
CMU
CHIANG MAI UNIVERSITY
SUSTAINABLE
DEVELOPMENT
GOALS

There are no **"OLD"**
projects that truly serve sustainability
their continuing impact is continual
RENEWAL.

PROF. PONGRUK SRIBANDITMONGKOL, M.D., Ph.D.
President of Chiang Mai University

PRESIDENT'S MESSAGE

On behalf of the entire Chiang Mai University community, I welcome you to our sixth decade of academic excellence and socially responsible stewardship.

When CMU was founded in 1964, we became Thailand's first public university established outside the capital city of Bangkok. Our mission was to expand higher education to the underserved populations of Northern Thailand. The challenges of building a new university were immense, yet the path forward was clearly illuminated by **His Majesty King Bhumibol Adulyadej (Rama IX)**, who in his commencement address to CMU's first graduating class urged us to "seek knowledge continuously, keep abreast of innovations, and constantly strive to promote the public good."

Those words have remained our guiding principles for 60 years, finding full expression in our commitment to the United Nations Sustainable Development Goals (SDGs). All 17 SDGs are integrated into the strategic objectives of CMU's 13th Educational Development Plan (2023–2027)—an actionable framework guiding our academic, research, and outreach missions toward a sustainable and inclusive future.

We take pride that the Times Higher Education (THE) Impact Rankings have recognized our commitment to sustainability by consistently placing CMU among the top 4 percent of universities worldwide. Our aspiration is to advance into the top 50 of the more than 2,000 universities assessed—not for recognition alone, but as a meaningful measure of how effectively we contribute to the betterment of our society and our world.

As is fitting for an SDG report commemorating our 60th anniversary as a socially engaged university, we highlight in the following pages not only new undertakings for a sustainable future but also continuing initiatives—some of long standing. In both cases, we provide historical context, for challenges to sustainability have deep roots.

Effective progress depends upon understanding the past: the challenges themselves and the earlier efforts to meet them, so that we may learn from both failures and successes. Once initiated, these efforts require vigilant monitoring to ensure that the very conditions that prompted their creation do not compromise their long-term viability.

TABLE OF CONTENTS

UN SDGs AGENDA

GLOBAL GOALS FOR A GLOBAL COMMUNITY

CMU | CHIANG MAI UNIVERSITY

SUSTAINABLE DEVELOPMENT GOALS

In 2015, all 193 member states of the United Nations adopted 17 Sustainable Development Goals (SDGs), advancing a shared vision to confront the world's most urgent challenges, from environmental degradation and climate change to poverty, hunger, inequality, and inadequate access to healthcare and education.

At their core, the SDGs embody the principle of sustainability : the belief that societal transformation must not come at the expense of subsequent generations; the conviction that current priorities must not compromise resources required for future fair and equitable growth. In essence, the SDG agenda is a global promise that the present will be the future's benefactor, not its burden.

CMU SDGs

To Be A Socially Responsible Institution That Drives Sustainable Development Through Innovation.

Chiang Mai University's Vision Statement,
13th Educational Development Report, 2024

Thailand Quality Class TQC+ 2023

CMU's institutional culture is deeply embedded in sustainability. As an early proponent of Thailand's Sufficiency Economy Philosophy—an ethical framework for balanced community and national growth through responsible use of resources—CMU has long acted on values aligned with sustainable development. It therefore embraced the UN's SDG agenda not as an external directive, but as a natural extension of its mission, reinforcing its determination to become a globally engaged university.

The university's 13th Educational Development Plan (2023–2027) integrates all 17 SDGs into 5 strategic platforms: Biopolis (campus quality of life), Medicopolis (regional and national healthcare), Creative Lanna (cultural and environmental stewardship), Education (traditional and lifelong learning), and Research and Innovation (technological collaboration and advancement).

CMU's ability to translate sustainability goals into meaningful outcomes has been recognized nationally and internationally. Thailand's Quality Award (TQA) , based on Malcolm Baldrige Framework, has consistently honored CMU faculties with TQC,TQC+ awards; in 2023, the university as a whole became the 1st university in the country To receive the TQC-Plus-Innovation Award.

THE IMPACT RANKINGS

74th Ranked in the World 2023 — 75th Ranked in the World 2024 — 44th Ranked in the World 2025 | 1st Ranked in Thailand 2025

CMU ranked worldwide in the Top 100 in 10 SDGs

*Qualifying SDG

TOP 20 Ranked in the World
- SDG 5: 10th Ranked in the World
- SDG 13: 15th Ranked in the World
- SDG 17: 17th Ranked in the World

TOP 50 Ranked in the World
- SDG 4: 40th Ranked in the World

TOP 100 Ranked in the World
- SDG 1: 53rd Ranked in the World
- SDG 8: 60th Ranked in the World
- SDG 12: 81st Ranked in the World
- SDG 3: 85th Ranked in the World
- SDG 10: 99th Ranked in the World
- SDG 6: 100th Ranked in the World

Globally, Times Higher Education (THE) has tracked CMU's performance in its annual SDG Impact Rankings. CMU first participated in 2020, ranking in the middle range among nearly 900 universities from 89 countries. By 2025, its commitment to SDG implementation had elevated it to 75th among 2,152 universities from 125 countries. In addition to this overall rise, CMU has consistently excelled in individual SDGs, particularly gender equality (SDG 5) and climate action (SDG 13). In 2024, THE also ranked CMU first among Thai universities for quality education (SDG 4).

FROM THE BEGINNING

Chiang Mai University Meant Innovation

Traditionally, public universities in Thailand clustered in the capital city of Bangkok, each focusing on its own field of specialization.

Chiang Mai University BROKE NEW GROUND.

Established in Northern Thailand in 1964, CMU was the nation's first regional institution of higher education. It was also the first university dedicated from the outset to a wide range of academic training, as well as the first to engage with a large underserved rural population. During 6 decades of achievement, CMU has grown from its initial 3 buildings and 291 scholars into an institution of international standing, with approximately 36,090 undergraduate and graduate students enrolled in 21 faculties, 3 colleges and 3 institutes dedicated to research and teaching in the natural and social sciences, applied sciences, commerce, and humanities.

True to CMU's founding, innovation flourishes on all 3 of the primary campuses, which are linked by battery-operated shuttles, charged by a renewable-energy grid that makes the scenic indigenously landscaped Main Campus the most solar-powered complex in Thailand.

The nearby Health Sciences Campus embraces CMU's acclaimed Medical School, Dentistry Faculty, and Nursing Faculty, along with Northern Thailand's largest tertiary-care teaching hospital. Assisted by specialized Centres of Medical Excellence, these facilities have helped transform the City of Chiang Mai into a major hub for patient care, clinical trials, and medical research, known for contributions to the fields of public health, infectious diseases, and molecular imaging technology.

About 5 kilometers distant is the veterinary and agribusiness campus, which is home to CMU's Energy and Research Development Institute – the nation's foremost center for environmentally friendly waste management solutions and sustainable biogas conversion systems for municipalities, industries, and agriculture. In a very real sense, CMU also hosts a fourth campus, existing largely in digital space. It is the School of Lifelong Education, which has opened up educational opportunities for more than 300,000 participants of diverse ages, backgrounds, and aspirations.

Chiang Mai University at a Glance

Powering People, Planet, Partnerships through »»» **Education, Innovation & Impact**

Total Number of Students, Academic Year 2024 : **36,090 Persons**

0.24%	83.88%	0.39%	11.99%	3.50%
63	30,774	37	3,893	1,323

- Graduate Diploma
- Bachelor's Degree
- Higher Graduate Diploma
- Master's Degree
- PhD programmes

- Humanities & Social Sciences **16,396**
- Science & Technology **14,034**
- Health Sciences **5,660**

Programmes Offered in Academic Year 2024 : **333 Programmes**

- Graduate Diploma — **1**
- Bachelor's Degree — **109**
- Higher Graduate Diploma — **3**
- Master's Degree — **136**
- PhD programmes — **84**

Academic Units

21 faculties · **3** colleges · **3** institutes

Personnel : **7,772 Persons**

36.20%	63.80%
2,814	4,958

Academic Staff · Professional& Support Staff

PEOPLE & INCLUSIVITY

36,090 Students
60% Women

Expanding access to quality higher education for diverse learners nationwide.

ACADEMIC & PROFESSIONAL COMMUNITY

7,772 Staff
63% Women in the Workforce

Building inclusive excellence through academic, professional, and research leadership.

GLOBAL REACH & PARTNERSHIP

800+ International Partners across **4** Continents

Strengthening global collaboration for sustainable development and innovation.

RESEARCH FOR IMPACT

5,777 SDG-Linked Publications (2020-20224)

Generating knowledge that advances all 17 Global Goals —a 14% increase year-on-year.

SUSTAINABLE OPERATIONS

12.68 MW Solar Rooftops
5,500 tons CO_2 Reduced Yearly

CMU's living laboratory leads Thailand's path to carbon neutrality by 2032.

LIFELONG LEARNING IMPACT

300,000+ Learners Nationwide
420 Program + **200** Workshops

Thailand's first Credit Bank System connects academic and informal learning for all ages.

SOCIO-ECONOMIC CONTRIBUTION

37 Billion THB
Socio-Economic Impact (2023)

Created through 5 strategic objectives or platforms linking education,health, research, and innovation.

GLOBAL RECOGNITION

TOP **4%** Worldwide in THE Impact Rankings 2024

Ranked #1 in Thailand for Quality Education (SDG 4).

OUR PEOPLE IMPACT

At Chiang Mai University, sustainability begins with people. Every breakthrough in energy, environment, health, and education is powered by the creativity and commitment of those who call CMU home. Our educators, researchers, learners, and community partners turn ideas into action, linking classrooms with communities and innovation with compassion.

From clean-energy engineers and social scientists to healthcare specialists, lifelong-learning advocates, and student entrepreneurs, these changemakers embody CMU's mission to serve society through knowledge and inclusion. Together, they show how a university becomes more than a place of learning—it becomes a living network of people shaping a better, fairer, and more sustainable future for all.

"Every tree we plant is a step toward restoring balance between people and nature."

Assoc. Prof. Dr. Steve Elliott
Researcher, Forest Restoration Research Unit (FORRU)

"Learning again at 83 taught me that age is not a limit—but an opportunity."

Inkaew Chaisri
Senior Learner, MEDEE Program

"I believe clean air is not a privilege; it's a duty of care we owe to the next generation."

Assoc. Prof. Dr. Somporn Chantara
Head of Environmental Science Research Center

"Empowerment begins when voices once unheard shape the future together."

Dr. Chayan Vaddhanaphuti
Director, Regional Center for Social Science and Sustainable Development (RCSD)

"We turn sunlight into science—and science into cleaner air."

Assoc. Prof. Dr. Sirichai Koonaphapdeelert
Director, Energy Research and Development Institute (ERDI)

"Innovation starts with curiosity—and grows when we create for others, not just ourselves."

Tanatat Intachin
Major: Management and Entrepreneurship

"Every smile healed is a life restored—and a community renewed"

Assist. Prof. Krit Khwanngern, MD.
Director, Princess Sirindhorn IT Foundation Craniofacial Center

"Lifelong learning is how we grow resilience—one learner, one community at a time"

Assoc. Prof. Dr. Nuttee Suree
Director, School of Lifelong Education (CMU-LE)

CARBON NEUTRAL BY DESIGN

12.68 MW
Solar Rooftops
Powering 168 buildings and cutting 9,900 tons CO_2 each year

5,500+ TONS
CO_2 reduced annually
From CMU's waste-to-energy and circular biomass systems

40 Electric Vehicles
Over 3.9 million passenger trips, reducing 380 tons CO_2

40% of Campus electricity by solar power

2032 : Full Carbon Neutrality Goal
Reaching 70% reduction by 2030 through renewable energy

4,500+ TONS
CO_2 saved yearly
From solar thermal and energy-efficiency upgrades

Pathway to Carbon Neutrality:

CMU's Living Laboratory for Sustainable Operations

ERDI-CMU | SCMC SUSTAINABLE CAMPUS MANAGEMENT CENTER | CMU CARBON ONE CHIANG MAI UNIVERSITY

CMU advances environmental stewardship through a broad portfolio of initiatives aimed at achieving carbon neutrality and sustainable resource management. Central to this effort is a unified operational framework coordinated by the Energy Research and Development Institute (ERDI) and the Sustainable Campus Management Center (SCMC). Together, they create a living laboratory for clean energy, waste management, and net-zero emissions, ensuring that the university's operations embody its sustainability values.

ERDI drives innovation through renewable energy systems. Among its energy-efficient technologies that reduce greenhouse gas emissions, ERDI oversees a recycling center that converts organic campus waste into biogas to create electricity for its own operations—as well as to provide fuel for campus transport. SCMC complements this work by managing campus waste efficiently and monitoring the overall energy grid through a smart-campus platform. Their close cooperation links research with real-world practice, ensuring that every ton of carbon saved is measurable, verifiable, and scalable.

This collaborative system underpins CMU's pathway to achieve full carbon neutrality by 2032. Current initiatives—such as 12.68 MW of solar rooftops, 40 electric vehicles for campus transport, and circular waste-to-energy systems—have already lowered emissions by thousands of tons of CO_2 annually.

By aligning research, operations, and community participation, CMU demonstrates how universities can lead Thailand's transition toward a low-carbon future. Its cooperative model exemplifies sustainability in action—turning scientific knowledge into measurable environmental impact.

CMU CHIANG MAI UNIVERSITY | SUSTAINABLE DEVELOPMENT GOALS

Pattern Guideline

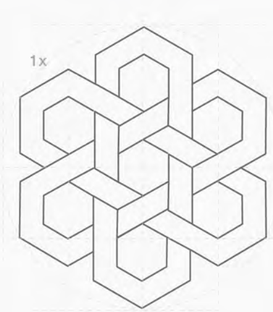
SPIRIT OF TA LAEW

Northern Thailand was once an independent kingdom known as Lanna, the “Land of a Million Rice Fields.” Its heritage continues to animate the region through distinctive festivals, cuisine, crafts, architecture, and dress. In the still-spoken Lanna language, the words Ta Laew – “Watchful Eye” – carry unique cultural significance. They name a time-honored talisman of Lanna well-being.

Woven from thin bamboo strips into a 5-sided lattice, Ta Laew is traditionally hung in homes, planted in fields, or placed at village entrances to invite good fortune and provide protection for these vital spaces. During festivals and ceremonies, villagers often come together to craft and display these lattices, deepening bonds of mutual care and shared identity.

As a symbol of guardianship, Ta Laew offers a fitting metaphor for CMU’s role in advancing sustainable development across Northern Thailand and beyond. Just as its interwoven strands form a resilient lattice, the university’s SDG initiatives weave together diverse efforts into a unified framework for social, environmental, and cultural well-being.

Guided by the spirit of Ta Laew, the following sections highlight CMU’s stewardship projects across 4 essential themes: **Land, Water, Air, and Community.**



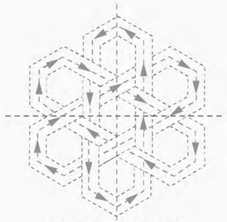
Design Modular

Wireframe Style

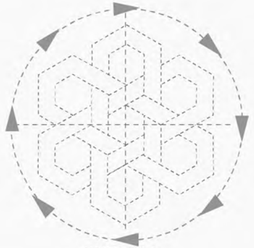
Solid Colors

Gradient Colors

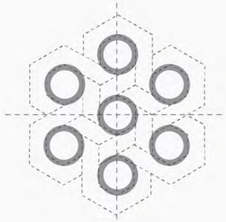
FLOWER ICONIC CMU



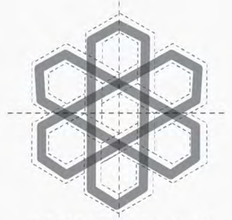
CROSS FUNCTION



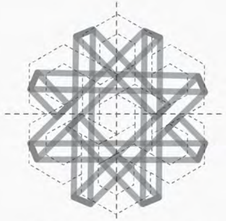
DYNAMIC



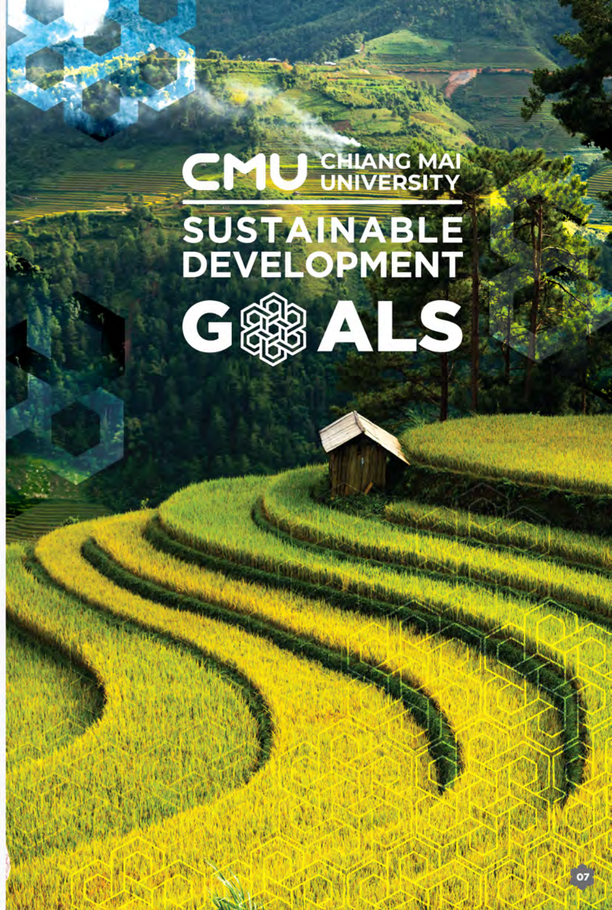
UNITY



INTEGRATION (Multiply)



WEAVING (Connective)



The United Nations often arranges the iconic17 SDG color blocks in the shape of a circle, emphasizing that these goals are inseparable and interdependent. Each SDG has a number, yet none takes precedence over the others. Any SDG may be a starting point, but none is an end in itself. Within the SDG circle, there is no hierarchy - only a shared commitment to the common good.

SDG INDEX:

LAND

CMU CHIANG MAI UNIVERSITY | SUSTAINABLE DEVELOPMENT GOALS

“ DOI SUTHEP ” WALK

20,000 Participants
join the annual CMU walk celebrating unity and sustainability

60 Years of Stewardship
honoring CMU's partnership with Doi Suthep National Park

Carbon Neutral Event (2024)
certified by Thailand Greenhouse Gas Management Organization

12 km Pilgrimage Route
linking campus to Wat Phra That Doi Suthep

50+ Partners
collaborating for zero-waste and conservation goals

Chiang Mai University (CMU) lies at the foot of Doi Suthep, a heavily forested summit that forms a scenic backdrop to metropolitan Chiang Mai. For almost half a century, the mountain’s rich biodiversity has been protected as a national park, and CMU has been a steadfast guardian of its environmental heritage. Through research initiatives, educational programs, and community partnerships, the university has championed conservation projects and sustainable farming practices that have directly benefited regional hillside villages and have proven valuable in other tropical settings.

Since its founding in 1964, CMU has honored its kinship with Doi Suthep through an annual pilgrimage up the mountainside to Wat Phra That Doi Suthep, a revered fourteenth-century Buddhist temple that draws visitors from across the nation. What began as a student tradition has evolved into a citywide celebration. As many as 20,000 participants – students, staff, alumni, and local residents – join the challenging trek each year. This cherished ritual embodies the shared commitment to protecting Doi Suthep’s natural splendor and spiritual significance, reinforcing CMU’s enduring partnership with the landscape that has shaped its identity for 60 years.

In 2024, CMU’s annual Doi Suthep trek was officially certified as a carbon neutral event by the Thailand Greenhouse Gas Management Organization.

SEED BANK

FORRU | CMU

4 Years of Collaboration
with Royal Botanic Gardens, Kew's Millennium Seed Bank

250 Native Tree Species
curated for restoration and biodiversity studies

2 International Projects
supporting forest seed management in ASEAN countries

3 Year "Tree to Seed" Initiative
strengthening regional reforestation partnerships

2 Year Grant Awarded
for capacity building in tropical seed conservation

When CMU established the Seed Bank Program in 2020 at the newly constructed Doi Suthep Nature Center, limited field-tested data existed concerning the effect of prolonged storage on the viability of native Thai tree seeds. This shortcoming limited woodland reclamation options for CMU's Forest Restoration Unit (FORRU). Although FORRU had developed scientifically validated methods for regenerating degraded tropical forests, applying those methods at scale required a reliable fertile supply of specific tree seeds that could be stored and deployed during the right season at the right habitat. To meet that need, the Seed Bank and its adjunct nursery began curating and testing critical seed species and soon became integral to CMU's reforestation efforts in Northern Thailand. The overall program aimed to promote plant and animal biodiversity, protect upland watersheds, increase carbon sequestration, and strengthen livelihoods of local forest-dependent communities.

Since its inception, the Seed Bank Program has benefited from consistent international collaboration and financial support. Notably, it has received funding and technical guidance from the Royal Botanic Gardens, Kew, through the Millennium Seed Bank Partnership. In 2024, this collaboration entered its fourth year under a new initiative called "Global Tree Seed Bank: Unlocked," which broadened curatorial and outreach activities. As part of this effort, CMU's Seed Bank received a two-year grant to strengthen reforestation and seed bank development at Indonesia's Mount Ciremai National Park

That same year, the Seed Bank also joined a three-year project, "Tree to Seed," based in Malaysia. This initiative supports indigenous communities in managing native seed stocks for forest restoration. For this work, CMU participates alongside a consortium of environmental organizations, including Malaysia's Tropical Rainforest Conservation and Research Centre, the Royal Botanic Garden Edinburgh, and the ASEAN Centre for Biodiversity.

LAND STEWARDSHIP

Holistic in Approach, Diverse in Practice

22 International Fellows
trained in 2024 Summer School on Land Governance

4 Mekong Countries
partnered for cross-border research and policy dialogue

2024 Gender Workshops
co-hosted with National University of Laos

9 Years of Exchange
advancing land rights and governance education

10+ Institutional Partners
in the Mekong Land Governance Network

Equitable Land & Resource Access

The Regional Center for Social Science and Sustainable Development Chiang Mai University

CMU's concern for environmental sustainability extends beyond ecology to encompass political, legal, and sociological dimensions. Central to this concern are questions about how land and its resources are owned, shared, and administered—issues that often disproportionately affect ethnic minority groups who have migrated to Thailand from neighboring countries.

The Regional Center for Social Sciences and Sustainable Development (RCSD) examines these matters in an interdisciplinary master's program addressing laws, norms, and societal practices related to land appropriation and resource distribution. Combining coursework, research, dialogue, and fieldwork, the program equips students with applied understanding of customary land rights and tenure security, framed by both local perspectives and national policy contexts.

Gender-related issues figure prominently in RCSD's program. In April 2024, RCSD partnered with CMU's Women's Studies Center and the National University of Laos to sponsor a workshop in Vientiane for advanced students and policy professionals. Conducted in Thai, Lao, and English, the workshop explored how gender intersects with various identities and backgrounds in development scenarios leading to forced displacement and migration.

Since 2015, RCSD has also hosted an annual Summer School on Land Governance in partnership with the Mekong Region Land Governance initiative, which has project offices in Cambodia, Lao PDR, Myanmar, and Vietnam. In June 2024, the program selected an international group of 22 participants from more than 200 applicants to attend lectures and workshops in Chiang Mai on tenure security, access rights, and collaborative governance. A field visit to an indigenous Karen village in Northern Thailand highlighted the crucial role of Karen women as social custodians of ecological resources and cultural continuity.

The A-BEE-Cs at CMU

Professor Dr. Panuwan Chantawannakul
(1974 - 2022)
Founder of CMU's Bee Laboratory and Smart Bees, author of over 200 studies on apiary science.

Thailand ranks among the world's top 20 producers of honey and bee products, with the Chiang Mai region playing a central role in national output. While large-scale commercial beekeepers often rely on naturalized imported honey bees, Thailand also supports indigenous species, including stingless bees. These native bees, valued for their docile temperament and ease of management, are frequently kept by family-run apiaries and small cooperative enterprises.

In 2015, Thai stingless bees drew international attention through research co-authored by CMU biologist Professor Dr. Panuwan Chantawannakul, founder of the university's Bee Protection Laboratory. The laboratory specialized in diagnosing and combating bee diseases that threatened the sustainability of pollination in regional agriculture. That year's study identified a new antimicrobial and anti-inflammatory compound in stingless bee propolis—a resinous hive substance long used in traditional Thai medicine and increasingly applied in global skincare and nutraceutical products.

In concert with the laboratory's work, Professor Dr. Panuwan established Smart Bees, a CMU initiative promoting sustainable beekeeping through coursework, workshops, and field training. Program activities address hive management, quality control of bee products, and organic certification. Smart Bees has also explored value-added innovation, such as commercialization of propolis.

Although Professor Dr. Panuwan's career was tragically cut short by illness in 2022, CMU's commitment to both basic apiary research and its practical applications has continued. In 2024, Bee Protection Laboratory researchers, in partnership with other academic institutions, added publications on hive disease, while Smart Bees broadened its outreach by internationally coordinating a Mekong-region study on sustainable beekeeping. The two-year project culminated in recommendations to harmonize government policies, reduce pesticide use, and create databases for cross-border collaboration. Published in 2024, the final project report was dedicated to the memory of Professor Dr. Panuwan Chantawannakul.


WATER
CMU
CHIANG MAI UNIVERSITY
SUSTAINABLE DEVELOPMENT GOALS

FLOODS
OLD PROBLEMS
INNOVATIVE SOLUTIONS

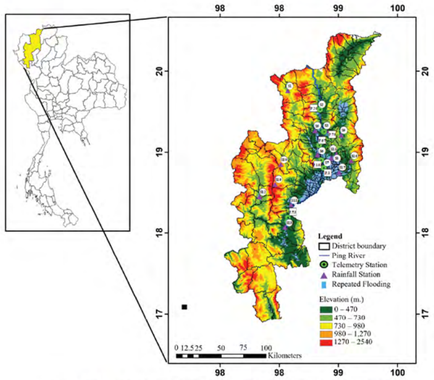
OASYS DATA ANALYTICS

SCMC SUSTAINABLE CAMPUS MANAGEMENT CENTER

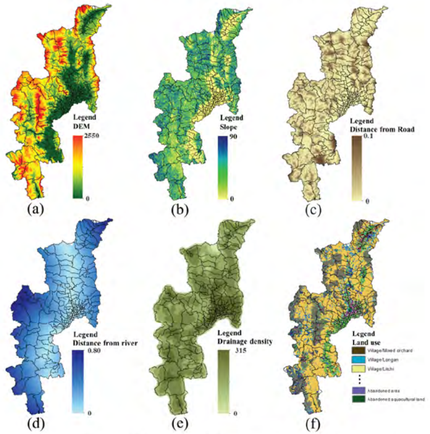
In Northern Thailand, localized cloudbursts can swiftly transform mountain streams into violent torrents that tear through hillside communities. On a larger scale, broad monsoon weather fronts swell major rivers, inundating fields and urban areas with floods that destroy crops, homes, infrastructure, and livelihoods. Flooding has long been a recurring danger, but in recent decades its severity and frequency have increased, driven by climate change and unsustainable land use. While weather itself cannot be controlled, early warning systems based on telemetry—the use of remote sensors to automatically collect and transmit data—can greatly reduce flood-related damage and loss of life.

CMU's work in telemetry-based flood forecasting and warning began more than 2 decades ago with the founding of OASYS, a research group in the Faculty of Engineering that develops and applies optimization theory and algorithmic techniques for complex environmental challenges. Partnering with the Royal Irrigation Department, OASYS strengthened the government's network of large-scale telemetry monitoring stations on major riverways by introducing smaller, low-cost, solar-powered telemeters on tributary streams. These devices employed ultrasonic scanning for accurate water level measurement, as well as adaptive technology to optimize battery usage. OASYS also made data from both systems publicly accessible through an online interface. Between 2018 and 2020, OASYS graduate students and faculty refined the solar-powered technology for deployment on remote mountain streams, enabling local villagers to receive real-time warnings through the internet or SMS.

In 2024, the collection and dissemination of telemetry data became the responsibility of CMU's newly established Center for Water Management Support, which saw its first full year of service as a communications hub for hydrological and flood-control data. That same year, OASYS founder Professor Dr. Paskorn Champrasert and colleague Pornnapa Panyadee published research that expanded CMU's role in flood forecasting. By combining historical hydrological records, topographical imaging, and real-time telemetry, the study pointed the way for the creation of flood hazard maps to improve long-term risk planning.



Location of the study area including telemetry and rain gauge stations: Chiang Mai Province, Thailand.



Flood spatial data; (a) DEM, (b) slope, (c) distance from road, (d) distance from river, (e) drainage density, and (f) land use.

Revitalizing the Cultural Heritage of Waterways

2 Year Research Project
documenting Chiang Mai's lost canal heritage

20+ Heritage Sites
surveyed and digitally mapped by CMU teams

15 Local Organizations
engaged in cultural and urban conservation

4 Heritage Initiatives
for trails, festivals, and digital interpretation

NRCT & Innovation Funding
supporting community heritage revitalization

CMU and its host city of Chiang Mai lie in a broad valley freshened by mountain streams that flow into the Ping River, a once-vital artery of transport and trade that crosses the metropolitan area. Since Chiang Mai's founding in 1296, the ecological and cultural interplay of water resources has shaped settlement, agriculture, commerce, and ritual life. This interdependence found visible expression in a well-engineered network of watercourses and irrigation canals. Although a water-filled moat still surrounds the city's original core, many of the historic waterworks have been lost to urban development, along with collective memory of how they structured the city's landscape and civic life.

In 2024, CMU faculty and students joined local initiatives to conserve, interpret, and celebrate this water heritage through a cultural resource management plan, "Lost Irrigation Canals: Towards the Revitalization and Management of the Cultural Heritage of Waterways." Working with Chiang Mai Municipality, Chiang Mai City Heritage Center, and numerous local temples, businesses, and civic groups, the study combined archival research, field surveys, cultural site mapping, and interviews with knowledgeable neighborhood residents to detail the canals' impact on the city's physical terrain and built environment.

Beyond historical documentation, the project advanced strategies for public engagement. These included plans for heritage trails, interpretive on-site kiosks, festival collaborations, and digital experiences designed to help residents and visitors connect with Chiang Mai's forgotten waterways. Together, these efforts will support sustainable cultural tourism and contribute to the local economy.

The two-year project benefited from funding by the National Research Council of Thailand and the government's Budget for Promotion of Research and Innovation.

Ecological Research for Waterway Restoration

2 Major Ecological Studies
conducted across upstream and city-center zones

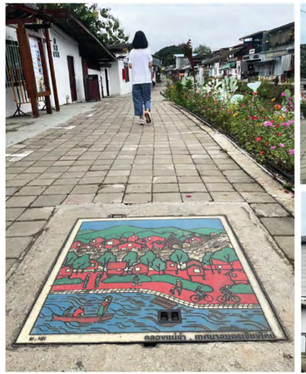
3 Sampling Points
tested for pollutants, bacteria, and biodiversity

Aquatic Bioindicator Study
revealed pollution-tolerant dominance in city reaches

1 Municipal Revitalization Plan
for hydrological and flood-control communication

Published Benchmark Papers
for tracking future water restoration progress

MAE KHA CANAL



Mae Kha is a small canalized stream running through urban Chiang Mai, paralleling the larger Ping River. Historically, it was a vital resource for fishing, irrigation, and potable water. Urban development, however, has transformed the waterway into a conduit for storm runoff and untreated residential and commercial waste.

CMU has recently sponsored 2 ecological studies to document the extent of degradation. The first, conducted in 2023 by researchers from the Environmental Science Research Center (ESRC), involved year-round physical, chemical, and bacterial testing of water samples collected at upstream, downstream, and city-center sites. The results identified pollutants and resulting environmental stresses harmful to aquatic life, as well as high levels of coliform bacteria posing risks to public health

The second study, completed in 2024 by CMU's Center for Water Management Support, expanded collection sites to evaluate biodiversity. The research focused on aquatic macroinvertebrates—small organisms such as insect larvae that act as natural indicators of water quality. Findings showed higher diversity upstream and downstream, but sharp reductions within city-center stretches, where pollution-tolerant species dominated. Sensitive taxa such as mayflies and caddisflies were rare, and stoneflies—classic markers of clean water—were entirely absent.

Revitalizing the Mae Kha has become a Chiang Mai municipal priority, both to safeguard community health and to restore the waterway's potential as a scenic and recreational asset for residents and tourists. CMU's twin ecological assessments provide essential benchmarks for measuring progress in future clean-water restoration.

AIR

CMU CHIANG MAI UNIVERSITY | SUSTAINABLE DEVELOPMENT GOALS

4 Month Haze Season
affecting Northern Thailand annually from Jan–Apr

3 Strategic Pillars
monitor • protect • prevent

Cross-Border Research
addressing transnational smoke and fire sources

Water Management Research Studies
for hydrological and flood-control communication

10+ Years of Leadership
in haze prevention and environmental governance

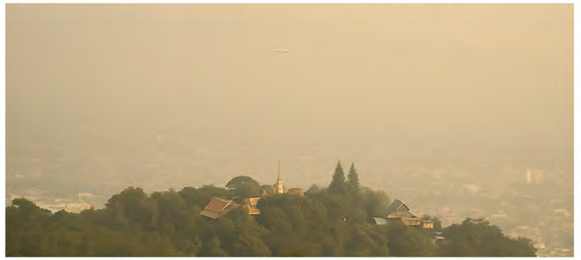
SEASONAL HAZE

[MONITORING PROTECTING PREVENTING]

The beginning of the calendar year in Thailand coincides with the driest stretch of the monsoon cycle, a period of minimal rainfall extending from January into April. These dry conditions foster the spread of forest, brush, and grass fires, while seasonal burning of rice straw and other crop residues adds still more fuel for recurrent outbreaks of air pollution. Increased agricultural production in recent decades has sharply intensified atmospheric haze, as traditional burning practices continue to be used to prepare fields quickly and inexpensively for the next planting. The problem extends across borders -- smoke drifts from neighboring Myanmar and Laos into Northern Thailand, where valleys such as Chiang Mai's basin trap haze for weeks at a time. On the worst days, concentrations of fine particulate matter (PM2.5) rise to many times above international health guidelines, creating significant health risks across all age groups. Relief comes with the arrival of spring rains, which dampen fields and forests, disperse accumulated particulates, and mark the start of the new planting cycle.

In response to this recurring seasonal challenge, Chiang Mai University has assumed a leading role in addressing air pollution. Its efforts are organized around 3 complementary strategies: monitoring air quality through research and technology, improving everyday environments by creating cleaner and safer spaces, and supporting long-term solutions by promoting changes in practice and policy. Together, these approaches reflect the university's sustained institutional commitment to cleaner air.

ACAIR
ACADEMIC CENTER FOR AIR POLLUTION IN NORTHERN THAILAND
CHIANG MAI UNIVERSITY



700+ Devices Nationwide
providing real-time PM2.5 data for communities

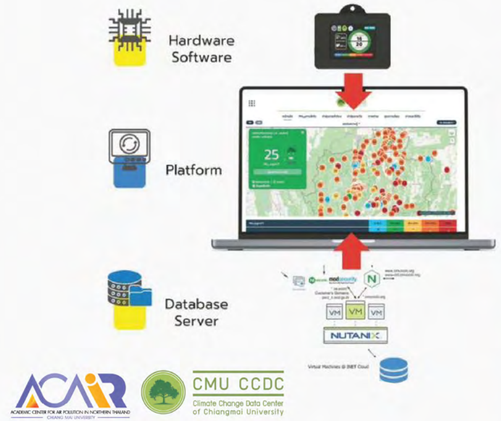
15 Government Stations Expanded
through university-driven sensor innovation

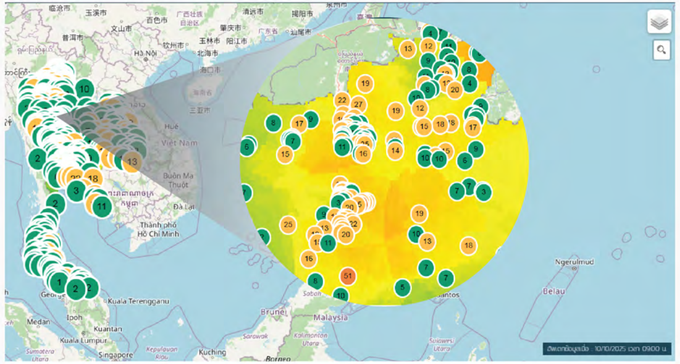
National Innovation Award (2024)
for social-impact engineering by CMU

Thai–Japan Satellite Collaboration
enhancing fire detection and data integration

Millions of Users
access accurate air-quality data via DustBoy apps

HAZE MONITORING WITH DUSTBOY





PM 2.5 (ug/m^3)	0-12	13-35	36-55	56-150	151-250	>250
OS AQI	0-50	51-100	101-150	151-200	201-300	>300

Each year, Thailand's National Innovation Agency confers best-in-class honors for outstanding technical achievements of broad social benefit. In 2024, CMU received top recognition for its development of DustBoy, a low-cost, easily serviceable device that monitors and reports air pollution in real time. By linking to mobile apps and internet websites, DustBoy enables communities to evaluate their exposure to PM2.5 and other airborne hazards on an hourly basis.

In the late 2010s, when Associate Professor Dr. Setth Sampattagul of CMU's Faculty of Engineering assumed leadership of the DustBoy project, Thailand's official air-quality monitoring system was limited to about 65 government-operated stations nationwide, with only 15 deployed in Northern Thailand—far too few to track the severe haze events engulfing the region. With funding from the National Research Council of Thailand, Dr. Sampattagul and a multidisciplinary team of engineers and IT specialists created a complementary system that dramatically expanded monitoring coverage. Starting with a pilot project of 25 units in 2018, the DustBoy network grew to more than 700 devices nationwide by 2024, with plans to expand to several thousand more.

While the basic DustBoy concept has remained intact, successive design modifications have improved resilience, reliability, and accuracy. CMU's Multidisciplinary Research Institute (MDRI) is now collaborating with Thai and Japanese space-technology partners to integrate DustBoy's sensor capabilities into a satellite-based surveillance system. This will allow detection of forest fires in remote areas where no ground-based monitors exist, adding another critical layer of early warning to Thailand's haze-hazard network.

Ultimately, DustBoy's social significance lies not only in its technical achievements but also in its public health impact. Real-time, accessible data empowers communities to make informed choices during haze season—such as limiting outdoor exposure, wearing protective masks, adjusting school and work schedules, and planning medical care for vulnerable groups.

CLEAN AIR SAFE SPACES

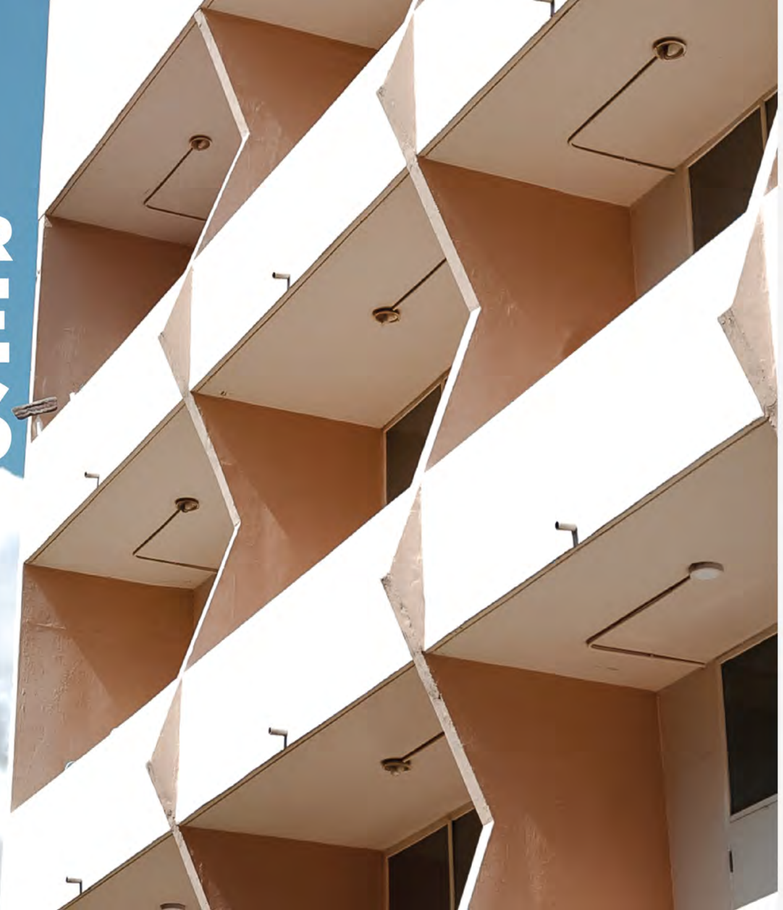
2,700 Dormitory Rooms
converted into clean-air living quarters

1 Hospital Pilot Ward
retrofitted to PM2.5-free medical environment

600+ Daycare Centers Planned
for expansion to safe-zone retrofit programs

3 Years of Innovation
developing filtration and airflow systems

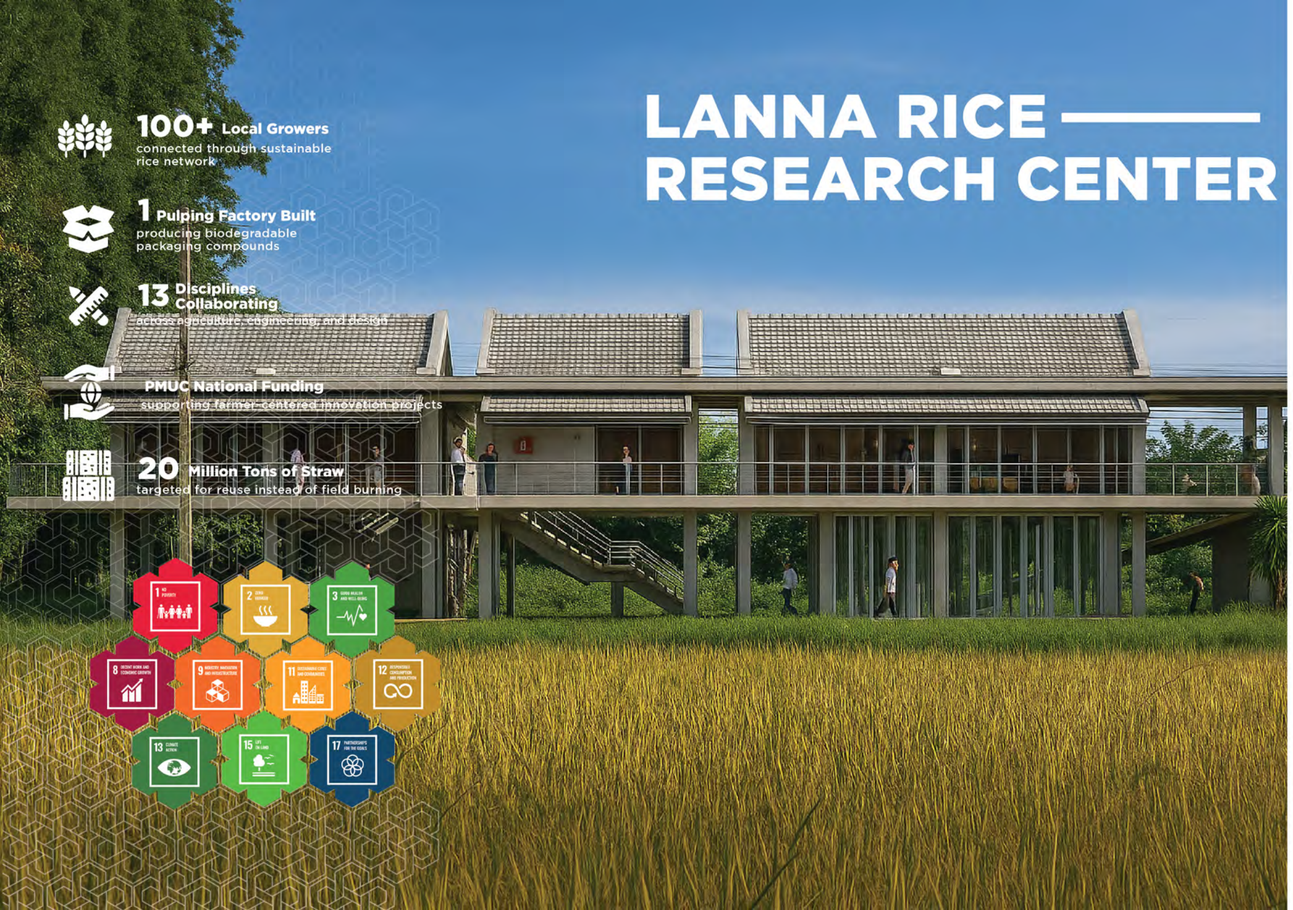
Foundation Partnership
mobilizing funds for vulnerable community protection



ERDI-CMU

Health officials strongly advise limiting outdoor activities when airborne PM2.5 concentrations exceed risk thresholds. Yet in many cases, indoor air quality is also hazardous during Northern Thailand's haze season. To safeguard students and staff, CMU embarked on a campus-wide initiative to create safe zones. Employing site-specific solutions devised by CMU's Energy Research and Development Institute (ERDI), the university turned classrooms, multi-purpose halls, and the main library into monitored clean-air spaces. From 2021 to 2024, an extensive retrofit program for student housing combined positive air flow systems, high-grade filtration devices, and window dust screens to convert more than 2,700 rooms across 16 dormitories into clean-air living quarters.

At the outset of 2024, CMU applied its clean-air program to clinical care. In a pilot project at the CMU-affiliated Maharaj Nakorn Chiang Mai Hospital—the largest tertiary care facility in Northern Thailand—university engineers adapted the dormitory airflow and filtration systems to convert a general ward, previously reliant on open-window ventilation, into a PM2.5-free environment. This effort, the first of its kind in a government hospital in Northern Thailand, improved patient comfort and clinical outcomes while laying the groundwork for hospital-wide application. At the same time, CMU worked with its philanthropic arm, the Chiang Mai University Development Foundation, to broaden community protection. In 2024, they completed a pilot project to retrofit day care centers in one of the provinces hardest hit by PM2.5 pollution. Although limited in scope, the initiative was combined with a fundraising program to convert more than 600 additional pre-school centers into safe zones. Together, the day care and hospital retrofit programs advanced clean-air protection to two of society's most vulnerable groups—the very young and the already infirm.



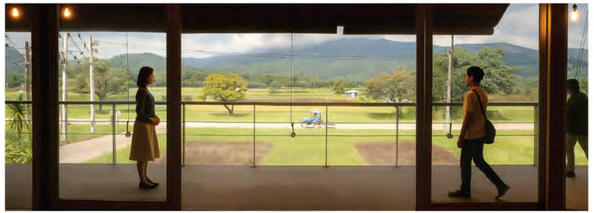
AIR POLUTION: PREVENTION

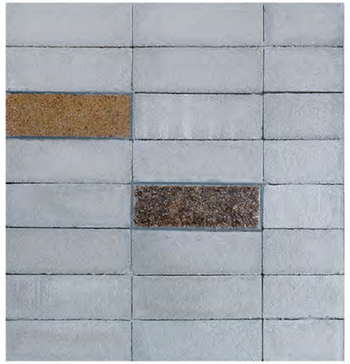
ศูนย์วิจัยข้าวล้านนา มหาวิทยาลัยเชียงใหม่
Lanna Rice Research Center, Chiang Mai University

Rice cultivation in Northern Thailand generates more than 20 million tons of straw annually. While some residue serves as animal feed or is plowed back into the ground, the bulk is burned in open fields, a practice that remains a major contributor to hazardous PM2.5 air pollution. Although the Thai government has imposed seasonal bans on burning, experience shows that prohibitions are more effective when farmers are given economic incentives and practical alternatives.

Chiang Mai University's Lanna Rice Research Center (LRRC), established in 2012, has taken this environmental challenge as a key part of its mission. The center coordinates research on indigenous rice varieties while fostering projects that enhance both the sustainability of farming communities and the well-being of consumers. Its network now spans more than 13 disciplines—ranging from agribusiness and engineering to food technology and packaging design—and connects directly with over 100 growers across the region. A strategic priority has been to create value-added uses for rice byproducts through partnerships with entrepreneurial ventures.

In 2023–2024, this vision advanced significantly with the construction of a semi-industrial rice pulping factory on CMU's Agri-Business campus. As an end product, the facility manufactures an export-grade chemical compound capable of improving the quality of biodegradable packaging—a rapidly expanding global industry seeking alternatives to plastic. In addition, the factory includes machinery and systems designed for transfer to community enterprises. The initiative is led by Dr. Suthaphat Kamthai, professor of engineering at CMU, in collaboration with Kasettham Company Ltd., a Chiang Mai-based agribusiness partner. Financial support has come from the Program Management Unit for Competitiveness (PMUC), a national funding body under Thailand's Office of National Higher Education Science Research and Innovation Policy Council. By offering farmers the chance to sell straw instead of burning it, and by converting that straw into biodegradable, petroleum-alternative products, the LRRC program demonstrates how research, partnerships, and commercialization can converge to fight air pollution, foster carbon neutrality, and create sustainable economic opportunities.





COMMUNITY

CMU CHIANG MAI UNIVERSITY | SUSTAINABLE DEVELOPMENT GOALS

CHIANG MAI UNIVERSITY LIFELONG EDUCATION | EdSociate | Skills4Life | CMU MOOC

Economically and demographically, Thailand is changing. Social media and automation are reshaping communication and commerce. Employment opportunities are both disappearing and emerging, while medical advances are transforming Thais into more health-conscious consumers within an increasingly older population

In 2021, CMU established the School of Lifelong Education (CMU-LE) to address these social and economic shifts by making learning more flexible, workplace-relevant, and lifestyle-oriented for people at every stage of life

Introducing Thailand's first university-wide credit bank system, CMU-LE allows learners to collect and combine credits from diverse learning experiences—including university courses, workshops, short tutorials, job training, and qualifying community activities—and apply them toward formal recognition, certification, or a degree. This approach connects traditional education with professional and informal learning, bridging academic study with real-life skills.

By 2024, CMU-LE had reached more than 300,000 learners nationwide through 420 programs and over 200 free workshops, expanding access to skill development across generations. Its blended model—onsite, hybrid, and online—helps bridge digital divides while connecting universities, industries, and local communities in a shared pursuit of sustainable growth. CMU-LE reflects a necessary shift in educational culture: learning is no longer confined to a single period of study but continues throughout life. By enabling people to update their skills and knowledge as their circumstances and aspirations change, the program strengthens both individual adaptability and collective resilience in a rapidly evolving society

39,400 Participants
nationwide, including 25,566 seniors (2024–25)

1,150 Certified Trainers
across the national MEDEE network

2,456 Elderly Schools
adopting digital micro-courses via LINE platform

11.88 : 1 SROI Ratio
creating 26.9 million baht in annual social value

94 New Community Products
providing additional income for senior learners

มีดี

Multi-Gen **E**ntrepreneur **D**evelopment **E**ducational **E**cosystem

[Aging Generation Propelling Nation]

Fostering Work Skills for Seniors in the Digital Era

CHIANG MAI UNIVERSITY LIFELONG EDUCATION

Thailand is a rapidly aging society. Approximately 20 percent of the population is 60 years of age or older, and this share is projected to approach 30 percent in the 2030s. Many older adults continue to work beyond retirement age but lack the digital skills needed to participate fully in modern livelihoods. To address this challenge, Chiang Mai University's School of Lifelong Education developed MEDEE—the Multi-generation Entrepreneur Development Educational Ecosystem—a nationwide research initiative transforming lifelong learning for seniors.

MEDEE uses Thailand's most popular instant messaging app, LINE, to deliver 40 micro-courses on digital literacy, online entrepreneurship, marketing, and financial management. The result is a blended model combining online instruction with community mentoring. Lessons are designed for ease of use, featuring automatic registration, one-click quizzes, and instant certification.

To extend outreach and accessibility, MEDEE has built a network of 1,150 certified trainers, 2,456 participating schools, and more than 70 community organizations across all 77 provinces. A constituent program, ADVOCATE, trains local officials and community leaders to serve as mentors for MEDEE learners.

Between 2024 and 2025, approximately 39,400 participants joined MEDEE. The project achieved a Social Return on Investment (SROI) of 11.88 : 1, generating 26.9 million baht in annual benefits and supporting 94 new community products that provide supplemental income for seniors. It also led to the formation of Khon Thai Mee Dee Co., Ltd., a retail enterprise for Thai handicrafts

MEDEE's success has informed government aging priorities, including the Chiang Mai Sandbox Model, which now shapes the province's 2025–2027 Elderly Development Plan.

4,500+ Students Engaged
in entrepreneurial activities across all faculties

800 Graduates Certified
across the national MEDEE network

14 Faculty Clubs Formed
to mentor cross-disciplinary entrepreneurs

20 Registered Startups
founded by CMU students and alumni

$710,000 Local Impact
generated for Northern Thailand's economy

BUILDING FUTURES, CREATING ENTREPRENEURS

imo Innovation Management Office

Basecamp24


ENTREPRENEUR AS FUTURE SKILLS


MORE CMU SPIN-OFF BUSINESSES


MORE HIGH SKILL JOB CREATION


FAST TRACK FOR ANTI-POVERTY

Since its founding, Chiang Mai University has sought to provide its graduates with the understanding and skills to be moral and productive citizens, both for their own sakes and for the public good. Traditionally, the benchmark of success has been gainful employment in a chosen field. But the world of employment is changing, and so are the pathways to success. In 2023, the university initiated a new program, Builds CMU, to encourage students to envision their futures in entrepreneurial terms—not simply as job seekers, but as job creators.

Builds CMU links innovation—developed on or beyond the campus—with regional development, helping to retain creative talent in Northern Thailand. It offers students opportunities to test ideas, learn from experience, and transform research or local knowledge into viable and responsible enterprises. The program combines classroom learning with practical engagement through short modules, mentoring, workshops, and an educational "sandbox" that allows participants to earn course credit while developing business models that consider both market and community needs.

In only two years, more than 4,500 students have taken part, with 800 graduates completing the program. Fourteen faculty startup clubs promote collaboration across disciplines, and 20 new ventures have been formally registered, generating more than 23 million baht for the local economy.

Builds CMU merges the reflective inquiry of scholarship with the practical innovation of enterprise. The result is a model of education that melds economic vitality with social and environmental responsibility—preparing graduates to create sustainable solutions that serve communities while strengthening the broader economy.

2,000 **Patients Served**
through integrated craniofacial digital care

300+ **Professionals Linked**
across 8 regional hospitals in shared records

6,700+ **Data Entries**
tracking multi-stage surgical treatments

1 in 1,100 **Newborns**
benefit from early access to coordinated care

8 **Hospitals &** **2** **Foundations**
partnered to expand rural treatment coverage

HEALING — SMILES UPLIFTING VOICES—

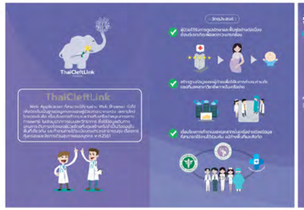
Princess Sirindhorn IT Foundation Craniofacial Center Chiang Mai University

MedCMU · AMS CMU · DENT CMU · ENGINEERING · ITSC CMU

Cleft lip and cleft palate (CL/P), whether occurring separately or together, are among the most common birth defects. In Northern Thailand, they affect approximately 1 in every 1,100 newborns. While precise causes are unclear, the consequences of leaving CL/P untreated are severe: lifelong facial disfigurement, recurrent illness, speech and hearing impairments, and psychosocial challenges. Surgery can improve appearance and function, but a single operation is never sufficient. Effective treatment requires a staged series of corrective surgeries coordinated with pediatric, dental, orthodontic, speech, hearing, and social-service specialists. Ideally, care begins in infancy and continues through adolescence. For low-income families, the burden of medical expenses, repeated travel, and lost workdays makes access to care an almost insurmountable challenge.

In response, CMU and the Princess Sirindhorn Information Technology Foundation, after a decade of informal collaboration, formally established in 2022 the Craniofacial Center of Excellence on the university's medical campus. Intended to expand access for disadvantaged rural families in Northern Thailand, the center combined advanced diagnostic and surgical facilities with ThaiCleft Link, a digital platform developed by CMU's medical and IT faculties. By transferring patient records rather than patients across hospitals, ThaiCleft created a seamless chain of care from infancy through adolescence. In addition to reducing travel costs, it managed the scale and complexity of treatment. In 2024, the platform supported more than 300 professionals across 8 regional hospitals, coordinating services for nearly 2,000 patients and handling over 6,700 data entries.

In 2024, financial assistance for CL/P families drew on international collaboration alongside support from Chiang Mai University and the Princess Sirindhorn Foundation. That year Operation Smile Thailand, part of a global humanitarian network, funded a program of speech therapy camps. Staffed by specialists from CMU's Faculty of Associated Medical Sciences, the camps addressed the national shortage of professionals in the field while offering families much-needed care. At the same time, the Faculty integrated CL/P speech therapy training into its curriculum to increase the number of qualified specialists.



1,713 Patients Enrolled
in hypertension pilot across Lampang Province

16 Clinical Sites
using WHO HEARTS Learning Health System model

$2.2 Million Funding
supporting 4-year UK-Thailand collaboration

3 Focus Diseases
hypertension, diabetes, kidney disease monitored

2 Global Universities
QMUL and LSHTM collaborating with CMU

NCDs
Non-Communicable Diseases

Global Health Research Center
Faculty of Medicine
Chiang Mai University

MedCMU

— Improving Primary Care For Primary Health Concerns

Nearly three-quarters of national deaths in Thailand result from non-communicable diseases (NCDs), including high blood pressure, diabetes, and kidney disease. Hypertension alone affects 1 in 4 Thai adults, and more than half of those diagnosed remain inadequately controlled, due largely to lapses in primary care and difficulties with patient adherence.

Between 2020 and 2022, CMU's Faculty of Medicine, led by Associate Professor Dr. Chaisiri Angkurawaranon, piloted a hypertension program in Lampang Province that enrolled 1,713 patients in primary care facilities. Following the HEARTS protocol of the World Health Organization (WHO), the project sought to improve hypertension treatment by introducing simplified drug regimens, training providers in behavior counseling, and adapting health records for better patient monitoring.

The successes of the Lampang pilot contributed to the establishment of CMU's Global Health Research Center, which pursues international collaborations on NCDs and aging. In 2024, the new center joined the Thai Ministry of Public Health in a four-year research project on primary care for NCDs, partnering with Queen Mary University of London and the London School of Hygiene and Tropical Medicine. With Dr. Angkurawaranon again serving as a principal investigator, the initiative received £2.2 million in UK government funding

The NCD project applies a Learning Health System (LHS) framework as developed by Queen Mary University. A new addition to Thai medical practice, this software-based system embeds continuous cycles of measuring, acting, and reassessing into routine care. Conducted as a controlled study at 16 sites in Chiang Mai and Lampang provinces, the first phase focuses on hypertension, with diabetes and kidney treatment planned for subsequent inclusion. Its methodology integrates stepped care protocols with predefined thresholds for escalating treatment, structured support for patient adherence, and simplified dashboards to guide providers. Economic monitoring further assesses sustainability within standard health budgets.

By combining evidence-based care with system-level learning, the LHS project aims to deliver a replicable model for NCD management across Thailand, with potential application to other countries.

Thailand

Hypertension Protocol

Step 1 Blood pressure ≥ 140/90 mmHg:
Amlodipine (2.5) mg once daily
Consider initiation with step 2 if SBP ≥ 150 mmHg during 1st visit

Step 2 If BP remains ≥ 140/90 mmHg:
Amlodipine (2.5) mg + losartan (50) mg once daily

Step 3 If BP remains ≥ 140/90 mmHg:
Amlodipine (5) mg + losartan (50) mg once daily

Step 4 If BP remains ≥ 140/90 mmHg:
Amlodipine (5) mg, losartan (50) mg, and HCTZ (12.5) mg once daily

Step 5 If BP remains ≥ 140/90 mmHg:
Refer to regional secondary/ tertiary care center for further adjustments

- **Monthly follow-up** for evaluation and titration until BP control is achieved
- **Once BP control is achieved,** 2-to-3-month interval visits are recommended for evaluation and re-medication
- **If BP at a visit is ≥ 160/100 mmHg,** consider 2-week follow-up visit instead
- **If BP at a visit is ≥ 180/110 mmHg,** consider referral to the nearest emergency department
- **In pregnant individuals,** refer to a gynecologist
- **In females during reproductive age without contraception,** avoid prescription of losartan

High blood pressure

Diabetes

Heart attack or stroke

Chronic respiratory disease

Heart disease

Cancer

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WATER

Revitalizing the Cultural Heritage of Waterways

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AIR

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CLEAN AIR SAFE SPACES

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AIR POLUTION: PREVENTION

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COMMUNITY

CMU-LE : Anticipating Change, Advancing Lifelong Learning

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HEALING SMILES UPLIFTING VOICES

Chiang Mai University+1
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