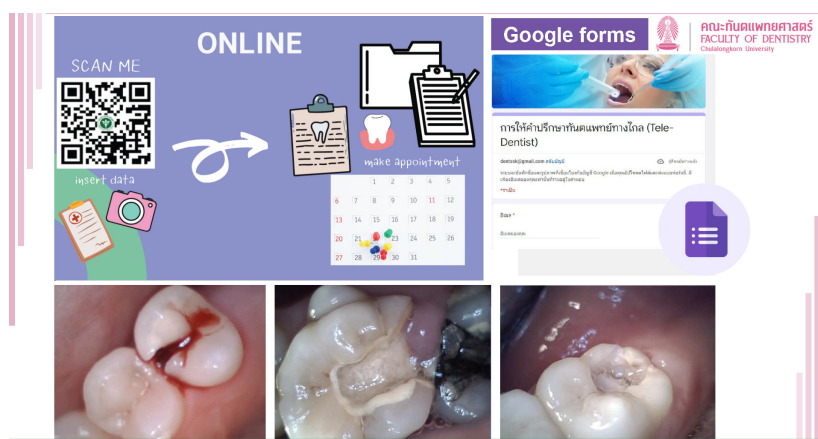


## Teledent: Enhancing Dental Healthcare Access for Vulnerable Groups

Oral health issues are prevalent and significantly impact people's daily lives. The treatment of dental conditions is essential to alleviate suffering and prevent further health complications. However, the current approach of repetitive treatments for recurring dental problems is unsustainable and fails to address the root causes. This leads to escalating costs, prolonged treatment periods, and an increased demand for specialized dental professionals. Conventional dental service models often fall short in effectively reaching and serving the entire population, especially economically and socially vulnerable groups.

The Teledent project aims to improve access to dental healthcare services for vulnerable populations. It achieves this by implementing measures such as telemedicine consultations, efficient appointment systems, extended service hours, and transportation services. Furthermore, the project focuses on training village health volunteers to provide basic oral health assessments, which enhances the efficiency of referrals to appropriate healthcare facilities.

Initiated by Issarapong Kaewkamnerdpong, D.D.S., Ph.D. at the Faculty of Dentistry, Chulalongkorn University, the Teledent project is an innovative approach to dental healthcare that aligns with SDG 3 by addressing inequalities in access to oral health services. Its emphasis on prevention, community involvement, and capacity building for healthcare providers showcases a comprehensive strategy for advancing oral health while promoting universal healthcare access and well-being. This project serves as a model for integrated oral healthcare solutions that improve health outcomes and enhance the quality of life for vulnerable populations.



## Thailand's First Pediatric Favipiravir Syrup: A Chula Pharmaceutical Sciences Triumph.

A collaboration between the Faculty of Pharmaceutical Sciences, Chulalongkorn University led by Assistant Professor Bodin Tuesuwan, Ph.D., the Chulabhorn Royal Academy, and the private sector resulted in Thailand's first pediatric favipiravir syrup for COVID-19 patients. The innovation received the Prime Minister's Award in the government sector category at the Startup and Innovation Thailand Expo 2021.

With the COVID-19 pandemic posing a significant health crisis in Thailand, Assistant Professor Bodin Tuesuwan, Ph.D., Faculty of Pharmaceutical Sciences, Chulalongkorn University, initiated the development of their favipiravir formula to enable hospitals to prepare the medicine in-house. The Chulabhorn Royal Academy provided the active ingredients for this initiative. The liquid favipiravir syrup, specifically formulated for pediatric patients, is sugar-free and flavored with raspberry, ensuring convenient and effective administration.

This initiative aligns with Sustainable Development Goal 3 (SDG 3) by enhancing the availability of a crucial COVID-19 treatment, making it accessible to a broader range of patients, especially children, and ensuring safe administration, thus advancing the principles of good health and well-being outlined in SDG 3





## International Nursing Conference: Shaping Healthcare for Sustainable Development

This conference under the supervision of Assistant Professor Suwimon Rojnowee, Ph.D., Faculty of Nursing, Chulalongkorn University adapted nursing education, research, and leadership to align with Thailand's "Thailand 4.0" and Sustainable Development Goals (SDGs). Established in 2012, Thailand Nursing Honors Society and Sigma Theta Tau International Honor Society of Nursing, Phi Omega-at-Large Chapter, aimed for knowledge exchange and excellence in nursing education, research, and leadership.

In 2023, Chulalongkorn University's Faculty of Nursing chaired the 15th annual international conference, uniting nine graduate nursing institutions. The impact included knowledge exchange from international and local experts, insights for 227 participants into research and nursing education, a highly-rated project (90.8% satisfaction), and 24 research papers with six awardees.

The conference emphasized SDG 3 (Good Health and Well-being) by enhancing healthcare quality through research, education, and healthcare management.



## Striving for Malaria Elimination in Thailand: The Malaria-Free Community Initiative

Operational from February 24, 2023, to August 31, 2023, the Malaria-Free Community Initiative is led by Assistant Professor Suttipat Srisutham, Ph.D., Department of Clinical Microscopy, Faculty of Allied Health Sciences, Chulalongkorn University, in collaboration with Raks Thai Foundation, Tak's World Vision Foundation, and Alight Foundation Thailand.

Initiated in alignment with the Thai government's commitment to malaria elimination, the project represents a linchpin in their strategy. Focusing on proactive case detection, it aims to target not only symptomatic individuals but also asymptomatic carriers. Detecting these hidden carriers is crucial as they, despite showing no symptoms, can still transmit the malaria parasite to others, perpetuating the disease's cycle. Thus, uncovering these asymptomatic carriers becomes pivotal in breaking the transmission chain.

Central to this endeavor is the utilization of advanced medical technology, specifically the real-time PCR HRM technique developed by Assistant Professor Suttipat Srisutham, Ph.D. at the Department of Clinical Microscopy, Faculty of Allied Health Sciences, Chulalongkorn University, renowned for its speed and pinpoint accuracy, this method can identify all five malaria strains, making it a game-changer for screening infections in high-risk malaria areas within Thailand, notably the provinces of Tak, Si Sa Ket, and Kanchanaburi.

The "Malaria-Free Community Initiative" has three primary objectives:

- **Proactive Detection:** The project aims to proactively identify malaria infections in the provinces of Tak, Si Sa Ket, and Kanchanaburi. It utilizes Rapid Diagnostic Tests (RDTs) and PCR-HRM technology to reach both symptomatic and asymptomatic cases.
- **Empowering Students:** This initiative instills a sense of social responsibility in the Faculty of Allied Health Sciences, Chulalongkorn University, participating in the project, they contribute to community well-being and gain invaluable real-world experience.
- **Sustainable Health:** The initiative puts its discoveries to work by offering proactive malaria case detection services. This contributes to the national objective of eradicating malaria and, more broadly, enhances the public health infrastructure in these communities, fostering sustainable health practices.

The project has successfully screened 389 individuals in high-risk areas, including asymptomatic cases.

By targeting malaria and bringing healthcare services to underserved communities, it contributes to SDG 3's mission of ensuring healthy lives and promoting well-being. This underscores the project's vital role in striving for a healthier and malaria-free future.





## Advancing Diabetes Management through Non-Invasive Wearable Glucose Monitoring

Diabetes is a global health concern, impacting millions of lives, and Thailand is no exception, with over 6.1 million people affected, half of whom remain undiagnosed. In response to this challenge, Nadhudda Rodthongkum, PH.D. at the Metallurgy and Materials Science Research Institute, Chulalongkorn University, initiated a groundbreaking project focused on Sustainable Development Goal 3 (SDG 3)

The project addresses the need for effective, non-invasive glucose monitoring systems for diabetes management. It aims to create a wearable glucose monitoring device that does not require skin piercing and can transmit data to smartphones for real-time monitoring.

This project has significant implications:

- **Improved Diabetes Management:** The non-invasive wearable device simplifies glucose monitoring, enhancing patient well-being.
- **Early Detection and Prevention:** It serves as an efficient tool for identifying at-risk individuals and implementing early interventions.
- **Relief on Healthcare Systems:** The project could reduce the burden on healthcare systems by minimizing hospital visits and costs.
- **Economic Growth:** The device's streamlined production process opens doors for medical device export, stimulating economic growth.

The project comprises three core research areas:

- **Non-Invasive Monitoring Device Development:** Creating a device that monitors blood glucose levels without skin piercing.
- **Data Transmission System:** Establishing a smartphone connection for real-time monitoring and data sharing.
- **Testing and Refinement:** Rigorous testing and refinement to ensure device accuracy and efficiency.

The impact achieved include:

- **Knowledge Dissemination:** The project's research findings have been published in a high-impact scientific journal.
- **Health and Quality of Life:** The non-invasive wearable device empowers individuals with diabetes to manage their health more effectively.
- **Economic Growth:** Streamlined production processes create opportunities for medical device exports, contributing to economic growth.
- The project exemplifies innovation in healthcare technology, significantly influencing public health. By pioneering a non-invasive wearable glucose monitoring system that seamlessly integrates with smartphones, this project contributes to the realization of SDG 3, ensuring improved health, accessible healthcare, and technological advancement for the betterment of society.



## Veterinary Initiatives Foster Health and Safety for Communities and Animals

The Faculty of Veterinary Science has embarked on two noteworthy projects aligning with Sustainable Development Goal 3 (SDG 3) - Good Health and Well-being. The first project, conducted from April 18, 2022, to April 20, 2022, centered on controlling the population of stray dogs and cats on Samed Island. Led by Miss Suwarat Wadeerat, D.V.M., The Small Animal Teaching Hospital, Faculty of Veterinary Science, Chulalongkorn University, in collaboration with Samed Resort Group and the local sub-district administration, implemented measures for sterilization and rabies vaccination, alongside providing general disease consultations to pet owners. The project successfully reduced the population of stray animals and prevented the spread of rabies, contributing to the health and safety of both residents and tourists on the island.

The second project, executed from July 4, 2022, to July 5, 2022, targeted the well-being of pets and the prevention of diseases in the community of Amphoe Mueang, Chon Buri. Also led by Miss Suwarat Wadeerat, D.V.M., The Small Animal Teaching Hospital, Faculty of Veterinary Science, Chulalongkorn University, sought to control the dog and cat population through neutering and administering rabies vaccines while offering disease consultations to pet owners. It successfully reduced the number of stray dogs and cats in the area and minimized the risk of rabies transmission, promoting the health and safety of the local population.

These projects demonstrate the Faculty of Veterinary Science's commitment to SDG 3 by actively addressing public health concerns related to animals and emphasizing the importance of responsible pet ownership.



## การศึกษาเท่าเทียม QUALITY EDUCATION

### One Fund, One Dream, Shaping the Future

Education stands as the cornerstone of individual development, societal progress, and national prosperity. In Thailand, the government highly prioritizes education, emphasizing equal access and opportunity for all, enshrined in a 15-year fundamental education policy, free of charge. However, challenges persist, especially for marginalized groups, including children with facial and cranial abnormalities, often coupled with social issues such as drug abuse, human trafficking, and unemployment.

Recognizing this gap, the Somdech Phra Debaratana Medical Center by Professor Emeritus Charan Mahatumarat, M.D., at the Faculty of Medicine, Chulalongkorn University, and the Thai Energy Foundation joined forces to initiate the “One Fund, One Dream, Shaping the Future” project to provide educational scholarships to underprivileged students receiving medical care for facial and cranial abnormalities.

In its inaugural year in 2022, the project granted scholarships to 30 deserving students, totaling 319,300 Thai Baht. The impact was profound, alleviating financial burdens on families and providing these students the highest benefit. It offered them the opportunity to pursue education, reducing the risk of them dropping out of the system due to economic hardships. The project plans to continue this effort from 2023 to 2026, expanding its reach to include at least 100 new students. This expansion aims to further align with Sustainable Development Goal 4: Quality Education.

This project contributes significantly to ensuring inclusive and equitable education for all, irrespective of their financial circumstances or medical conditions, fostering a brighter future for Thailand's youth.



### Advancing High-Skill Career Opportunities for Special Needs Learners: High-Skill Career Innovation Fund – Year 2

In the realm of Chulalongkorn University's educational initiatives, the High-Skill Career Innovation Fund project emerges as a transformative force. Championed by Assistant Professor Chanisa Tantixalerm, Ph.D., Faculty of Education, Chulalongkorn University, this project is dedicated to bridging educational gaps for learners with special needs. Its core mission revolves around enhancing and expanding the impact of high-skill career opportunities tailored to these learners. The multifaceted approach entails not only improving the support systems within vocational education but also delving into profound research, aimed at exploring innovative strategies that can elevate the quality of educators. These strategies encompass instilling knowledge and skills while fostering positive attitudes essential for effective teaching of learners with special needs. Moreover, the project extends its reach to provide comprehensive care, assistance, and the development of necessary skills that enable a smooth transition into the workforce, thus ensuring these learners are well-prepared for employment. Collaboration is at the heart of this initiative, as it actively engages a network of entities and stakeholders in the transformative journey towards enhancing employability. The impacts are far-reaching: learners with special needs are granted scholarships to pursue advanced vocational certificates; vocational institutions witness a remarkable improvement in the management of special education; and a network for job creation targeting these learners expands, encompassing both government agencies and private sector organizations. This project, operating under the High-Skill Career Innovation Fund, is not just about education; it's a commitment to creating talent, generating opportunities, and fostering employment. In a society where highly skilled professionals hold the key to economic prosperity and development, initiatives like these pave the way for a more inclusive and equitable future, aligning perfectly with Thailand's vision of Thailand 4.0.





## Chulalongkorn University's Faculty of Commerce and Accountancy – Advancing Sustainable Development through Collective Initiatives

As the world strives to meet the United Nations' Sustainable Development Goals (SDGs), education stands at the forefront of creating a better future for all. Among these goals, SDG 4 - Quality Education - holds a pivotal role in shaping a more equitable and sustainable world. The Faculty of Commerce and Accountancy, under the supervision of Professor Wilert Puriwat, D.Phil. (Oxon), at Chulalongkorn University, Thailand, is passionately leading the charge in responding to SDG 4 through transformative projects.

### **Ensuring Educational Institution Safety**

In the era of the “New Normal,” ensuring safety in educational institutions is paramount. The project exemplifies a model for safety and quality in education, directly addressing SDG 4's call for secure and quality learning environments.

### **Encouraging Active Learning with Innovative Convenience Store Competition**

Active learning is central to effective education. The project emphasizes hands-on learning experiences to equip students with practical skills, making them active contributors to their communities.

### **Quality Learning Materials for Financial Literacy**

The project is dedicated to enhancing financial literacy among school students. By developing high-quality learning materials, it aims to empower individuals with essential life skills and knowledge for responsible financial decision-making.

### **UP ACADEMY – Bridging Academia and Industry**

The project focuses on enhancing the quality of education by aligning curriculum with real-world business challenges. This prepares the students to enter the workforce seamlessly and also offers opportunities for continuous learning and development. The primary beneficiaries are the students of Chulalongkorn University's Faculty of Commerce and Accountancy.

### **Bridging the Digital Divide in Education**

Recognizing the importance of digital literacy, the project seeks to bridge the digital divide by providing necessary technological resources to underserved students. It directly supports SDG 4 by ensuring equal access to quality education.

### **SME Capacity Building in Thailand**

This project is a partnership between the Department of International Trade Promotion (DITP). It emphasizes the vital role of small and medium-sized enterprises (SMEs) in Thailand's economic future. The initiative supports academic activities, knowledge sharing, and trade promotion activities aimed at empowering Thai SMEs to grow domestically and internationally. The primary beneficiaries are small and medium-sized enterprises (SMEs) in Thailand.

### **Practical Learning Enhancement for Students**

By continually enhancing the quality of higher education, the project strives to prepare students with the knowledge and skills they need to excel in a competitive world. This directly contributes to SDG 4's vision of providing quality education.

### **Promoting Lifelong Learning**

The project encourages continuous learning among adults and professionals. In a rapidly changing world, upskilling and reskilling are vital to adapt to evolving demands in the job market.

### **World Economic Forum's Future of Jobs Report 2023**

In collaboration with the World Economic Forum, the project conducts the Future of Jobs Report. This vital survey influences changes in business and organizational landscapes, driving preparedness for the rapidly transforming job market.

### **Innovation for Society**

The project highlights the importance of integrating sustainability principles into business education. By doing so, the project prepares students to contribute to sustainable development and align with SDG 4's emphasis on relevant skills.



Collectively, these projects embody the faculty's holistic approach to SDG 4. They emphasize lifelong learning, inclusivity, and adaptability, ensuring education remains relevant to evolving societal needs. The information generated from these projects is invaluable to government agencies, executives, entrepreneurs, educational institutions, and the interested public. They offer insights into crucial aspects of changing job markets, facilitating effective human resource planning and development.

These projects not only respond to the challenges of today but also illuminate the path to future-ready education, empowering individuals and organizations to thrive in an ever-changing world.

## Comprehensive Report: Faculty of Arts, Chulalongkorn University's Contributions to SDG 4

The Faculty of Arts by Assistant Professor Nirada Chitrakara, Ph.D. at Chulalongkorn University is deeply committed to advancing the United Nations Sustainable Development Goal 4 (SDG 4), dedicated to Quality Education. Through a series of eight dynamic projects, the Faculty demonstrates its resolute commitment to the pursuit of quality education, lifelong learning, and the promotion of sustainable development.

### Language Lessons through the Screen:

Embracing innovative teaching methods to make language education more accessible and lifelong learning possible.

**Toward Global Humanities:** Promoting a global perspective on cultural studies and contemporary societal issues.

**Gender Diversity in TV Series:** Raising awareness about gender diversity in media to educate and enlighten the academic community and the public.

### Linguistic Change in Pandemics:

Exploring the effects of pandemics on language, enhancing language competence and global awareness.

**The Spread of English:** Focusing on the global influence of the English language, while promoting global social understanding.

**ASEAN and the West:** Promoting a comprehensive understanding of ASEAN-Western interactions to foster cultural competence.

**Environmental History:** Increasing awareness of global societal issues by studying environmental history.

### Virtual Field Trips for Geography

**Teaching:** Leveraging technology to provide virtual field trips, fostering intellectual development.

These projects reflect the Faculty's dedication to quality education, inclusivity, and addressing contemporary issues, directly aligned with SDG 4. Together, they contribute to a more informed, inclusive, and aware society creating a better, more informed world through quality education and lifelong learning, both within and beyond its academic community.

## Transdisciplinary Education: A Pathway to Achieving SDG4

Sustainable Development Goal 4 (SDG4) underscores the significance of quality, inclusive, and accessible education for all. In this context, initiated by Associate Professor Naruemon Thabchumpon, Ph.D. at the Faculty of Political Science, transdisciplinary education emerges as a powerful tool to align with SDG4's objectives. Transdisciplinarity encourages breaking down academic barriers and nurturing a holistic approach to understanding complex global challenges.

Transdisciplinary education seeks to transcend traditional boundaries within academia. It promotes an approach where students, teachers, and researchers engage with diverse forms of knowledge and perspectives. This method complements SDG4 by advocating inclusive and high-quality education.

The Teaching Manual: A teaching manual dedicated to transdisciplinary research acts as a practical resource for educators, students, and researchers. It draws on insights from a diverse group of contributors, making it adaptable and accessible through online platforms. This openness fosters flexibility, allowing users to tailor their learning experiences to specific contexts and needs.

It promotes:

- **Inclusivity and Equity:** Transdisciplinarity welcomes diverse perspectives and voices, aligning with SDG4's commitment to education for all.
- **Quality Education:** The manual promotes critical thinking, reflexivity, and knowledge synthesis, enhancing the quality of education.
- **Lifelong Learning:** Transdisciplinary education nurtures a culture of continuous learning, resonating with SDG4's call for lifelong learning opportunities.
- **Global Citizenship:** By addressing global challenges, transdisciplinarity encourages a sense of global citizenship, reflecting SDG4's global perspective.
- **Partnerships:** Collaboration is at the heart of both the manual's development and SDG4's emphasis on global partnerships.
- **Ethics and Values:** The manual's ethical considerations align with SDG4's focus on instilling values and ethics in education.

Transdisciplinary education, as exemplified by the teaching manual, embodies the principles of SDG4. Its inclusive, adaptable, and quality-driven approach empowers individuals and contributes to societal progress, thereby advancing the broader goals of sustainable development.







## Language Institute's Contribution to SDG4: Quality Education

Chulalongkorn University's Language Institute by Assistant Professor Wutthiphong Laoriandee, Ph.D. is actively engaged in supporting Sustainable Development Goal 4 (SDG4). Through a series of impactful initiatives, the Language Institute demonstrates a commitment to improving education, particularly in the realm of language instruction. Here's an overview of the four key projects undertaken by the Language Institute.

### **International Research Webinar 2022 - "Sustainable Development Goals: Ensuring Quality Education and Leveraging Innovative Classrooms"**

This international research webinar focuses on the critical role of SDG 4 in promoting inclusive and equitable quality education. By offering a platform for discussions on research and development in the field of language education, it fosters innovative practices and the development of quality education standards. The event targets English language practitioners, researchers, administrators, policymakers, and students, both local and international.

### **Reskilling and Upskilling Secondary School Teachers in Thailand**

This project centers on elevating the skills and knowledge of secondary school English teachers in Thailand. As proficient teachers are essential for enhancing students' language proficiency and readiness, the project aims to provide real-world training, ensuring that these educators can adapt to evolving teaching approaches effectively. The program targets 30-40 secondary school English teachers across the country.

### **Equitable and Inclusive Language Education Seminar: New Paradigms, Pathways, and Possibilities**

This seminar, under the theme "Equitable and Inclusive Language Education: New Paradigms, Pathways, and Possibilities," emphasizes the importance of diversity in education. It encourages dialogue among educators, policy-makers, and other stakeholders to explore innovative classroom practices and policy implementation. The project has a profound impact on improving English language teaching quality in Thailand.

### **Enhancing English Language Teaching Skills at the Primary Level - Phase 1**

This project supports primary school English teachers in Thailand, enhancing their teaching skills and English proficiency. Through training, the project aims to uplift the knowledge and capabilities of these teachers, directly contributing to quality education at the primary level. The initiative targets 100 primary school English teachers in both government and private schools.

In summary, the Language Institute at Chulalongkorn University actively participates in the pursuit of SDG4 - Quality Education, Covering a wide spectrum of educational levels, from primary to secondary, and focus is on strengthening language teaching and learning. By advancing language education and adopting innovative practices, the Language Institute plays a vital role in ensuring quality education and fulfilling the objectives of SDG4. Through research, training, and seminars, they foster an inclusive and equitable learning environment, positively impacting both educators and students alike.

## Pioneering Lifelong Learning and Skill Development in the 21st Century

The Faculty of Economics at Chulalongkorn University, in collaboration with SEAC, ITIM, and Degree Plus, has embarked on a mission to address the evolving demands of the 21st century by developing a curriculum that nurtures essential life skills and fosters lifelong learning opportunities. This initiative, spanning from October to September 2023, is a response to the rapid societal changes where the need for continually acquiring and updating skills has become paramount.

Recognizing its role in enhancing educational accessibility and skill development, the Faculty of Economics has partnered with various organizations to create and promote curricula that facilitate the acquisition of new skills. Moreover, it has taken steps to make these training programs widely accessible, thereby reducing societal disparities and embracing a lifelong learning approach.

The curriculum focuses on two primary objectives. First, it aims to upskill and reskill individuals, ensuring they possess the updated competencies needed for contemporary jobs. Second, it strives to widen access to quality economics education through online platforms, catering to the evolving educational landscape. Skill Development Certificate Programs, such as Economic and Business Data Analysis, Mini Master in HR Management, Risk Management, Project Investment Analysis and Management, Human Resource Development, and Strategies for Achieving Competitive Advantage, have garnered significant interest from government institutions, the private sector, and the public, benefiting over 1,200 participants.

Additionally, the program seeks to broaden educational opportunities, exemplified by the Foundation Economics for High School Students Program. This initiative enables high school students, both in Bangkok and various provinces, to gain university-level education in economics. Its objective is to equip students with essential information for making informed decisions when pursuing a degree in economics at the higher education level.

In summary, this collaborative effort aligns with Sustainable Development Goal 4 (SDG 4) It addresses the evolving educational needs of the 21st century, ensuring individuals have access to skill development and educational opportunities that empower them to thrive in an ever-changing world.



## Transforming Thailand's Metal Plating Industry Through Innovative Education

Thailand's metal plating industry stands at a crossroads, grappling with the challenges posed by rapid technological advancements. Small and Medium-sized Enterprises (SMEs) within this sector are particularly susceptible, struggling to keep pace with the ever-evolving landscape of technology and innovation. At the forefront of this transformation is the Metallurgy and Materials Science Research Institute, Chulalongkorn University, led by the visionary Professor Yuttanant Boonyongmaneerat, Ph.D.

Among the myriad issues faced by Thailand's metal plating industry, one looms large - the critical skills gap pervasive throughout its workforce. From fundamental electrochemistry principles to specialized roles such as machine operators, quality inspectors, and cutting-edge researchers, this industry demands a diverse and dynamic skill set. However, the current educational infrastructure in Thailand falls short of delivering these specialized skills, leading to a significant "skills gap" affecting both existing professionals and those aspiring to join the industry.

In response to this formidable challenge, Chulalongkorn University has joined forces with the Fraunhofer Institute IPA and Thailand Professional Qualification Institutes to embark on an ambitious project. Their mission is to create a tailor-made Human Resource Development Platform meticulously designed to cater to the unique requirements of the metal plating industry. This holistic platform encompasses curriculum development, collaboration with stakeholders, and the creation of specialized course content, ensuring that education and training precisely align with industry demands and professional benchmarks.

A pivotal element of this endeavor is Continuous Vocational Education & Training (C-VET), emphasizing the continuous nature of learning. C-VET offers existing industry professionals opportunities to augment and modernize their skill sets, guaranteeing their competitiveness and adaptability within a swiftly evolving field.

Yet, the project's aspirations extend beyond the immediate horizon. It envisions creating a scalable model for human resource development, capable of enhancing the capacities of diverse industry clusters. This ripple effect holds the potential to bolster the competitiveness of numerous sectors within Thailand's economy.

In the context of Sustainable Development Goals (SDGs), this project harmonizes seamlessly with SDG 4: Quality Education. It actively advocates for the nurturing of a highly skilled and adaptable workforce, a prerequisite not solely for the metal plating industry but for various sectors grappling with the need for adept professionals. In doing so, it underscores the pivotal role of education in preparing individuals to confront the challenges posed by a rapidly evolving job market.





## Education Beyond Boundaries: A Catalyst for Inclusivity

In a bid to promote educational inclusivity and empower students outside the formal education system, the “Support and Development of Teachers and Out-of-School Children Mechanism” project came to life. This initiative spanned from July 15, 2020, by the Faculty of Education, specifically, the “Children and Youth Development Research Unit” within the Department of Lifelong Education., led by Associate Professor Wirathep Pathumcharoenwattana, Ph.D.

Associate Associate Professor Wirathep Pathumcharoenwattana, Ph.D., and a dedicated team. The project was sponsored by the Equitable Education Fund (EEF), established by the Equitable Educational Act of 2018. The EEF’s mission, focuses on promoting and supporting children and youth without access to conventional education.

This initiative sought to address the needs of children outside the formal education system, striving to create a more diverse, flexible, and inclusive framework to reach these students, especially in various provinces across the nation.

Activities within this endeavor included collecting data on both teachers and out-of-school children, organizing interactive learning forums to assess the situation, needs, and developmental requirements of these children. Training sessions, equipped with practical insights, were conducted to enhance the capabilities of teachers working with these students. A knowledge repository was established to support the work of teachers with out-of-school children.

Furthermore, the project encompassed field visits, continuous support, coaching, and advisory roles for initiatives that received funding from the EEF. This collective approach involved various local and national stakeholders, such as provincial governors, education officials, local health agencies, and educational institutions.

The impact of the project was remarkable, directly benefiting 3,161 out-of-school children and 35,003 children involved in different projects. These children gained essential skills and developed a profound understanding of their own interests and abilities, empowering them to pursue skill development, livelihood, and basic education beyond the conventional school environment.

By extending educational support to out-of-school children and enhancing the skills of teachers, it contributes significantly to the broader goal of global educational inclusivity.



## Building Inclusive Futures: Strengthening Teacher Competencies for Non-Formal Education

The project “Development of Competencies for Non-Formal Education Teachers” by Associate Professor Wirathep Pathumcharoenwattana, Ph.D., Head of Department of Lifelong Education, Faculty of Education, Chulalongkorn University, seeks to improve the competencies of teachers working with out-of-school children in Thailand. It addresses several key issues related to the education of children who are not part of the formal education system.

The project’s main goal is to analyze and enhance the competencies of teachers working with out-of-school children. It aims to develop a competency-based model for these teachers, ensuring that they can provide the necessary education, support, and guidance to children facing diverse challenges. The project involves collaborating with various stakeholders, including government agencies, non-governmental organizations, and universities, to develop and implement this model.

The “Development of Competencies for Non-Formal Education Teachers” project aligns with SDG4 by promoting inclusive education, enhancing teacher competencies, and providing equal opportunities for out-of-school children, thereby contributing to the broader agenda of sustainable development.



## Empowering Female Migrant Workers: Research on Violence Experiences

Led by Assistant Professor Montakarn Chuemchit, Ph.D., Deputy Dean of College of Public Health Sciences, Chulalongkorn University, this research project delves into the experiences of violence among women migrant workers (WMW) migrating from Lao PDR, Myanmar, and Cambodia to Thailand.

The study's potential impact is significant. It will contribute valuable evidence regarding Violence Against Women (VAW) within the context of labor migration in the ASEAN region. It seeks to explore the intricate connections between migration and the vulnerability of WMW to violence. By identifying risk factors that expose WMW to violence and exploitation, as well as protective measures and coping strategies that can mitigate these risks, the research aims to prioritize the voices and perspectives of women and survivors. Ultimately, it aspires to inform program development and service delivery that is responsive to the needs of these vulnerable populations.

The primary target audience for this research includes women migrant workers from Myanmar, Cambodia, and Laos who are currently residing in Thailand. This project aligns closely with Sustainable Development Goal 5 (SDG 5) - Gender Equality, as it addresses the issue of violence against women, particularly in the context of labor migration, and seeks to empower and protect these women through research-based solutions and advocacy.

## ความเท่าเทียมทางเพศ GENDER EQUALITY

### Breaking Barriers: Transforming Healthcare for Gender-Diverse Communities

In a pioneering move, Thailand's Chulalongkorn University's Faculty of Medicine is reshaping healthcare for gender-diverse individuals. Led by Associate Professor Krasean Panyakhamlerd, M.D., this initiative is not only breaking new ground but also advancing Goal 5 of the Sustainable Development Goals (SDGs) – Gender Equality.

This visionary project responds to shifting social norms, legal changes, and the recognition of diverse gender identities. It aims to create a healthcare environment that is accessible, respectful, and non-discriminatory for all, regardless of age or gender identity.

Central to this initiative is the King Chulalongkorn Memorial Hospital, established in March 2018. The clinic's primary mission revolves around three pillars:

**Holistic Care:** The clinic collaborates closely with the Center of Excellence in Transgender Health at Chulalongkorn University, ensuring that gender-diverse individuals receive comprehensive, coordinated care. This approach has streamlined patient care and reduced wait times.

**Knowledge Sharing:** The project conducts national conferences on transgender health, educating medical and public health professionals. These conferences have attracted over 400 participants, fostering a deeper understanding of transgender healthcare.

**Educational Resources:** A significant milestone is the creation of Thailand's first comprehensive transgender healthcare manual. It serves as a guide for medical and public health practitioners, promoting correct and up-to-date care practices.

The impact of this initiative is substantial:

**Enhanced Access and Satisfaction:** Gender-diverse individuals now experience more convenient and satisfying healthcare services. They feel respected and confident when seeking medical care, with the provision of psychiatric services and shorter waiting times.

**Knowledge Dissemination:** The national conferences have empowered medical professionals and public health workers with the knowledge and practical skills required for transgender healthcare. The inclusion of renowned experts has also raised awareness among the general public, fostering greater acceptance of gender diversity.

**Educational Resources:** The comprehensive healthcare manual ensures that medical practitioners and public health workers across Thailand have access to standardized, up-to-date transgender healthcare guidelines.

**Research Contributions:** Several research studies related to gender-diverse individuals have been published in prestigious international journals, serving as references for Thailand's societal and healthcare advancements.

This groundbreaking project not only promotes Gender Equality (SDG 5) but also contributes significantly to reducing health-related inequalities, promoting the well-being of gender-diverse individuals, and conserving the country's healthcare budget. As Thailand continues to lead in transgender healthcare, it sets an inspiring example for the world to follow in the path toward gender equality.





# การจัดการน้ำและสุขาภิบาล CLEAN WATER AND SANITATION

6 CLEAN WATER  
AND SANITATION



## Faculty of Engineering's Visawapat Dam at Huai Tang Ho in Nan Province: A Model for Clean Water Access

In a proactive initiative led by Assistant Professor Surat Kwanmuang, Ph.D., Chulalongkorn University's Faculty of Engineering, in collaboration with student scholars, has embarked on a transformative project with far-reaching implications for clean water accessibility in Nan Province, Thailand. The project's primary objective is to foster sustainable local development and cultivate a sense of social responsibility among community members. At its heart lies an annual engineering camp where students pool their talents and resources to make a tangible impact.

Through extensive surveys and data collection within the Sunta community of Nan Province, a pressing issue came to the forefront: water scarcity. Particularly during dry seasons, the community grappled with insufficient water for both consumption and agriculture, apart from corn cultivation. This scarcity had cascading effects, from encroachments on reserved forest areas to severe smoke pollution caused by burning corn stalks. While the village was situated near perennial streams, the volume and depth of water were inadequate for practical use. The solution, as the project team determined, lay in constructing check dams to trap water and establishing a robust system to channel water to reservoirs. Furthermore, tanks would be set up to ensure a consistent water supply for the community.

The impacts of this project resonate powerfully with the Sustainable Development Goal 6 (SDG 6): Clean Water and Sanitation. By ensuring year-round access to clean water, the project directly addresses SDG 6's mandate of ensuring the availability and sustainable management of water and sanitation for all. This not only contributes to environmental sustainability but also enhances the livelihoods and well-being of Sunta community residents. In addition to fulfilling the basic human right to clean water, the initiative has instilled vital engineering skills in student scholars, bolstered their community engagement abilities, and imbued them with a profound sense of social responsibility. As a model for sustainable community development and responsible citizenship, Faculty of Engineering's Visawapat Dam at Huai Tang Ho in Nan Province sets a compelling example for realizing the objectives of SDG 6 on a local scale.



## Sustainability on Tap

Chula Zero Waste is an initiative by Chulalongkorn University that involves the installation of 130 water dispensers across the university campus. These dispensers are part of a sustainable waste management project within the university, covering an area of 1 square kilometer. They cater to the needs of over 40,000 students and staff, and they are strategically located in various campus buildings, including offices and food facilities.

These water dispensers are regularly maintained and have their filters replaced as needed. Some of them, especially those in high-traffic areas like the food facilities, may require more frequent filter changes, given their heavy use.

Importantly, these water dispensers are designed to provide clean drinking water for everyone within the university community, not just students and staff. Approximately 19 dispenser locations have been identified across the campus. These locations include cafeteria areas, university buildings, and student dormitories, ensuring that anyone in these areas can access clean drinking water for free.

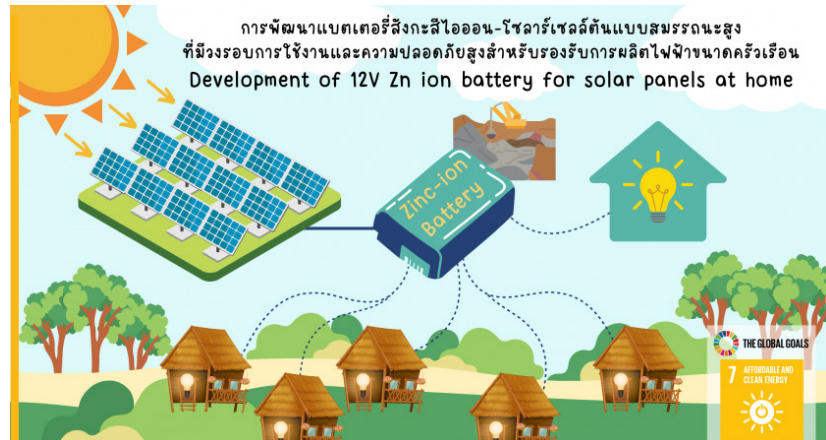
Beyond the convenience and accessibility of clean water, Chula Zero Waste aligns with Sustainable Development Goal 6 (SDG 6) - Clean Water and Sanitation. This initiative promotes access to clean water for all, regardless of their status within the university. It also encourages the responsible use of water resources by reducing unnecessary plastic waste. Users can fill their reusable water bottles at these dispensers, eliminating the need to purchase bottled water in single-use plastic containers. This contributes to reducing plastic waste, with the potential to prevent up to three plastic bottles per visit.

In summary, Chula Zero Waste is an initiative that not only provides easy access to clean drinking water for everyone within Chulalongkorn University but also promotes sustainability by reducing plastic waste. It directly aligns with SDG 6, contributing to the global effort to ensure clean water and sanitation for all.



# พลังงานสะอาดที่ทุกคนเข้าถึงได้

## AFFORDABLE AND CLEAN ENERGY



### Innovative Battery-Solar Cell Hybrids: Empowering Communities with Sustainable Energy

In a world where sustainable energy is becoming increasingly crucial, Professor Pranut Potiyaraj, Ph.D., and his team at the Metallurgy and Materials Science Research Institute, Chulalongkorn University, are pioneering an innovative project that holds the potential to revolutionize access to clean and affordable energy. Their research focuses on the development of high-capacity zinc-ion batteries integrated with solar cells, offering an efficient and cost-effective solution for household electricity production.

One of the main challenges of renewable energy sources like solar power is their intermittency. Traditional lithium-ion batteries, although widely used, have safety concerns and production costs that need to be addressed. However, zinc-ion batteries, which possess remarkable advantages. They boast high capacity, safety features, environmental sustainability, and cost-effectiveness. The research team capitalizes on Thailand's abundant zinc resources, particularly in the Doi Pha Dang in Tak Province, to produce these batteries.

The impact of this project is far-reaching, particularly in the context of Sustainable Development Goal 7 (SDG 7): Affordable and Clean Energy. By developing a dependable and affordable energy storage solution, it addresses the critical need for accessible and clean energy. This innovative approach can be a game-changer for off-grid communities and regions near protected areas, where traditional power infrastructure is impractical. Moreover, it has economic implications, reducing reliance on imported battery technology and fostering local production.

In summary, Professor Pranut Potiyaraj, Ph.D., research project offers a promising path to overcome energy access and affordability challenges. It taps into Thailand's natural zinc resources to provide clean, sustainable energy solutions. By creating a secure and cost-effective means of energy storage and distribution, this project aligns seamlessly with SDG 7's goals of ensuring universal access to affordable, reliable, sustainable, and modern energy. It empowers communities with the tools they need to embrace renewable energy sources, bringing us closer to a future powered by clean and accessible energy for all.





## CASE Project: Advancing SDG 7 for Clean, Affordable, and Secure Energy in Southeast Asia

Southeast Asia is undergoing a pivotal energy transition, driven by the Clean, Affordable, and Secure Energy (CASE) project. Led by Siripha Junlakarn, Ph.D., and orchestrated by the Energy Research Institute, Chulalongkorn University, this initiative is set to revolutionize the energy landscape across the region, aligning closely with the United Nations Sustainable Development Goal 7 (SDG 7).

The CASE project has its sights firmly set on four key nations: Indonesia, the Philippines, Thailand, and Vietnam. The primary objective is to redefine the narrative and mindset surrounding energy transition. This paradigm shift is essential for fostering long-term impacts and, most importantly, for safeguarding the environment.

At the heart of CASE lies the promotion of renewable energy sources, aiming to increase their share in the electricity generation process. By doing so, the project seeks to reduce the heavy reliance on fossil fuels, a crucial step in lowering greenhouse gas emissions and mitigating climate change. In addition to environmental benefits, this transition creates economic opportunities. The renewable energy sector generates employment and reduces health issues.

The CASE project also offers valuable policy recommendations for governments. These recommendations empower public institutions to achieve their climate change objectives effectively. This multi-pronged approach embodies the spirit of SDG 7, advancing accessibility, affordability, and sustainability of energy sources while safeguarding the environment and fostering economic growth.

The CASE project's target groups encompass a broad spectrum, including governments and public sectors, local think tanks, civil society organizations, and the private sector, including financial institutions and investors. This comprehensive approach ensures that the initiative doesn't merely remain a blueprint but transforms into a catalyst for real change in energy practices, accessibility, and climate action.



## The Shift Towards Electric Bicycles in Thailand

In a research endeavor led by Ornicha Anuchitchanchai, Ph.D., at the Transportation Institute, Chulalongkorn University, the focus is firmly set on understanding the evolving landscape of personal transportation in Thailand, with a particular emphasis on electric bicycles (e-bikes). The project seeks to unravel the intricate web of factors that influence consumers' choices and attitudes toward e-bikes. Furthermore, it aims to shed light on the critical factors that prompt consumers to make the switch from traditional gasoline-powered vehicles to e-bikes. Crucially, this research anticipates future trends in consumer acceptance, offering a roadmap for sustainable transportation in Thailand.

This research project holds significant implications for Sustainable Development Goal 7 (SDG 7): Affordable and Clean Energy. By examining consumer preferences for e-bikes, it lays the groundwork for informed policy recommendations that can propel a shift away from conventional, fossil fuel-dependent vehicles.

Moreover, the positive impacts of this project reach into the realm of economic development. The project engages a diverse set of stakeholders, including governmental bodies like the Ministry of Energy, the Ministry of Industry, and the Ministry of Transport, along with industry players in the automotive sector. As it shapes policies and promotes e-bike adoption, it stands as a catalyst for the broader goal of achieving clean and sustainable energy solutions in Thailand.





# DECENT WORK AND ECONOMIC GROWTH

## ARRI's Commitment to Sustainable Economic Growth

The Aquatic Resources Research Institute (ARRI) at Chulalongkorn University is actively involved in two projects by Assistant Professor Nilnaj Chaitanawisuti, Ph.D., each addressing critical environmental concerns and contributing to Sustainable Development Goal 8 (SDG 8): "Decent Work and Economic Growth."

**Community-Based Learning Center for Flower Crab Aquaculture and Flower Crab Bank:** ARRI has established a "Flower Crab Bank" in Chonburi, Thailand, which aims to revive the declining population of flower crabs along the coast. The project introduces community-based learning centers to educate and train local communities in sustainable flower crab aquaculture. By creating economic opportunities and promoting responsible practices, this initiative aligns with SDG 8's goal of fostering decent work and sustainable economic growth.

**Technology and Innovation for Soft Coral Propagation:** ARRI, in collaboration with Chulalongkorn University, is spearheading a project focused on the propagation and conservation of soft corals, which are crucial to marine ecosystems. With declining populations due to climate change and human activities, the project's objective is to develop technology and innovation for breeding and conserving soft corals. By promoting the sustainable trade of soft corals, this project directly contributes to SDG 8's mission of economic growth through responsible economic activities.

Both projects exemplify ARRI's dedication to addressing environmental challenges through technological innovation, job creation, and sustainable economic growth. They showcase how academic research and community-based efforts can play a significant role in supporting the United Nations' sustainable development agenda, particularly SDG 8.

## The Accountant's Role in Building Sustainable Communities

The collaboration between the Faculty of Commerce and Accountancy, Chulalongkorn University overseen by Associate Professor Sarun Chookhiatti, the Department of Business Development under the Ministry of Commerce, and the Department of Agriculture Extensions under the Ministry of Agriculture and Cooperatives is forging a path towards the Sustainable Development Goal (SDG) 8

This initiative aims to support Small and Micro Community Enterprises (SMCEs) by implementing efficient accounting systems. By offering training and expertise, it equips community members with the essential tools to enhance their businesses. In essence, it nurtures inclusive and sustainable economic growth, aligning perfectly with SDG 8's objectives.

Through this collaboration, students from Chulalongkorn University's Faculty of Commerce and Accountancy are gaining valuable experience. They are empowered to design and implement accounting systems tailored to the specific needs of SMCEs. This initiative not only fosters the development of students' leadership and management skills but also promotes critical thinking, communication skills, and problem-solving abilities.

Moreover, the project's engagement with SMCEs in the community ensures a direct impact on local businesses. The newly implemented accounting systems empower these enterprises to operate efficiently, make informed decisions, and expand their market reach. As a result, the project stimulates economic activity, generates employment opportunities, and contributes to the overall economic growth of the community.

In conclusion, this collaborative project echoes the principles of SDG 8 by promoting sustained, inclusive, and sustainable economic growth. It demonstrates how academic institutions, government bodies, and community enterprises can work together to create a more prosperous and equitable future for all.







## Sustainable Agribusiness Project for Forest Revival in Nan, Northern Thailand

In an effort to revitalize the ailing forests of Nan Province in Northern Thailand, the Kasikorn Thai Foundation and Chulalongkorn University's Faculty of Pharmaceutical Sciences have initiated a collaborative project. Under the leadership of Professor Pornanong Aramwit, Ph.D., this endeavor combines academic expertise with community involvement to promote sustainable agribusiness and economic recovery.

The primary goal is the restoration of forest areas adversely affected by unsustainable agricultural practices. This initiative capitalizes on Nan Province's potential for cultivating high-value crops and traditional herbs, actively engaging the local community in driving economic development.

The project's impact is threefold: forest rehabilitation, increased income for local farmers, and the international recognition of Thai herbal products, all contributing to economic growth.

This initiative is specifically aimed at local herb farmers in Nan Province and those interested in sustainable agribusiness, closely aligning with UN Sustainable Development Goal 8, which focuses on promoting sustained, inclusive economic growth and providing decent work for all.

This collaborative effort clearly shows the synergy between academia and communities in pursuing sustainable development. It serves as a model for fostering inclusive agribusiness growth and promoting local economic revival.



## Chulalongkorn University's 'Industry Term Project': Fostering Economic Growth Under Pietro Borsano, Ph.D. Leadership

Chulalongkorn University's School of Integrated Innovation (CSII), guided by Pietro Borsano, Ph.D., is spearheading an educational revolution through its 'Industry Term Project.' This innovative initiative serves as a bridge between academia and industry, with a special focus on advancing Sustainable Development Goal 8 (SDG 8).

At its core, the 'Industry Term Project' equips students with practical skills, making them workforce-ready. It directly aligns with SDG 8 by fostering sustained economic growth and providing opportunities for decent work. Industry partners collaborate with CSII by proposing projects that complement the school's diverse courses, spanning Digital Transformation, business model innovation, R&D management, entrepreneurship, and more. This synergy offers dual benefits: students gain hands-on experience, while industry partners receive actionable solutions.

The project's scope extends beyond traditional partnerships. Additional support from mentors, advisors, and domain experts ensures students receive expert guidance, and industry partners access specialized knowledge, maximizing the project's impact.

Pietro Borsano, Ph.D., leadership in this transformative project underscores Chulalongkorn University's commitment to SDGs. Beyond addressing SDG 8, this collaboration fosters a culture of innovation and entrepreneurship, nurturing a skilled workforce and benefitting society at large. It promotes responsible business practices and environmental sustainability, reflecting the university's dedication to driving positive change.

## International Labor Integration Policies in Thailand: Challenges, Opportunities, and the Path Forward

Thailand is undergoing significant demographic changes, transitioning into a “Completely Aged Society.” As the population decreases, the nation is increasingly reliant on international labor. However, Thailand’s integration policies for these workers have faced criticism for being outdated. It’s vital to review and reshape these policies to meet contemporary challenges.

**Policy Review:** This project aims to comprehensively review Thailand’s international labor integration policies over the past three decades, tracing their evolution and context.

**Identifying Challenges:** The project identifies gaps and challenges in these policies, considering the influence of social movements, public opinions, and labor issues.

**Policy Recommendations:** Evidence-based policy recommendations are developed based on research findings and stakeholder input to align policies with Thailand’s changing labor landscape.

This project by Sayamol Charoenratana, Ph.D., Leader of the Human Security and Equity Research Unit, Social Research Institute, Chulalongkorn University, targets academics, government officials, NGOs, laborers, and migrant laborers. By examining existing policies and proposing evidence-based recommendations, it aims to bridge the knowledge gap regarding migrant integration policies in Thailand.

Aligned with UN Sustainable Development Goal 8 (SDG 8) of “Decent Work and Economic Growth,” this project fosters sustainable economic development and supports labor rights, contributing to achieving decent work and economic growth in Thailand. It ensures the nation’s labor force remains adaptable amid demographic and economic shifts.







## Development Model for Sustainable Cocoa Business: A Case Study in Nan Province

The School of Agricultural Resources by Assistant Professor Tansiphorn Na Nan, Ph.D. at Chulalongkorn University has launched an innovative initiative to enhance the cocoa supply chain in Nan Province, Thailand. This project, supported by the Program Management Unit for Area-based Development (PMU-A) from 2021 to 2023, addresses the challenges faced by the cocoa industry. It focuses on improving product quality, aligning production with market demand, promoting organic farming, and enhancing both skills and employment opportunities. This initiative serves as a learning station for farmers and promotes the development of high-quality cocoa.

This project is strongly aligned with Sustainable Development Goal 8 (SDG 8), Here's how it responds to SDG 8:

- **Skill Enhancement and Employability:** The project empowers local farmers by providing training and knowledge. It enhances their employability and aligns with SDG 8's goal to provide decent work and employment opportunities.
- **Economic Growth:** By improving cocoa quality, the project directly contributes to economic growth. It stimulates income generation in local communities and supports the economic well-being of farmers, in line with SDG 8's objectives.
- **Local Business Development:** The project supports local cooperatives, community enterprises, and small businesses involved in cocoa processing and marketing. This nurtures entrepreneurship and job creation within the community, promoting sustainable and inclusive economic growth.
- **Innovation and Research:** The emphasis on research and innovation in cocoa production aligns with SDG 8's aim to stimulate economic growth through creative strategies and innovative practices.
- **Decent Work:** SDG 8 focuses on creating decent work opportunities. This project directly provides meaningful employment in the local community, contributing to overall well-being and economic development.

### Insummary

The project has enhanced the capacity of 200 cocoa farming families and improved their ability to adapt to changing weather conditions. It has increased the production of high-quality cocoa and empowered local businesses, including agricultural cooperatives, community enterprises, and cocoa product manufacturers. These outcomes contribute to the sustainable development of the cocoa industry in the region.



## Agriculture Meets Technology: Driving Economic Progress in Chachoengsao

The “Digital Platform Innovation for Agricultural Competitiveness and Marketing” project, running from 2023 to 2024, led by Pornpod Sridan, Ph.D., Leader of BCG towards Sustainable Development Research Unit, Social Research Institute, Chulalongkorn University, aims to address key challenges in the agriculture sector, particularly in Chachoengsao Province, Thailand. This region heavily relies on agriculture, especially mango production, contributing significantly to the local economy. However, there are several challenges, such as aging farmers, limited technology adoption, and insufficient market access.

The project's objectives are as follows:

1. Study agricultural business and marketing challenges.
2. Develop agricultural business and marketing plans using the BCG economic model.
3. Create a digital platform to enhance farmers' market competitiveness.

This project aligns with Sustainable Development Goal 8 (SDG8) by addressing economic growth, decent work, and promoting sustained and inclusive economic development. It empowers farmers by enhancing their market access through digital platforms and improving their income opportunities. It also aims to boost the local economy and create a sustainable agricultural ecosystem.



# อุตสาหกรรม นวัตกรรม และโครงสร้างพื้นฐาน

## INDUSTRY, INNOVATION AND INFRASTRUCTURE

### Thailand's Strategic Investment in Research and Innovation

In a rapidly evolving global landscape, Thailand is making a strategic move to bolster its economic prowess through the power of research and innovation. Led by Associate Professor Manachaya Uruyos, Ph.D., from Chulalongkorn University's Faculty of Economics, this visionary project not only underscores Thailand's commitment to progress but also aligns seamlessly with Sustainable Development Goal 9 (SDG 9) - "Industry, Innovation, and Infrastructure."

At the heart of this endeavor lies a profound economic theory: technology serves as the catalyst for sustained economic growth. It asserts that targeted investments in Research and Development (R&D) and the expansion of the R&D workforce are paramount.

This research initiative presents irrefutable insights into the intricate relationship between public R&D investments and sustained economic expansion. In doing so, it equips policymakers with the knowledge to steer Thailand's development journey towards sustainable growth and innovation, squarely within the realm of SDG 9.

The potential impact is nothing short of transformative. By establishing a crystal-clear connection between R&D investments and long-term economic expansion, policymakers can wield this knowledge as a potent tool for informed decisions. This will, in turn, bolster Thailand's progress towards sustainable economic growth and innovation, in perfect resonance with SDG 9's overarching goal.

### Chulalongkorn University's 'Economic Industry Development Project': Paving the Way for Thailand's Industrial Invigoration

In the ever-evolving landscape of Thailand's economy, the industrial sector has long been a cornerstone of growth and prosperity. However, as the world hurtles further into the digital age, the boundaries between traditional manufacturing and emerging service industries have begun to blur. This transformation is driven by modern technology and a user-centric approach, creating new opportunities and challenges for Thailand's economic landscape.

To address these shifts and bolster Thailand's industrial competitiveness, Chulalongkorn University's Faculty of Economics by Assistant Professor Thanee Chaiwat, Ph.D. has embarked on a visionary endeavor - the "Economic Industry Development Project" for the fiscal year 2023.

Defining the 'Economic Industry': One of the primary goals of this project is to define the concept of the "economic industry." This nuanced definition aims to provide clarity in understanding the scope and boundaries of this dynamic sector. By doing so, it becomes possible to chart a course towards targeted policies and support mechanisms that can elevate Thailand's economic industry to new heights.

Categorizing Economic Industries: The project delves into categorizing economic industries. This process involves classifying industries into distinct categories, a vital step in formulating effective policies and development strategies. The project identifies at least five promising branches of the economic industry, each with its unique potential for growth over the next 1-5 years. The target for these strategies encompasses public-sector organizations, private enterprises, and stakeholders invested in Thailand's economic future.

Crucial Collaboration and Policy Support: The project seeks essential collaborations. Key among these is the partnership with the Office of Industrial Economics (OIE) under the Ministry of Industry. Together, they aim to create and advocate for policies that will fortify Thailand's economic industry sector, fostering sustainable economic growth.

The projected impact of this endeavor is immense. By clearly defining the "economic industry," policymakers can direct resources and support more effectively, thus driving the growth of Thailand's industrial sector. Furthermore, the categorization of economic industries offers a structured approach to developing strategies and policies tailored to specific industry branches. This ensures that efforts are focused, resources optimized, and developmental initiatives set up for success.







## A Pathway to Sustainable Development

Thailand's Department of International Trade Promotion (DITP) and Chulalongkorn University's Faculty of Commerce and Accountancy, led by Professor Wilert Puriwat, D.Phil. (Oxon), have united in a transformative project aimed at advancing small and medium-sized enterprises (SMEs). With a profound commitment to ushering these businesses into the modern economic landscape, this collaborative endeavor seeks to provide academic support, disseminate critical knowledge concerning Thai business development, and ultimately empower SMEs.

At its core, this initiative represents a synergy between academia and industry, with a strong emphasis on enhancing SMEs' practical skills and job readiness.

While the primary partnership revolves around Chulalongkorn University's Faculty of Commerce and Accountancy, SMEs, and the Department of International Trade Promotion, this project warmly welcomes additional expertise. This extended network ensures SMEs have access to specialized knowledge, a pivotal aspect in amplifying the project's impact. To this end, the Faculty of Commerce and Accountancy is serving as the center between the DITP and Thai SMEs, hosting knowledge sharing sessions, securing guest speakers, running academic activities and workshops, publicizing information from the DITP, and promoting joint research efforts involving the three parties. Meanwhile, the DITP is in charge of holding exhibitions on international trade and supplying news and updates to the faculty.

It is expected that with the substantial resources and solid know-how of the two organizations, the alliance will successfully boost the competitive edge of Thai SME operators in order that they can grow steadily and contribute to the Thai economy in a sustainable manner.

This project delivers extensive benefits to SMEs, individuals, and communities. By augmenting SMEs' knowledge, skills, and competitiveness, it makes a substantial contribution to economic growth - a direct alignment with SDG 9. Furthermore, this collaboration nurtures a culture of innovation and entrepreneurship, essential facets of a thriving modern economy.

## Bridging Sustainability and Innovation in 3D Printing with rPETG Filament

The Faculty of Architecture by Assistant Professor Shanya Orasutthikul, Ph.D. at Chulalongkorn University is spearheading a groundbreaking initiative: crafting sustainable 3D printing filaments using recycled PETG plastic, aptly named rPETG. Notably, this undertaking strongly aligns with the United Nations Sustainable Development Goal 9 (SDG9)

The prevalent 3D printing method, particularly fused deposition modeling (FDM), has become a focal point of environmental concerns due to its linear production model. This model not only exhausts resources but also significantly contributes to waste. This laudable project epitomizes the principles of SDG9 by actively promoting sustainable industrial practices, nurturing innovation, and bolstering the development of essential infrastructure.

At its core, the rPETG filament project embodies the concept of a circular economy. This visionary initiative repurposes PETG plastic to create 3D printing filaments, championing the philosophy of reduce, reuse, and recycle.

Remarkably, the project serves as an encouraging catalyst for PETG recycling, potentially inspiring similar endeavors. The ripple effect of this project stands to benefit not only the realms of plastic recycling and 3D printing but also extends its influence to educational institutions and organizations ardently committed to the cause of sustainability.

In essence, this project harmoniously blends the realms of sustainability and innovation within the 3D printing domain, establishing an impressive alignment with SDG9. Its inherent potential to revamp resource management and reshape industry practices marks a significant stride towards a 3D printing world that is inherently eco-conscious.

## Driving Sustainable Urban Transformation: The Belt and Road Initiative in Southeast Asia

Led by Associate Professor Sutee Anantsuksomsri, Ph.D. from Chulalongkorn University's Faculty of Architecture, this research venture, in collaboration with Dr. Adele Esposito Andujar from the Centre national de la recherche scientifique (CNRS), France, and Assistant Professor Dr. Nij Tontisirin from Thammasat University, delves into the profound impact of the Belt and Road Initiative and Chinese Investments on urban evolution within Southeast Asia. Employing Thailand's Eastern Economic Corridor (EEC) as a compelling case study, this project unearths valuable insights into the region's urban transformation.

The study's implications span across various dimensions of sustainability—social, economic, and environmental. By scrutinizing the intricate interplay between the Belt and Road Initiative, Chinese investments, and urban evolution, this research contributes to the development of sustainable strategies that foster inclusive growth, economic prosperity, and ecological equilibrium. Its ripple effects are anticipated to benefit not only the bustling city of Pattaya but also its diverse populace and the Economic Bases Development Office for Eastern Economic Corridor.

This endeavour aligns seamlessly with the aspirations of Sustainable Development Goal 9 (SDG 9) - Industry, Innovation, and Infrastructure. It underscores the project's dedication to advancing sustainable urban development and enhancing the connectivity, resilience, and inclusivity of vital infrastructure. As the Belt and Road Initiative continues to reshape urban landscapes across Southeast Asia, this research serves as a guiding light, ensuring that progress is harmonized with sustainability, benefiting present and future generations alike.

## Unlocking Knowledge: Chulalongkorn's Open Chula Data Project

The Open Chula Data project, spearheaded by Chulalongkorn University's Office of Information Technology and led by Mr. Tharakorn Chongchua and Mr. Chin Ruengvilairat, serves as a pivotal hub for open data accessibility. Its mission is to democratize data, enabling everyone to access and harness information for diverse applications, such as analysis, innovation, and collaboration. By facilitating data utilization, this initiative fuels creativity and innovation across various domains, ultimately fostering positive change and progress.

Running from May 3, 2022, to February 26, 2023, the project publishes data in various formats, offering data previews, visualizations, and automatic Application Programming Interfaces (APIs) for the datasets. Furthermore, in addition to disseminating open data within Chulalongkorn University, this initiative extends its reach to the broader public by sharing datasets with the Open Government Data of Thailand. This democratization of information empowers citizens and interested individuals to access Chulalongkorn University's data, leveraging it for various purposes. For instance, educational data can be analyzed to enhance and align curriculum development with the rapidly evolving global landscape. This supports human resource development in Thailand, equipping individuals with the knowledge and skills needed to thrive in an ever-changing world and fostering a culture of creativity and innovation that benefits society at large.

Open Chula Data resonates deeply with Sustainable Development Goal 9 (SDG 9) - Industry, Innovation, and Infrastructure. By championing open data, this project contributes to building resilient, inclusive, and sustainable infrastructure. It promotes innovation by making valuable data accessible to all, fostering technological advancement, and enabling progress toward more equitable and sustainable development.

## Leveraging Progesterone Testing Strips for Enhanced Swine Reproduction

The swine industry is facing a crisis due to the African swine fever outbreak, necessitating an urgent increase in pig production. One crucial aspect of this challenge is optimizing swine reproduction, particularly the breeding of sows. Traditional methods for detecting the estrus cycle in sows are often subjective and challenging to scale up. This project introduces an innovative solution, utilizing progesterone testing strips to precisely monitor the estrus cycle in female pigs, significantly enhancing swine breeding efficiency.

### Challenges Addressed

1. Inefficient Estrus Detection: The conventional method of estrus detection in female pigs is based on behavioral observation, rendering it unreliable and subject to human error.
2. Prepubertal Gilt Identification: Identifying prepubertal gilts before sexual maturity remains a daunting challenge, leading to inaccuracies in swine breeding.

This project aims to:

1. Develop Reliable Progesterone Testing Strips: Create dependable progesterone testing strips to accurately detect estrus cycles in swine.
2. Enhance Swine Breeding Efficiency: Improve breeding efficiency by accurately identifying optimal breeding times, thereby reducing losses.
3. Extend Sow Productivity: Increase the productive lifespan of breeding sows, resulting in higher piglet production.
4. Boost Economic Returns: Contribute to the sustainability of the swine industry by delivering economic benefits to farmers.

A collaborative effort between researchers from Associate Professor Kittinan Komolpis, Ph.D., The Institute of Biotechnology and Genetic Engineering and the Faculty of Veterinary Science has successfully developed progesterone testing strips. These strips will be integrated into swine field studies and commercial pig farms.

This project aligns directly with Sustainable Development Goal 9 (SDG 9) - "Industry, Innovation, and Infrastructure." By introducing innovative technology into the agricultural sector to address swine breeding challenges, it enhances industry practices, promotes innovation, and strengthens infrastructure in the swine farming sector. The expected outcomes include improved swine production, reduced losses, and economic benefits for farmers. This project plays a significant role in fostering technological advancement and industry growth, making a noteworthy contribution to SDG 9's objectives.

The success of this project holds the potential to revolutionize swine breeding practices, demonstrating the positive outcomes that can be achieved through technology and innovation in the agricultural sector.







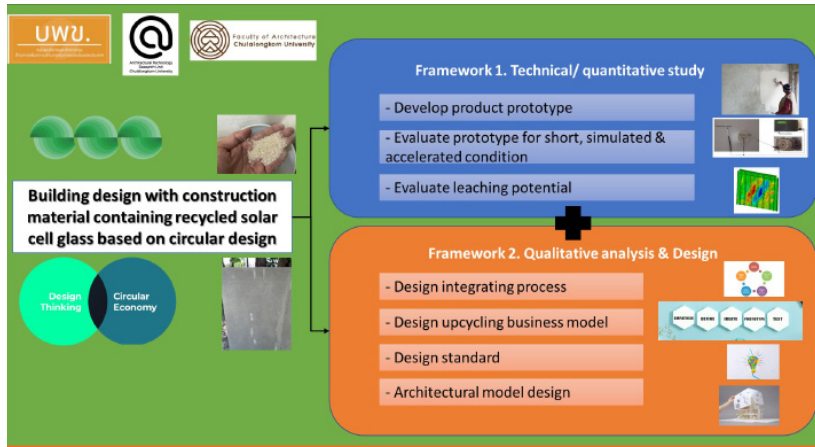
## Recycling Solar Cell Glass for Sustainable Construction

In Thailand, solar cell systems are widely used for clean energy production. However, as these systems age or become damaged, the solar panels need to be dismantled and disposed of, leading to an increasing amount of hazardous electronic waste. To address this issue, research has focused on recycling and reusing these discarded solar panels in construction materials.

Studies conducted in laboratories by Assistant Professor Lapyote Prasittisopin, Ph.D., Faculty of Architecture, Chulalongkorn University, have shown that solar cell glass can effectively replace traditional building materials, such as cement and coatings. This approach helps reduce resource consumption, minimize waste, create value from discarded products, and promote sustainable development. Additionally, it enhances aesthetic qualities by effectively reflecting light and reducing the need for reflective paint.

This initiative aligns with the United Nations Sustainable Development Goal 9 (SDG9). It specifically targets innovation and infrastructure development by exploring alternative uses for discarded solar cell glass. By incorporating recycled solar cell glass into construction materials, this project contributes to reducing waste, promoting resource efficiency, and improving the sustainability of infrastructure and industry. It addresses the issue of hazardous waste generation from solar panels and seeks to create more sustainable construction materials.

Overall, this research initiative endeavors to develop innovative practices that align with SDG9 and promote a more sustainable approach to infrastructure and construction materials through circular design principles.



## Innovation Meets Tradition: The Insight Wat Pho App Enhances Cultural Learning

The “Insight Wat Pho” application, developed by Wilasinee Suksawang-Darnthamrongkul, Ph.D., the Faculty of Architecture at Chulalongkorn University, transforms mobile devices into interactive companions for exploring Wat Pho, a renowned historical and cultural site. Users can simultaneously enjoy tourism and educational experiences as they learn about history, architecture, art, and Thai Buddhist beliefs through audio descriptions in both Thai and English, images, and augmented reality (AR) technology.

The app addresses the challenge of preserving the cultural heritage of Wat Pho in the face of large crowds and limited accessibility due to the vast and intricate nature of the site. It offers interactive activities, including a photo scavenger hunt featuring ancient photographs and an augmented reality quest to find hidden treasures within the temple. These activities make tourism and learning at Wat Pho more engaging and enjoyable.

“Insight Wat Pho” promotes sustainable development by enhancing cultural understanding and education while contributing to the preservation of historical sites. By making knowledge more accessible and enjoyable, It helps create a learning community and lifelong opportunities for exploring and caring for Wat Pho’s heritage.



## ECON For the Deaf: Fostering Inclusive Education

In a world that increasingly recognizes the importance of inclusivity, Chulalongkorn University's Faculty of Economics is making significant strides towards reducing inequalities and promoting equitable educational access. Collaborating with EDeaf (Education for the Deaf), this project, is a testament to the university's commitment to empowering individuals with hearing impairments.

The core mission of this initiative is to inspire creativity, nurture latent potential, and create diverse learning opportunities for young members of the deaf community. But it doesn't stop there. This project also extends its reach to prepare volunteer teachers. These teachers participate in simulated teaching sessions, gaining hands-on experience in imparting various skills, ranging from photography to culinary arts. This preparation equips them with a profound understanding of the distinctive learning environment within deaf classrooms.

One of the project's key goals is to develop teaching methods that are effective yet sensitive to the unique needs of the deaf community. By nurturing this understanding among educators, this initiative strives to contribute to nationwide educational equality. It paves the way for a teaching format and curriculum tailored to deaf education, creating lasting impact and inclusivity.

This project resonates deeply with Sustainable Development Goal 10 (SDG 10) - Reduced Inequalities. It embodies Chulalongkorn University's vision of a society where opportunities are equitable, and no individual is marginalized. ECON For the Deaf is a shining example of the university's commitment to building a more inclusive world, ensuring that "every voice is heard, and every talent is nurtured."

## ลดความเหลื่อมล้ำ

# REDUCED INEQUALITIES

## Bridging Healthcare Gaps: The Interprofessional Collaboration Mobile Clinic

In 2016, the Faculty of Medicine introduced the Interprofessional Collaboration Mobile Clinic, led by the esteemed Associate Professor Nond Rojvachiranonda, M.D.. This innovative initiative was conceived to address the healthcare needs of individuals with facial and cranial abnormalities, particularly those residing in rural areas. The overarching goal is to provide these individuals with access to high-quality medical care, effectively eliminating the financial and logistical burdens often associated with seeking treatment in urban hospitals. It is important to note that while there is an established system for referring rural patients to urban healthcare facilities, this system can often be cumbersome, leading to significant time and financial losses for the patients.

The year 2020 brought plans to expand the project's reach to cover more regions, specifically the northeastern region, with a focus on Buriram Province, and the northern region, including Chiang Rai Province. These expansion plans, however, were thwarted by the rapid spread of the COVID-19 pandemic.

However, in 2022, the project remains steadfast in its original mission: to provide comprehensive, high-quality care for individuals with facial and cranial abnormalities throughout the nation, effectively alleviating the financial burdens they might otherwise face.

The impact of this initiative is threefold:

1. **Enhanced Healthcare Access:** The project ensures that individuals with facial and cranial abnormalities, irrespective of their geographical location, can access comprehensive care without the hindrance of financial constraints.
2. **Data for Development:** A significant byproduct of the project is the compilation of invaluable patient data. This data plays a pivotal role in informing the development of preventive care, high-quality medical treatment, and academic research.
3. **Strengthened Collaboration:** The project fosters a robust collaboration between King Chulalongkorn Memorial Hospital, the Medical Council of Thailand, and provincial healthcare professionals. This collaborative effort is essential in not only providing medical care but also ensuring its ongoing improvement and accessibility.

The primary target audience for this project comprises individuals with facial and cranial abnormalities residing in various provinces. This includes new cases, individuals who have not previously received care from the project, and returning patients who have received prior care at the project's facilities.

The Interprofessional Collaboration Mobile Clinic stands as an exemplary effort in bridging the healthcare accessibility gap, particularly for rural individuals with facial and cranial abnormalities. This aligns perfectly with the principles of Sustainable Development Goal 10, Reduced Inequality, as it ensures that access to quality medical care is not hindered by financial or geographical constraints. In a world where healthcare inequality is a pressing issue, this initiative is a beacon of hope, emphasizing the importance of accessible and equitable healthcare for all.







## Addressing Inequality and Promoting Well-being: A Case Study of the Urban Homelessness Project

In today's rapidly evolving urban landscape, one of the most pressing issues confronting cities worldwide is urban homelessness. Homelessness, characterized by vulnerability, is intricately linked to structural changes, economic hardships, and social risks within urban environments. In the bustling city of Bangkok, Thailand, an innovative project has emerged, aiming to develop knowledge, improve well-being, and foster networks for homeless and impoverished individuals.

The Urban Homelessness Project, led by Mr. Anuk Pitukthanin, operating under the Institute of Asian Studies at Chulalongkorn University, is a comprehensive effort to address the challenges faced by homeless and impoverished individuals in urban areas, particularly in Bangkok. This project recognizes the intricacies of homelessness and how it relates to the structural transformation and socio-economic risks inherent in the modern urban environment.

The Urban Homelessness Project aligns seamlessly with the principles and objectives of Sustainable Development Goal 10. By targeting homelessness, the project contributes significantly to the reduction of inequality in urban settings. It promotes inclusive and sustainable cities, addressing the growing disparities between the homeless and those with secure housing. A distinctive aspect of the project is the active involvement of homeless individuals themselves. This empowers them and acknowledges their role in finding sustainable solutions.

One of the significant impacts of the project is the creation of an "Innovative Housing Service" model. This model emphasizes a network of shared housing arrangements, designed to facilitate access to housing for homeless individuals. It breaks down the barriers they face when seeking traditional housing options.

The project emphasizes collaboration as a cornerstone of its approach. It forms partnerships with government agencies, civil society organizations, and academic institutions. This multi-stakeholder approach is crucial to address the multifaceted issue of homelessness effectively.

The Urban Homelessness Project in Bangkok is a notable example of a localized effort with global implications. It addresses the complex issue of urban homelessness by enhancing well-being, fostering innovative housing solutions, and, most importantly, reducing inequalities. It actively contributes to the global mission of creating a more equitable world where all individuals, regardless of their housing status, can lead dignified lives. The project's collaborative approach, focus on empowerment, and dedication to reducing inequality serve as a model for other cities striving to combat homelessness while advancing the SDGs.

## A Cultural and Inclusive Development Initiative for the Moken People

In the serene islands of Mu Ko Surin, Thailand, Associate Professor Narumon Arunotai, Ph.D., Social Research Institute, Chulalongkorn University, leads a significant project. This project, while focusing on cultural preservation, addresses the issue of statelessness within the Moken community.

This project involves comprehensive data collection within the Mu Ko Surin Moken community. Data is gathered to understand their challenges and strengths. Surveys in about 80 Moken households investigate their living conditions, livelihoods, public health, and future perspectives. Moreover, it actively collaborates with governmental agencies, addressing the issue of statelessness and fostering personal development.

This initiative seeks to enhance Moken people's security and basic rights, reducing inequality. It promotes multisectoral collaboration, breaking down barriers and tackling inequality at its roots. Furthermore, it preserves Moken heritage and ensures sustainable development.

Associate Professor Narumon Arunotai, Ph.D., project combines cultural preservation with inclusive development. It empowers the Moken people and offers hope for marginalized communities globally, aligning with the core principles of SDG 10.

## Empowering Pattani's Islamic Community: A Case for Reducing Inequality

The global pandemic has left its mark on Thailand's economy, especially in Pattani, where unemployment surged. In response, a collaborative project aims to reduce inequality and promote sustainable livelihoods.

Led by Assistant Professor Yupin Patarapongsant, Ph.D., of the Sasin School of Management at Chulalongkorn University, this project "Examining Personal Savings Behavior and Financial Risk A Case of Islamic Poverty in Pattani, Thailand" unites several partners, including the National Research Council of Thailand (NRCT), the Provincial Community Development Office, the Islamic Bank of Thailand, and the Islamic Committee of Pattani Province. Under Assistant Professor Yupin Patarapongsant's guidance, the initiative seeks to empower Pattani's communities by enhancing economic resilience and advocating financial prudence.

The endeavor revolves around three key goals. Firstly, it aims to bolster economic resilience through skill development, especially in agriculture, to combat poverty. Secondly, it encourages savings behavior and risk management to protect against financial crises. Thirdly, it stimulates local economies by creating value-added products and promoting local brands.

This undertaking serves residents of Rata Pan Yang, Yaring, and Pattani, where economic disparities are pronounced. Activities involve data collection, COVID-19 support, digitalizing governmental agencies, grassroots development, and applying marketing theory to influence savings behavior.

The project intends to promote savings behavior and risk management, fostering social change. It also seeks to develop a user-friendly financial application tailored to the Muslim community, eliminating complexities and ensuring equitable access to financial services.

This collaborative initiative epitomizes a proactive strategy for reducing inequality in Pattani, closely aligned with SDG 10. By focusing on skill development, economic resilience, and income generation, it empowers marginalized communities. Moreover, its dedication to fostering savings behavior and providing tailored financial solutions ensures equitable access to tools for economic prosperity. This collaborative initiative offers hope for a more equitable and prosperous future.







## Empowering Students for Inclusive Journalism and Community Engagement

In the Faculty of Communication Arts, Chanettee Tinnam, Ph.D., leads a significant initiative known as the “Community Classroom” project. This endeavor aims to equip students with the necessary skills to become responsible media practitioners. It achieves this by immersing students in social laboratory settings and intimate journalism, encouraging them to explore pressing societal issues aligned with the Sustainable Development Goals (SDGs), and promoting in-depth fieldwork in diverse and distinct communities.

The core objective of this project is for students to conduct fieldwork in various communities to study and comprehend social issues. Leveraging their media expertise, they create advocacy media that addresses these challenges. In the academic year 2022, students selected four locations for intensive fieldwork:

- The Center for Training and Child Development in Baan Kanjanapisek, focusing on child and youth issues within the justice process.
- Migrant labor communities in Samut Sakhon province, in collaboration with the Labor Rights Promotion Network Foundation, addressing transnational labor concerns.
- Prostitution areas in Nana Alley, in partnership with the Alliance Anti-Traffic (AAT), addressing human trafficking issues.
- The Khlong Lod community, in partnership with the Issarachon Foundation, with a focus on homelessness issues.

All collaborating organizations provided comprehensive support to facilitate a deep understanding of these complex situations.

This project not only enhances students’ media and communication skills but also nurtures their sense of responsibility toward society. It plays an important role in reshaping pedagogical approaches, fostering community relationships, and establishing networks through National Partnerships.

In conclusion, the “Community Classroom” project within the Faculty of Communication Arts is a compelling example of how students can be empowered to become advocates for societal change through media and journalism. This initiative strongly aligns with the principles of Sustainable Development Goal 10, Reduced Inequality.

## Knowledge Management for Child and Youth Assistance in Educational Crisis

Education is a universal right, yet many children face educational crises. To address this issue, the Equitable Education Fund (EEF) launched a pioneering project in four Thai provinces: Phitsanulok, Khon Kaen, Yala, and Bangkok. Operating from July 1, 2022, to February 28, 2023, this project collaborates with academic units at Chulalongkorn University.

Led by Surasak Kao-lean, Ph.D. and Associate Professor Wiratthep Pathumcharoenwattana, Ph.D., the project draws expertise from Chulalongkorn University’s Children and Youth Development Research Unit, the Department of Educational Research and Psychology, and the Department of Lifelong Education.

The project’s goal is to prevent students from leaving the education system during crises. It employs an area-based approach, using provincial teams and case managers to assess, screen, and provide tailored support to at-risk students.

The objectives are:

- Knowledge Gathering: Collect insights from Child and Youth Assistance Centers to develop guidelines and policies.
- Case-Based Insights: Study real cases to understand dropout factors.
- Driving Policy Change: Create awareness to catalyze policy changes.

This project benefits the EEF by enhancing its support for students in crises. It aids core teams in provinces, offers a practical guide for professionals, and aligns with SDG 10, working to reduce educational inequalities.





# SUSTAINABLE CITIES AND COMMUNITIES

## Reimagining Suburban Bangkok: Tourism, Culture, and Sustainability

The “Development of Waterfront Community Sustainable Tourism Program in Bangkok Suburban Area” project, led by Associate Professor Thanapan Laiprakobsup, Ph.D., Deputy Dean of Faculty of Political Science, Chulalongkorn University, and his team, aims to promote sustainable tourism and community development in suburban Bangkok, specifically the Khlong Bang Phai waterfront community in Nonthaburi province.

This project seeks to:

- Explore Community Identity:

The project delves into the identity of waterfront communities in suburban areas, considering their physical and cultural aspects. Understanding their dynamics in response to changing contexts is crucial.

- Foster Local Participation: To bridge the gap between local and urban communities, the project emphasizes local involvement, as strong relationships depend on understanding community identity, societal changes, and active local engagement.

- Develop Tourism Program: Researchers analyze the Khlong Bang Phai community, identifying strengths (e.g., multicultural heritage, proximity to the waterfront, and fruit gardens) and weaknesses (e.g., pollution and limited accessibility). They propose a comprehensive tourism program that extends beyond immediate tourist spots, including activities such as temple visits and organic fruit garden tours.

- Enhance Public Spaces: The project suggests developing public areas within the community, particularly at Wat Mo Lee, to support the local tourist program. These spaces serve as recreational areas for residents, tourists, and urban dwellers, fostering social bonds and a sense of community.

Aligned with Sustainable Development Goal 11 (SDG11) - Sustainable Cities and Communities, this project revitalizes and sustains suburban communities by promoting cultural preservation, environmental sustainability, and community engagement. It aims to create a tourism program that educates visitors about the community's identity and connects them to the region's economic and social contexts.



## Phra Phutthabat Street Art: A Tapestry of Community and Creativity

In Saraburi Province, a captivating project unfolds, intertwining art, culture, and community spirit in a vivid mosaic. Led by Pichai Thurongkinanon, Ph.D., from the Faculty of Fine and Applied Arts, the “Phra Phutthabat Street Art” initiative transcends mere artistic expression. It embodies Sustainable Development Goal 11 - Sustainable Cities and Communities, revealing art's potential as a catalyst for urban transformation.

At its core, “Phra Phutthabat Street Art” is a testament to collaboration. Local stakeholders, including the Phra Phutthabat community, the Saraburi Provincial Cultural Office, Phra Phutthabat Municipality, Phra Phutthabat temples, and Phra Phutthabat Hospital, unite in a remarkable public-private partnership. This mirrors the essence of SDG 11, emphasizing inclusive, safe, resilient, and sustainable urban environments.

This initiative breathes life into local legends, weaving them into the urban tapestry. Inspired by literary treasures like the Ramayana epic and Nirat Than Thong Daeng by Thammathibet, Prince Senaphithak, the artistry transcends aesthetics to encapsulate community cultural heritage.

“Phra Phutthabat Street Art” celebrates community identity and creativity. Ordinary streets now burst with vibrancy, showcasing contemporary collaborative artistry. It revitalizes public spaces and empowers individuals to embrace their creative potential.

The primary beneficiaries are the residents of Phra Phutthabat and neighboring communities, working tirelessly to transform their urban surroundings into a canvas that embodies the spirit of SDG 11. This project is inspiring, demonstrating art's transformative power to unite and uplift communities.

“Phra Phutthabat Street Art” symbolizes the convergence of art, culture, and community, forging the path to sustainable urban living. This initiative showcases how creativity can drive positive change, creating a brighter, more sustainable community for all.





## Sustainable Development for Healthier Farming Communities: A Green Revolution in Thailand

In the serene landscapes of Amphoe Ubolratana in Khon Kaen Province, Thailand, a transformative project seeks to cultivate sustainable development and nurture community well-being. Spearheaded by Professor Supawan Tantayanon, Ph.D., from the Faculty of Science, this initiative harmoniously aligns with several Sustainable Development Goals (SDGs). However, its primary focus lies firmly on SDG 10.

At the core of this undertaking lies the Thung Prong community, an area that had initiated the concept of an organic farming network. However, a significant challenge loomed large - how to entice local farmers to embrace this ecological approach fully. Conventional farming practices that relied on chemical inputs were leaving an indelible mark on the land.

Driven by a visionary quest to ensure secure and sustainable farming practices across the entire community, this project ventures into the realm of extensive research. Its mission: to identify pragmatic approaches that can sow the seeds of commitment to chemical-free agriculture, ultimately nurturing a legacy of good health for generations to come.

The effects of this project ripple in two essential ways. Firstly, it encourages an expansive shift towards the adoption of safe farming practices within the community, significantly reducing chemical contamination in this fertile land. Secondly, this transition towards healthier, organic farming directly translates into a bounty of improved community health.

In Conclusion, this initiative not only showcases how sustainable farming practices can sprout healthier communities but also highlights its active role in supporting multiple SDGs.



## Thai ARi: Empowering Aging Communities in Thailand

Thailand faces the challenges of transforming into an aging society. Thai ARi, an extension of Chulalongkorn University's Chula ARi project by College of Population Studies, Chulalongkorn University, strives to address these challenges and enhance the quality of life for senior citizens across the nation.

This initiative, in alignment with UN Sustainable Development Goal 11 (Sustainable Cities and Communities), collaborates with local organizations, government offices, community leaders, and senior citizens. Its primary focus areas include healthcare, technology and innovation, the physical environment, the economy, public participation, and society.

The key focus areas are data-driven policy, healthcare and medical services, economics and sociology, and lifelong learning promotion.

Thai ARi aims to serve as a model for creating sustainable, inclusive communities nationwide, where senior citizens play an active role, contributing to their well-being and societal development.



## Transforming Urban Life: The Fusion of Nature and Art

In the fast-paced, concrete jungles of modern urban existence, the toll on mental and physical health is becoming increasingly evident. Overcrowding, pollution, and the enduring effects of the COVID-19 pandemic have amplified the need for innovative solutions that can alleviate stress and enhance well-being in cities. One such remarkable undertaking, led by Assistant Professor Kanokwalee Suteethorn, Ph.D., from the Faculty of Architecture, is the “Forest Bathing. Healing Art and Healing Landscape” project. This project advocates for a transformative urban experience, where nature and art are the keys to healing.

Urban environments, characterized by ceaseless noise, air pollution, and high-stress routines, have long been associated with heightened levels of anxiety and stress-related health problems. It's not merely a personal affliction; the impact ripples across economies and societies, posing a complex challenge. Acknowledging this, the “Forest Bathing” project aims to examine the roles that nature and art can play in mitigating urban stressors, seeking a healthier and more holistic urban future.

At the core of this initiative is the practice of “forest bathing,” an idea of Japanese origin that doesn't involve water but, instead, immerses individuals in the therapeutic embrace of nature. It's about connecting with the natural environment using all your senses. This immersive practice has been shown to reduce stress hormones, lower blood pressure, and contribute to overall mental well-being, providing a nature-infused balm for urbanites.

The project's mission is to unravel the synergistic relationship between nature and art within urban landscapes. By harnessing the healing properties of both, it explores how thoughtfully designed urban environments can alleviate stress, aid recovery, and enrich the lives of city residents.

The impact of this initiative spans wide:

**Advancing Research:** By delving into the realm of urban forest bathing, the project is advancing the knowledge surrounding its potential benefits for city dwellers.

**Disseminating Knowledge:** Sharing insights about healing landscapes and the influence of nature and art on well-being is contributing to a deeper understanding of the environment's role in human health.

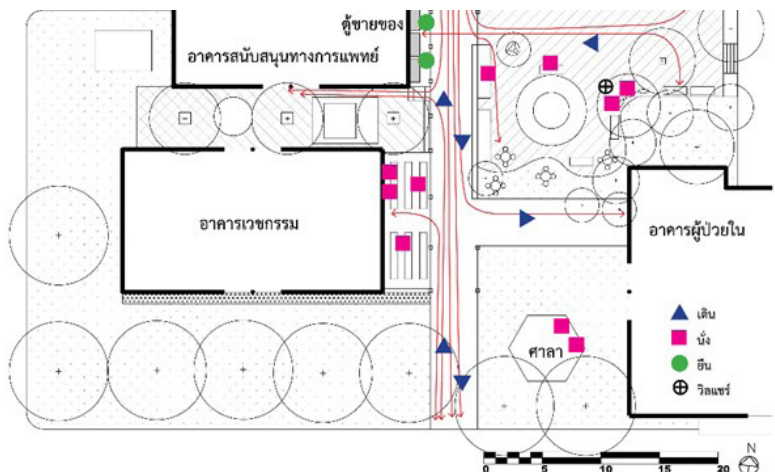
**Building a Network:** The establishment of a research and education network focused on nature-based therapy and healing environments holds the promise of future discoveries.

**Promoting Well-being:** Providing knowledge and activities that enhance well-being for students, faculty, and the broader public.

The “Forest Bathing. Healing Art and Healing Landscape” project enriches our comprehension of the therapeutic potential of nature and art and offers pragmatic insights into designing cities that prioritize the health, happiness, and harmony of their residents.







## Nurturing Health and Sustainability: Transforming Hospital Environments in Central Thailand

Nestled in the heart of Central Thailand, a groundbreaking project is sprouting, driven by Associate Professor Pavadee Ansusinha from the Faculty of Architecture. At its core, it resonates profoundly with Sustainable Development Goal 11 (SDG 11).

This initiative acknowledges something often overlooked—the immense influence of the natural environment on the healing process. It highlights the role that the surroundings of healthcare institutions play in patient recovery, stress alleviation, and swift recuperation from illnesses. Most notably, this project tailors its design and development to align with the region's unique hot and humid climate.

The project's impact reaches far and wide. Its primary aim is to craft outdoor spaces that are thoughtfully designed to address the specific climatic challenges of Central Thailand. These spaces serve more than just a functional purpose; they provide patients with a serene environment conducive to their overall well-being.

The beneficiaries of this project are diverse. Hospital users are the most direct beneficiaries, experiencing the benefits of these revitalizing outdoor areas firsthand. Physical management teams overseeing these spaces gain valuable insights into maintaining and enhancing their therapeutic value. Researchers in related fields find fertile ground for further exploration and study.

While this project's central focus lies in enhancing outdoor environments within community hospitals, its alignment with SDG 11 remains clear. By creating sustainable and therapeutic outdoor spaces within healthcare settings, it actively contributes to the broader aim of nurturing sustainable and resilient communities.

In summation, this initiative transcends conventional architecture. It's a holistic undertaking that embraces sustainability, compassion, and well-being. By recognizing the potent role of nature in the healing process and translating this insight into innovative design and development, it demonstrates how sustainable practices in healthcare can pave the way for greener, more resilient cities and communities.

## Yala's Mosaic of Identities: A Journey into People, Communities, and Cultures

The Yala Stories festival, showcased the rich cultural and natural heritage of Yala, a province often associated with terror. However, its youth celebrated it for its diverse and harmonious culture. The event, organized by various local institutions, allowed young people to express their views on their hometown's potential and future, focusing on sustainability and unity among different ethnic and religious backgrounds.

Throughout the festival, the Metro Hotel was transformed into a platform for youth to share their perspectives through various media. The event included talks, seminars, cooking demonstrations, walking tours, performances, and a chef's table dinner. Yala Stories aimed to demonstrate the province's capacity for sustainable growth and development, with locals realizing their town's potential.

Mayor Pongsak Yingchoncharoen emphasized Yala's abundant resources, rich history, and cultural diversity. He highlighted the importance of the younger generation's involvement in shaping the town's future and expressed his joy that they were committed to their hometown.

This initiative, led by Associate Professor Ritirong Jiwakanon, Ph.D., Director of Institute of Thai Studies, Chulalongkorn University, aligns with Sustainable Development Goal 11 (SDG11) - Sustainable Cities and Communities. It seeks to transform Yala into a "learning city" where people of all ages benefit socially, intellectually, and economically from the region's unique resources, promoting unity and sustainable development in the community.





# RESPONSIBLE CONSUMPTION AND PRODUCTION

## Improving Waste Management in Baan Thung Noi, Prachuap Khiri Khan

In the serene coastal village of Baan Thung Noi in Prachuap Khiri Khan, Thailand, where the sea meets a beautiful shoreline, a project of significant environmental importance is taking shape. Spearheaded by Assistant Professor M.L. Siripastr Jayanta, from the Faculty of Science, this initiative focuses on waste management and aligns closely with Sustainable Development Goal 12.

Baan Thung Noi is a small fishing village renowned for its scenic beauty. However, like many communities, it grapples with waste management issues. These challenges not only affect the aesthetic appeal of the village but also its overall health and well-being.

The project aims to address these waste management issues by working closely with the community to find suitable solutions. By involving the residents in the process, the initiative seeks to establish effective and sustainable waste management practices.

The envisioned impacts of this project are twofold. Firstly, it strives to create a cleaner and more visually appealing community with sustainable waste management practices in place. Secondly, by achieving this, it opens doors to potential tourism opportunities, fostering economic growth and further community development.

The primary beneficiaries of this project are the residents of Baan Thung Noi who will directly benefit from the improved waste management system.

In conclusion, the waste management project in Baan Thung Noi reflects the essence of SDG 12 - Responsible Consumption and Production. By addressing waste management challenges at the local level and actively involving the community, it highlights the significance of sustainable development within the context of SDG 12.







## Promoting Sustainable Waste Management through Zero-Waste Concept: A Case Study of Paklad Community, Phra Pradaeng District, Samut Prakan Province

Led by Yotwadee Hawangchu, Ph.D. and organized by the Environmental Research Institute, this effective and sustainable waste management requires collaborative efforts from all sectors, beginning with addressing the root causes, such as the production of goods and advocating for legislation that promotes recycling and the circular economy. Simultaneously, it necessitates instilling a sense of responsibility for waste management in the public.

At the community level, key to tackling waste-related issues is community involvement in waste reduction and source separation. Support from local authorities, including communication, awareness campaigns, and providing necessary equipment and materials, is essential. Furthermore, it involves establishing infrastructure and services for community waste separation and the proper disposal or recycling of various waste types, guided by sound academic and safety principles.

This project's core mission aligns closely with Sustainable Development Goal 12 (SDG12) - Responsible Consumption and Production. By implementing the zero-waste concept and involving local communities in sustainable waste management practices, it contributes to reducing waste generation, promoting responsible consumption, and advancing the principles of the circular economy. Ultimately, this initiative seeks to create more responsible and sustainable waste management practices at the community level, which is fundamental for achieving SDG12's targets.

## Innovative Food Waste Management Transforming Nonthaburi Municipality

Chulalongkorn University Graduate School (CUGS) is championing the "Nakhon Non Model for Sustainable Food Waste Management" project in collaboration with Nonthaburi Municipality and the Technology and Informatics Institute for Sustainability (TIIS). This initiative, led by Associate Professor Nuta Supakata, Ph.D., addresses the pressing issue of food waste through efficient segregation and management practices, replacing conventional landfill methods.

The project offers several benefits, including reduced landfill waste, economic value measurements, and innovative waste management applications. Crucially, it aligns with four UN Sustainable Development Goals: Zero Hunger (SDG 2), Sustainable Cities and Communities (SDG 11), Responsible Consumption and Production (SDG 12), and Climate Action (SDG 13). Recognized for its significance, the project has received support from the National Research Council of Thailand (NRCT).

This impactful endeavor exemplifies responsible consumption and production (SDG 12), setting a precedent for sustainable food waste management in Thailand.



## รับมือกับสภาพภูมิอากาศ CLIMATE ACTION

### Empowering Youth to Combat Forest Fires: A Satellite Solution

Northern Thailand faces persistent challenges with forest fires and the resulting air pollution, particularly affecting local communities. To address this critical issue, a comprehensive study was initiated, led by Assistant Professor M.L. Siripastr Jayanta, the Faculty of Science, aimed at reducing forest burning through the development of an innovative fire tracking website.

The project encompassed several key components:

**Youth Education:** A crucial aspect involved educating students aged between 11 and 14 on how to effectively utilize the fire tracking website, accompanied by a rigorous evaluation of their proficiency in using this technology.

**Community Engagement:** The project extended its reach to engage local youth, providing them with the knowledge and skills required to create fire maps, which are instrumental in monitoring and managing forest fires.

**User-Centric Approach:** Valuable insights were gathered through user feedback via surveys, providing critical data for the continuous enhancement and optimization of the fire tracking website.

**Sustainability Initiatives:** In line with the project's commitment to long-term forest protection, discussions and collaborations with officials from Mae Ping National Park resulted in the innovative "Students Tour Guide" project, aimed at ensuring the sustainability and continuity of forest fire reduction efforts.

The collaborative efforts and ideas generated during the project have set the stage for future developments. This project aligns directly with Sustainable Development Goal 13 (SDG13) - Climate Action, emphasizing the urgent need for climate mitigation efforts.

### Building Resilience in Koh Klang Community Against Coastal Erosion and for Marine and Mangrove Ecosystems

The journey to combat coastal erosion, protect marine life, and preserve mangrove ecosystems on Koh Klang Island, Krabi Province, has been a collaborative effort marked by gratitude, support, and unwavering dedication.

Thanks to the guidance and invaluable insights from the advisors of the project as well as the sponsorship from the Population and Community Development Association (PDA), the knowledge and time inputted has significantly contributed to the project's success.

Moreover, the mentorship derived from Professor Dr. Santi Pailoplee and Assistant Professor Jes Kettratad, coupled with the leadership of Assistant Professor Numpon Insin, Ph.D., of the Faculty of Science, helps drive the enthusiastic coordinations from the the Ban Koh Klang and Ban Klong Prasong schools. The involvement and dedication from all parties ignited a passion for change that radiated through the community.

This initiative perfectly aligns with SDG13 - Climate Action. Coastal erosion, a direct consequence of climate change, poses a significant threat to communities like Koh Klang. By tackling this issue and nurturing marine and mangrove ecosystems, the project has been actively contributing to climate resilience and environmental sustainability. The collective efforts serve as a testament to the power of community-driven change, echoing the spirit of SDG13 in the pursuit of a more sustainable and resilient world.







## Nan Province's Path to Carbon-Neutral Tourism

Nan Province is embarking on a transformative journey towards sustainable tourism with an eye on carbon neutrality, in line with Sustainable Development Goal 13 (SDG13) for Climate Action.

This initiative, led by Puntita Tanwattana, Ph.D., Environmental Research Institute, Chulalongkorn University, comprises two key objectives. First, it scrutinizes the carbon footprint of tourism in Nan Province. Second, it outlines a blueprint for low-carbon tourism, charting a course toward a carbon-neutral destination.

The project focuses on five key tourism activities:

**New Nan Experience with Low-Carbon Products:** Encouraging eco-friendly product choices.

**Nan Low Carbon Walking Street:** Promoting low-carbon travel methods like walking and cycling.

**Nan Low Carbon Organic Meal:** Redefining gastronomy with locally sourced, low-carbon organic meals.

**Nan Low Carbon Hotels:** Implementing energy-efficient practices in accommodations.

**Nan Zero Carbon Travel Route:** Designing carbon-neutral travel routes for tourists.

This project delivers a profound impact, providing markets for low-carbon tourism and carbon credit sales, spurring economic growth. Communities gain sustainable skills, boosting their resilience against climate challenges. Moreover, this research translates findings into practical solutions, going beyond academia.

Nan Province's journey towards carbon-neutral tourism exemplifies SDG13's essence, blending economic growth and environmental protection. It inspires national regions to pursue similar sustainable paths, fostering a greener, more sustainable planet.

## Modeling Flood Risk and Enhancing Community Resilience in Thailand

Thailand, among the countries most severely affected by extreme weather, faced with recurrent flooding due to the global climate crisis. Addressing this local challenge with global significance, Faculty of Arts, Chulalongkorn University, collaborates with the University of Sussex, London School of Economics and Political Science, and the University of Bristol, led by Associate Professor Pannee Cheewinsiriwat, Ph.D.

This collaborative endeavor spans from February 2022 to January 2023 and brings together a dedicated team comprising Associate Professor Pannee Cheewinsiriwat, Ph.D., and her associates from Chulalongkorn University, along with Dr. John Barlow and Dr. Yi Wang representing the University of Sussex. The project also enjoys the expertise of Prof. Hyun Bang Shin from SEAC at the London School of Economics and Political Science and Prof. Jonathan Rigg from the University of Bristol. Financial support for this initiative is provided by the Thai-UK World-class University Consortium and the British Council.

This interdisciplinary partnership employs cutting-edge methodology and expertise in climate science, physical geography, social science, and economics. High-resolution climate modeling is used to create flood risk maps and study the impact of government policies on community responses to flooding. Additionally, the project explores how community knowledge and resilience can inform improved flood management policies for both government and private sectors in Thailand.

In addition, Chulalongkorn University postgraduate researchers join the project, strengthening the institution's position as a global center for geography and climate science research and education. This initiative promotes knowledge exchange, benefiting UK partners with insights into hydrological modeling and flood management policy in Thailand.

Anticipated outcomes encompass a joint pilot research project involving seven trained Thai researchers, the formulation of a research proposal for prospective grants, and collaborative publications presenting the project's findings. This comprehensive effort offers a platform for knowledge exchange and capacity-building, positioning Chulalongkorn University as a global hub for geography and climate science research and education.



## Addressing Microplastic Pollution and Promoting Sustainable Waste Management

In collaboration with the Environmental Research Institute and Aquatic Resources Research Institute (ARRI) of Chulalongkorn University, Kasetsart University's Si Racha Fisheries Research Station, and Ko Sichang Municipality, Chulalongkorn University's Assistant Professor Vorapot Kanokkantapong, Ph.D., Department of Environmental Science, Faculty of Science, spearheaded a year-long project from January to December 2023 to combat microplastic pollution and advance sustainable waste management.

Microplastic pollution, a pressing global concern, poses significant threats to terrestrial and marine ecosystems. These minuscule plastic particles, measuring less than 5 millimeters, accumulate toxins and harm both the environment and human health.

The project's primary objectives included identifying, categorizing, and quantifying plastic waste and microplastics, alongside raising awareness and promoting responsible plastic use and waste disposal practices. The research commenced on Ko Sichang Island in Chonburi Province, Thailand, known for its ecological significance and maritime activities.

By fostering behavioral changes among locals and tourists on Ko Sichang Island and encouraging sustainable waste management, the project aimed to mitigate plastic pollution's impact on both land and marine environments. In line with Sustainable Development Goal 14 (SDG14) - Life Below Water, the initiative sought to preserve marine resources and enhance the island's overall environmental sustainability. Ultimately, the project aims to improve the quality of life for the local community while promoting responsible tourism practices.

## ชีวิตใต้เบื้องสมุทร LIFE BELOW WATER

### Tropical Peatlands: Guardians of Ecosystem Services

Tropical peatlands are important ecosystems. These regions offer vital ecosystem services, from biodiversity support to carbon storage and natural hazard regulation. Additionally, they provide food, materials, and clean water to local communities.

However, human activities like draining and fires, compounded by climate change, pose severe threats. These pressures disrupt the ecosystem's balance and release large carbon emissions, contributing to climate change.

Under the guidance of Associate Professor Sakonvan Chawchai, Ph.D., Faculty of Science, a research project is decoding the history and current status of tropical peatlands. The mission includes:

Understanding Past Records: Exploring historical peatland data to decipher how they've responded to climate changes.

Analyzing Land-Use Changes: Establishing links between historical data and contemporary land-use patterns, crucial for sustainable resource management.

Collaborating with Stakeholders: Engaging stakeholders in peatland resource management to ensure a comprehensive approach to protection.

This research project is essential for preserving tropical peatlands. Its outcomes will enrich the understanding of these ecosystems and provide a blueprint for their preservation, contributing to SDG14 by ensuring the longevity of life below water and the critical ecosystem services they provide.



### Innovareef: A 3D Solution for Thailand's Ailing Coral Reefs

Chulalongkorn University's Veterinary Medical Aquatic Animal Research Center of Excellence (VMARCE), Faculty of Veterinary Science, by Thanida Haetrakul, Ph.D. has introduced Innovareef, innovative cement-based structures designed to support coral reef recovery. These lifelike structures are tailored for planula settlement and growth, addressing the deterioration of Thai coral reefs caused by global warming and human activities.

Innovareef helps accelerate coral reef recovery and promotes ecotourism while functioning as smart monitoring stations for marine environments. By mimicking natural coral structures and using materials like cement, it provides an attractive and sustainable solution. VMARCE's research team has integrated marine monitoring equipment into Innovareef, enabling it to measure water temperature, tidal forces, and pH levels.

Since 2020, Innovareefs have been installed along the coasts of Chonburi province, including Si Chang Island, Lan Island, and Sattahip. These structures are lightweight, easy to transport, and simple to install, making them cost-effective. The rapid colonization of marine life around Innovareef indicates its success in enhancing biodiversity and supporting coral settlement and growth.

Aligned with Sustainable Development Goal 14 (Life Below Water), Innovareef offers hope for the restoration of coral reefs and the preservation of marine ecosystems. Recognized with the National Innovation Awards in 2020, it showcases the potential of innovative solutions in marine conservation.





## Developing a Crude Oil and Relevant Oil Product Fingerprint Library in Thailand (2022–2024)

Associate Professor Siriporn Jongpatiwut, Ph.D. at the Petroleum and Petrochemical College, Chulalongkorn University works rigorously on the issue of oil spills which poses a significant threat to marine and coastal ecosystems worldwide, necessitating effective remediation and prevention measures. However, identifying spilled oils has proven to be a complex challenge, particularly as these oils undergo various weathering processes at sea, transforming into tar balls before reaching shorelines. These weathering processes, which include evaporation, photo-oxidation, and biodegradation, bring about substantial changes in the physical and chemical composition of the oil. To address this challenge, biomarker compounds such as hopanes and steranes are commonly used for oil fingerprinting due to their high durability and stability.

In Thailand, a collaborative effort involving ten organizations, encompassing government and private sectors and spearheaded by the Pollution Control Department, Ministry of Natural Resource and Environment, was initiated through a Memorandum of Understanding (MOU) in November 2018. The central objective of this collaboration is the “Development of Crude Oil and Relevant Oil Product Fingerprint Library in Thailand.” As part of this partnership, the Petroleum and Petrochemical College plays a crucial role in analyzing oil fingerprints using advanced GCxGC TOF-MS technology. Additionally, the Pollution Control Department, in conjunction with its collaborators, has recently released the “Manual for Collecting and Analyzing Crude Oil, Spilled Oil, and Tar Balls.” This manual serves as a knowledge-sharing resource for relevant sectors involved in oil spill management.

An ongoing project spanning from 2022 to 2024 focuses on the development of a comprehensive database containing information about crude oils commonly used in Thailand. This database is a vital step toward enhancing crude oil identification capabilities in the country, thus contributing to more effective responses to oil spills and aligning with the objectives of Sustainable Development Goal 14 (SDG14) - Life Below Water

## Repurposing Petrochemical Platforms to Conserve Marine Life in Thailand

In the pristine waters of Koh Phangan, Thailand, a groundbreaking collaboration involving Chulalongkorn University, specifically the Aquatic Resources Research Institute (ARRI) by Se Songploy, Ph.D., Walailak University, and Chevron Thailand Exploration and Production has revitalized seven retired petrochemical platforms. These former industrial structures have been repurposed into artificial reefs, an innovative endeavor designed to assess their impact on the environment and local communities.

The project’s primary objective is to enhance marine resource conservation in the region by repurposing platforms previously dedicated to oil production. The installations were successfully completed in September 2020, marking a significant milestone. This forward-thinking initiative is directly in line with Sustainable Development Goal 14 - Life Below Water, emphasizing the critical importance of conserving marine resources and the positive influence on the livelihoods of local communities dependent on these vital ecosystems.

Through this visionary undertaking, Thailand exhibits its dedication to the preservation of marine life and the advancement of sustainable practices. While the project currently serves as a pioneer for the alternative utilization of retired petrochemical platforms within Thailand’s maritime boundaries, it also has the potential to inspire similar initiatives both nationally and globally.



## ชีวิตบนพื้นพิภพ LIFE ON LAND

### Long-term Tropical Forest Monitoring for Sustainable Ecosystems

Led by Associate Professor Pantana Tor-ngern, Ph.D. at the Faculty of Science, Chulalongkorn University's Faculty of Science, this project has run since November 2020, contributing directly to Sustainable Development Goal 15 (SDG15). It aims to monitor tropical forests' responses to environmental changes, essential for their sustainable management.

The project includes two flux towers in Khao Yai National Park, tracking water and carbon fluxes in the forest ecosystem. Continuous weather data collection and self-made sap flow sensors for water flow rates are part of this monitoring. Eddy covariance systems precisely measure CO<sub>2</sub> absorption and water vapor loss.

Key goals include:

- Gain insights into climate change's impact on forests as climate regulators and CO<sub>2</sub> mitigators.
- Focus on successional forests, particularly in Southeast Asia.
- Seek continuous funding to expand and create a data repository.
- Share data with educational institutions and researchers to inform forest and water management.

Initial funding came from the Swedish Research Council and the National Science and Technology Development Agency of Thailand. Subsequent phases are supported by the National Research Council of Thailand and Chulalongkorn University.

The project has led to significant research outcomes, including three postgraduate students' graduation with publications in reputable journals. Associate Professor Pantana Tor-ngern has gained national and international recognition for her contributions.

This comprehensive project aligns perfectly with SDG15, offering crucial insights for the sustainable management of tropical forests.

### Sustainable Corn Farming and Ecosystem Conservation in Ban Pha Daeng, Lampang

In response to the critical Sustainable Development Goal 15 (SDG15), the project titled "Alternatives or Survival? Enhancing Risk Assessment in the Environmental and Health Systems of Intensive Agriculture among Farmers in the Watershed Area" is conducted from October 2023 to September 2024. This initiative aims to address the pressing issue of sustainable land use and ecosystem preservation, with a specific focus on Ban Pha Daeng in Lampang Province.

The project is executed through soil and surface water sampling, chemical soil analysis, and interviews with farmers in order to assess the presence of glyphosate and atrazine in soil and surface water seasonally during the wet (May to October) and dry (November to April) seasons. Evaluate the environmental and health risks for farmers in the area and analyze the resource utilization patterns concerning sustainable farming while preserving community well-being.

The Department of Environmental Science, Faculty of Science, by Associate Professor Pasicha Chaikaew, Ph.D., with collaborative efforts involved with other research units, including the Faculty of Economics at Chulalongkorn University and the Faculty of Science at Lampang Rajabhat University. Key stakeholders, such as village chiefs and the Subdistrict Administrative Organization (SAO), are actively involved. The primary beneficiaries of this project are the farmers and residents of Ban Pha Daeng, Tambon Ban Rong, Wang Nua District, Lampang.

As a result of this study: Corn farmers, primarily engaged in livestock feed production, have gained a deep understanding of the critical connection between water sources, the local environmental impact of corn farming, and the persistent use of chemical pesticides. Specifically, they have become acutely aware of the heightened environmental consequences of farming on steep hillsides compared to flatlands. This newfound awareness has prompted them to explore alternative livelihoods that are safe, sustainable, and conducive to long-term resource conservation, significantly contributing to community resilience.

Significant time and costs have been saved for local agencies such as the Ban Rong Subdistrict Administrative Organization, community health service organizations, the Lampang Environmental and Pollution Control Office 2, and educational institutions in Lampang Province. The research data can serve as a valuable resource for planning future campaigns or policies tailored to their missions.

The study area, especially in the fifth sector of Ban Pha Daeng, where corn cultivation is most extensive, has provided a robust platform for an integrative study approach. This approach encompasses risk assessment and economic analysis, effectively reflecting environmental and economic assessments rooted in the specific needs of this small-scale community. The results can be extrapolated to similar contexts at the subdistrict and district levels.







## Phu Chong Na Yoi National Park: Biodiversity and Sustainable Progress

Phu Chong Na Yoi National Park in Ubon Ratchathani is a hope for biodiversity and community development. Led by Assistant Professor Natapot Warrit, Ph.D. from the Faculty of Science, it focuses on studying the park's insect life, especially pollinators, to transform it into an eco-friendly tourist spot.

Aligned with UN Sustainable Development Goal 15 - Life on Land, this project raises environmental awareness, conserves species, and boosts local economies.

The project's impact has been far-reaching. New species of bee has been discovered; the new species is named "Bee Yard Amber Phu Chong" (*phuchongensis*). The word "phuchong-" comes from the name of Phu Chong Na Yoi National Park, Ubon Ratchathani Province. That is the place where this type of bee was first discovered. The "-ensis" is a Latin suffix meaning "originating in." Moreover, local communities have become active participants in conservation activities, reinvigorating endangered plant and animal species. Remarkably, sustainable ecotourism has emerged as a vital source of income, significantly reducing the need for rural-to-urban migration in search of employment. This, in turn, bolsters family bonds and ensures that children receive care within the reassuring proximity of their homes.

Ultimately, Phu Chong Na Yoi National Park and its neighboring communities reap the greatest rewards from this endeavor. This project, characterized by its holistic approach to development, exemplifies the harmonious coexistence of nature and humanity. It stands as an exemplary model of sustainable progress, promising a brighter and more harmonious future for both the environment and its inhabitants.

## Promoting Environmental Conservation and Youth Engagement in Nan

In collaboration with the Phu Fa Development Center under the Patronage of Her Royal Highness Princess Maha Chakri Sirindhorn, Chulalongkorn University's Faculty of Communication Arts by Assistant Professor Munyat Akarachntachote, Ph.D. has launched the R-radio network FM 102 MHz project. This initiative empowers children and youth in Nan Province's Bo Kluea and Chaloei Phra Kiat Districts to learn, create radio programs, and contribute to local environmental conservation efforts.

Faculty members and students from the Department of Mass Communication have played a vital role by designing training courses, hosting radio program production camps, and creating radio programs and short films. These activities have engaged 124 students from primary to high school, instilling in them a sense of responsibility for safeguarding the region's natural resources and ecosystems.

This project significantly supports Sustainable Development Goal 15 (SDG15) - Life on Land by promoting environmental conservation and educating youth about the importance of preserving northern Thailand's natural beauty. It aligns with SDG15's objectives of protecting terrestrial ecosystems, sustainable forest management, combating desertification, and halting biodiversity loss, making it a valuable contributor to achieving these global sustainability goals.





# สงบสุข ยุติธรรม และเป็นสถาบันที่เข้มแข็ง

## PEACE, JUSTICE AND STRONG INSTITUTIONS

### Advancing Social Justice Through Transformative Leadership by Social Research Institute (The Human Security and Equity Research Unit – HuSE)

In Thailand, the pursuit of social justice has gained significant momentum over the past decade. However, the multifaceted nature of this concept remains a challenge due to varying interpretations and limited resources available in the Thai language. To address this, a practical and action-oriented approach has emerged. This initiative, funded by the Thai Health Promotion Foundation, recognizes the potency of Transformative Leadership as a driving force for effective social change.

This project, led by Sayamol Charoenratana, Ph.D., the Leader of the Human Security and Equity Research Unit, Social Research Institute, consists of two components:

- Evaluating Existing Programs, both national and international training programs, to identify opportunities for improvement. The objective is to ensure that Thai programs can stand shoulder-to-shoulder with their global counterparts in leadership development.
- Developing contemporary training programs, including identifying target customer groups and conducting various practical training exercises customized for these specific groups.

This initiative resonates profoundly with Sustainable Development Goal 16 (SDG16) - Peace, Justice, and Strong Institutions. Furthermore, the objectives of utilizing social innovation outputs include:

- Enhancing Competitive Training Programs: This fosters excellence and market competitiveness, aligning with SDG16's call for accountable and inclusive institutions.
- Experimenting with Targeted Training: By experimenting with different training approaches, the project ensures that it caters to specific audience needs, contributing to more inclusive and just societies.
- Developing Sales Channels: This not only expands the reach of training programs but also aligns with SDG16's emphasis on accessible and responsive institutions.
- Exploring Business Strategies: The initiative explores sustainable business strategies, echoing SDG16's vision for strong, inclusive institutions.
- Evaluating Social Return: Lastly, by evaluating the social return on investment, the project measures its impact on societal fairness and justice, a fundamental aspect of SDG16.

This initiative not only responds to the challenges of social justice in Thailand but also actively contributes to achieving SDG16. It empowers transformative leaders, reduces disparities, and fosters strong, inclusive institutions, paving the way for a more just and equitable society.







## Bridging Justice Gaps: People-Centric Justice for All

In a transformative effort led by Assistant Professor Thanee Chaiwat, Ph.D. from the Faculty of Economics, Chulalongkorn University's Faculty of Economics, the "People-Centric Justice" project aims to narrow the divide between the public and the legal system in Thailand. Running from 2022 to 2023 with support from the Thailand Institute of Justice, the project seeks to make the legal process more accessible and efficient, fostering trust in the country's legal system.

This initiative focuses on understanding the legal challenges faced by vulnerable groups and aligning the justice system with their needs. It consists of two key components: examining the legal interactions of these groups and developing tailored mechanisms for efficient and comprehensive access to justice.

Significantly, the Thailand Institute of Justice is a close collaborator in this initiative, thereby amplifying its impact. Notably, this project has been crafted as a model for legal systems within the ASEAN (Association of Southeast Asian Nations). It was recently showcased at the United Nations conference in Vienna on May 26, 2023, during a session focused on "Toward People-Centered Justice: Advancing Collaboration of Data in Southeast Asia." This presentation served as a pioneering example of People-Centric Justice in action.

In essence, this project responds to UN Sustainable Development Goal 16 by promoting a legal system that works for everyone, particularly vulnerable communities, thus advancing fairness and accessibility in justice.

## Nurturing Legal Excellence: Chulalongkorn Law Students Collaborate with Police

In alignment with UN Sustainable Development Goal 16, the Royal Thai Police and Chulalongkorn University's Faculty of Law, under the leadership of Assistant Professor Pareena Srivanit, Ph.D., the Dean of Faculty, have launched the "Special LawLAB: Young Lawyers – Police Engagement Pilot Project." Commencing on August 30, 2022, this groundbreaking initiative bridges the gap between law students and contemporary police investigations in the era of 5G technology.

Twenty-five Chulalongkorn University law students, ranging from the 2nd to 4th year, have been meticulously selected for this self-learning Young Lawyers – Police Engagement Pilot Project. This endeavor facilitates academic and practical collaborations with police officers across diverse departments, fostering a distinctive learning experience.

Dean Asst. Prof. Dr. Pareena Srivanit underscores the project's alignment with the Faculty of Law's LawLAB, offering students invaluable insights into investigative processes. It equips aspiring lawyers with practical, real-world understanding, enabling them to contribute significantly to legal development. Simultaneously, it offers law enforcement officers fresh perspectives from a diverse student group.

Crucially, this pilot project enriches students' practical skills, preparing them to be forward-thinking lawyers who integrate real-world experiences into their practice. In consonance with Sustainable Development Goals 16 and 17, it advances a robust judicial system and collaborative partnerships, particularly with youth groups.

This initiative symbolizes a progressive collaboration between law enforcement and youth, akin to England's Youth Commission Model on Police and Crime. It recognizes the abilities of young individuals, dismantles stereotypes, and builds a more inclusive legal framework. In a rapidly changing society, such partnerships empower future legal professionals and enhance law enforcement's understanding of youth perspectives, fostering a more inclusive and forward-looking legal ecosystem.

## Towards a Better Future for Older Persons

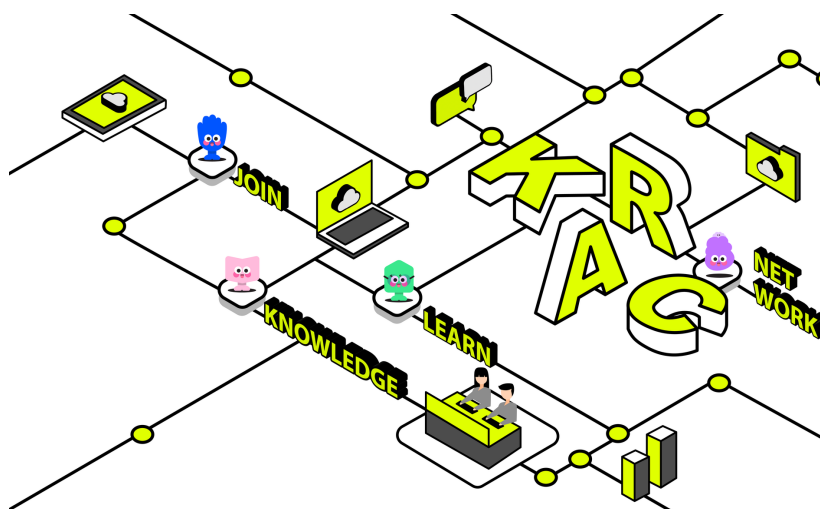
College of Population Studies, in collaboration with Ministry of Social Development and Human Security, as well as government, non-profit organizations, and network partners, held an online consultation and an onsite meeting at the BANGKOK MIDTOWN Hotel on Tuesday, June 14, 2022, from 8:30 a.m. to 12:00 p.m. with the goal of presenting information, exchanging data, and sharing opinions and recommendations on the topic of older people. A total of 33 people attended, with 18 online and 15 in the conference room.

The team was led by Associate Professor Ruttiya Bhula-Or, Ph.D., Deputy Dean of College of Population Studies, Dr. Nopphawan Photphisutthiphong, Dr. Chadatan Osatis, Lecturer of College of Population Studies, Chulalongkorn University along with qualified and experts from many agencies from Department of Older Persons, Ministry of Social Development and Human Security, Office of the National Economics and Social Development Council, Ministry of Interior, Ministry of Justice, Ministry of Labour, Ministry of Education, Ministry of Commerce, Office of the Permanent Secretary, Ministry of Justice, Ministry of Transport, Ministry of Digital Economy and Society, Ministry of Public Health, Department of Women's Affairs and Family Development, Department of Local Administration, Ministry of Interior, Department of International Trade Promotion, Ministry of Commerce. In addition, representatives from Foundation for Woman (FFW), Foundation For Older Persons' Development (FOPDEV), National Housing Authority, ThaiHealth Organization, Kenan Foundation Asia.

This discussion aims to facilitate the review and appraisal of the implementation of the Madrid International Plan of Action on Ageing (MIPAA). The voluntary national survey and report on MIPAA implementation are essential to the Asia-Pacific Regional Review and Appraisal in 2022. This report will be a part of the global review and appraisal in 2023 and will be included in the 2023 report for the United Nations Decade of Healthy Aging, 2021-2030.







## LawLAB Program: Empowering Human Rights Awareness and Advocacy

Led by Pat Niyomsilp, Ph.D. and hosted by the Faculty of Law at Chulalongkorn University, LawLab was established to provide students and the public with insights into legal issues and legal operations related to business, with a particular focus on laws crucial to Thailand's future economy and society. Within this initiative, the "LawLAB for Human Rights" program was launched in 2021. It aimed to engage law students in defending human rights and civil liberties in Thailand, particularly in cases that require compliance with the International Covenant on Civil and Political Rights (ICCPR).

This program not only educated students but also raised awareness among the general public about the significance of safeguarding human rights and civic freedoms in Thailand. It addressed the challenges and obstacles faced by human rights lawyers, providing students with a well-rounded understanding of the legal landscape. Moreover, students gained insights into the Sustainable Development Goals (SDGs), particularly Goal 16, which advocates for peaceful, just, and inclusive societies, access to justice, and effective, accountable, and inclusive institutions. The training included observation of public demonstrations, documentation of human rights cases and political cases, and practical legal skills, all in collaboration with organizations like Thai Lawyers for Human Rights (TLHR), Human Rights Lawyers Association, EnLawThai Foundation (EnLAW), iLaw, and Zen-Dai.

## KRAC: The Knowledge Hub for Ethical Governance and Anti-Corruption Excellence

The Knowledge Hub for Regional Anti-corruption and Good Governance Collaboration (KRAC), under the leadership of Assistant Professor Torplus Yomnak, Ph.D. and hosted by the Faculty of Economics at Chulalongkorn University, is dedicated to becoming a globally recognized center of excellence in anti-corruption and ethical governance. In collaboration with partners like the United Nations Office on Drugs and Crime (UNODC), National Research Council of Thailand, Office of the National Anti-Corruption Commission, HAND Social Enterprise, and Faculty of Law, Chulalongkorn University, KRAC aims to create a robust ecosystem for anti-corruption efforts.

The establishment of KRAC has already yielded significant outcomes. It serves as a platform for showcasing academic research, articles, courses, projects, and innovations related to various anti-corruption initiatives in the country. KRAC has also successfully nurtured a network of cooperation at the regional level, emphasizing fairness and integrity in governance practices. Furthermore, the center has effectively disseminated knowledge, technology, and innovations related to anti-corruption throughout the ASEAN region, attracting a significant number of Thai and international researchers, experts, instructors, and students who engage in collaborative work and research studies at the center.

The center's future focus includes comprehensive analysis and assessment of its operations, leading to the creation of academic and practical knowledge in anti-corruption. It aims to align policies with the evolving crisis situation in Thailand and work efficiently with national and regional networks to advance anti-corruption initiatives. In essence, KRAC seeks to contribute substantially to the effective and sustainable transformation of anti-corruption efforts in the country.

The work of KRAC directly aligns with Sustainable Development Goal 16 (SDG16) - Peace, Justice, and Strong Institutions. It promotes justice through its focus on combating corruption, fosters strong and accountable institutions, and contributes to creating a fair and equitable society in Thailand. KRAC's efforts to establish a regional network for ethical governance further reinforce its alignment with SDG16's objectives for peace, justice, and strong institutions.



## หุ้นส่วนความร่วมมือสู่ทุกเป้าหมาย

# PARTNERSHIPS FOR THE GOALS

## Chula Neuron – Digital Knowledge Repository for Lifelong Learning

Chula Neuron, operated by Chulalongkorn University General Education Center, is a digital knowledge repository designed to support high-quality online education and activities for a diverse audience. It encompasses general education subjects and CUVIP (Chulalongkorn University Virtual Interactive Platform) activities, making learning accessible to students, staff, alumni, high school students, and the general public. It enables self-directed and lifelong learning through diverse and flexible online learning methods. Additionally, Chula Neuron features a personal credit bank system that aggregates learning data to encourage continuous and lifelong learning.

The Chula Neuron project strongly aligns with Sustainable Development Goal 17 (SDG17) - Partnerships for the Goals, by fostering various collaborations and partnerships:

**Digital Development Fund Support:** The project received support from the Digital Economy and Society Development Fund in the fiscal year 2022, highlighting the collaboration between public and private sectors to advance digital literacy and human resources in the country.

**Collaboration with External Organizations:** Chula Neuron has established partnerships with various external organizations, such as True Digital Academy, the National Health Security Office (NHSO), and the Stock Exchange of Thailand (SET), aimed at expanding the reach and impact of its educational programs.

In terms of knowledge and skills, Chula Neuron offers a diverse range of online courses that cater to the needs of individuals and society. These courses cover subjects such as GenEd (General Education), CUVIP, Chula MOOC, CU Engineering, general digital skills, and introduction to the digital age. Currently, Chula Neuron hosts approximately 160 online courses, addressing the learning needs of a wide audience.

Apart from being a hub for digital learning, Chula Neuron is also a proof to the power of partnerships and collaborations in advancing education and digital literacy. By providing accessible and quality education to a broad spectrum of learners, it contributes significantly to SDG17's vision of enhancing partnerships to achieve the Sustainable Development Goals.

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## Chula Volunteer and Cultural Exchange Activities Hub: Promoting Global Engagement

The Chula Volunteer and Cultural Exchange Activities Hub, by Ms. Arunya Pakdee, the Director of Division of Student Activities, Office of Student Affairs, organizes activities year-round with the goal of fostering cross-cultural learning. Its mission is to facilitate the exchange of knowledge about both Thai and international cultures, drawing from the wealth of Thai wisdom to promote sustainable living and harmonious societies in the present and future. Additionally, it aims to cultivate positive relationships among students from Chulalongkorn University and partner institutions within its network. This initiative strongly aligns with the Sustainable Development Goals of the United Nations, specifically Goal 17 - Partnerships for the Goals.

This program empowers participants to enhance their academic skills and broaden their understanding of volunteer activities and cultures, encompassing both Thai and international perspectives. These efforts take place within the context of our rapidly changing global landscape. Core activities include hands-on training, exchange programs, and discussions aimed at addressing emerging global issues. Moreover, it offers opportunities for international travel to facilitate experiential learning.

The project comprises two key components: activity enhancement and hosting visiting universities. The central focus of these initiatives is to promote global success for students and staff, encourage active global engagement, address pressing global challenges, and create an international environment at both the university and national levels. Collaborative partnerships with the Office of International Affairs and the Global Network are essential for achieving these objectives.

The Office of Student Affairs plays a vital role in overseeing and coordinating university-student interactions, with a specific emphasis on international students. Regarding activities and operations, students take the lead within the Chula International Volunteer Hub project, which has been in operation since 2019. This program has experienced remarkable growth, with participation from over 80 students spanning all faculties at Chulalongkorn University, representing an astounding increase of over 200%. These students actively engage in various activities, with 60% currently participating, 30% in preparation for engagement, and 10% having traveled for international activities. All participants embrace these activities to expand their opportunities for international engagement.

In conclusion, the Chula Volunteer and Cultural Exchange Activities Hub exemplifies the principles of SDG 17 by fostering collaboration and partnerships among students and universities, ultimately contributing to a more inclusive and sustainable world.

## Chula The Master Program: Elevating Alumni Engagement to Unlock Lifelong Learning and Impactful Partnerships

In response to evolving educational paradigms, Chulalongkorn University introduces the Chula The Master Program, redefining the alumni-university relationship. Departing from traditional alumni engagement, this initiative envisions a dynamic partnership, tapping into the wealth of alumni knowledge.

Managed by the Development Center and Alumni Relations Center, it aims to encourage alumni to co-create educational content and offers inclusive lifelong learning to all, regardless of background. With digital accessibility, this project provides convenient registration and resource access.

Aligned with UN SDG 17 - Partnerships for the Goals, this program fosters knowledge exchange and support. It creates inclusive, sustainable partnerships, benefiting society.

Chula The Master Program is a visionary approach to alumni engagement, exemplifying how partnerships drive broader social and educational goals. It's a model for universities to empower alumni effectively.











# Chulalongkorn University Sustainability Report 2022–2023

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Chulalongkorn University Alumni Relations

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An aerial night photograph of the Chulalongkorn University campus in Bangkok. The image shows a mix of modern and traditional architecture. On the left, a large, multi-story modern building with a grid of lit windows stands out. To the right, a traditional Thai building with multiple tiers of ornate, red-tiled roofs is illuminated. The campus is filled with lush green trees, and the streets are lit with warm yellow lights. The overall scene is a vibrant display of the university's urban environment at night.

# Chula

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