



AIT
Asian Institute of Technology

2024 ANNUAL RESEARCH REPORT

ASIAN INSTITUTE OF TECHNOLOGY





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PRESIDENT'S MESSAGE



Prof. Pai-Chi Li
President
Asian Institute of Technology (AIT)

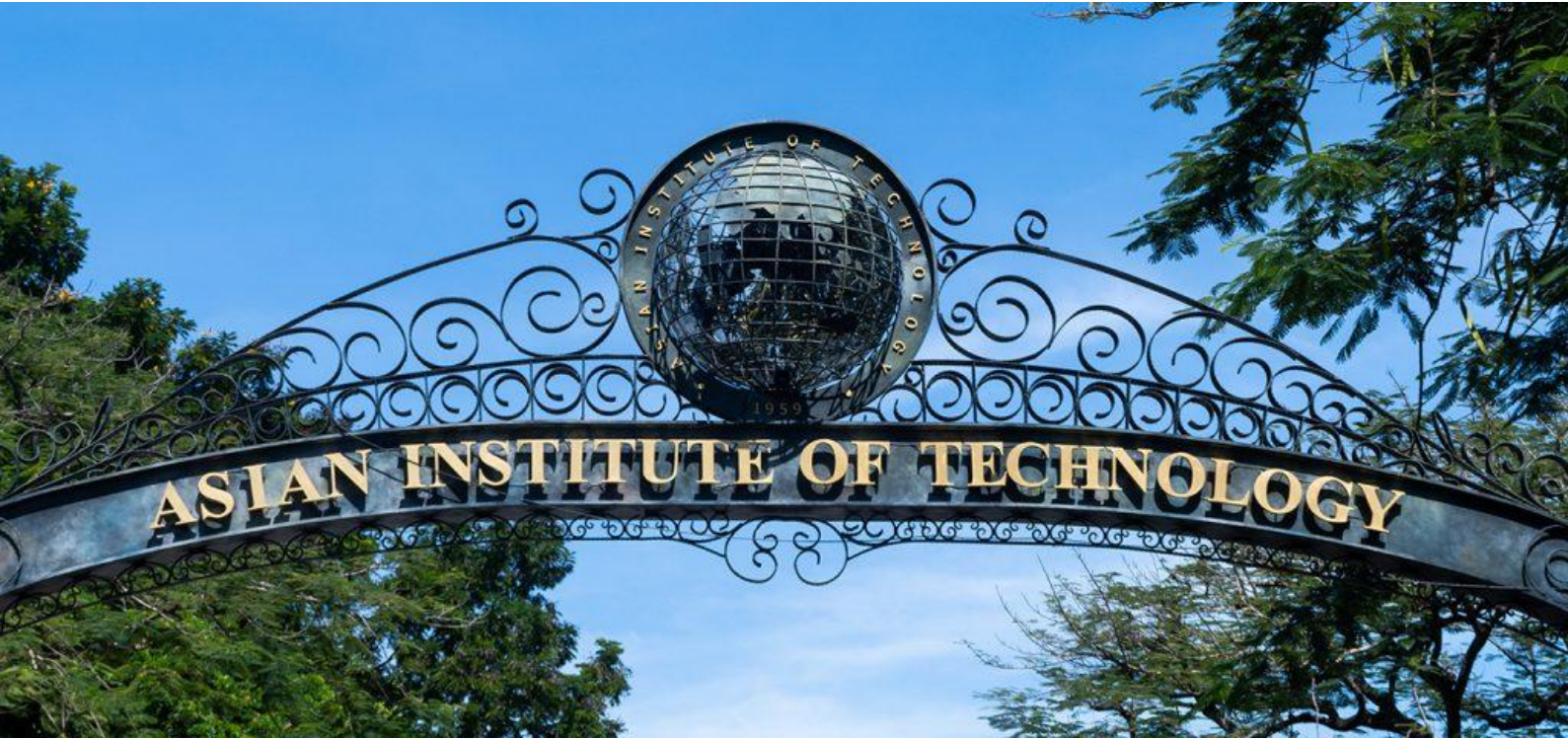
*I*t gives me immense pleasure to announce the release of the Annual Research Report for 2024, which provides a detailed overview of our research and capacity building engagements across the institute throughout the year. In an era of academic advances, AIT continues to foster innovative research acquiring valuable expertise and nurturing talent. We take immense pride in the significant strides made through our research endeavors, demonstrating our collective commitment to the sustainable development of the region. Such outcomes demonstrate the institute's strong emphasis on interdisciplinary collaboration, strategic alliances, and dedication to sustainable development goals. The year saw a revitalized interest in research and development centered around AIT's key thematic areas. Numerous initiatives have resulted in practical solutions addressing sustainable technology and social challenges. Enhanced regional and international partnerships enabled meaningful engagements, which have contributed significantly to the broader society we serve. The year's accomplishments reflect our commitment to creating cutting-edge solutions for some of the most urgent challenges in our region and beyond. We extend our appreciation to the entire AIT community for their unwavering dedication to achieving our research goals, as well as to our partners for their support and trust, which have been instrumental in facilitating our research agendas.

VICE PRESIDENT'S MESSAGE



Prof. Manukid Parnichkun
Vice President for Academic and
Research (VPAR)

*W*e are delighted to release the 2024 Annual Research Report, highlighting the progress and achievements of our research throughout the past year. This report outlines our extensive collaborations and impactful work conducted across five key thematic areas: Climate Change; Smart Communities; Infrastructure; Technology; Policy and Society; and Food-water-energy. I congratulate our dedicated researchers, faculty members, and staff and also our key partners who have worked hard and put forth tremendous efforts to develop innovative solutions to address the global challenges of our era. They have broadened understanding and solved pressing problems while successfully maximizing societal impact. Our multidisciplinary engagements have also played to the strengths of researchers, added new fields and explored new complementing disciplines that led to pioneering projects and initiatives. There were major advances in the development of sustainable solutions, building up community resilience, and technology development with a focus to benefit the society. We wish to thank all researchers, experts and partners for their wholehearted support that have contributed to the year's achievements. Your activities are a testament to our ambition to become the region's prominent institution for sustainability. I would also like to thank the Sponsored and Contracted Projects Unit and AIT's other departments for their valuable contributions in the production of this Report.



CHAPTER 1: INTRODUCTION

AIT MISSION

The Asian Institute of Technology (AIT) promotes technological advancement and sustainable development across the Asia-Pacific region through higher education, research, and outreach. Its mission is to develop highly qualified and committed professionals who will play a leading role in the region's sustainable development and its integration into the global economy. Guided by this mission, AIT strives to be a trailblazer in advanced and multidisciplinary education, uphold excellence in academic quality and

professional development, and serve as a hub for regional and transnational research while fostering global academic collaboration. The Institute models international citizenship through a multicultural, inclusive campus community and maintains financial sustainability, good governance, and strong partnerships with donors, the private sector, and alumni. Through these efforts, AIT empowers its graduates to shape a sustainable, technologically advanced, and globally connected Asia-Pacific region.

AIT RESEARCH

Recognized as one of Asia's leading academic institutes in sustainability, the Asian Institute of Technology (AIT) advances research to explore new frontiers, build a stronger knowledge base, and drive actions toward sustainable development in the region.

AIT's research projects aim to make a significant and lasting impact on communities by promoting technological innovation, environmental conservation, policy development, and applied solutions for sustainability. Aligned with all 17 Sustainable Development Goals (SDGs), AIT contributes to regional sustainable development, strengthens knowledge and business capacity, and supports communities' economic growth and integration into the global economy. Through appropriate technology, applied research, sustainable development frameworks, and

informed policy guidance, AIT assists stakeholders in promoting sustainability across Asia. Its academic programs are delivered through three schools: the School of Environment, Resources and Development (SERD), the School of Engineering and Technology (SET), and the School of Management (SOM) while its institute-wide centers and departments implement numerous research, consultancy, and capacity development projects funded by partners such as the Asian Development Bank, World Bank, FAO UK, GIZ, UN agencies, USAID, UKRI, UNDP, UNOPs, UNU, ISCU, and AAC. AIT pursues research excellence across five interconnected thematic areas: Climate Change; Smart Communities; Infrastructure; Technology, Policy, and Society; and Food-Water-Energy, all of which are essential for creating a sustainable future for the planet.





GRANTS AND SPONSORED PROJECTS AT A GLANCE

The total number of research projects through which AIT contributes to promoting technological change and sustainable development. As of 31 December 2024



194 Projects

Sponsored and Contracted Project



591 MILLION
THB

Total Budget in 2024

PROJECTS INITIATED UNDER AIT SCHOOLS AND OUTREACH CENTERS

AIT Schools and outreach Centers jointly implement research and development projects under their respective areas of expertise with a multidisciplinary approach towards addressing

real-life challenges in a holistic manner. The following graphs give an overview of the projects together with its project value, carried out by different Schools and outreach Centers in 2024

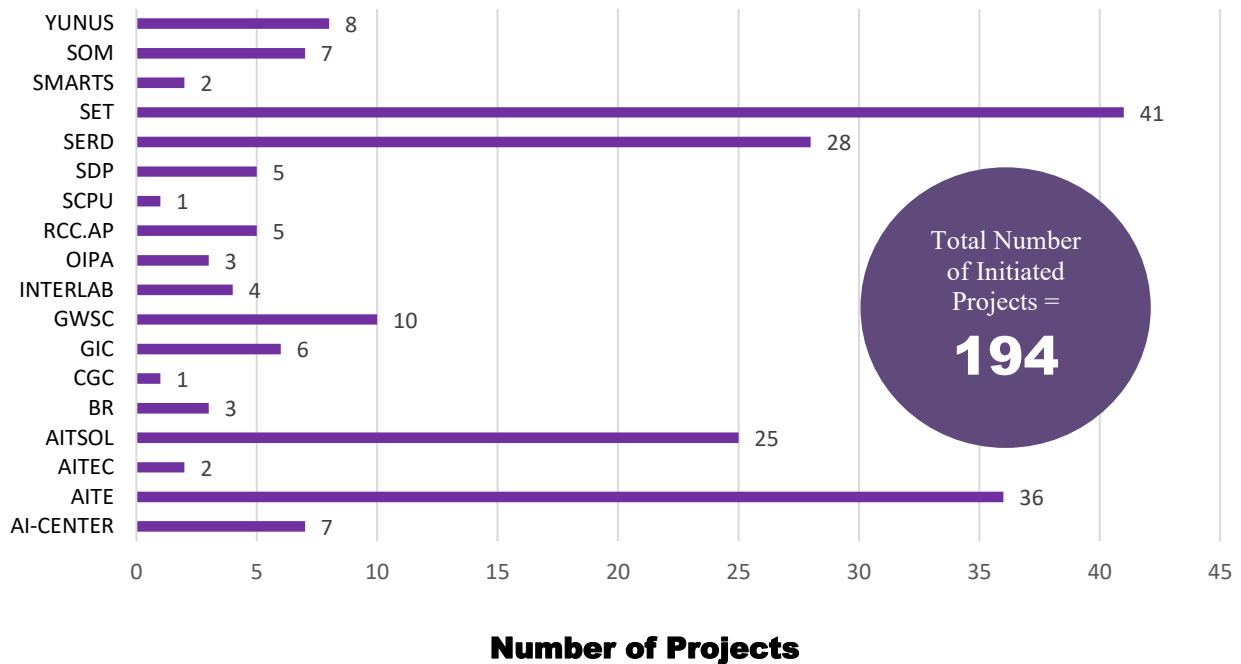


Figure 1. Projects initiated in 2024 by AIT Schools and outreach Centers

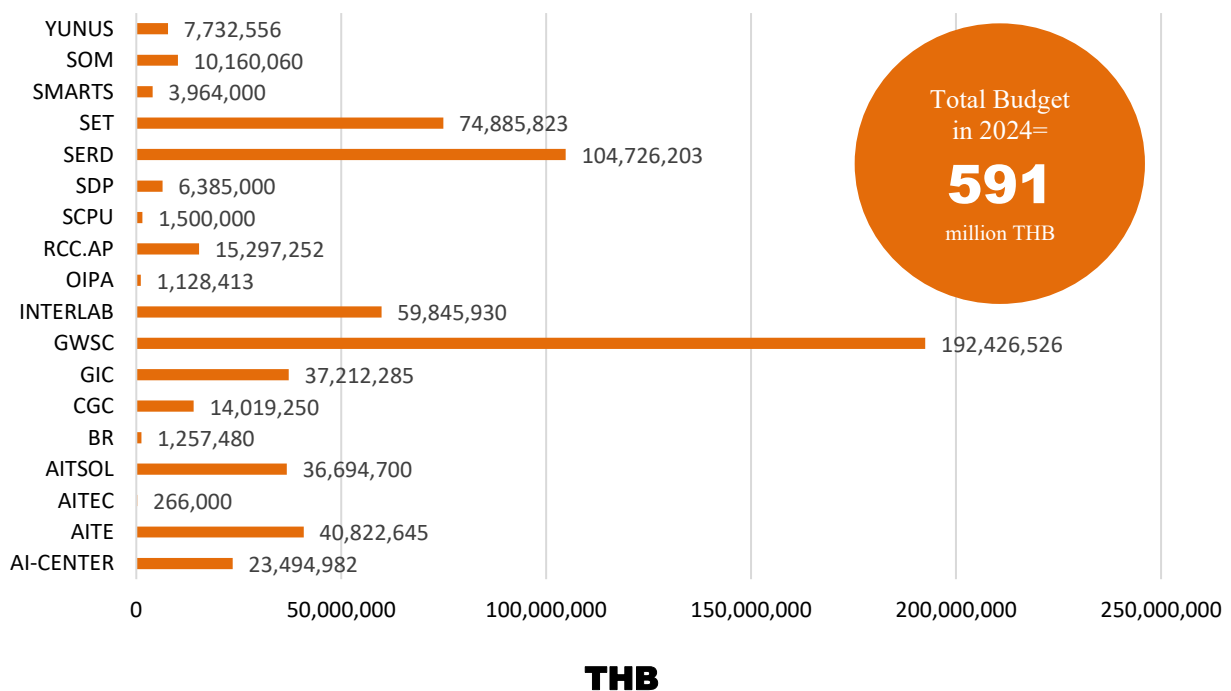


Figure 2. Value of projects initiated 2024

PROJECTS INITIATED UNDER RESEARCH THEMES

Research at AIT is aligned under five thematic areas of focus namely: 1.) Climate Change 2.) Smart Communities 3.) Infrastructure 4.) Technology, Policy and Society and 5.) Food-Water-Energy. The following chart¹ gives an overview of all projects initiated under five thematic areas in the year 2024.

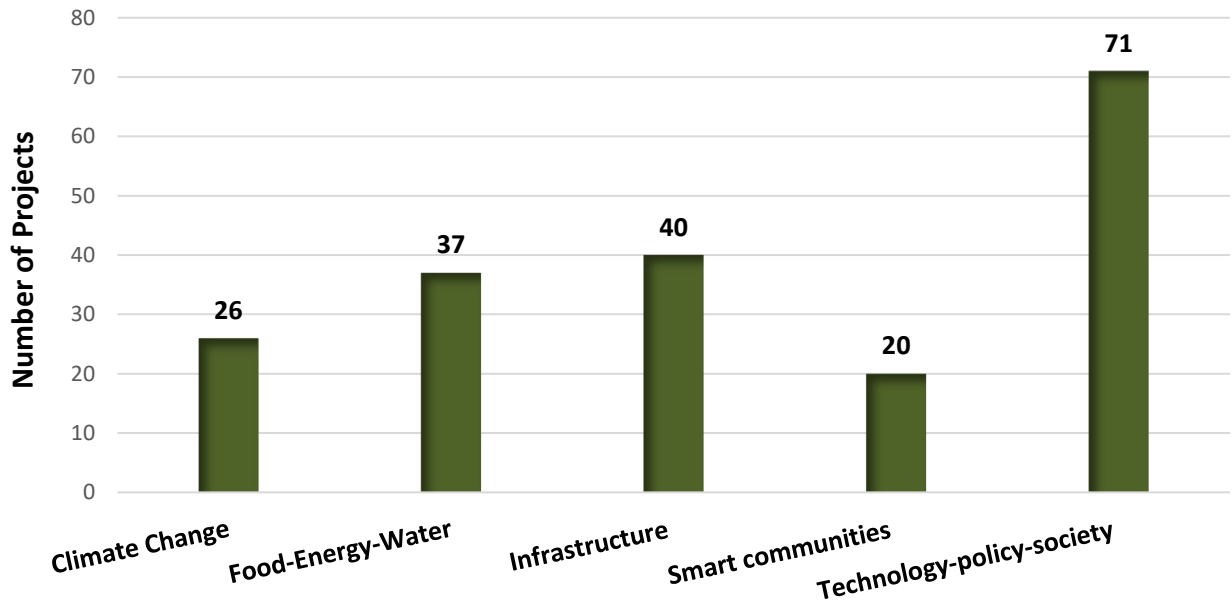


Figure 3. Projects initiated under research themes in 2024

The total value of all projects initiated in 2024 amounts to 591 million Thai Baht (THB), as shown as shown in the below chart giving an overview of cumulative budget for each thematic area.

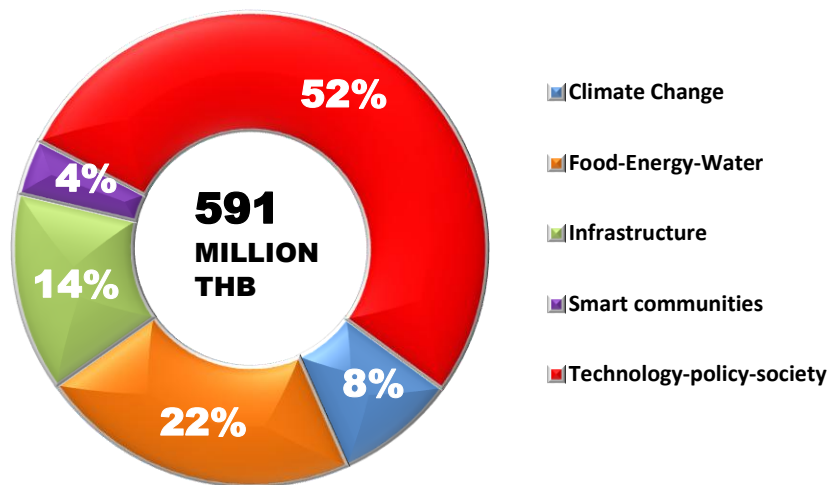


Figure 4. Value of projects initiated under reserach themes in 2024

¹ As the five research themes are interconnected and overlapping, crossing their traditional boundaries, the charts in this section (Projects initiated under Research Themes) are presented based on the indicative number of projects that fall under their most relevant (single) research themes.

AIT PUBLICATIONS

The report presents the publications available from SCOPUS database for 2024. Grouping under five thematic research areas, the chart below² shows the publications in 2024, reaching a total of 401 publications.

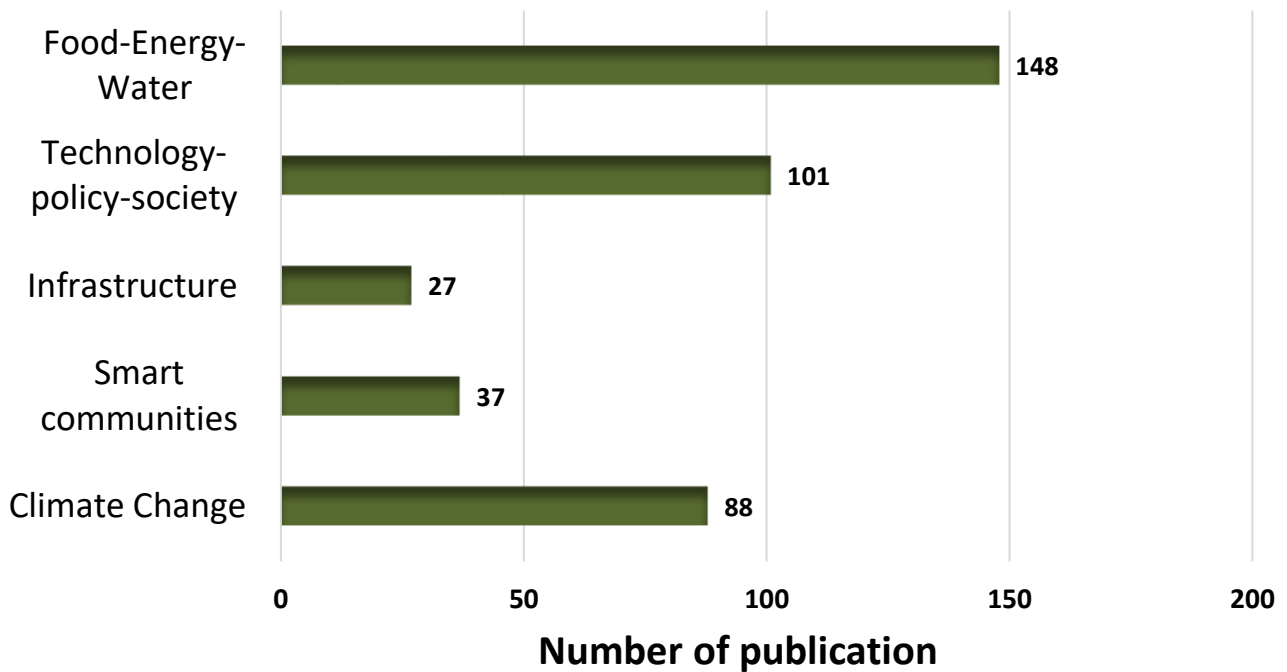


Figure 5. Publications associated with the research themes in 2024

²As five research themes are interconnected and overlapping, crossing their traditional boundaries, the charts in this section (AIT Publications) aim to give an indicative overview of the publications that fall under their most relevant (single) research themes.

CHAPTER 2: RESEARCH THEMES

CLIMATE CHANGE



AIT, as a leading regional institute for advancing sustainable development, conducts cutting-edge and solution-focused climate change research within an interdisciplinary framework. Building on its strong academic and applied research foundation, AIT examines the complex interactions between human activities and a changing climate, while identifying technological and policy pathways that advance low-carbon development and strengthen climate resilience across Asia and beyond.

By integrating environmental, social, and technological perspectives, AIT assesses greenhouse gas emissions and the diverse impacts of climate change on communities and ecosystems. The climate change research theme aims to develop and support effective mitigation and adaptation strategies that incorporate economic, social, and ecological approaches, aligning with the Sustainable Development Goals and complementing other regional development priorities.

Sub-themes

1. Transition towards Net Zero Emissions
2. Climate Change and Ecosystem
3. Enabling Technology and Innovations
4. Societal Dimension of Climate change
5. Cities and Climate Change
6. Climate Change Adaption and Resilience

TRANSITION TOWARDS NET ZERO EMISSIONS



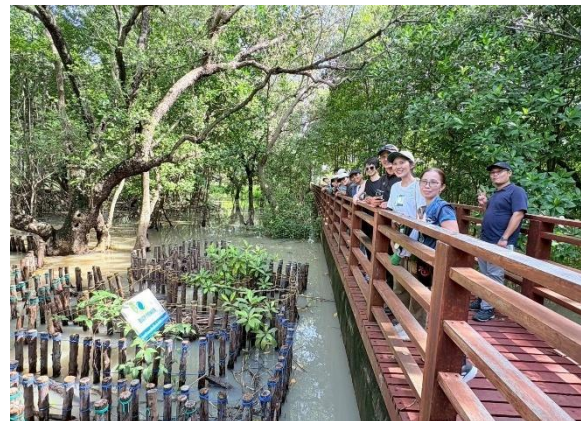
With the continued rise of global greenhouse gas emissions at the present time that have caused global warming already at 1.1°C from the pre-industrial times, ignoring the transition to net-zero emission is no longer an option. The climate emergency requires the swift and ambitious action to reduce emissions urgently. Rapid energy transitions to renewable energy, addressing the

deforestation, the large-scale investment and innovation are needed to provide technologically viable and economically competitive alternatives to reduce GHG emissions across all sectors of the economy. In view of this, AIT research focuses on analysis of the transition pathways to low-carbon energy system, and low carbon climate resilient communities. It includes greenhouse gas (GHG) accounting and the mitigation actions and policy options – encompassing study of emission sources and monitoring of GHG emissions in key sectors of energy, agriculture, forest and land use; sustainable forest management (REDD+); effective waste management; renewable energy such as solar, bioenergy and biofuel; energy storage technologies and its applications; clean coal technologies; carbon capture and storage; smart grids and microgrids; and climate policies, carbon pricing and carbon markets.

CLIMATE CHANGE AND ECOSYSTEM

Climate change threatens all ecosystems such as freshwater ecosystem, grassland, forests ecosystem, coral reefs, agro-ecosystems, and communities' livelihoods dependent on these ecosystems. Human and social systems also play a key role in both causing and responding to climate change. The drastic change in global climate and the earth's temperature is increasingly influenced by human-driven actions such as GHG emissions, land use/cover changes, deforestation, urbanization, etc. The climate change impact on ecosystems is to be exacerbated in ecosystems that already are under pressure from human activities, including air and water pollution, habitat destruction. The interactions between ecosystem vulnerability and human activities, and human well-being are the important aspects that should be emphasized in face of the growing population of the present time. Understanding the causes of climate change, ecological dynamics of climate impacts, has never been more important to pave the way for effective solutions in tackling climate change and its impacts.

AIT's research under this sub-theme focuses on climate change and its interaction with human activities and ecosystem. It addresses the practical



challenges in ensuring the sustainable use of natural resources, land, soil, water, and environmental management. The innovative ways of adapting to, mitigating, and reducing the impacts of climate change on vulnerable ecosystems are also explored. The topics covered under sub-theme include, among others, the impact analysis and adaptation to climate change in water, land, agriculture sectors; modelling for future climate projections and ecosystem services, climate financing for adaptation and mitigation; the circular economy; micro-biology and the environment.

ENABLING TECHNOLOGY AND INNOVATIONS



In the face of changing climate and its adverse effects, the development and adoption of new technology is an essential element of response actions to global climate change. These problems cannot be addressed without technology. Technology continues to play an even more significant role as we pursue efforts through adopting climate-friendly technology for mitigation and adaptation. In view of technological solutions playing a key role towards mitigating and adapting to impacts of climate change, the research under this sub-theme focuses on technology, policy options and strategies through AIT's leadership role to Technological Needs Assessments (TNA) in over 25 countries of Asia with United Nations Environment Program (UNEP) and technology enabling through UN Framework Convention on Climate Change (UNFCCC)'s CTCN Programme,

as well as other innovative mechanisms from technological, managerial, and institutional aspects in mitigating and adapting to the climate change. Some of the AIT's areas that have covered this sub-theme, are, for example, geospatial technologies (GIS, remote sensing, AI based approaches) in environmental monitoring and resource management such as water resource and air quality under changing climate conditions; climate smart agriculture technologies and practices; farm green innovation; early-warning and climate information services; innovative climate risk financing; technology clinic for Agro-food SMEs, data driven approaches in environmental research landscape, and the role of inclusive social media and digital platforms for climate adaptation and resilience building in Southeast Asia.

SOCIETAL DIMENSION OF CLIMATE CHANGE



Climate change affects people's lives from several aspects of economic, social, and environmental dimensions. Certain social groups of the society with vulnerability to the climate crisis including women, children, persons with disabilities and the elderly face disproportionate impacts of climate change despite being the least contributor to the crisis. The social crisis caused by climate change highlights the need to step up the efforts in

addressing the core issues of inequality on many levels between rich and poor, women and men. Climate actions thus need to take a holistic approach addressing the social drivers of climate change across disciplines and sectors. AIT's research seeks to understand the social factors and conditions that make social systems less vulnerable and resilient to climate change; and examine opportunities to adapt social systems in ways that are fair and sustainable. With a focus on social impacts and climate change, research covers a wide range of areas encompassing the role of economic, social, and institutional resources in building resilience to climate change. That includes social learning and networking, health, livelihoods, gender, migration, lifestyle changes, civil society organizations and NGOs, and inclusive strategies for climate mitigation and adaptation support system.

CITIES AND CLIMATE CHANGE



The cities are increasingly consuming natural resources at large scale while producing growing amount of waste and emissions, which leads to negative impacts on the environment and the climate. Cities contribute to over 70% of global CO₂ emissions but they have enormous potential to incorporate strategies for reducing the root causes of climate change by changing people's lifestyles, enhancing resource efficiency, and other actions. At the same time, as climate change continues, the growing effects of climate change are also increasingly felt by the cities – including the

impacts of climate induced disasters such as flooding, intense rainfall, landslides, and strong typhoons, etc. It is thus critical to make cities an integral part of the solution in combating climate change. AIT's research addresses urban carbon accounting, pathways to low carbon city development and analysis of city climate actions. Practical application of urban resilience approaches and promoting green city concepts are further key areas addressed under the sub-theme. This includes urban resilience assessment to disasters and climate risks, urban cooling for heat island mitigation, urban ecosystem services exploration and valuation, climate change impact scenarios on cities, climate-resilient urban planning and design including green infrastructure, infrastructure resilience planning, smart energy building, circular economy, responsible consumption, urban FOOD-WATER-ENERGY nexus including groundwater vulnerability and resilience assessments, the policy analysis and options for harnessing the innovation potential in cities to foster resilience and sustainability.

CLIMATE CHANGE ADAPTATION AND RESILIENCE



In the face of climate crisis, the efforts to adapt to the changing climate and reduce the climate-induced disaster risks have become a global priority. Promoting resilient societies to the climate risks require a range of complementary approach from climate change adaptation and disaster risk reduction concepts to prevent massive loss of life and destruction of infrastructure and hard-won development gains. The incomplete and uncertain knowledge bases, interplay of multiple actors for effective integration of disaster risk reduction and climate change adaptation in the development work are the issues that need to be urgently addressed. AIT's research focuses on climate change adaptation, disaster risk reduction and



resilience building for sustainable society through risk-sensitive policies, practices and tools. Among other topics covered under sub-theme, are the role of governments, NGOs in climate change adaptation; early warning systems and tools for detection of natural disaster; risk, vulnerability, and impacts assessment of floods, droughts, tsunamis; solutions to overcome extreme seasonal events of floods and droughts, social vulnerability analysis; multi-hazard risk assessment; community-based disaster risk reduction; remote sensing and GIS in disaster risk reduction; risk sensitive land use planning; risk perception and implication on risk governance.

HIGHLIGHTED PROJECTS UNDER CLIMATE CHANGE

The following lists some examples of projects that highlight AIT's global, regional, and country development experience under "Climate Change" thematic area during 2024.

Downscaling Future Extreme Weather and Natural Hazard Risks for Bangladesh

Project budget: 5,937,508 THB

Project duration: 24 Jan 2024- 28 Feb 2025

Donor: The World Bank

This technical assistance assignment seeks to downscale global and regional climate models to assess the changing intensity and occurrence of climate hazard risks in Bangladesh, with the objective of informing resilient power system planning. Considering a range of plausible scenarios, the assignment prepares hazard risk profiles for overlaying with available power system asset location data, including for electricity networks, generators, and fuel supply. The objective is to equip Government of Bangladesh and power sector agencies with resources to facilitate asset and



system-level resilience planning and policy under uncertainty. This project will improve the resilience of the communities against climate change and hydro-meteorological (flood and tropical cyclone) disasters.

Innovative tools to support the design and monitoring of NBS and GHG emission reduction projects

Project budget: 3,568,712 THB

Project duration- 31 Dec 2023 – 31 May 2025

Donor- Food and Agriculture Organization of the United Nations (FAO)

Under FAO Regional Priority Area 2 on accelerating sustainable natural resources management for biodiversity conservation and climate action which aims to support Members to protect, restore and promote sustainable use of terrestrial and aquatic ecosystems and combat climate change in realizing more efficient, resilient and sustainable agri-food systems, FAO is developing a new generation of analysis and tools to support the improved targeting and design of climate finance investments in agri-food systems consistent with the priorities of member countries and public and private sector donor organizations. Specifically, RAP is working with partners is developing tools to support integrated investments in climate and ecological resilience through nature-based solutions in the GEF and GCF portfolios



Testing Point-source Carbon Capture Technology under SMR Process Conditions

Project budget- 3,988,336 THB

Project duration- 30 Nov 2024-31 Jan 2026

Donor- Bangchak

AIT and Bangchak Corporation are piloting a CCUS initiative to support Thailand's net-zero goals under Bangchak's BCP 316 NET Plan. The project captures CO₂ from the Steam Reforming Hydrogen Production Unit using a solid sorbent fixed-bed system, achieving over 95% capture efficiency and high-purity CO₂ release. The collaboration includes environmental, economic, and deployment assessments to guide large-scale implementation, combining industrial data with academic research for scalable, cost-effective decarbonization. This initiative contributes to SDG 13 (Climate Action)



PROJECTS INITIATED UNDER CLIMATE CHANGE

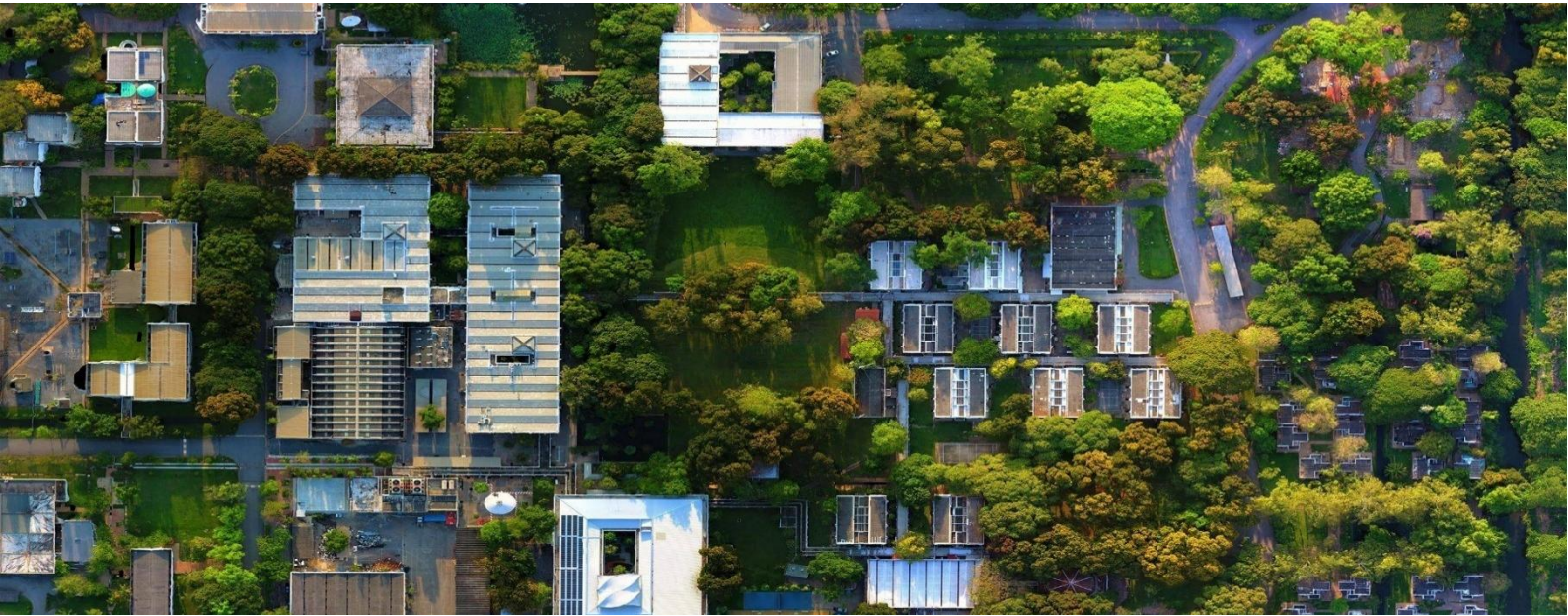
Below is the list of research, consultancy and capacity development projects initiated under “Climate Change” by various Institute wide outreach centers and departments during 2024.

- Title: Climate Resilient Infrastructure for Social Transformation and Adaptation (CRISTA 2.0)**
 - Duration: 1 January 2024 - 31 October 2025
 - Project Investigator(s): Indrajit Pal
 - Sponsor: Asian Disaster Preparedness Center (ADPC)
 - Total contracted amount: 5,200,000 THB
- Title: BREATHE-Cities: Bolstering Resilience and Environmental Air-Quality through Transformative Healthy Emission Transport in Cities**
 - Duration: 15 December 2023 - 31 July 2024
 - Project Investigator(s): Malay Kumar Pramanik
 - Sponsor: Research and Innovation for Development (RIDA), United Kingdom through University of Huddersfield, United Kingdom
 - Total contracted amount: 644,220 THB
- Title: Climate Change Adaptation in Agriculture for Enhanced Recovery and Sustainability of Highlands**
 - Duration: 1 December 2020 - 30 August 2024
 - Project Investigator(s): Voravate Chonlasin
 - Sponsor: ADB, Thailand
 - Total contracted amount: 1,275,000 THB
- Title: Climate Smart and Sustainable Agriculture using Cutting-Edge Technology and IoT, 04-09 March 2024**
 - Duration: 4 March 2024 - 30 September 2024
 - Project Investigator(s): Md. Zakir Hossain
 - Sponsor: Self / Participants' Organization
 - Total contracted amount: 323,400 THB
- Title: 18th Summer School on Environmental and Natural Resource Economics**
 - Duration: 29 April 2024 - 30 June 2024
 - Project Investigator(s): Kristine Mendoza Perez; Naharuethai Supakarn
 - Sponsor: South Asian Network for Development and Environmental Economics (SANDEE)
 - Total contracted amount: 1,434,860 THB
- Title: Downscaling Future Extreme Weather and Natural Hazard Risks for Bangladesh**
 - Duration: 24 January 2024 - 28 February 2025
 - Project Investigator(s): Manzul K. Hazarika
 - Sponsor: The World Bank, United States of America
 - Total contracted amount: 5,937,508 THB
- Title: ReTrEAT Cities: Resettlement, Transformation, and Eco-Adaptation Typology for Cities (and Communities) amidst rising seas in the Lower Mekong**
 - Duration: 1 February 2024 - 30 July 2025
 - Project Investigator(s): Malay Kumar Pramanik; Rajendra Prasad Shrestha; Shobhakar Dhakal; Paula Banerjee
 - Sponsor: DFAT, Australia through SEI, Afghanistan
 - Total contracted amount: 6,093,261 THB
- Title: Urban planning tools for addressing land degradation and land restoration**
 - Duration: 19 April 2024 - 31 December 2024
 - Project Investigator(s): Rajendra Prasad Shrestha
 - Sponsor: UNCCD, G20 Global Land Initiative, Afghanistan
 - Total contracted amount: 3,051,797 THB

- 9. Title: Innovative tools to support the design and monitoring of NBS and GHG emission reduction projects**
- Duration: 31 December 2023 - 31 March 2025
 - Project Investigator(s): Manzul K. Hazarika; Rajendra P. Shrestha
 - Sponsor: FAO
 - Total contracted amount: 3,568,712 THB
- 10. Title: Stocktaking and Methodological Assessment of Emissions Inventories and Source Apportionment of Air Pollution in Southeast Asia**
- Duration: 2 February 2024 - 31 January 2025
 - Project Investigator(s): Ram Lal Verna
 - Sponsor: UNEP, Thailand
 - Total contracted amount: 1,533,000 THB
- 11. Title: Developing of Environmental Management and Conservation Measures Optimization Strategy for the Valued Freshwater Bodies of ASEAN Countries**
- Duration: 17 June 2024 - 31 December 2026
 - Project Investigator(s): Thammarat
 - Sponsor: ASEAN-Russian Federation Dialogue Partnership Financial Fund (ARFDPFF), Indonesia
 - Total contracted amount: 6,657,840 THB
- 12. Title: Advancing Agriculture, Climate, Environmental, and Disaster Monitoring Through Satellite-Based Soil Moisture Retrieval and Applications in South East**
- Duration: 1 July 2024 - 31 December 2024
 - Project Investigator(s): Natthachet Tangdamrongsub
 - Sponsor: AIT, Thailand
 - Total contracted amount: 150,000 THB
- 13. Title: Logistic Arrangement for Urban Planning Tools for Addressing Land Degradation and Promoting Land Restoration, 22-26 July 2024**
- Duration: 22 July 2024 - 22 January 2025
 - Project Investigator(s): Narumon
 - Sponsor: G20 Global Land Initiative, Thailand
 - Total contracted amount: 2,048,840 THB
- 14. Title: Towards Sustainability - An ESG Journey for Management Students; 21-28 July 2024**
- Duration: 21 July 2024 - 31 December 2024
 - Project Investigator(s): Md. Zakir Hossain
 - Sponsor: Chitkara University, India
 - Total contracted amount: 954,720 THB
- 15. Title: Tackling Climate Change: Integrating Loss and Damage, Adaptation and Mitigation, 04-10 September 2024**
- Duration: 4 September 2024 - 30 March 2025
 - Project Investigator(s): Md. Zakir Hossain
 - Sponsor: NETZ, Bangladesh
 - Total contracted amount: 506,600 THB
- 16. Title: Empowering Developing Member Countries to Use Multispectral Satellite Images and Artificial Intelligence for Land Use and Coastal Planning**
- Duration: 9 August 2024 - 31 March 2025
 - Project Investigator(s): Manzul K. Hazarika
 - Sponsor: Asian Development Bank, Philippines
 - Total contracted amount: 1,715,000 THB
- 17. Title: Professional Development Program on Mainstreaming Climate Change and Gender in the Planning and Budgeting Process**
- Duration: 9 September 2024 - 30 June 2025
 - Project Investigator(s): Faiz Hassan Shah
 - Sponsor: Ministry of Finance, Tanzania
 - Total contracted amount: 2,475,000 THB
- 18. Title: Operational Foresight and Supporting Local Preparedness in the Context of Climate Displacement**
- Duration: 10 June 2024 - 31 December 2026
 - Project Investigator(s): Indrajit Pal
 - Sponsor: IOM, Thailand
 - Total contracted amount: 1,280,000 THB

- 19. Title: Video Production of Climate-Smart Agriculture Practices and Alternative Livelihood Options for Highlands, 15 October-15 November 2024**
- Duration: 15 October 2024 - 14 May 2025
 - Project Investigator(s): Narumon Wangnai
 - Sponsor: Asian Development Bank, Thailand
 - Total contracted amount: 475,749 THB
- 20. Title: Country-Scale Quantifications of GHG Emissions from Domestic WWTP in Thailand**
- Duration: 27 September 2024 - 27 March 2025
 - Project Investigator(s): Thammarat Koottatep
 - Sponsor: United Nations Human Settlements Programme (UN-Habitat), Kenya
 - Total contracted amount: 501,790 THB
- 21. Title: National Workshop on Higher Education and Industry Partnership for Climate Resilience (HEIP-CR) in Thailand**
- Duration: 1 September 2024 - 31 March 2025
 - Project Investigator(s): Indrajit Pal
 - Sponsor: AIT, Thailand
 - Total contracted amount: 150,000 THB
- 22. Title: AIT-ADPC joint capacity development/training program**
- Duration: 1 August 2024 - 31 December 2025
 - Project Investigator(s): Indrajit Pal
 - Sponsor: ADPC, Thailand
 - Total contracted amount: 270,000 THB
- 23. Title: Online Webinar Series for subjects on A1 101 Fundamentals; ESG Fundamentals; and DEI in the Workplace, 01 November-30 December 2024**
- Duration: 1 November 2024 - 28 June 2025
 - Project Investigator(s): Bahul Raj Shrestha
 - Sponsor: Chailease Holding Co., Ltd., Taiwan
 - Total contracted amount: 396,000 THB
- 24. Title: International Delta Summit and Living Deltas Hub Network**
- Duration: 1 October 2024 - 30 December 2025
 - Project Investigator(s): Indrajit Pal
 - Sponsor: Newcastle University, UK; ACCARD and Registration
 - Total contracted amount: 2,750,000 THB
- 25. Title: Testing Point-source Carbon Capture Technology under SMR Process Conditions**
- Duration: 30 November 2024 - 31 January 2026
 - Project Investigator(s): Ekbordin Winijkul
 - Sponsor: Bangchak, Thailand
 - Total contracted amount: 3,988,336 THB
- 26. Title: Green Industry Innovation and Development Program in Chongqing, China**
- Duration: 27 November 2024 - 30 June 2026
 - Project Investigator(s): Wenchao Xue
 - Sponsor: Multiple sponsors, China
 - Total contracted amount: 190,000 THB

SMART COMMUNITIES



Due to rapid urbanization, urban rural disparity, growing environmental footprint and inequality, the communities are facing economic, environmental, and social challenges. However, they are also trying to leap-frog through grasping the new opportunities presented by the smart technologies, the digital revolution and the policy innovation that are rapidly emerging. Especially, experiences of smart urban and rural communities are supported by a wide range of information and communication technology (ICT) systems that provide advanced

and innovative services that span all sectors. AIT's research focuses on transition to smart communities by leveraging the innovative technologies and practices for the community. Within the changing context of smart communities from infrastructure & supply-oriented to improving citizens' quality of life, the research is conducted in multi- and interdisciplinary way— integrating the different dimensions of development such as technology, environment, socio-economic, and the governance.

Sub-themes

1. Emerging Technologies for Inclusive Development of Rural and Urban communities
2. Ecosystem-based Environmental Solutions for Communities
3. Digital Transformation for Economy and Businesses

EMERGING TECHNOLOGIES FOR INCLUSIVE DEVELOPMENT OF RURAL AND URBAN COMMUNITIES

As technology becomes more prevalent, the technological infrastructure serves as an enabling platform providing essential services for the benefits of the community. Digital technologies bring the great benefits to the communities through innovative services and solutions to the challenges facing the fast-growing cities and communities such as climate change, urbanization, issues of mobility, food, and water security.

It is important to note that smart communities concept application is considered not only in the urban area and its development, but also enabling each community's requirements to be identified and addressed to raise the standard of living for all. While the technology continues to advance, society needs to be properly prepared for using their functionalities to effectively use the opportunities related to the development of modern technologies. This sub-theme recognizes the social implications along with the development of smart communities including digital divide; disparities among different communities in access and use of technology, geography (rural and urban areas), gender, and economic status.

AIT's research examines a wide variety of socio-technical aspects that bring the interconnected view of technology and the human systems that operate and interact with it. It encompasses the areas including community applications of



different emerging technologies (artificial intelligence, Internet of Things, block chain, 5G, machine learning); tools and smart devices that affect human activities and capacities. Research also explores the social implications of digital communities and the analysis of policies and regulations for communities that promote innovation and investment through technologies. The topics include, among others, ICTs application in delivering better education, health care, traffic management, real-time monitoring and management including air, water quality, renewable energy performance, and solid waste measurements (smart waste solutions); AI/IoT application in Geo-Engineering; telecommunication services; digital traceability in value chain; data protection and privacy; accessibility gap between urban and remote areas; and the factors that foster the digital inclusion.

ECOSYSTEM-BASED ENVIRONMENTAL SOLUTIONS FOR COMMUNITIES

While the 'smart communities' uses information and communication technologies (ICTs) to provide innovative and efficient services for the communities, it is important to step up the efforts in reducing the human impact on the environment and promote the sustainability. The growth of urbanization and human settlements, coupled with limited planning are adversely affecting the natural resources and puts cities and communities at risk from climate change. These challenges have highlighted the critical need to respond to sustainability issues by incorporating environmental sustainability as one of the key important aspects to urban and rural planning. Realizing the increasing negative impact of urbanization on wider ecological systems, the



research promotes nature-based solutions in dealing with increasing complexity of environmental burdens in both urban and rural contexts. It explores the options to meet socio-

ecological system needs in ways that promote healthy ecosystems, human well-being, and viable economies. Under this sub-theme, AIT's research promotes the socio-ecological systems approach to address a range of environmental issues related to energy, water security, land use, waste – such as sustainable land use planning and management,

environmental systems analysis and sustainability assessment, adaptation approaches to disaster risks and climate change (nature-based flood management), waste management and circular economy, sustainable metropolitan development, green and inclusive buildings with a focus around ecosystems.

DIGITAL TRANSFORMATION FOR ECONOMY AND BUSINESSES

While technology continues to bring changes in our daily lives, it has the substantial impact on the economy from several aspects of policies, innovation, productivity, growth, and employment. While the use of digital technology can solve business problems and make business processes more efficient and effective, it is also necessary to understand the impact of emerging technologies on economies from political and social aspects to ensure a sustainable and equitable economic

growth. AIT's research seeks to understand the process of digital transformation of businesses that drives the transformative change in economic efficiency, policy, and competitiveness including the adoption of digital financial services. The financial and social implications in response to technological advancement such as AI and IoT are further key issues addressed under this sub-theme. The areas covered include, for example, the impact



analysis of AI/IoT on economic policies, technological applications in production, operation, management, and marketing; communities' digital transaction; data-driven organizational management and business development; digital marketing and skills for the digital workplace; innovations and entrepreneurship in Agribusinesses including digital precision farming; marketing and traceability tool.

HIGHLIGHTED PROJECTS UNDER SMART COMMUNITIES

The following lists some examples of projects that highlight AIT's global, regional, and country development experience under "Smart Communities" thematic area during 2024.

Mobile Application and Associated Technology for Traceability mobile system for Thai tea farmers

Project budget- 2,200,000 THB

Project duration- 1 Mar 2024-15 Aug 2025

Donor- Monsoon Tea Company, Thailand

Description- The project develops mobile application coupled with cutting-edge traceability technology. This innovative solution will provide Thai tea farmers with a comprehensive toolset to enhance productivity, improve quality, ensure sustainability, and foster consumer trust while promoting biodiversity conservation.



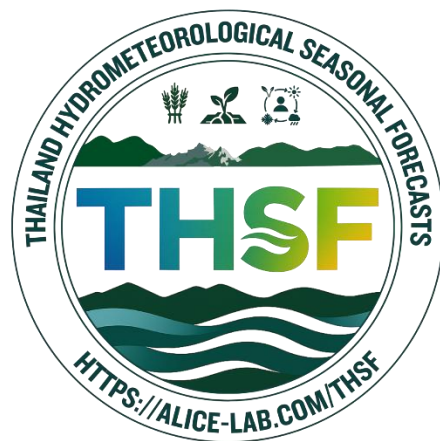
Empowering the Thailand high-resolution seasonal hydrometeorological forecasting system (THSF) to support smart agriculture under climate variation

Project budget- 14.8 million THB

Project duration- January 2023- May 2025

Donor- Agricultural Research Development Agency (ARDA)

The project aims at creating a model system capable of simulating real-time data for the agricultural sectors, producing high-resolution data (1 km) for the entire Thailand to forecast hydrological and climate variables up to a season ahead. The project to simulate high-resolution hydrology and climate variables promises significant social impact by enabling precise seasonal forecasts at a 1 km scale. This capability supports agriculture by enhancing crop planning and irrigation strategies, thereby reducing losses and strengthening food security. By improving the accuracy of climate predictions, the project also contributes to SDG 2 (Zero Hunger), SDG 13 (Climate Action), and SDG 15 (Life on Land), by facilitating better adaptation strategies and mitigation efforts. Ultimately, these advancements hold the potential to elevate agricultural productivity, minimize resource waste, and foster more resilient communities in the face of climate variability and change



The study of using technology and innovation to reduce particulate emissions from targeted vehicles (pick-up trucks and diesel-engine trucks)

Project budget- 2,739,986.25 THB

Project duration- 23 Feb 2024 – 22 Oct 2025

Donor- National Science and Technology Development Agency (NSTDA)

The study of using technology and innovation to reduce particulate emissions from targeted vehicles (pick-up trucks and diesel-engine trucks) AI Center is responsible for developing Remote Sensing to detect Black Smoke from Vehicles by using Deep learning and Image processing technology within the Pathumtani and Bangkok provinces to measure and evaluate PM_{2.5} Emissions caused by Black Smoke discharged from diesel engine Vehicles.



PROJECTS INITIATED UNDER SMART COMMUNITIES

Below is the list of research, consultancy and capacity development projects initiated under “*Smart Communities*” by various Institute wide outreach centers and departments during 2024.

1. **Title: AI Bootcamp 2024**
 - Duration: 1 January 2024 – 31 Dec 2024
 - Project Investigator(s): Chutiporn Anutariya
 - Sponsor: Chulalongkorn School of Integrated Innovation (CSII), Thailand
 - Total contracted amount: 1,470,000 THB
2. **Title: Smart City ASEAN Learning Network (SCALE)**
 - Duration: 1 January 2024 – 31 Dec 2030
 - Project Investigator(s): Manukid Parnichkun
 - Sponsor: Universiti Malaya, Malaysia
 - Total contracted amount: 1,314,000 THB
3. **Title: Training Management Institute in Smart Era**
 - Duration: 5 February 2024 – 31 Jul 2024
 - Project Investigator(s): Fazle Karim; Thaniya Jirasathipornpong
 - Sponsor: BIM, Bangladesh
 - Total contracted amount: 411,400 THB
4. **Title: Mobile – Air Quality**
 - Duration: 1 February 2024 – 31 Jan 2025
 - Project Investigator(s): Adisorn Lertsinsruttavee
 - Sponsor: University of Washington
 - Total contracted amount: 875,000 THB
5. **Title: Asian Internet Engineering Conference 2024 (AINTEC 2024)**
 - Duration: 1 February 2024 – 28 Feb 2025
 - Project Investigator(s): Kanchana Kanchanasut; Adisorn Lertsinsruttavee
 - Sponsor: Researchers/Engineers who are interested in Internet Technologies
 - Total contracted amount: 2,805,000 THB
6. **Title: Stock Market Connectedness and ESG (SMC-ESG)**
 - Duration: 1 March 2024 – 31 May 2025
 - Project Investigator(s): Joseph Jerome French
 - Sponsor: AIT Research Grant
 - Total contracted amount: 150,000 THB
7. **Title: Using Remote Sensing and AI Techniques to Forecast Future Peatland Fire Risk of the Kuan Kreng Landscape (KKL) in Thailand (KKL Fire Forecasts)**
 - Duration: 10 January 2024 – 31 Dec 2024
 - Project Investigator(s): Natthachet Tangdamrongsub
 - Sponsor: ECOSECURITIES GROUP LIMITED, Ireland
 - Total contracted amount: 925,855 THB
8. **Title: Mobile Application and Associated Technology for Traceability mobile system for Thai tea farmers (Thai-tea App)**
 - Duration: 1 March 2024 – 15 Aug 2025
 - Project Investigator(s): AI Center PI; Mongkol Ekpanyapong
 - Sponsor: Monsoon Tea Company, Thailand
 - Total contracted amount: 2,200,000 THB
9. **Title: Feminist AI Research: Incubating Feminist AI: From Paper to Prototype to Pilot (FAIR)**
 - Duration: 1 May 2024 – 30 Jun 2024
 - Project Investigator(s): Paula Banerjee
 - Sponsor: Instituto Tecnológico de Costa Rica, Costa Rica
 - Total contracted amount: 208,000 THB
10. **Title: Training on LiDAR Application in Agriculture and Flood Risk Mapping**
 - Duration: 13 June 2024 – 31 Dec 2024
 - Project Investigator(s): Nitin Kumar Tripathi
 - Sponsor: Food and Agriculture Organization of the United Nations (FAO), Bangladesh
 - Total contracted amount: 842,000 THB
11. **Title: AIT-RSQ: Generative AI Workshop Series (RSQ Series)**
 - Duration: 6 June 2024 – 29 May 2025
 - Project Investigator(s): Narumon Wangnai
 - Sponsor: Multi-donors
 - Total contracted amount: 612,000 THB

- 12. Title: SKILLADVANCEMENT on Empowering Mid-level Officers with Soft Skills and Technology (Sindh Barrage Mid-level)**
- Duration: 30 May 2024 – 31 Aug 2024
 - Project Investigator(s): AI Center PI; Mongkol Ekpanyapong; Furqan Ali Shaikh
 - Sponsor: Sindh Barrages Improvement Project, Pakistan
 - Total contracted amount: 674,090.76 THB
- 13. Title: Empowering the Thailand high-resolution seasonal hydrometeorological forecasting system (THFS) to support smart agriculture under climate variation**
- Duration: 15 July 2024 – 14 July 2025
 - Project Investigator(s): Natthachet Tangdamrongsub; Kittiphon Boonma
 - Sponsor: Agricultural Research Development Agency, Thailand
 - Total contracted amount: 2,093,250 THB
- 14. Title: Enhancing Global Citizenship and Sustainable Development Awareness Through UN Engagement; 30 July - 1 August 2024 (SDGs Awareness)**
- Duration: 30 July 2024 – 28 Jan 2025
 - Project Investigator(s): Bahul Raj Shrestha
 - Sponsor: GYLDC, Singapore
 - Total contracted amount: 402,491 THB
- 15. Title: The study of using technology and innovation to reduce particulate emissions from targeted vehicles (pick-up trucks and diesel-engine trucks) (Black Smoke NATDA)**
- Duration: 23 February 2024 – 22 Feb 2025
 - Project Investigator(s): AI Center PI; Mongkol Ekpanyapong
 - Sponsor: National Science and Technology Development Agency (NSTDA), Thailand
 - Total contracted amount: 2,739,986.25
- 16. Title: Asian Summer School for Geoinformatics and Issues on Sustainable Development in Asia 2024 (SummerSchool-2024)**
- Duration: 1 August 2024 – 30 Jan 2025
 - Project Investigator(s): Sarawut Ninsawat
 - Sponsor: Chubu University, Japan
 - Total contracted amount: 250,000 THB
- 17. Title: Development of a Vehicle Identity Image Processing Platform from AI CCTV (AI-CCTV-ITAP5)**
- Duration: 1 July 2024 – 31 Dec 2024
 - Project Investigator(s): AI Center PI; Mongkol Ekpanyapong
 - Sponsor: Pineapple Vision System Co., Ltd., Thailand
 - Total contracted amount: 435,490 THB
- 18. Title: Capacity Building Center for Human-Centric Sustainable Smart Industry (CBC 5.0)**
- Duration: 1 October 2024 – 30 Sep 2025
 - Project Investigator(s): Pisut Koomsap
 - Sponsor: ReCap 4.0 under the Erasmus+ program (200,000 THB), SCB (500,000 THB)
 - Total contracted amount: 700,000 THB
- 19. Title: Net2Home D2D-CDN**
- Duration: 16 October 2024 – 31 Mar 2026
 - Project Investigator(s): Preechai Mekbungwan; Rey Padilla; Adisorn Lertsinsrubtavee
 - Sponsor: THNIC Foundation, Thailand
 - Total contracted amount: 1,500,000 THB
- 20. Title: Strengthening Digital Agriculture Ecosystem and Developing e-Agriculture Solutions (Digital Agriculture-FAO)**
- Duration: 19 November 2024 – 18
 - Project Investigator(s): Sushi Kumar Himanshu; Muhammad Yaseen; Duanduan Duan; Avishek Datta;
 - Hayat Ullah
 - Sponsor: Food and Agriculture Organization (FAO) of the United Nations, Thailand
 - Total contracted amount: 1,516,356 THB

INFRASTRUCTURE



Infrastructure systems play a critical role in social and economic activities, and function as critical lifelines for connecting communities, industries, markets, goods, and services as well as for efficient governance. Infrastructure forms the backbone of any social and political development of communities and countries. Hence, investments in infrastructure are increasing rapidly, especially in developing countries to meet the increasing demand for reliable and efficient transportation, power, tele-communication, and water, often termed as the basic services essential for human and social well-being. However, across the world, millions of people are still facing severe absence and shortages of such systems. Unreliable power grids, inadequate water supply and sanitation systems, poor transportation networks are still a key bottleneck in many developing nations. The improvement and resilience of infrastructure systems and services

have become vital in the path towards sustainable development and for resilient and prosperous societies. In responding to the future trends and challenges with the rapidly growing communities, it is essential to ensure that infrastructure system and facilities are designed in sustainable, resilient, and inclusive approach. With technology expanding at the fast rate, it is now, infra-structures need to be flexible to adapt to technological improvements and incorporate better solutions as they become available. AIT's infrastructure theme represents the physical components of interrelated systems providing commodities and services essential to enable, sustain, or enhance societal living conditions. That includes transportation systems and networks including roads, bridges, and mass transit; housings, buildings, and facilities; electrical grids, ICTs networks including telecommunications.

Sub-themes

1. Planning and Management
2. Water Infrastructure
3. Digital (ICTs) Infrastructure

Economic growth and prosperity of the countries largely depend on the sustainable and resilient infrastructure and services which facilitate the daily social and economic activities to be more productive and efficient. Effective planning and management is therefore crucial in creating a resilient and sustainable infrastructure facilities which are the primary prerequisite for development.

Well-planned infrastructure system strengthens the sustainability and livability of our cities and communities while moving towards a greener, equitable future. AIT's research focuses on the processes necessary for the planning and development of new infrastructure in a cost-effective manner, and on maintaining and operating mature infrastructure for sustainability while integrating economic, social, environmental and policy aspects along these processes. It addresses the issues related to city systems and network, transportation, environmental and social aspects, financing and investment, logistic and supply chain management, construction engineering & management including sustainable construction, quality and safety improvement, bridge engineering, maintenance management. Specific topics addressed in relation to planning and management include the effective strategies for infrastructure development and project management; climate resilient, earthquake resistant urban infrastructure; appropriate costing



methods of climate change adaptation in infrastructure development (roads); safety, and security measures for public/private schools and hospitals; traffic engineering such as traffic and road safety; highways and pavements designs; infrastructure financing options; financial and risk management in infrastructure development; operation and maintenance of facilities; geo-engineering aspects in civil engineering issues; the rural-urban interconnected infrastructure and the infrastructure sustainability. Recently completed infrastructure resilience projects are related to coastal critical infrastructure resilience index in Thailand and implementing pilot demonstration project “Climate Resilient Infrastructure for Social Transformation and Adaptation (CRISTA)” providing solution to the pressing gaps in infrastructure resilience towards climatic hazards in Nepal and Bangladesh.

WATER INFRASTRUCTURE

The water system is an essential infrastructure providing the basic services to growing populations. But rapid population growth, urbanization and economic development are increasing the demand for water bringing enormous pressure on water

resources and supply. With this growing pressure on the water sector, investing in building resilience of water infrastructures to the adverse effects of climate change and emerging global health issues (pandemic) requires a comprehensive approach and a long-term outlook that contributes to economic productivity and environmental sustainability. AIT's research on water related infrastructure addresses the issues related to planning, design, implementation, operation, and maintenance of water infrastructures – critically exploring the technology solutions and policy



options to improve the water use efficiency, productivity, and security in context of changing environmental conditions. A wide variety of topics are explored under sub-theme such as water supply and distribution infrastructure in urban and rural areas; sanitation system services; wastewater treatment and disposal systems;

impact of COVID-19 on waste water management, irrigation and drainage system; real-time hydrological information systems for urban flooding and drainage; innovative approaches for resilient water infrastructure including innovative water conservation technologies, climate smart

DIGITAL (ICTS) INFRASTRUCTURE

The development of Information and Communication Technology (ICT) infra-structure has brought significant changes and impacts to our everyday lives from many aspects. The ICTs has become the part of every individual's life as the essential infrastructure to connect the people, share the information through a wide range of digital applications, services and solutions on which society and businesses rely.

Recognizing the ICTs as a key enabler to the social and economic development, AIT's research seeks to ensure that the application, services, and investments of ICT based systems and processes are efficient and sustainable for businesses, industries, communities, and the governments. Key areas of the research include - telecommunications, information systems and management, mobile phone applications, and ICTs applications for information society. The

WASH technology, climate friendly wastewater treatment, nature-based solutions and transformative adaptation for water security; and analysis of the policies and business models applied to improve the water resource infrastructure planning and management.



topics covered under sub-theme, include, among others, telecom market dynamics including service quality control and resource management; data modelling and management; data-driven organizational systems and management, data- driven approaches in methods in environmental research and urban issues, ICTs application in built environment and transport network system including road and traffic control management.

HIGHLIGHTED PROJECTS UNDER INFRASTRUCTURE

The following lists some examples of projects that highlight AIT's global, regional, and country development experience under "Infrastructure" thematic area during 2024.

The study of motorcycle accident causation and countermeasures design to reduce the severity of motorcycle accident at nighttime

Project budget- 4,999,200 THB

Project duration- 16 Nov 2023 – 31 Mar 2024

Donor- Department of Land Transport

The project is to conduct in-depth motorcycle accident investigation with high severity at nighttime and to identify the factors related to motorcycle accident at nighttime to develop proper countermeasures to reduce the number and severity of motorcycle accident at nighttime.



Earthquake Research Center of Thailand (Year 2)

Project budget- 5,000,000 THB

Project duration- 27 May 2024- 26 May 2025

Donor- National Research Council of Thailand

Thailand Earthquake Research Center brings together members and earthquake experts, encouraging them to share their ideas, innovations, and support. The center creates the regular event called the 'National Symposium on Earthquake Research,' inviting scientists, engineers, students, press, and the public to participate in the symposium.



Sustainable Infrastructure Programme in Asia

Project budget- 14,019,250 THB **Project**

duration- 25 Jul 2024 – 30 Sep 2025

Donor- DMCI

The Project as part of the OECD/UNDP Sustainable Infrastructure Programme in Asia (SIPA), aims to establish a long-lasting regional network of relevant knowledge institutions on sustainable infrastructure in Southeast Asia. The purpose of this network is to connect institutions on sustainable infrastructure in Southeast Asia. The purpose of this network is to connect policymakers, practitioners, and relevant experts within the



three focus countries in the region, namely, Indonesia, the Philippines, and Thailand, for the planning of sustainable infrastructure development in the region, in particular, to help direct investments towards energy, transport, and industry infrastructure projects that accord with the Paris Agreement and the Agenda 2030.

PROJECTS INITIATED UNDER INFRASTRUCTURE

Below is the list of research, consultancy, and capacity development projects initiated under “Infrastructure” by various Institute wide outreach centers and departments during 2024.

- 1. Title: The study of motorcycle accident causation and countermeasures design to reduce the severity of motorcycle accident at nighttime (MC-AI Nighttime)**
 - Duration: 16 November 2023 – 31 December 2024
 - Project Investigator(s): Kunnawee Kanitpong
 - Sponsor: Department of Land Transport
 - Total contracted amount: 4,999,200 THB
- 2. Title: Physical Hydraulic Model Study of Luang Prabang Hydroelectric Power Project, Lao PDR - Detailed Design Stage (Luang Prabang - Detailed Design Stage)**
 - Duration: 1 January 2024 – 31 December 2024
 - Project Investigator(s): Supot Thammasittirong; Arturo G. Roa
 - Sponsor: Ch. Karnchang (Lao) Co., Ltd.
 - Total contracted amount: 2,750,000 THB
- 3. Title: Structural Design Review of Suspension Pedestrian Bridge**
 - Duration: 15 January 2024 – 15 January 2025
 - Project Investigator(s): AIT Solution PI
 - Sponsor: SCB Engineering Co., Ltd., Thailand
 - Total contracted amount: 200,000 THB
- 4. Title: Structural Peer Review of Alegre Project**
 - Duration: 19 December 2023 – 19 December 2024
 - Project Investigator(s): AIT Solution PI
 - Sponsor: Federal Land, Philippines
 - Total contracted amount: 2,065,590 THB
- 5. Title: PERA of Verdon Parc**
 - Duration: 19 December 2023 – 19 December 2024
 - Project Investigator(s): AIT Solution PI
 - Sponsor: DMCI, Afghanistan
 - Total contracted amount: 367,605 THB
- 6. Title: Thailand Road Safety Forum**
 - Duration: 1 February 2024 – 31 July 2024
 - Project Investigator(s): Kunnawee Kanitpong
 - Sponsor: Mitsubishi Motor Thailand
 - Total contracted amount: 1,558,288 THB
- 7. Title: Baengpun IV Technical support for Baengpun deployment (Baengpun IV)**
 - Duration: 1 February 2024 – 28 February 2025
 - Project Investigator(s): Kanchana Kanchanasut; Rey Padilla
 - Sponsor: Multi donors
 - Total contracted amount: 500,000 THB
- 8. Title: Structural Peer Review of Tunasan Sewerage System**
 - Duration: 31 January 2024 – 31 October 2024
 - Project Investigator(s): AIT Solution PI
 - Sponsor: Abyzenith Structural Engineers, Philippines
 - Total contracted amount: 1,222,900 THB
- 9. Title: Wind Tunnel Testing of Torre Lorenzo Loyola 2&3 - Premium Residences**
 - Duration: 1 February 2024 – 31 July 2024
 - Project Investigator(s): AIT Solution PI
 - Sponsor: SY^2, Philippines
 - Total contracted amount: 953,910 THB
- 10. Title: Wind Tunnel Testing of J Tower 3**
 - Duration: 19 February 2024 – 19 September 2024
 - Project Investigator(s): AIT Solution PI
 - Sponsor: Tanichu Assessment Co. Ltd., Cambodia
 - Total contracted amount: 1,037,620 THB

11. Title: Car Accident Investigation Project: Year 2023-2024 (Car AI 2023-2024)

- Duration: 1 March 2024 – 31 August 2024
- Project Investigator(s): Kunrawee Kanitpong
- Sponsor: Toyota Daihatsu Engineering & Manufacturing Co., Ltd.
- Total contracted amount: 343,918 THB

12. Title: Motorcycle Accident Investigation Step 1: 2024 (MC AI Step 1: 2024)

- Duration: 1 March 2024 – 31 December 2024
- Project Investigator(s): Kunrawee Kanitpong
- Sponsor: Asian Honda Motor Co., Ltd.; Yamaha Motor Co., Ltd.; Honda Motor Co., Ltd.
- Total contracted amount: 2,345,483 THB

13. Title: PBD of Mantawi

- Duration: 19 March 2024 – 19 November 2025
- Project Investigator(s): AIT Solution PI
- Sponsor: SY², Philippines
- Total contracted amount: 4,306,800 THB

14. Title: Construction Management in Practice for Sustainable Power Company, 25 April 2024 (CCMSPC_Apr 24)

- Duration: 25 April 2024 – 31 December 2024
- Project Investigator(s): Fazle Karim
- Sponsor: Global Power Synergy Public Company Limited (GPSC), Thailand
- Total contracted amount: 120,015 THB

15. Title: Wind Engineering and Floor Analysis of CBG Project

- Duration: 25 March 2024 – 31 October 2024
- Project Investigator(s): AIT Solution PI
- Sponsor: Carabao Connex Co., Ltd., Thailand
- Total contracted amount: 1,970,000 THB

16. Title: Human Induced Floor Vibration Assessment of Tamarind Project

- Duration: 25 March 2024 – 31 December 2024
- Project Investigator(s): AIT Solution PI
- Sponsor: Abyzenith Structural Engineers, Philippines
- Total contracted amount: 108,360 THB

17. Title: Technical Support During Construction of UNESCAP Building

- Duration: 25 March 2024 – 31 December 2024
- Project Investigator(s): AIT Solution PI
- Sponsor: Copenhagen Contractors, Denmark
- Total contracted amount: 375,395.16 THB

18. Title: Testing of Tunnel Segment for Klong Premprachakorn Drainage Tunnel Project (Klong Premprachakorn Segment Test)

- Duration: 27 March 2024 – 31 December 2025
- Project Investigator(s): Anawat Chotesuwan
- Sponsor: Advance Prefab Company Limited
- Total contracted amount: 225,560 THB

19. Title: Wind Tunnel Testing of SPI-Bauhinia

- Duration: 22 April 2024 – 22 October 2024
- Project Investigator(s): AIT Solution PI
- Sponsor: Shang Properties, Philippines
- Total contracted amount: 993,600 THB

20. Title: PBD of Torre 2 & 3

- Duration: 16 May 2024 – 16 May 2025
- Project Investigator(s): AIT Solution PI
- Sponsor: SY²
- Total contracted amount: 915,500 THB

21. Title: Earthquake Research Center of Thailand (Year 2)

- Duration: 27 May 2024 – 26 May 2025
- Project Investigator(s): Pennung Warnitchai
- Sponsor: National Research Council of Thailand (NRCT)
- Total contracted amount: 5,000,000 THB

22. Title: Structural Evaluation of Foundation for Eccentric Precast Wall Panel at 2-Story House

- Duration: 5 June 2024 – 5 December 2024
- Project Investigator(s): AIT Solution PI
- Sponsor: Lalin Property PCL, Thailand
- Total contracted amount: 80,000 THB

23. Title: Black Spots Improvement in Chachoengsao

- Duration: 1 June 2024 – 30 June 2025
- Project Investigator(s): Kunnawee Kanitpong; Chaklam Silpasuwanchai
- Sponsor: Toyota Mobility Foundation (TMF), Japan
- Total contracted amount: 3,984,814 THB

24. Title: Accounting for Production Sharing Contract (PSC) and Implementation of IFRS in Oil and Gas Company (PSCIFRS)

- Duration: 19 June 2024 – 31 December 2024
- Project Investigator(s): Fazle Karim; Thaniya Jirasathipornpong
- Sponsor: MPRL E&P Pte Ltd., Myanmar
- Total contracted amount: 210,000 THB

25. Title: PBD of Thor

- Duration: 23 April 2024 – 22 July 2025
- Project Investigator(s): AIT Solution PI
- Sponsor: SY^2, Thailand
- Total contracted amount: 897,250 THB

26. Title: PBD of Borealis

- Duration: 24 May 2024 – 22 August 2025
- Project Investigator(s): AIT Solution PI
- Sponsor: SY^2 & Associates, Afghanistan
- Total contracted amount: 2,920,800 THB

27. Title: PBD of olin@Jade

- Duration: 24 May 2024 – 22 August 2025
- Project Investigator(s): AIT Solution PI
- Sponsor: SY^2 & Associates, Thailand
- Total contracted amount: 912,750 THB

28. Title: PBD of Portico 4

- Duration: 24 May 2024 – 28 February 2025
- Project Investigator(s): AIT Solution PI
- Sponsor: SY^2 & Associates, Thailand
- Total contracted amount: 255,570 THB

29. Title: Wind Tunnel Testing of Exhibition Hall and Stadium

- Duration: 23 July 2024 – 23 July 2025
- Project Investigator(s): AIT Solution PI
- Sponsor: Visionary Architecture, Philippines
- Total contracted amount: 1,300,680 THB

30. Title: Wind Tunnel Testing of Iconic Tower

- Duration: 17 July 2024 – 16 July 2025
- Project Investigator(s): AIT Solution PI
- Sponsor: SY^2
- Total contracted amount: 974,160 THB

31. Title: Scope 1 - Physical Hydraulic Model Tests on the Flow Field Effects of Rig2Reef and concrete Block Artificial Reef Structures (Scope 1 – Rig2Reef Structures)

- Duration: 1 September 2024 – 31 August 2025
- Project Investigator(s): Arturo G. Roa
- Sponsor: Kasetsart University
- Total contracted amount: 472,000 THB

32. Title: Scope 2 - Physical Hydraulic Model Tests on the Flow Field Effects of Rig2Reef and Concrete Block Artificial Reef Structures (Scope 2 – Concrete Block AR structures)

- Duration: 1 September 2024 – 31 August 2025
- Project Investigator(s): Arturo G. Roa
- Sponsor: Kasetsart University
- Total contracted amount: 498,000 THB

33. Title: Pump Application and Products, 25 September – 02 October 2024 (EBARA 2024)

- Duration: 25 September 2024 – 31 March 2025
- Project Investigator(s): Narumon Wangnai
- Sponsor: EBARA Hatekayama Memorial Fund (EHMF), Japan
- Total contracted amount: 792,000 THB

34. Title: Sustainable Infrastructure Programme in Asia

- Duration: 25 July 2024 – 30 September 2025
- Project Investigator(s): Deepak Sharma; Suwin Sandhu
- Sponsor: United Nations Development Programme (UNDP), Thailand
- Total contracted amount: 14,019,250 THB

35. Title: Structural Strengthening Design of Tunasan Project

- Duration: 1 July 2024 – 31 August 2025
- Project Investigator(s): Thaung Htut Aung; Keerati Tunthasuwatana
- Sponsor: Abyzenith Structural Engineers, Philippines
- Total contracted amount: 455,390 THB

36. Title: Reconduct Wind Tunnel Testing of Torre Loyola Tower 2 and 3

- Duration: 3 September 2024 – 12 September 2025
- Project Investigator(s): Thaung Htut Aung
- Sponsor: SY², Philippines
- Total contracted amount: 921,780 THB

37. Title: Seismic Evaluation of LC-2 Building, DLSU – Laguna Campus

- Duration: 24 September 2024 – 29 April 2025
- Project Investigator(s): Thaung Htut Aung
- Sponsor: SY², Philippines
- Total contracted amount: 722,040 THB

38. Title: The Study of the Effectiveness of Hazard Perception Training on Young Motorcycle Riders in Thailand (Hazard Perception Training)

- Duration: 1 December 2024 – 31 December 2026
- Project Investigator(s): Kunnawee Kanitpong
- Sponsor: Thai Health Promotion Foundation, Thailand
- Total contracted amount: 9,664,050 THB

39. Title: Structural Peer Review of Trojena Discovery Tower

- Duration: 30 October 2024 – 31 October 2025
- Project Investigator(s): AIT Solution PI; Thaung Htut Aung
- Sponsor: Egis, Dubai
- Total contracted amount: 1,172,500 THB

40. Title: Re-evaluation of PBD of Forum Tower 1 & 2

- Duration: 18 November 2024 – 18 November 2025
- Project Investigator(s): AIT Solution PI; Thaung Htut Aung
- Sponsor: SY², Philippines
- Total contracted amount: 864,500 THB

TECHNOLOGY, POLICY, AND SOCIETY



The future of economic prosperity and inclusive societal transformation depends on how we address the key societal issues benefiting from emerging innovative technologies and policies. The application of digital technologies, bio-process technologies, environmental technologies, energy technologies, and nanotechnologies holds the greatest potential for competitiveness and sustainable growth of the countries if can be used appropriately. Despite the major technological advancements, the complexity of technologies and the implications they have for many aspects of social life still need to be fully understood and issues of disparity, divide and inequality remain. Understanding of the ongoing digital transformation and consequences of these new and emerging technologies is important to improve the individual and societal outcomes, particularly in the face of increasing societal pressures.

AIT's Technology-Policy-Society research theme is focused on technology development and application, policy innovation, and development and societal issues including the nexus between them. The theme recognizes the growing need of bridging the gap between technology and policymaking that requires the understanding of the policy tools required for modern society and the modern technologies. In view of this, the research explores how social science and technology interact with everything from environmental issues to public policies, and better understanding on the impacts of emerging technologies (artificial intelligence, internet of things, big data, etc.) from societal and policy dimensions while moving forward to inclusive and sustainable development.

Sub-themes

1. Digital Technology Solutions and Societal Transformation
2. Innovative Policies for Coping with Rapid Transformation taking place in the Region
3. Information, Communication Technologies (ICTs) and the Environmental Management
4. Equitable Societal Change and Inclusive Development
5. Gender and Forced Displacement

DIGITAL TECHNOLOGY SOLUTIONS AND SOCIETAL TRANSFORMATION

Modern digital technologies, information, and communication technologies (ICTs) services are fundamental in all areas of society today, and extremely important for social development. Technological advancements have brought major changes to our daily lives – changing the way we work, communicate, and do businesses. Artificial Intelligence (AI) is set to play an even more important role in every aspect of our daily lives in the future. It is thus important to look more closely at how these new and emerging technologies will affect social equity, in particular gender dynamics and power relations. It is important to understand the potential opportunities and risks associated with these technologies and recognize their potential to make positive changes in societies, for example challenging oppressive gender norms. It is necessary for societies to be able to adapt to the social changes that technology will continue to bring in future.

AIT research under this sub-theme addresses the societal consequences of new and emerging technologies from the multidisciplinary approach. It provides a landscape for critical inquiries about technology and its intersections with socio-economic drivers. Research covers a wide range



of areas – including information systems and management for health care, education, and transport, businesses sectors; nanotechnology focusing on application of nano particles (e.g., nanostructured anti-reflective coating for solar panels); application of AI and big data for agricultural productivity including aquaculture value chain; natural resources management using conventional and modern temporal and geospatial technologies; digital inclusion such as inclusive AI development; technological impacts on cultural and social aspects such as fake news, depression; digital policies and governance.

INNOVATIVE POLICIES FOR COPING WITH RAPID TRANSFORMATION TAKING PLACE IN THE REGION

Recent decades have seen the increasing role of innovative policies in the areas of development and emerging technologies to generate solutions for the challenges such as climate change, and other emerging societal issues. While these rapid changes with emerging technologies present a significant opportunity to achieve the sustainable development, they also raise a major ethical, legal, economic, policy and social issues especially inequality - posing new challenges for policymakers to meet the goals of sustainable development.

The focus significantly not only for the economic growth or sectors, but also to addressing the challenges of inter-connected issues and synergies between environmental sustainability and sustainable development. Such shifting policymaking environment highlights a critical need for policymakers to use multiple policy framings in dealing with the complex challenges and adapting to shifting social realities. Just as technology and innovations are central elements of modern societies, it is equally important to recognize the



role of innovative policies with government initiatives by integrating the scientific and technological knowledge into public policies to foster the strategic growth. The sub-theme seeks to understand the policy approaches, which will help guide the direction of future policies and facilitate transformative change. AIT's research examines the question of how governance structures and their policies deal with the emerging challenges related to social, environmental, developmental, and technological

aspects, and how they can have far-reaching impacts. It focuses on understanding the effectiveness of policy approaches, policy evaluation and impact analysis with a particular emphasis given on approaches that benefit low-income and other marginalized communities. The research focus areas in relation to innovative policies include science, technology, and data, gender and development, poverty reduction, business, and regulations, social development; environment and energy sustainability; resilient

cities and communities; agricultural development policies and strategies. The topics include, among other, evidence-based policies for the sustainable use of energy resources in the Asia Pacific Region; Labor migration & human trafficking laws, regulations & policies; Mainstreaming ecosystem services in national policies for sustainable management of freshwater ecosystems in South & Southeast Asia; and Strengthening ASEAN Member State Policies with Environmental Health Data on Costs of Inaction and Co-Benefits.

INFORMATION, COMMUNICATION TECHNOLOGIES (ICTS) AND THE ENVIRONMENTAL MANAGEMENT

While the increasingly widespread use of ICTs enables socio-economic development, ICTs are also a growing enabler for effectively addressing climate change and environmental issues, and transition to circular economy. Focusing on the ICTs and its impacts on the environmental sustainability, AIT's research focuses on how ICT development with the frontier technologies, systems and applications can be harnessed for tackling environmental challenges including climate change.

Specific topics addressed are, for example, the data-driven natural resource management (water resources, air quality, land use); emerging technologies and tools (AI, IoTs, big data, machine learning) applied for climate and environmental monitoring and management such as climate information



system, early-warning, disaster relief communications and AI based energy management including microgrid platforms; GIS and remote sensing applications in agriculture and natural resource management.

EQUITABLE SOCIETAL CHANGE AND INCLUSIVE DEVELOPMENT

Social equity and inclusion across all our communities is driven by the several factors of change including access to and control over resources, gender, education, technology, and the policies. Achieving social justice and equality requires long term and sustainable action to close the inequity gap among demographic and socio-economic segmentations. For instance, the digital literacy gap is present between women and men, in addition to the unique barriers of women and girls in accessing to and use of digital tools and services.

In wake of growing recognition on importance of social equity to sustainable development, research under this sub-theme, addresses the drivers that determine equity and social inclusion – examining how they have shaped our identity,



communities, and the role they play in promoting the inclusive sustainable development. This systematic understanding of drivers will support the development of policy priorities, decisions,

and development programming to accelerate the poverty reduction and achieve the sustainable development. AIT's research focuses on behavioral, social, and physical barriers and opportunities for equity including policy options to ensure that individuals, groups, and communities participate fully in meaningful ways in society. Moving towards the achievement of the inclusive development, AIT research addresses the issues from several aspects of social, cultural, economic, political dimensions.

The areas covered under sub-theme include, among others, gender relations in the issues of migration, forced displacement, labor, agriculture, fisheries; cultural influence, human resource, and leadership development; women and political participation, influencing factors on entrepreneurship, social capital in sustainable agriculture, equitable access to resources and technologies, policy interventions, the role of media and public perception on equitable social change.

GENDER AND FORCED DISPLACEMENT

Asia is witness to both on-going and emerging pressures that drive forced displacement in contexts where political systems range from unstable democracies to full-blown dictatorships. The Region is also one of the most vulnerable to disasters and the impact of climate change; and continues to undergo rapid infrastructure development including dams, roads, ports, and Special Economic Zones that displace populations. Existing research and responses remain surprisingly gender blind, which in turn, results in poor policy and programmatic responses. In addition, gender is often understood in limited terms, focusing on impacts, or on women as victims in forced displacement. This hides many gender dimensions of forced displacement. For instance, the focus on impacts fails to highlight how drivers of displacements have strong gender dimensions, including policies designed by male-dominated political systems or conflict and gender-based violence being a cause of displacement overlapping drivers. Or that a discourse of women as victims, reinforces stereotypes which negate women's agency and participation and contribute to less effective responses. Narrow understanding of gender obscure gender patterns where men can be victims, e.g., where men and boys have been forced into combat, or targeted as civilians; or hides potential where men can engage and contribute as agents of change and solidarity. Finally, our understanding with regards to sexual orientation and gender identity and expression (SOGIE) in forced displacement is extremely limited, making diverse SOGIE groups invisible in research and policy processes. AIT hosts the IDRC funded Center on Gender and Forced Displacement. The Center and affiliated research activities bring attention to the ongoing imperative to center gender issues globally. The research under sub-theme addresses



the gap between important drivers of forced displacement in the region with needed knowledge and policy responses when it comes to gender dimensions of forced displacement. It examines the drivers of forced displacement influenced by gender dynamics and the gender dimensions in experiences of forced displacement; and analyze the policy responses and the gaps in addressing the gender dimensions of forced displacement in the region at these different levels. Under this sub-theme, the areas focused include, among others, strengthening knowledge, evidence use and leadership on forced displacement; the impact of political trends, climate change and investments on drivers of forced displacement and their gender dynamics; displaced people and their vulnerabilities in various stage of displacement, and the effort in addressing gender needs in forced displacement.

HIGHLIGHTED PROJECTS UNDER TECHNOLOGY, POLICY, AND SOCIETY

The following lists some examples of projects that highlight AIT's global, regional, and country development experience under “*Technology, Policy, and Society*” thematic area during 2024.

Strengthening Plastic Pollution Management in Asia and the Pacific - Implementation

Project budget- 14,019,250 THB

Project duration- 25 Jul 2024- 30 Sep 2025

Donor- UNDP

The project is to enhance the systematic approach to plastic pollution management in the project Strengthening Plastic Pollution Management in Asia and the Pacific funded by the Government of Japan, which aims to enhance tools and protocols for assessment and monitoring capabilities with the Mekong River Commission (MRC) and to strengthen national and local waste management systems, for plastic pollution management in the Mekong River Basin and in the Pacific Islands.



Transformative Technology Commercialization Hub

Project budget- 172,622,135 THB

Project duration- 05 Nov 2023- 01 Nov 2026

Donor- Bill & Melinda Gates Foundation

To facilitate the promotion and adoption of reinvented sanitation technologies in Asia, AIT Global Water and Sanitation Center (GWSC) establishes a Transformative Technology Commercialization Hub. It will manage the implementation of awareness raising, market development and demonstration of reinvented sanitation technologies project packages. The hub will play a pivotal role in driving the project and its foreseen functions and responsibilities, such as strategic support, project oversight, communication and advocacy, evolve in line with the project implementation. Engaging with government officials, National and Regional Standard Bodies, Development Financial Institutions (DFI), UN Agencies, the projects allow the Hub to strategically guide government officials and Development Financial Institutes in raising awareness and identifying the most suitable reinvented sanitation technologies for their specific needs.



It offers insights on their integration into existing infrastructure. It connects the missing links between product manufacturing and standardization, regulatory adjustment (such as procurement), and sustainable operation and maintenance. In support of broader market assessment and action planning, the Hub oversees the execution of the on-going projects, ensuring timely deliverables and quality results through continuous monitoring and evaluation of implementation.

Third-Party Validation and Monitoring and Development of Data Analytics Tool of Sindh Flood Emergency Rehabilitation



Project budget- 9,000,000 THB

Project duration- 15 Dec 2023 – 31 Dec 2026

Donor- Bill & Melinda Gates Foundation

Sindh province in Pakistan suffered the most from the 2022 floods, with damages estimated at US\$9 million and recovery needs at US\$7.9 billion. Over 12 million people were affected, and 24 out of 30 districts were declared as "calamity hits." The Sindh Flood Emergency Recovery Project (SFERP) will focus on infrastructure rehabilitation, short-term livelihood support, and building long-term resilience to climate change and natural disasters.

PROJECTS INITIATED UNDER TECHNOLOGY, POLICY, SOCIETY

Below is the list of research, consultancy and capacity development projects initiated under “*Technology, Policy, and Society*” by various Institute wide outreach centers and departments during 2023.

1. **Title: Traversing interconnected local-to global action spheres to advance the post-2030 agenda.**
 - Duration: 01/Jan/24 – 31/Jul/24
 - Project Investigator(s): Indrajit Pal
 - Sponsor: IGES JAPAN
 - Total contracted amount: 481,000 THB
2. **Title: Agro-meteorological Forecasts and Advisories through Mobile Application and social media for Climate-smart Agriculture in Thailand and Vietnam-AFAS**
 - Duration: 05/Jan/24 – 04/Jan/27
 - Project Investigator(s): Sushi Kumar Himanshu; Avishek Datta; Farhad Zulfiqar
 - Sponsor: Asian Development Bank (through Landell Mills Ltd.)
 - Total contracted amount: 3,014,901 THB
3. **Title: Strengthening Plastic Pollution Management in Asia and the Pacific - Cost of Inaction**
 - Duration: 08/Dec/23 – 30/Jun/24
 - Project Investigator(s): Ekbordin Winijkul
 - Sponsor: -
 - Total contracted amount: 1,610,000 THB
4. **Title: International weeks - Loyola University New Orleans, USA**
 - Duration: 01/Jan/24 – 31/Mar/24
 - Project Investigator(s): Roger Levermore
 - Sponsor: The College of Business, Loyola University New Orleans, USA
 - Total contracted amount: 577,962 THB
5. **Title: AITE Strategic Investment 2024**
 - Duration: 01/Jan/24 – 30/Jun/25
 - Project Investigator(s): Voravate Chonlasin
 - Sponsor: Multi Donor
 - Total contracted amount: 17,474,132 THB
6. **Title: Transformative Technology Commercialization Hub**
 - Duration: 05/Nov/23 – 01/Nov/26
 - Project Investigator(s): Thammarat Koottatep; Sangam Shrestha
 - Sponsor: Bill & Melinda Gates Foundation
 - Total contracted amount: 172,622,135 THB
7. **Title: Strategic Account Fund 31 AIT Solutions**
 - Duration: 01/Jan/24 – 31/Dec/24
 - Project Investigator(s): AIT Solution PI
 - Sponsor: AIT Solutions
 - Total contracted amount: 10,700,000 THB
8. **Title: Supporting feminist scholars from Myanmar and strengthening connections within and across diverse feminist movements in Thailand and the broader region**
 - Duration: 01/Jan/24 – 31/Dec/24
 - Project Investigator(s): Kyoko Kusakabe
 - Sponsor: Nordic International Support Foundation
 - Total contracted amount: 1,752,025 THB
9. **Title: PSGIM: Business Beyond Borders**
 - Duration: 01/Feb/24 – 30/Apr/24
 - Project Investigator(s): Roger Levermore
 - Sponsor: PSG Institute of Management, India
 - Total contracted amount: 4,854,400 THB
10. **Title: Project Implementation Management, Monitoring and Evaluation**
 - Duration: 21/Feb/24 – 26/Aug/24
 - Project Investigator(s): Narumon Wangnai
 - Sponsor: Ministry of Health, Bhutan
 - Total contracted amount: 377,513.93 THB

- 11. Title: Developing and Delivering a Capacity Building Training and Study Tour Program on Behavioral Change in Plastics and Plastic Waste Management in ASEAN**
- Duration: 01/Dec/23 – 31/Dec/24
 - Project Investigator(s): Thammarat Koottatep
 - Sponsor: SEA-MaP Project Management Unit, Indonesia (under The World Bank)
 - Total contracted amount: 3,499,300 THB
- 12. Title: Leadership and Management, 11-15 March 2024**
- Duration: 11/Mar/24 – 11/Sep/24
 - Project Investigator(s): Narumon Wangnai
 - Sponsor: Royal University of Bhutan, Bhutan
 - Total contracted amount: 222,750 THB
- 13. Title: Strategic Human Resource Management and Business Leadership**
- Duration: 18/Mar/24 – 31/Dec/24
 - Project Investigator(s): Fazle Karim; Thaniya Jirasathipornpong
 - Sponsor: Multi-donor
 - Total contracted amount: 236,640 THB
- 14. Title: Research for senior fellows**
- Duration: 01/Mar/24 – 31/Dec/27
 - Project Investigator(s): Nitin Kumar Tripathi
 - Sponsor: Candidates from various partner universities, Thailand
 - Total contracted amount: 600,000 THB
- 15. Title: Project: Third-Party Validation and Monitoring and Development of Data Analytics Tool of Sindh Flood Emergency Rehabilitation**
- Duration: 15/Dec/23 – 31/Dec/26
 - Project Investigator(s): AI Center PI; Furqan Ali Shaikh; Mongkol Ekpanyapong
 - Sponsor: 360 Engineering & Management Solutions Company Limited (360EMS), Thailand
 - Total contracted amount: 9,000,000 THB
- 16. Title: Strategies for Effective Public Health Policy Making: Unveiling Thailand's Insights for Influencing Practice and Shaping Policies**
- Duration: 01/Dec/23 – 31/Dec/24
 - Project Investigator(s): Malay Kumar Pramanik; Mokbul Morshed Ahmad; Vilas Nitivattananon
 - Sponsor: MATI, India
 - Total contracted amount: 3,148,805 THB
- 17. Title: Strengthening Plastic Pollution Management in Asia and the Pacific - Implementation**
- Duration: 01/Jan/24 – 30/Apr/25
 - Project Investigator(s): Ekbordin Winijkul
 - Sponsor: UN Environment Programme, Kenya
 - Total contracted amount: 5,300,000 THB
- 18. Title: Enhancing and scaling up the joint AIT and UNEP's efforts for air quality management - Phase 2**
- Duration: 28/Mar/24 – 31/Jan/25
 - Project Investigator(s): Ekbordin Winijkul
 - Sponsor: UN Environment Programme, Kenya
 - Total contracted amount: 3,300,000 THB
- 19. Title: Enhancing Higher Management Skills in Pension Fund Management and Health Insurance (EPF)**
- Duration: 01/Apr/24 – 31/Dec/24
 - Project Investigator(s): Narumon Wangnai
 - Sponsor: EPF of Nepal, Nepal
 - Total contracted amount: 754,500 THB
- 20. Title: Advanced Policy and Practices for Election Management, 15 April – 31 May 2024**
- Duration: 15/Apr/24 – 27/Nov/24
 - Project Investigator(s): Bahul Raj Shrestha
 - Sponsor: The Election Commission of Bhutan (ECB), Bhutan
 - Total contracted amount: 1,648,350 THB

21. Title: Strategic Leadership and Organizational Renewal, 21-27 April 2024

- Duration: 21/Apr/24 – 31/Dec/24
- Project Investigator(s): Narumon Wangnai
- Sponsor: Nepal Telecom, Nepal
- Total contracted amount: 924,000 THB

22. Title: Strategic Customized Programs Liaison: AIT-GBA (Batch I)

- Duration: 15/Dec/23 – 31/Dec/24
- Project Investigator(s): Shawn Patrick Kelly; Duanduan Duan
- Sponsor: Georgia Tech Shenzhen Institute, China
- Total contracted amount: 309,413 THB

23. Title: ASEAN Municipal Solid Waste Management Enhancement (AMUSE) - GIZ

- Duration: 01/Feb/24 – 31/Dec/24
- Project Investigator(s): Guilberto Borongan
- Sponsor: Deutsche Gesellschaft für International Zusammenarbeit (GIZ) GmbH, Germany
- Total contracted amount: 1.45 million

24. Title: 11th Social Business Academia Conference 2024

- Duration: 01/Mar/24 – 31/Dec/24
- Project Investigator(s): Faiz Hassan Shah
- Sponsor: EDSMAT and Multi Donor
- Total contracted amount: 482,633 THB

25. Title: Operational Framework of Unified Special Olympics Development in Schools in Bangkok

- Duration: 15/May/24 – 11/Nov/25
- Project Investigator(s): Narumon Wangnai
- Sponsor: Special Olympics, Thailand
- Total contracted amount: 450,000 THB

26. Title: Student Mobility Exchange Program

- Duration: 01/May/24 – 31/Dec/27
- Project Investigator(s): Nitin Kumar Tripathi
- Sponsor: Ajeenkya DY Patil University (ADYPU), India
- Total contracted amount: 3,675,000 THB

27. Title: HEC-Montreal Campus Abroad Program in Thailand for Summer 2024

- Duration: 05/May/24 – 31/Dec/24
- Project Investigator(s): Faiz Hassan Shah
- Sponsor: HEC Montreal, Canada
- Total contracted amount: 655,475 THB

28. Title: DBAR-ICoE Strategic Development Plan 2024 - 2026

- Duration: 08/May/24 – 07/May/25
- Project Investigator(s): Wenchao Xue
- Sponsor: National Research Council of Thailand (NRCT)
- Total contracted amount: 909,480 THB

29. Title: Leadership and Management (RUB_Batch2)

- Duration: 09/Jun/24 – 12/Dec/24
- Project Investigator(s): Narumon Wangnai
- Sponsor: Royal University of Bhutan
- Total contracted amount: 284,490 THB

30. Title: Strategic Human Resource Management and Business Leadership

- Duration: 03/Jun/24 – 31/Dec/24
- Project Investigator(s): Fazle Karim; Thaniya Jirasathipornpong
- Sponsor: Multi-donor, Bangladesh
- Total contracted amount: 354,375 THB

31. Title: Project Management & Leadership for Development Professionals in Thailand

- Duration: 28/Jun/24 – 31/Dec/24
- Project Investigator(s): Md. Zakir Hossain
- Sponsor: Palli Karma-Sahayak Foundation (PKSF), Bangladesh
- Total contracted amount: 1,493,104.32 THB

32. Title: Empowering Developing Member Countries to Use Multispectral Satellite Images and Artificial Intelligence for Land Use and Coastal Planning

- Duration: 12/Feb/24 – 31/Mar/25
- Project Investigator(s): Manzul K. Hazarika
- Sponsor: Asian Development Bank (ADB), Philippines
- Total contracted amount: 2,905,000

- 33. Title: Circular Plastic Economy: Bridging theory and practice to train future leaders in sustainable plastics research**
- Duration: 25/Mar/24 – 30/Dec/25
 - Project Investigator(s): Joyashree Roy; Ekborderin Winijkul; Tanujjal Bora
 - Sponsor: International Science Partnerships Fund, UK
 - Total contracted amount: 964,000 THB
- 34. Title: Development Policies & Practices Program at AIT in 2024**
- Duration: 01/Jun/24 – 31/Jul/25
 - Project Investigator(s): Roger Levermore
 - Sponsor: The Swiss Development Cooperation (SDC), Switzerland
 - Total contracted amount: 3,026,227 THB
- 35. Title: Online Webinars covering SDGs, Youth Leadership, Artificial Intelligence (AI), and United Nations initiatives on SDGs.**
- Duration: 16/Jun/24 – 12/Jan/25
 - Project Investigator(s): Bahul Raj Shrestha
 - Sponsor: Global Youth Leadership Development Congress (GYLDC), Singapore
 - Total contracted amount: 171,500 THB
- 36. Title: Industry-Academia International Business Incubation Conclave 2024**
- Duration: 15/Jul/24 – 31/Dec/24
 - Project Investigator(s): P.V. Gopi Krishna; Nitin Kumar Tripathi
 - Sponsor: AIT and other partners, Thailand
 - Total contracted amount: 1,500,000 THB
- 37. Title: Strategic Customized Program Liaison: AIT-Hohai University (Batch 1)**
- Duration: 30/Jun/24 – 31/Dec/24
 - Project Investigator(s): Shawn Patrick Kelly
 - Sponsor: Hohai University, China
 - Total contracted amount: 261,000 THB
- 38. Title: International Education Innovation Camp - NMIT**
- Duration: 25/Jul/24 – 31/Dec/25
 - Project Investigator(s): Nitin Kumar Tripathi
 - Sponsor: Nitte Meenakshi Institute of Technology (NMIT), India
 - Total contracted amount: 1,200,000 THB
- 39. Title: Public Expenditure Management: Towards Fiscal Sustainability and Macroeconomic Stability and Transparency**
- Duration: 09/Aug/24 – 22/Dec/24
 - Project Investigator(s): Narumon Wangnai
 - Sponsor: Ministry of Finance, Bhutan
 - Total contracted amount: 1,699,200 THB
- 40. Title: Strategies for Effective Public Health Policy Making: Unveiling Thailand's Insights for Influencing Practice and Shaping Policies**
- Duration: 02/Sep/24 – 31/Dec/25
 - Project Investigator(s): Malay Kumar Pramanik; Vilas Nitivattananon; Mokbul Morshed Ahmad
 - Sponsor: MATI, India
 - Total contracted amount: 2,165,707 THB
- 41. Title: Leadership and Organizational Renewal**
- Duration: 16/Sep/24 – 15/Mar/25
 - Project Investigator(s): Narumon Wangnai
 - Sponsor: Nepal Telecom, Nepal
 - Total contracted amount: 905,674 THB
- 42. Title: Strengthening Global Justice: A High-level Exchange on Combating Human Trafficking**
- Duration: 17/Sep/24 – 16/Mar/25
 - Project Investigator(s): Bahul Raj Shrestha
 - Sponsor: K.J. Inter-Tech (Siam) Co.,Ltd., Thailand
 - Total contracted amount: 302,400 THB

- 43. Title: Strategic Human Resource Management and Business Leadership**
- Duration: 25/Sep/24 – 31/May/25
 - Project Investigator(s): Fazle Karim; Thaniya Jirasathipornpong
 - Sponsor: Multi-donor, Thailand
 - Total contracted amount: 293,700 THB
- 44. Title: Training Project on: Strategic Customized Program Liaison: AIT-BUPT (Batch 1)**
- Duration: 23/Jul/24 – 31/Dec/24
 - Project Investigator(s): Shawn Patrick Kelly
 - Sponsor: Beijing University of Posts and Telecommuting (BUPT), China
 - Total contracted amount: 558,000 THB
- 45. Title: International Education Innovation Camp - UGI**
- Duration: 01/Sep/24 – 31/Dec/25
 - Project Investigator(s): Nitin Kumar Tripathi
 - Sponsor: United Group of Institution (UGI), India
 - Total contracted amount: 385,000 THB
- 46. Title: Global Mobility Exchange Program with United University**
- Duration: 01/Sep/24 – 31/Dec/25
 - Project Investigator(s): Nitin Kumar Tripathi
 - Sponsor: United University (UU), India
 - Total contracted amount: 525,000
- 47. Title: KGU World Study Program**
- Duration: 01/Sep/24 – 31/Dec/24
 - Project Investigator(s): Faiz Hassan Shah
 - Sponsor: Kanto Gakuin University
 - Total contracted amount: 392,315 THB
- 48. Title: Development of Remote Sensing for Black Smoke Measurement and Evaluation of PM2.5 Emissions from Measured Black Smoke Values**
- Duration: 01/Jul/24 – 30/Jun/25
 - Project Investigator(s): Ekbordin
 - Sponsor: National Research Council of Thailand (NRCT)
 - Total contracted amount: 1,125,013.75
- 49. Title: Women-led Responses to the intersectional impact of the climate crises, generated inequalities, poverty and conflict in Myanmar and Nepal**
- Duration: 28/Jun/24 – 27/Dec/25
 - Project Investigator(s): Kyoko Kusakabe
 - Sponsor: The British Academy, United Kingdom
 - Total contracted amount: 1,849,500 THB
- 50. Title: Study Trek for PGD students from SGI**
- Duration: 19/Oct/24 – 25/Oct/24
 - Project Investigator(s): Roger Levermore
 - Sponsor: Suryadatta Institute of Management & Mass Communication PGDM, India
 - Total contracted amount: 631,071 THB
- 51. Title: Public Relations and Communication Skills**
- Duration: 07/Oct/24 – 30/Apr/25
 - Project Investigator(s): Fazle Karim
 - Sponsor: National Pension and Provident Fund (NPPF), Bhutan
 - Total contracted amount: 429,000 THB
- 52. Title: Project Management & Leadership for Development Professionals in Thailand Batch 2, 14-23 October 2024**
- Duration: 14/Oct/24 – 31/Dec/24
 - Project Investigator(s): Md. Zakir Hossain
 - Sponsor: Palli Karma-Sahayak Foundation (PKSF), Bangladesh
 - Total contracted amount: 978,776.32 THB
- 53. Title: Project for promoting Minamata Convention on Mercury by making the most of Japan's knowledge and experiences**
- Duration: 04/Oct/24 – 31/Mar/25
 - Project Investigator(s): Guilberto Borongan; Solomon Kofi Mensah Huno; Naharuethai Supakarn; Bayasgalan Sanduijav
 - Sponsor: United Nations Environmental Programme Nairobi, Kenya
 - Total contracted amount: 5,222,740 THB

- 54. Title: United Strategies for Black-Odorous Urban Rivers: Insights and Innovations from China and Thailand Perspectives**
- Duration: 01/Oct/24 – 30/Jun/25
 - Project Investigator(s): Wenchao Xue
 - Sponsor: Multiple sponsors, China
 - Total contracted amount: 158,000 THB
- 55. Title: Hands-on Capacity Development Programme on Citywide Inclusive Sanitation (CWIS) and Faecal Sludge Management (FSM)**
- Duration: 01/Aug/24 – 31/Jan/25
 - Project Investigator(s): Thammarat Koottatep; Sangam Shrestha; Isha Basyal
 - Sponsor: Islamic Development Bank (IsDB), Saudi Arabia
 - Total contracted amount: 2,813,430 THB
- 56. Title: Strengthen capacities for tackling air pollution and improving air quality and health in Cambodia and the Maldives**
- Duration: 04/Oct/24 – 28/Apr/26
 - Project Investigator(s): Ekbordin Winijkul
 - Sponsor: United Nations Environment Programme (UNEP), Kenya
 - Total contracted amount: 2,150,000 THB
- 57. Title: Enhancing the Science-Policy Interface to Manage Microplastic Influx from Major Cities into the Oceans in Southeast Asia**
- Duration: 01/Oct/24 – 30/Sep/26
 - Project Investigator(s): Wenchao Xue; Simon Guerrero Cruz
 - Sponsor: APN, Japan
 - Total contracted amount: 2,906,108 THB
- 58. Title: Global Experience & Engagement Program for Meghalaya- ADC Members**
- Duration: 19/Nov/24 – 22/Nov/24
 - Project Investigator(s): Md. Zia Islam
 - Sponsor: Indian Institute of Management- Shillong (IIM-Shillong), India
 - Total contracted amount: 277,200 THB
- 59. Title: Corporate Governance, 27 to 30 November 2024**
- Duration: 04/Nov/24 – 29/May/25
 - Project Investigator(s): Narumon Wangnai
 - Sponsor: Asian Development Bank, Bhutan
 - Total contracted amount: 336,000 THB
- 60. Title: Refreshment of Management, 11 to 13 November 2024**
- Duration: 05/Nov/24 – 12/May/25
 - Project Investigator(s): Narumon Wangnai
 - Sponsor: RDP III (AMC)/ GITEC-IGIP GmbH, Lao PDR
 - Total contracted amount: 233,113.80 THB
- 61. Title: Global Mobility Exchange Program with IMIK**
- Duration: 01/Nov/24 – 31/Dec/25
 - Project Investigator(s): Nitin Kumar Tripathi
 - Sponsor: International Management Institute Kolkata (IMIK), India
 - Total contracted amount: 1,200,000 THB
- 62. Title: AVPN-LMS Open Burning 2024**
- Duration: 08/Nov/24 – 30/Sep/25
 - Project Investigator(s): Mongkol Ekpanyapong
 - Sponsor: Asian Venture Philanthropy Network Limited (AVPN), Singapore
 - Total contracted amount: 5,045,414 THB
- 63. Title: ReVitalize: Vitiligo Treatment Disposable Kit**
- Duration: 21/Nov/24 – 31/Jul/25
 - Project Investigator(s): Dieter Wilhelm Trau
 - Sponsor: Dermatologist: Dr Henry Loh, Singapore
 - Total contracted amount: 116,000 THB
- 64. Title: Donor-Funded Entrepreneurial Programs**
- Duration: 08/Nov/24 – 30/Nov/26
 - Project Investigator(s): Dieter Wilhelm Trau
 - Sponsor: EC Donors and Sponsors
 - Total contracted amount: 150,000 THB

65. Title: Strategic Human Resource Management & Leadership for Business Transformation

- Duration: 11/Nov/24 – 30/Jun/25
- Project Investigator(s): Faiz Hassan Shah
- Sponsor: Bangladesh Bank, Bangladesh
- Total contracted amount: 701,250 THB

66. Title: Mekong Thought Leadership and Think Tanks Network/ Fellowship Program

- Duration: 04/Dec/24 – 29/Nov/25
- Project Investigator(s): Indrajit Pal
- Sponsor: SEI - DFAT, Thailand
- Total contracted amount: 607,000 THB

67. Title: LMS Open Burning 2

- Duration: 11/Dec/24 – 30/Sep/25
- Project Investigator(s): Ekbordin Winijkul
- Sponsor: Asian Venture Philanthropy Network (AVPN), Singapore
- Total contracted amount: 3,974,585 THB

68. Title: High Emitter: Tackling Air Pollution in Thailand

- Duration: 11/Dec/24 – 30/Jan/26
- Project Investigator(s): Ekbordin Winijkul
- Sponsor: United Nations Environment Programme (UNEP), Kenya
- Total contracted amount: 1,500,000 THB

69. Title: Executive Development Program for Bankers

- Duration: 19/Dec/24 – 30/Jun/25
- Project Investigator(s): Yuosre F.M. Badir
- Sponsor: Public and Commercial Banks from Nepal, Nepal
- Total contracted amount: 643,200 THB

70. Title: Waste to Quest Blue Labs Program: Creating Blue Labs for a Greener Future and Happier Customers

- Duration: 18/Dec/24 – 30/Nov/26
- Project Investigator(s): Faiz Hassan Shah
- Sponsor: Roche Diagnostics (Thailand) Ltd.
- Total contracted amount: 1,804,800 THB

71. Title: Professional Training for Enterprise Risk Management (ERM)

- Duration: 18/Dec/24 – 30/Jun/25
- Project Investigator(s): Faiz Hassan Shah
- Sponsor: Druk Holdings & Investment Limited, Bhutan
- Total contracted amount: 841,500 THB

FOOD - WATER - ENERGY



Food, Energy and Water are of vital and critically important to the human societies. They are inextricably interrelated to each other and with other societal goals. Global challenges of climate change, ecosystem degradation, intensive economic growth, population growth, and urbanization are increasingly threatening the security and services of FEW systems. With the growing demands of FEW resources driven by these challenges, the social and environmental implications are increasing with unpredictable impacts for livelihoods and the environment. In order to reduce the negative impacts of and to across FEW nexuses, effective solutions with integrated low carbon and multi-sectoral adaption

strategies and policies are needed urgently. To achieve long-term water, energy and water security, there is also a need to step up the efforts dealing with technology development in addressing the main environmental issues. The AIT research encompasses the field of each domain of FEW resources, and the nexus approach considers all three different dimensions recognizing the inter-dependencies of different resource uses sustainably. The issues covered in relation to FEW sectors include efficiency, equity, resilience, and sustainability, as well as the key questions required to enhance adoption of technologies and policies to promote the strong synergies of food security, energy, and water investments.

Sub-themes

1. Food Security
2. Sustainable Energy
3. Water Management
4. Water- Energy-Food Nexus

FOOD SECURITY

The agri-food systems of present time are undergoing a series of profound changes brought by climate change, biodiversity loss, emerging technologies, and innovations. With the growing population, the need of more food to be produced to feed the world population is on rise. A well-functioning agricultural sector is essential to ensure food security, and agricultural livelihoods as the agriculture is the provider of food and feed to the world, and its products are a major source of income for the communities. It is thus crucial to improve production techniques and boost the resilience and sustainability of agri-food systems. With an emphasis given on different dimensions of food security such as availability, accessibility, utilization, and stability, AIT research addresses a wide range of aspects covering resilient food production, distribution, and consumption through environmental solutions, sustainable agricultural technologies, policy responses. AIT's research topics include, among others, sustainable agricultural development; climate smart agriculture; Agri-Food value chain management; technological innovations in Agribusiness such as



tech-clinic for Agro-food SMEs, AI driven precision agriculture; technological applications in soil, crop productivity, pests and disease management; food technology, food processing, food engineering; Food safety, and quality; biotransformation of Agro-industrial waste; market analysis; consumer behavior and practice; Nutrition, diet, and health; Aquaculture and aquatic resource management. The impact of economic and social forces on food security including public policies, programmers and services is also examined such as impact of property tax on food security.

SUSTAINABLE ENERGY

Sustainable Development Goals (SDGs 7 and 13), and the ambitious Paris Agreement on Climate Change have called for accelerated universal energy access combined with energy efficiency and deep-decarbonization for the energy sector. But the world today is yet on fossil-fuel pathways despite improving cost and efficiency of renewable energy technologies and facing energy crisis with the rising prices of gas, oils and growing demand on energy infrastructure driven by energy shortage problems resulted from countries' mismanagement and a post-pandemic rebound in demand. With the global deepening energy crisis, it is important to make efforts to dramatically increase the use of renewable energy while reducing the environmental impacts. Energy efficiency brings several benefits from environmental, and economic perspective, including lower greenhouse gas emissions, decreased water uses and lower costs from daily utilities, and promoting job creation. Apart from the traditional energy sector, the transport sector is also converging onto the power sector via electrifying it for several reasons, so its potential and challenges need to be analyzed. The sustainable energy sector's transition phase needs societal change with new values, system thinking, technical and modeling skill, business, policy, and the governance.



AIT's research in relation to energy is conducted in an interdisciplinary approach - encompassing a wide range of areas such as clean energy transition technologies, energy policies and environmental management aspects. It addresses the issues related to the sustainable energy transition at the cities and national level for delivering a reliable, clean, affordable energy supply compatible with sustainable development. The topics covered under this sub-theme include, among others, climate change mitigation from the energy sector, bioenergy and biofuel development, application of AI, big data and machine learning in energy efficiency and barriers, policies for renewable energy and storage integration to the grid, waste to energy technologies, techno-economic assessment of renewable energy technologies, evaluation of

energy policies and stochastic analysis through energy and power sector modelling at smaller time scale, energy access and security assessments, regional electricity trade, barriers, and system integration; smart grids and microgrids, demand response. Moreover, a new dimension in the energy and transport sectors is emerging from integrating

more intermittent renewable energy sources with the help of smart grid, demand response and energy storage, including hydrogen energy, to meeting the COP26 commitment by achieving carbon neutrality and net-zero GHG emissions goals.

WATER MANAGEMENT

The impact of rapidly growing population, economic growth, and environmental changes have brought enormous pressure on water security which is essential foundation to the peoples' lives and ecosystem services. The problems water sector faces today are daunting with the challenges in developing, conserving, and managing water resources, its safe and productive use, particularly with regards to sustainability and environmental impacts on both at supply and end-use sides. The increasing challenges and urgency to ensure water security in our time of unprecedented changes and shocks, highlights the critical need for a transformation in thinking and approach. Moving forward, the adoption of new management capitalizing on innovative technologies in water sector is necessary to ensure the water security. Innovation and technology have a vital role to play in combating water scarcity, water efficiency, utility operations, wastewater management, monitoring and treatment and data and analytics. The risk management of water resources is also critical to prevent the damage and loss from natural disasters such as flooding and drought.

AIT's research seeks to understand and respond to the issues related to the complexity of water use and water resources management including the water related risks influenced by climate extremes and human activities. It explores the new models and technological innovations covering the focus areas of agricultural water; coastal water; urban water; water resources; wastewater; and extreme



events and risk management. Research projects include, among others, the data-driven approaches and nature-based solutions in water management; transformative adaptation for water security; water allocation planning; impacts of climate change and adaptation in water sector; integrated water resource management; water quality management; water recycling and resources recovery; groundwater governance and resilience; urban and rural water supply and distribution systems; irrigation and drainage system management; cropping systems; erosion and water quality problems; watershed management; social and environmental impact assessment of water resources. The extreme events and risk management including river flow analysis, flood control and mitigation, flood modeling and forecasting, flood plain development, and management, are also covered under this sub-theme.

FOOD-WATER-ENERGY (FEW) NEXUS

The complex interrelationships between the water, energy and food systems have clearly highlighted the need to transform the way we think in managing the complex challenges. In this context, the “business as usual” approach cannot achieve the realization of long-term water, energy, and food security. A new approach with nexus perception is necessary to better understand and systematically analyze the interactions between the natural environment and human activities. This paradigm shift is vital to achieving the sustainability development goals in an environment of global climate and economic change.

AIT’s research focuses on the interconnectedness of WE systems including the tradeoffs and synergies between different resource uses; the dynamics of FEW nexus interactions with climate change and human intervention. Specific topics covered include, among others, food production with efficient use of water, energy, and other



resources; innovative water conservation technologies for agriculture/horticulture productivity; energy and carbon footprint of urban and national water system; wastewater to resources/energy; resources nexus approach in addressing issues related to climate and environment; and the policy response options towards a more coordinated management of resources.

HIGHLIGHTED PROJECTS UNDER FOOD-WATER-ENERGY

The following lists some examples of projects that highlight AIT's global, regional, and country development experience under "FOOD-WATER-ENERGY" theme during 2023.

Agricultural and Rural Transformation for Nutrition, Entrepreneurship, and Resilience in Bangladesh

Project budget- 9,000,000 THB

Project duration- 30 May 2024- 30 May 2025

Donor- Bangladesh Agricultural Research Council

The main objective of this project is to admit government officials from various agricultural research organizations in Bangladesh as PhD students (fully funded) at the ASE/ABM Academic Program and arrange/provide exposure visits/trainings to the government officials from Bangladesh.



Applications of Nanobubbles to Reduce Antibiotic Use in Aquaculture

Project budget- 23,127,200 THB

Project duration- 1 Jun 2024- 30 May 2027

Donor- (IDRC), Canada

This project is part of the initiative on Innovative Veterinary Solutions for Antimicrobial Resistance (InnoVet-AMR), a partnership between the International Development Research Center (IDRC) in Canada and the UK Department of Health and Social Care (DHSC). The initiative aims to reduce the emerging risk that antimicrobial resistance (AMR) in animals poses to global health and food security. This project introduces an innovative solution known as the "nanobubble-vaccine" to tropical aquaculture, potentially revolutionizing health management practices for small-scale farmers. By employing vaccination techniques tailored for fish, it aims to advocate for non-antibiotic use in disease prevention. The anticipated outcomes of this endeavor hold promise for substantially enhancing the sustainability of aquaculture operations in the Asia Pacific region and beyond.



Technical Training for 100 South Asian Women Engineers' Leadership (SAR100-2.0)

Project budget- 5,840,000THB

Project duration- 1 Nov 2024 – 31 Dec 2026

Donor - The World Bank-led, Australian Government-funded SARIC Large Systems Training Program (LSTP) under subcontract to Palladium International

The project involves designing, developing, delivering, assessing, and validating eight modules for the second cohort of the Technical Training for 100 South Asian Women Engineers' Leadership (SAR100-2.0) program under the World Bank-led and Australian Government-funded SARIC Large Systems Training Program, subcontracted through Palladium International and delivered via AIT's Regional Knowledge Hub. The scope includes developing detailed course content aligned with approved instructional design, proposing qualified subject experts, setting quality standards, validating materials through the curriculum committee, and delivering the modules in line with contractual commitments. It also involves providing relevant learning resources, ensuring professional oversight with feedback mechanisms, implementing evaluation methods for content and learner performance, and certifying student achievement through professional transcripts.



PROJECTS INITIATED UNDER FOOD-WATER-ENERGY

Below is the list of research, consultancy and capacity development projects initiated under “Water-Energy-Food” by various Institute wide outreach centers and departments during 2024.

1. **Title: An Assessment of Perceptions and Behaviors of stakeholders in Central Thailand and Factors Influencing Farmed Fish Welfare Decisions in the Aquaculture**
 - Duration: 01/Jan/24 – 30/Jun/25
 - Project Investigator(s): Krishna R. Salin, Kyoko Kusakabe
 - Sponsor: Open Philanthropy, UK
 - Total contracted amount: 630,000 THB
2. **Title: Calculating Evapotranspiration using GIS and Remote Sensing Techniques for Calculating Crop Water Productivity in Sindh Province, Pakistan**
 - Duration: 15/Dec/23 – 30/Apr/25
 - Project Investigator(s): AI Center PI, Furqan Ali Shaikh
 - Sponsor: The Asian Disaster Preparedness Center (ADPC)
 - Total contracted amount: 3,400,000 THB
3. **Title: International Conference on Sustainable Energy 2024 (ICUE 2024) on Energy Transition and Net Zero Climate Future**
 - Duration: 16/Feb/24 – 28/Feb/25
 - Project Investigator(s): Shobhakar Dhakal, P. Abdul Salam; Jai Govind Singh; Weerakorn Ongsakul; Mokbul Morshed Ahmad; Rajendra Prasad Shrestha; Deepak Sharma
 - Sponsor: Clients: conference delegates, members of the academe, corporate delegates, Thailand
 - Total contracted amount: 1,999,999 THB
4. **Title: Capacity Building on Food Innovation and Sustainability IV**
 - Duration: 01/Jan/24 – 30/Jun/26
 - Project Investigator(s): Anil Kumar Anal, Loc Thai Nguyen
 - Sponsor: World Bank through NAHEP-ICAR, India
 - Total contracted amount: 698,701.90 THB
5. **Title: Immersive Training on Innovation, Design Thinking and Technology Transfer in the Postharvest and Food Processing**
 - Duration: 01/Jan/24 – 31/Dec/26
 - Project Investigator(s): Anil Kumar Anal
 - Sponsor: UNIDO, Austria
 - Total contracted amount: 706,743 THB
6. **Title: Knowledge Advancing on Probiotics and Functional Foods Product Development**
 - Duration: 01/Feb/24 – 31/Dec/26
 - Project Investigator(s): Anil Kumar Anal
 - Sponsor: Commission of Higher Education Development (CHED), Philippines via Mariano Marcos State University (MMSU), Philippines
 - Total contracted amount: 2,180,467 THB
7. **Title: Future-Water**
 - Duration: 01/Mar/24 – 31/Aug/24
 - Project Investigator(s): Sangam Shrestha
 - Sponsor: Future H2O-B Inc, United States of America
 - Total contracted amount: 178,253 THB
8. **Title: Reducing the effects of mycotoxins in shrimp (REMS)**
 - Duration: 15/Mar/24 – 15/Mar/25
 - Project Investigator(s): Ram C. Bhujel
 - Sponsor: BIONTE SL, Spain
 - Total contracted amount: 755,820 THB
9. **Title: Mapping the plastic litter leaking into the waterways of Mekong countries and providing innovative solutions for efficient waste management**
 - Duration: 01/Mar/24 – 31/Aug/26
 - Project Investigator(s): Kittiphon Boonma
 - Sponsor: Mekong Institute, Thailand
 - Total contracted amount: 21,318,780 THB

- 10. Title: Pathum Thani Agrihood Model: An Innovative, Multidisciplinary Approach for Greywater Reuse to Enhance Wellbeing of Informal Housing Resettlement Communities**
- Duration: 01/Apr/24 – 30/Jun/27
 - Project Investigator(s): Thammarat Koottatep
 - Sponsor: Nanyang Environment and Water Research Institute's NEWRI Community Development Division, Singapore
 - Total contracted amount: 1,289,652 THB
- 11. Title: Techno-economic feasibility of sewage based adsorptive media and water reuse technologies for polishing treated wastewater in BMA**
- Duration: 01/Mar/24 – 28/Feb/25
 - Project Investigator(s): Thammarat Koottatep
 - Sponsor: Joint Venture Gem Environmental Management Company Limited (GEM), Thailand and Global Utilities Services Company Limited (GUSCO), Thailand
 - Total contracted amount: 2,000,000 THB
- 12. Title: Biochar Integration for Optimal Methane Recovery and Nutrient Assimilation in Anaerobic Digestion of Food Waste**
- Duration: 01/May/24 – 30/Jun/25
 - Project Investigator(s): Anish Ghimire
 - Sponsor: Research Initiation Grant, Thailand
 - Total contracted amount: 150,000 THB
- 13. Title: Capacity Building Programme for Reducing Recycling Related Marine Plastic Pollution in ASEAN Cities (CaRMPAC Project)**
- Duration: 01/Apr/24 – 01/Jul/25
 - Project Investigator(s): Guilberto Borongan, Solomon Kofi Mensah Huno; Bishal Bhari; Naharuethai Supakarn
 - Sponsor: Economic Research Institute for ASEAN and East Asia (ERIA)
 - Total contracted amount: 5,655,237 THB
- 14. Title: PyAEZ for localized crop suitability and land productivity assessment**
- Duration: 01/Apr/24 – 31/Mar/25
 - Project Investigator(s): Kittiphon Boonma
 - Sponsor: Food and Agriculture Organization of the United Nations (FAO)
 - Total contracted amount: 1,767,285 THB
- 15. Title: Agricultural and Rural Transformation for Nutrition, Entrepreneurship, and Resilience in Bangladesh**
- Duration: 30/May/24 – 30/May/32
 - Project Investigator(s): Avishek Datta, Sushil Kumar Himanshu; Muhammad Yaseen; Hayat Ullah
 - Sponsor: Bangladesh Agricultural Research Council (BARC), Bangladesh
 - Total contracted amount: 26,172,996 THB
- 16. Title: Application of Nanobubbles to Reduce Antibiotic Use in Aquaculture**
- Duration: 01/Jun/24 – 31/May/27
 - Project Investigator(s): Ha Thanh Dong
 - Sponsor: The International Research Center (IDRC), Canada
 - Total contracted amount: 23,127,200 THB
- 17. Title: Management of Agricultural and Rural Development Projects in China, 19-28 June 2024**
- Duration: 19/Jun/24 – 30/Oct/24
 - Project Investigator(s): Md. Zakir Hossain
 - Sponsor: Palli Karma-Sahayak Foundation (PKSF)
 - Total contracted amount: 1,080,010.80 THB
- 18. Title: Water, Sanitation and Hygiene (WASH) Sector in Sri Lanka, 30 June to 09 July 2024**
- Duration: 30/Jun/24 – 31/Dec/24
 - Project Investigator(s): Md. Zakir Hossain
 - Sponsor: Palli Karma-Sahayak Foundation (PKSF), Bangladesh
 - Total contracted amount: 1,288,800 THB

- 19. Title: Energy Demand changes Induced by Technological and Social innovations**
- Duration: 01/Jun/24 – 31/Dec/27
 - Project Investigator(s): Joyashree Roy, Joyee S. Chatterjee
 - Sponsor: METI/RITE, Japan
 - Total contracted amount: 3,000,000 THB
- 20. Title: Strengthening Groundwater Governance and Management in Cambodia**
- Duration: 01/Jun/24 – 31/Dec/24
 - Project Investigator(s): Sangam Shrestha
 - Sponsor: Stockholm Environment Institute (SEI), Sweden
 - Total contracted amount: 1,357,000 THB
- 21. Title: Strengthening climate resilience of agricultural livelihoods in Savannakhet Province, Lao PDR through participatory Ecosystem-based Adaptation**
- Duration: 01/Jul/24 – 30/Dec/24
 - Project Investigator(s): Indrajit Pal
 - Sponsor: SEI, Thailand
 - Total contracted amount: 1,163,000 THB
- 22. Title: Community-Based Tourism COVID-19 Recovery Project: Freshwater prawn aquaculture in Cambodia**
- Duration: 01/Aug/24 – 30/Jun/26
 - Project Investigator(s): Ram C. Bhujel
 - Sponsor: Asian Development Bank (ADB) through Civil Society Alliance Forum (CSAF), The Office of the Council of Ministers, Cambodia
 - Total contracted amount: 2,310,000 THB
- 23. Title: Design and Developed the Prototype Program to Recommend Fertilizer Use Based on Soil Analysis Values (On the Device Program) LandDev2024**
- Duration: 01/Aug/24 – 31/Mar/25
 - Project Investigator(s): Sanit Arunplod
 - Sponsor: Land Development Regional 2, Thailand
 - Total contracted amount: 480,000 THB
- 24. Title: Polycentric Approaches to the Management of Urban Water Resources in South-East Asia - A Localization of the Sustainability Goals of Agenda 2030**
- Duration: 01/Aug/24 – 31/Jan/25
 - Project Investigator(s): Thammarat Koottatep
 - Sponsor: BORDA, Germany
 - Total contracted amount: 1,147,536 THB
- 25. Title: Design and Construction of Climate Resilient Water Supply Schemes**
- Duration: 09/Sep/24 – 30/Mar/25
 - Project Investigator(s): Fazle Karim
 - Sponsor: Water Infrastructure Division under MoIT, Bhutan
 - Total contracted amount: 356,400 THB
- 26. Title: Phase 1 - GSGS Regional Hubs Workshop and Strategic and Implementation Plan**
- Duration: 01/Sep/24 – 31/May/25
 - Project Investigator(s): Thammarat Koottatep
 - Sponsor: IHE Delft Institute for Water Education, Netherlands
 - Total contracted amount: 684,000 THB
- 27. Title: Benefits and challenges of digitalization in agriculture and food system for enhanced resilience and improved sustainability: Preliminary assessment**
- Duration: 01/Sep/24 – 31/Jul/25
 - Project Investigator(s): Mohana Sundaram Shanmugam
 - Sponsor: Economic Research Institute for ASEAN and East Asia and ASEAN Secretariat, Indonesia
 - Total contracted amount: 502,650 THB
- 28. Title: DIWAM project: From Drought Impact to Water Adaptations in the Upper Mun River Basin**
- Duration: 01/Aug/24 – 31/Dec/25
 - Project Investigator(s): Mukand S. Babel
 - Sponsor: Agence Francaise de Developpement (AFD), France
 - Total contracted amount: 1,206,459 THB

- 29. Title: Sustaining the shared groundwater resources of the Transboundary Cambodia-Vietnam Mekong River Delta aquifer under Climate Change impacts**
- Duration: 01/Jul/24 – 31/Dec/26
 - Project Investigator(s): Mukand S. Babel
 - Sponsor: Department of Foreign Affairs and Trade (DFAT) of Australia through SEI, Asia office Bangkok, Australia
 - Total contracted amount: 5,500,000 THB
- 30. Title: Empowering Farming Communities on the Adoption of Regenerative Agriculture as Nature-Positive Solutions for Rice Production**
- Duration: 15/Nov/24 – 15/Nov/25
 - Project Investigator(s): Sushi Kumar Himanshu
 - Sponsor: Asian Institute of Technology, Thailand
 - Total contracted amount: 150,000 THB
- 31. Title: Technical Training for 100 South Asian Women Engineers' Leadership (SAR100-2.0)**
- Duration: 01/Nov/24 – 31/Dec/26
 - Project Investigator(s): Jai Govind Singh, P. Abdul Salam
 - Sponsor: The World Bank-led, Australian Government-funded SARIC Large Systems Training Program (LSTP) under subcontract to Palladium International, Australia
 - Total contracted amount: 5,840,000 THB
- 32. Title: SEA of Solutions**
- Duration: 28/Aug/24 – 27/Feb/25
 - Project Investigator(s): Ekbordin Winijkul
 - Sponsor: United Nations Environment Programme (UNEP), Kenya
 - Total contracted amount: 1,330,000 THB
- 33. Title: 9th Global Conference on Gender in Aquaculture and Fisheries (GAF9)**
- Duration: 01/Nov/24 – 30/Apr/27
 - Project Investigator(s): Kyoko Kusakabe, Krishna R. Salin
 - Sponsor: Conference participants & donors, Thailand
 - Total contracted amount: 1,400,000 THB
- 34. Title: Technical Assistance for Aquaculture Development in Nepal (TAADiN)**
- Duration: 15/Nov/24 – 14/Nov/27
 - Project Investigator(s): Ram C. Bhujel
 - Sponsor: Farm Land Agro-Concern Research Collaboration Center (FLACRC) Co.,Ltd., Nepal
 - Total contracted amount: 4,029,000 THB
- 35. Title: Technical Support and Capacity Building in Aquaculture to PNG (TCAP)**
- Duration: 01/Dec/24 – 01/Dec/25
 - Project Investigator(s): Ram C. Bhujel
 - Sponsor: FAO, PNG, Papua New Guinea
 - Total contracted amount: 920,703 THB
- 36. Title: One week Professional Development Program on Philippine - Agri-Food and Processing Hub Learning Exchange**
- Duration: 09/Dec/24 – 30/Jun/25
 - Project Investigator(s): Faiz Hassan Shah
 - Sponsor: Taloy Farmers Multipurpose Cooperative, Philippines
 - Total contracted amount: 379,583 THB
- 37. Title: Treatment Performance Test of Wastewater Treatment Tanks Against the High-Efficiency Prefabricated Septic Tank Label Criteria for the Fibertech Co.**
- Duration: 01/Aug/24 – 31/Dec/25
 - Project Investigator(s): Thammarat Koottatep
 - Sponsor: Fibertech Co., Ltd., Thailand
 - Total contracted amount: 1,210,842 THB

CHAPTER 3: RESEARCH PUBLICATIONS ASSOCIATED WITH AIT RESEARCH THEMES

The report presents the publications available from SCOPUS database for 2023. Grouped under five thematic research areas, this section lists the publications in 2023, reaching a total of more than 400.

As the five research themes are interconnected, crossing their traditional boundaries, the publications are grouped based on their most relevant (single) research themes.

PUBLICATIONS

The following lists the total 401 publications available from SCOPUS database for 2024 that fall under five thematic research areas. Out of all publications in 2024, below is the list of publications that fall under “Climate Change”.

CLIMATE CHANGE

1. Achini Ishankha, W.C.; Shrestha, S.; Binh, D.; KANTOUSH, S.A. **Comprehensive assessment of cascading dams-induced hydrological alterations in the Lancang-Mekong river using machine learning technique** (2024). Volume 371. DOI: 10.1016/j.jenvman.2024.123082
2. Ahmad, M.M.; Mushwani, H.; Sahak, K.; Hairan, M.H. **The current state of early warning system in South Asia: A case study of Afghanistan** (2024). Volume 100. DOI: 10.1016/j.ijdr.2023.104201
3. Ai, Z.; Zhao, X.; Boulange, J.; Li, F.; Mahmood, R.; Zhang, Q.; Yang, Y.; Xia, J. **How will climate change affect the sources of global irrigation water withdrawal?** (2024). Volume 69, Issue 21, pp 3361-3364. DOI: 10.1016/j.scib.2024.08.032
4. Akahoshi, K.; Zusman, E.; Hanaoka, T.; Kim Oanh, N.T.; Nguyen, L.N.; Wangwongwatana, S.; Homyok, P.; Malley, C.S.; Hirayama, T.; Goto, Y.; Kawashima, K.; Amann, M. **The Prospects of Controlling Open Burning of Crop Residues in Thailand: A Quantitative Assessment of Implementation Barriers and Costs** (2024). Volume 15, Issue 11. DOI: 10.3390/atmos15111309
5. Akther, H.; Ahmad, M.M.; Nguyen, T.P.L. **Livelihood vulnerability to urban flood: the case of urban poor households in Dhaka, Bangladesh** (2024). Volume 16, Issue 7, pp 551-562. DOI:10.1080/17565529.2023.2257625
6. Ali, S.; Ran, J.; Luan, Y.; Khorrami, B.; Xiao, Y.; Tangdamrongsub, N. **The GWR model-based regional downscaling of GRACE/GRACE-FO derived groundwater storage to investigate local-scale variations in the North China Plain** (2024). Volume 908. DOI: 10.1016/j.scitotenv.2023.168239
7. Ansari, N.; Rukhsana; Pramanik, M.; Alkhuraiji, W.S.; Zhran, M. **An assessment of the seasonally dependent biophysical mechanism and dynamic land use change: A research effort from emerging urban agglomeration of West Bengal**. Volume 24. DOI: 10.1016/j.rineng.2024.103291
8. Aryal, S.; Babel, M.S.; Gupta, A.; Farjad, B.; Khadka, D.; Hassan, Q.K. **Assessment of hydrological baseline condition and its alteration in Athabasca River Basin, Canada** (2024). Volume 53. DOI: 10.1016/j.ejrh.2024.101805
9. Aslam, M.N.; Ashraf, S.; Shrestha, S.; Ali, M.; Nguyen, N.C. **Climate change impact on water scarcity in the Hub River Basin, Pakistan** (2024). Volume 27. DOI: 10.1016/j.gsd.2024.101339
10. Babel, M.S.; Chawrua, L.; Khadka, D.; Tingsanchali, T.; Shanmungam, M.S. **Agricultural drought risk and local adaptation measures in the Upper Mun River Basin, Thailand** (2024). Volume 292. DOI: 10.1016/j.agwat.2023.108655

11. Bachri, S.; Sanjaya, E.H.; Sendari, S.; Shrestha, R.P.; Irawan, L.Y.; Billah, E.N.; Putri, N.R.C.; Prastiwi, M.R.H.; Hakiki, A.R.R.; Hidiyah, T.M. **The Development of Disaster Risk Map for Semeru Volcano Eruption 2021-2022, East Java, Indonesia** (2024). Volume 56, Issue 3, pp 446-455. DOI: 10.22146/ijg.89918
12. Bachri, S.; Shrestha, R.P.; Sumarmi, S.; Irawan, L.Y.; Masrurroh, H.; Prastiwi, M.R.H.; Billah, E.N.; Putri, N.R.C.; Hakiki, A.R.R.; Hidiyah, T.M. **Land use change simulation model using a land change modeler in anticipation of the impact of the Semeru volcano eruption disaster in Indonesia** (2024). Volume 14. DOI: 10.1016/j.envc.2024.100862
13. Bajaj, M.; Sasaki, N.; Tsusaka, T.W.; Venkatappa, M.; Abe, I.; Shrestha, R.P. **Assessing changes in mangrove forest cover and carbon stocks in the Lower Mekong Region using Google Earth Engine** (2024). Volume 3, Issue 3. DOI: 10.1016/j.igd.2024.100140
14. Bastola, R.; Shrestha, S.; Shanmugam, M.; Ho, H.H. **Climate change-induced drought and implications on maize cultivation area in the upper Nan River Basin, Thailand** (2024). Volume 15, Issue 2, pp 628-651. DOI: 10.2166/wcc.2023.521
15. Bhandari, R.; Xue, W.; Yu, S.; Viridis, S.G.P.; Winijkul, E.; Tabucanon, A.S.; KURNIAWAN, T.A.; Sriratana, M. **Sedimentary contamination study in the Great Chao Phraya River watershed, Thailand, using geographically weighted regression** (2024). Volume 17, Issue 1. DOI: 10.1080/17538947.2024.2356113
16. Biswas, J.C.; Al Mamun, A.A.; Rahman, M.; Haqu, M.M. **Technological Intervention for Climate Change Adaptation and Mitigation** (2024). Volume nan, pp 25-50. DOI: 10.1007/978-981-97-6635-2_2
17. Chaiklang, P.; Karthe, D.; Babel, M.S.; Giessen, L.; Schusser, C. **Reviewing changes in mangrove land use over the decades in Thailand: Current responses and challenges** (2024). Volume 17. DOI: 10.1016/j.tfp.2024.100630
18. Champeechoensuk, A.; Dhakal, S.; Chollacoop, N.; Phdungsilp, A. **Greenhouse gas emissions trends and drivers insights from the domestic aviation in Thailand** (2024). Volume 10, Issue 2. DOI: 10.1016/j.heliyon.2024.e24206
19. Chanthorn, W.; Wiegand, T.; Nathalang, A.; Kanagaraj, R.; Davies, S.; Sun, Z.; Tripathi, N.K.; Réjou-Méchain, M.; Brockelman, W.Y. **Species assemblages and their drivers differ between trees and lianas in a seasonal evergreen forest in Thailand** (2024). Volume 15, Issue 8. DOI: 10.1002/ecs2.4942
20. Chao, K.C.; Kongsung, T.; Saowiang, K. **Effect of Vehicle Cyclic Loading on the Failure of Canal Embankment on Soft Clay Deposit** (2024). Volume 14, Issue 6. DOI: 10.3390/geosciences14060163
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SMART COMMUNITIES

From the publications available from SCOPUS database in 2024, below is the list of publications that fall under “*Smart Communities*”.

1. Ahmed, F.; Ho, H.H.; Babel, M.S.; Stamm, J. **A community-scale study on nature-based solutions (NBS) for stormwater management under tropical climate: The case of the Asian Institute of Technology (AIT), Thailand** (2024). Volume 26, Issue 5, pp 1080-1099. DOI: 10.2166/hydro.2024.288
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3. Bakebillah, M.; Ahmad, M.M. **Half a Decade of the Rohingya Refugee Crisis: The Threats to Peace and Sustainability in Bangladesh** (2024), pp 137-157. DOI: 10.1007/978-981-97-8772-2_7
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5. Boonprong, S.; Punturasan, N.; Varnakovida, P.; Prechathamwong, W. **Towards Sustainable Urban Mobility: Voronoi-Based Spatial Analysis of EV Charging Stations in Bangkok** (2024). Volume 16, Issue 11. DOI: 10.3390/su16114729
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TECHNOLOGY, POLICY, AND SOCIETY

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From the publications available from SCOPUS database in 2024, below is the list of publications that fall under "Food -Water-Energy".

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For further inquiries contact: scpo@ait.asia

ASIAN INSTITUTE OF TECHNOLOGY

Address: Km. 42 Paholyothin Highway Klong Neung,
Klong Luang Pathumthani 12120,
Thailand

Website: www.ait.ac.th

