



AIT SUSTAINABILITY REPORT 2021



AIT
Asian Institute of Technology



SUSTAINABLE DEVELOPMENT GOALS

AIT SUSTAINABILITY REPORT 2021

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Asian Institute of Technology wishes to thank its faculty, staff, students, and the many people who rendered their assistance in preparing the AIT Sustainability Report 2021.



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ASIAN INSTITUTE OF TECHNOLOGY



ABOUT THIS REPORT

The Sustainable Development Goals (SDGs) are a set of 17 interlinked global goals designed to be a “blueprint to achieve a better and more sustainable future for all.” According to the United Nations, the SDGs are a roadmap for humanity, encompassing almost every aspect of human and planetary wellbeing and, if met, will provide a stable and prosperous life for every person and ensure the health of the planet.

The coronavirus pandemic has clearly demonstrated how interconnected we are as a global community when it comes to the challenges we face and shown that issues cannot be dealt with in isolation. Reaching the 2030 Agenda and the SDGs present both challenges and opportunities. People all over the world have experienced tremendous hardship and suffering, and the pandemic has forced us to reconsider almost every aspect of how we live and further highlighted the importance in addressing the SDGs.

Asia is home to more than 60% of the world’s population. If it is to be prosperous, their future must be built upon sustainable and sound green principles. Like other universities and institutions playing essential roles in the SDGs, AIT is driving forward academic programs, research projects, and outreach activities designed to bolster sustainable development, sustainability, and environmental conservation around Asia and beyond. Recognized as one of the leading academic institutes in the field of sustainability in Asia, AIT has been collaborating with its partners to contribute its expertise to the sustainable development of the region over the past six decades. Under its five thematic areas, namely Climate Change; Smart Communities; Food – Energy – Water; Infrastructure; and Technology, Policy and Society, AIT focuses on learning and research strategies that will drive poverty reduction, reduce risk and resource consumption, and create opportunities for green job creation by building sustainable livelihoods in Asia.

This report provides a summary of the range of activities undertaken at AIT during 2021 with a view to meeting the SDGs through its teaching, research, outreach and public engagement, and operations. AIT conducts a diverse range of activities across the Institute, and this report lists only some of many such initiatives. AIT strives to produce solutions and recommendations on climate change, water insecurity, food insecurity, air pollution, biodegradation, biodiversity loss, plastic pollution, and many others. The Institute continually strives to implement sustainability in all its core operations under its motto of “Social Impact with Innovation,” including by creating a platform to showcase its efforts toward achieving the SDGs in a comprehensive and detailed manner.

AIT was ranked 15th in the world in SDG1—No Poverty—in the Times Higher Education (THE) Impact Rankings for 2021. This is a very important SDG, and this distinction is a recognition of the work undertaken by our faculty and students in education and in research on eradicating poverty in their home countries. We are also pleased with our overall improvement this year—being now ranked in the Top 101-200 globally. However, we will spare no effort in continuing to make improvements in our work on sustainability.

I would like to thank all in the AIT community who contributed to the important work on SDG's. And I would like to thank the editorial team, which has worked closely with the AIT Schools and Centers in identifying significant work this year that could be showcased in this annual Sustainability Report.

**Eden Y. Woon
AIT President**



Asian Institute of Technology
RANKED 101–200

THE IMPACT RANKINGS 2021

www.thewur.com

The *Times Higher Education* (THE) Impact Rankings assesses universities worldwide against the United Nations' 17 Sustainable Development Goals (SDGs), using indicators in four areas: research, teaching, outreach, and stewardship. The THE rankings aim to be a catalyst for action, a mechanism for holding universities to account, and an opportunity for universities to highlight their work. The Sustainable Development Goals (SDGs), which were adopted by every member state of the United Nations, are an urgent call for action to end poverty, requiring parallel improvements in health and education, reductions in inequality, stimulation of economic growth, solutions to climate change, preservation of oceans and forests.

This report is categorized under the following:

RESEARCH

OUTREACH

OPERATIONS

TEACHING

PUBLIC ENGAGEMENT

FIELD SURVEY



Asian Institute of Technology
RANKED 15th
FOR SDG1: NO POVERTY

THE IMPACT
RANKINGS 2021
www.thewur.com

AIT'S PARTICIPATION IN THE TIMES HIGHER EDUCATION IMPACT RANKINGS 2021

AIT ranked 15th in the world in the prestigious *Times Higher Education* (THE) Impact Rankings 2021 for its work toward ending poverty in line with the United Nations Sustainable Development Goal: SDG 1 – No Poverty. Work on four other SDGs also positions the Institute in the global top 100.

The THE Impact Rankings measure how universities worldwide are performing against the United Nations' Sustainable Development Goals (SDGs). With over 1,200 universities from 98 countries participating, the overall results placed AIT in the global top 101-200, with five individual goals in the top 100, as follows:



15th for SDG 1 No Poverty - for its research on poverty, number of financial aid packages provided, and anti-poverty programs at both university community levels. AIT has long been recognized for providing education to students from countries where poverty is an issue and for its success in producing graduates who return home to help eradicate poverty in their countries. Last year, the Institute ranked 19th in the world for this goal.



58th for SDG 17 Partnership for the Goals - scoring top marks for its relationships cultivated through collaborations with global partners to support its work in achieving the goals

and the publication of SDG reports, the Institute is also recognized for its research and education in the SDGs. This goal is mandatory for inclusion in the overall rankings.



64th for SDG 14 Life Below Water

- in recognition of AIT's support of aquatic ecosystem education, support for aquatic ecosystem action, SDG 14 research, local ecosystem maintenance, and water-sensitive waste disposal.



67th for SDG 2 Zero Hunger

- As part of the global effort to ensure food security, AIT is recognized for the number of its graduates in agriculture, programs to eliminate student hunger, SDG 2 research, programs to eliminate national hunger, and its management of campus food waste. Last year, the institute ranked 86th for this goal.



80th for SDG 15 Life on Land

- Especially notable is the Institute's support for land ecosystem education, land-sensitive waste disposal, land ecosystem action, and SDG 15 research.

In addition, AIT also ranks in the top 200 for its work on Clean Water and Sanitation (SDG 6), Affordable and Clean Energy (SDG 7), and Sustainable Cities and Communities (SDG 11).



**1 NO
POVERTY**



END POVERTY IN ALL ITS FORMS EVERYWHERE

In 2021, the Asian Institute of Technology contributed to work on reducing poverty by collaborating with global research hubs and international institutions in seeking solutions to poverty-related conditions affecting the lives of vulnerable populations. Through its GeoInformatics Center, the Institute helped countries build up resilience and mitigate the effects of climate change and the COVID-19 pandemic through a range of participatory

projects designed to monitor and analyze production systems from small local operators to agro-enterprises in both aquaculture and agriculture. Cutting-edge approaches were promoted through webinars aimed at AIT students and alumni working as drivers of positive change in alleviating and ultimately eliminating poverty.

UK RESEARCH AND INNOVATION (UKRI) GLOBAL CHALLENGES RESEARCH FUND (GCRF) TRADE HUB



AIT conducted a series of follow-up activities with project partners in Indonesia, China, Tanzania, Brazil, the Democratic Republic of the Congo, the Republic of Congo, Gabon, and Cameroon as well as the UK. Publications were produced on various research themes, including the impacts of non-pharmaceutical COVID-19 policy interventions on international trade flows using panel data analysis and the vector autoregression approach.

The UKRI GCRF Trade Hub includes economists, trade modelers, political scientists, ecologists, development scientists, large companies, UN bodies, and NGOs who

work together across supply chains to influence trade-related policy and practice. The Hub plans to produce quality research to help ensure that trade becomes a driver of positive change in the world, with biodiversity loss halted and people permanently lifted out of poverty. The Hub will select trade activities with existing potential to have a major impact on biodiversity as well as those that are important to local livelihoods.

🌐 <https://dds.ait.ac.th/sdgs/2019/08/02/trade-hub>

🌐 <https://tradehub.earth>



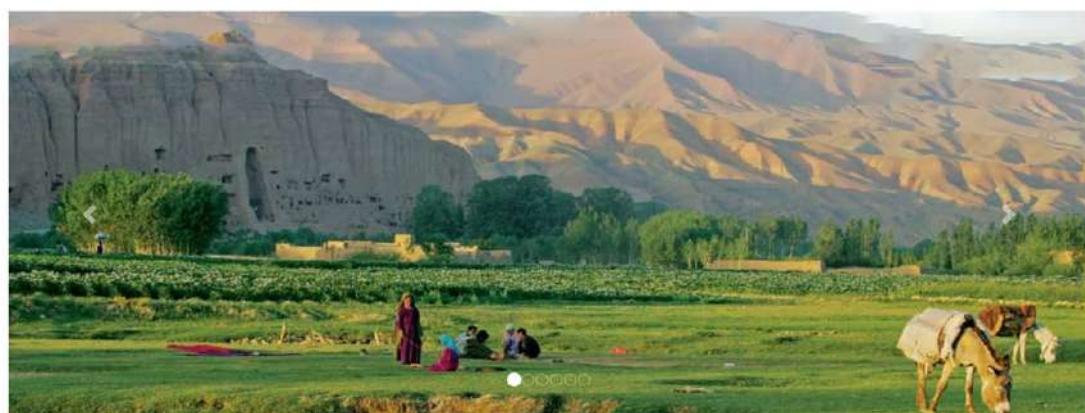
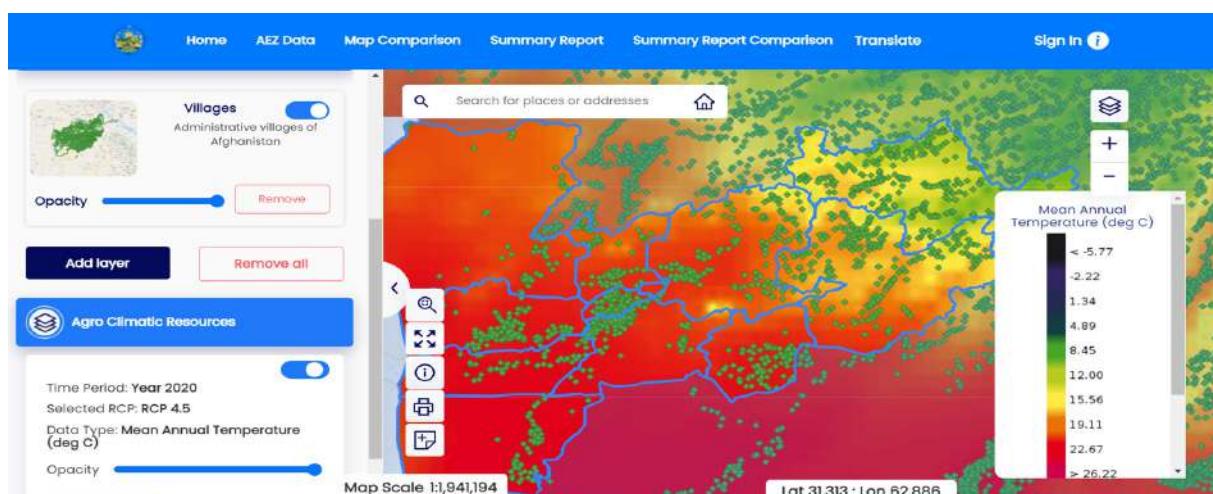
DEVELOPMENT OF LAND RESOURCES INFORMATION MANAGEMENT SYSTEM (LRIMS) FOR AFGHANISTAN (LRIMS – AEZ)



The Food and Agriculture Organization of the United Nations (FAO) and AIT's GeoInformatics Center (GIC-AIT) have joined together to strengthen the capacity of Afghanistan institutions to monitor and analyze agricultural production systems through development of a Land Resources Information Management System (LRIMS) and National Agro-Ecological Zoning (NAEZ).

LRIMS provides stakeholders with access to standardized GIS data for land and agriculture resources. It provides the framework for examining current and future cropping scenarios with climate and agricultural production inputs based on National Agro-ecological Zoning (NAEZ) models developed by International Institute for Applied Systems Analysis. LRIMS has the capacity to answer questions such as: Which area is most suitable for cultivating a specific crop? If a crop is changed or replaced, what will be the effect on production? What

will be the effect of climate variability or change on crop cultivation (suitability) and yields? Services are delivered through a user-friendly web portal in which users can select, visualize, query, analyze, and report geospatial data. The portal provides access to integrated base maps, static or modeled geographic data, and time series data, thereby enabling relevant agencies to explore options for efficient deployment of input resources for agricultural development in Afghanistan. With the web portal finalized, GIC-AIT handed over the system to the Afghanistan Ministry of Agriculture, Irrigation, and Livestock (MAIL). To prepare MAIL officers to take over LRIMS responsibilities, two training courses were held in 2021: LRIMS User Training, which was a part of the Final Workshop (2 days), and System Administrator and Technical Training (1 day).





DEVELOPMENT OF INTENSIVE INDOOR SHRIMP AND FISH GROW-OUT SYSTEM



Commercial intensive rearing of white shrimp requires substantial refinement of protocols, particularly to suit urban aquaculture settings. High-density rearing in closed containments employing cleaner aquaculture practices in areas close to the markets supplying a broad range of consumers is an upcoming field of research. Two intensive experimental grow-out units in an entirely recirculating aquaculture system (RAS) primarily for grow-out trials of white shrimp have been constructed at AIT's Aquaculture and Aquatic Resources Management (AARM AIT). Another RAS for nutritional experiments with finfish has also been established at AARM.



THAI TAPIOCA STARCH PROJECT



During 2021, panel data analysis was underway with the data from the Department of Business Development (DBD), Ministry of Commerce, Thailand. Additional key informant interviews were conducted with managing directors of processing companies. A major research question is whether the growth and development of this industry were driven by substantial foreign direct investment. Qualitative interviews in selected factories were conducted in Nakhon Ratchasima Province in November 2019. To further investigate the mechanisms behind growth, the project will conduct a structured questionnaire survey with owners or managing directors of various cassava processing factories in the

country in partnership with the Thai Tapioca Starch Association. The survey will collect information on their profile, practices, performance, and relationship with other value chain actors as well as the Tapioca Starch Association, current and past operation size, sources of technology and market information, history of mergers and acquisitions, composition of capital by country of origin, and constraints on further growth.

 <https://bit.ly/3IJxPAw>

PARTICIPATION IN TARS 2021: THE AQUACULTURE ROUNDTABLE SERIES



The Aquaculture Roundtable Series (TARS) is a series of technical conferences organized by AQUACULTURE Asia-Pacific Publishing Group based in Singapore and are one of the most popular business conferences in aquaculture. AIT's Aquaculture Program coordinated a special session on the panel on Genetics, Hatchery

& Farmers (GHF). On 9 September 2021, Dr. K.R. Salin from the Aquaculture program joined the final Virtual Breakout room presentation and discussion on GHF as the panel member.

 <https://tarsaquaculture.com/program>



NUTRIENT AND IRRIGATION WATER MANAGEMENT IN FIELD AND HORTICULTURAL CROPS THROUGH SMART AGRICULTURE TECHNOLOGIES (SMART AGRICULTURE)



The overall project aims to carry out agriculture internships to provide undergraduate students from Junagadh Agricultural University, India with technical and practical experience for sustainable agricultural development on Nutrient and Irrigation Water Management in Field and Horticultural Crops through Smart Agriculture Technologies.

The main objectives are: (i) to provide experience in field design and experimental set-up; (ii) to provide practical

experience in data collection (nutrient and irrigation water management, salt stress, and iron toxicity); (iii) to familiarize students with agricultural systems and engineering facilities in Thailand; and (iv) to provide basic information and hands-on training on applications of GIS, Remote Sensing, and Big Data in agriculture.

TECHNOLOGY CLINIC FOR SMALL- AND MEDIUM-SIZED AGRO ENTERPRISES IN THAILAND



The planned 2021 workshop was postponed due to COVID-19 regulations. Materials were generated based on the fieldwork conducted in 2020 and 2021. The training material included transfer and commercialization of precision farming technologies for SMEs in the agro-

food sector along with discussions of business cases to demonstrate good practices relevant to the training program.

 <https://bit.ly/3z5wdhl>

NEDAC HYBRID EVENT ON COCONUT OIL VALUE CHAINS

This webinar was organized on 30 October 2021 on behalf of the Network for the Development of Agricultural Cooperatives (NEDAC) in Asia and the Pacific to promote international trade in coconut oil and allied products. Nearly 50 participants from 12 countries

attended this event. The report on the meeting has also been published.

 <https://nedac.info/international-trade-and-agri-commodities>

WEBINAR ON THE IMPACT OF THE COVID-19 PANDEMIC ON THE GLOBAL AQUACULTURE INDUSTRY



Keynote presentation at the International Webinar on the Impact of the COVID-19 Pandemic on the Global Aquaculture Industry organized by the College of

Fisheries Panangad Alumni Association (COFPAA), Kochi, India on 2 October 2021.

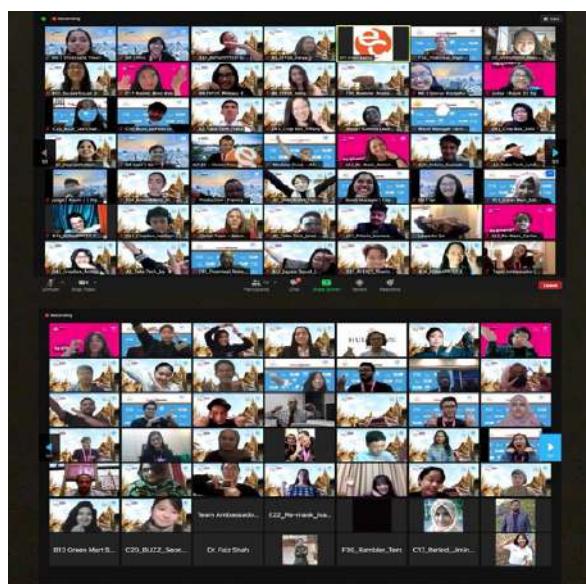


END HUNGER, ACHIEVE FOOD SECURITY AND IMPROVED NUTRITION AND PROMOTE SUSTAINABLE AGRICULTURE

AIT partners with research and funding institutions working on reducing under- and malnutrition in low-income countries worldwide as well as on trade-related policies hampering the availability of appropriate nutrition to populations in need. In 2021, the Institute's award-winning work included providing stakeholders with opportunities to showcase innovative ideas, learn from their peers, and be inspired by a

generation of young people committed to changing the world for the better by eliminating hunger. Specific actions affected weather-related insurance, GIS-assisted identification of land suitable for farming under specific climatic conditions, facilitating value chains, and adapting the Circular Economy concept to agriculture and aquaculture.

HULT PRIZE IMPACT SUMMIT ON FOOD FOR GOOD



AIT was selected to co-host the Hult Prize Impact Summit, the first in Thailand, out of 1,000 applicants, representing various organizations including private foundations, NGOs, and higher education institutions. Hult Prize Impact Summits, which are hosted in over 100 different cities, provide students from around the world with an opportunity to showcase their innovative ideas, learn from their peers, and be inspired by a generation of young people committed to changing the world through business. The very best startups represented in each program will win a spot in the world's largest Global Accelerator. The Bangkok Impact Summit on the theme of Food for Good was held on 2-3 April 2021 in virtual mode by the AIT Entrepreneurship Center.



❑ FEASIBILITY STUDY OF WEATHER INDEX INSURANCE (WII) FOR TAJIKISTAN (CROP INSURANCE)



UNDP Tajikistan has launched a project to assess the feasibility of Weather Index Insurance (WII) for farmers in Tajikistan to address climate change-related pressures on the agriculture sector. The objective of the project is to assess the feasibility of weather index insurance in Tajikistan and provide recommendations on pilot sites for launching relevant interventions. Costs involving field visits to assess and verify damage often makes insurance premiums prohibitively costly to farmers, especially in the developing world. To address this issue, the concept of Weather Index Insurance (WII) was introduced, pay-outs based primarily on rainfall thresholds. This eliminates field visits to assess the extent of crop damage, especially in the most remote locations.

This project is being jointly implemented by AIT's Geoinformatics Center (GIC-AIT) (<http://geoinfo.ait.ac.th>) and Sanasa Insurance Company Ltd (SICL) (<http://www.sicl.lk>), a leading WII provider in Sri Lanka. The project's inception workshop was organized in the last quarter of 2021 to elicit feedback from relevant stakeholders on the potential of implementation of WII in Tajikistan. The current status of agriculture insurance in Tajikistan was evaluated and data availability was discussed and assessed in the workshop.

❑ PyAEZ: PYTHON PACKAGE FOR AGRO-ECOLOGICAL ZONATION (GAEZ/PyAEZ)



In June 2021, FAO launched the fourth version of Global Agro-ecological Zoning (GAEZv4), an easily accessible data portal containing a large volume of spatial natural resources indicators and results of agro-ecological crop analyses. Agro-ecological zonation is a concept that uses established land evaluation principles to identify land most suitable for agriculture. Applying environmental inputs and climate conditions makes it possible to select crop types based on productivity and resilience to changing climate scenarios.

With GAEZv4 launched in mid-2021, the next iteration of the platform, GAEZv5, is currently underway with contributions from various international collaborators including AIT's Geoinformatics Center (GIC-AIT). GAEZv5 will focus on countries performing their own AEZ analysis. This objective closely matches a tool recently developed by GIC called "PyAEZ" (Python for Agro-ecological zoning). GIC-AIT's intent in developing PyAEZ is twofold: 1) to make GAEZ more accessible to users by transcribing it into a modern scripting language (Python); 2) and to provide users with the capability to input their own datasets (on a finer scale than global) to create AEZ data products with higher resolution.

In 2021, GIC held two training courses for AEZ and PyAEZ taught by experts from GIC-AIT and FAO. The AEZ course focused on key modules including climatic data analysis, biomass and yield, agro-climatic yield constraints, agro-edaphic constraints, and the integration of climatic and edaphic evaluation. The PyAEZ course featured a Python recap, data preparation, and modules for climate regime, crop simulation, production costs, and constraints on climate, soil, and terrain. The training courses were hosted in Google Classrooms and are freely available to anyone interested. Please see the weblink section below for the link to the training courses.

PyAEZ Github Repository:

🌐 <https://github.com/gicait/PyAEZ>

AEZ 5-Day Training Course:

🌐 <https://classroom.google.com/c/NDA5ODk1NzU4Nzc0?jc=4zbq3ly>

PyAEZ 5-Day Training Course:

🌐 <https://classroom.google.com/c/NDE2MjAwOTY2OTQ2?jc=3g2xoha>





SUSTAINABLE DEVELOPMENT OF INDIAN AQUACULTURE PROJECT



A project supported by the National Fisheries Development Board (NFDB) of India was conducted from 2019 to 2021 and aimed at capacity development programs for Indian aquaculture administrators from the Fisheries Departments of various states and the Federal Ministry of Fisheries, India). A series of capacity building initiatives, including training programs and exposure visits, were organized in Thailand and Vietnam for senior management and mid-level technical personnel from India. These included top officials from the Ministry, fisheries directors of various states, senior executives, and technicians from NFDB and the Indian aquaculture industry.



INTERNATIONAL CAPACITY DEVELOPMENT PROGRAM ON AQUACULTURE AND VALUE CHAINS



A rapidly growing world population necessitates increasing production and consumption of seafood and aquaculture-made products. Fisheries and allied resources have been fully or over-exploited to meet increasing demand. It is essential to focus on value chain analysis and development to ensure food security. The International Capacity Development Program on Aquaculture and Value Chains was organized through the NEDAC Training Center Bangkok (NTCB) via the Zoom Conference Platform. A presentation on India's fisheries and aquaculture development was given by Chief Guest Dr. Rajeev Ranjan, Federal Secretary, Department of Fisheries, India. The key resource person, Dr. K.R. Salin, AARM Program AIT, presented an overview of global aquaculture value chains, especially in Asia. "Green and blue economies for sustainable aquaculture

are applied to provide better food safety and quality of the seafood produced," said Dr. Salin. "Sustainable aquaculture production systems encompass advanced technologies such as Biofloc or Aquamimicry systems, Aquaponics and Integrated Multi-Trophic Aquaculture (IMTA), rice-fish and prawn farms, and utilization of open water resources such as capture-based fisheries in reservoirs," he added. The meeting was attended by (among other dignitaries) Her Excellency Suchitra Durai, India's Ambassador to Thailand, and Mr. Sundeep Kumar Nayak, Chairman, NEDAC and nearly 120 participants from several countries.

https://www.youtube.com/watch?v=Gbh_EpqJmrM&t=539s

NATIONAL WEBINAR ON SYSTEM DIVERSIFICATION IN AQUACULTURE: AQUAFEED FROM SECONDARY FISHERY RAW MATERIALS



This webinar was organized by the Indian Council for Agricultural Research (ICAR)-Central Institute of Fisheries Technology (CIFT), India, on 1 September 2021 as part of Bharat ka Amrut Mahotsav, commemorating the 75th anniversary of Indian independence. The joint keynote lecture on "Challenges and Opportunities in Feeding

Fish Using Low-cost Raw Materials" was delivered by AARM faculty, ICAR-CIFT, Kochi, India.

https://cift.res.in/uploads/news/Brochure%20-%20final_20210820064430.pdf



ADOPTING CIRCULAR BIOECONOMY IN THAILAND FOOD SUPPLY CHAINS THROUGH INDUSTRY-ACADEMIA COLLABORATION



The aim of this project is to facilitate transformational change in Thai food supply chains from linear to circular using a holistic approach.

During the study period, the research will reveal the current state of Circular Economy (CE) in three food supply chains – seafoods, fresh fruits and vegetables, and poultry foods as well as the effect of food security measures on CE adoption. Additionally, this will facilitate CE adoption within three farms and three food processors in the selected three supply chains.

Finally, the research will create a CE knowledge hub based at AIT to facilitate CE adoption in Thailand through training businesses, policy makers, higher education institutions, and academic researchers and conducting further research to strengthen cooperation between all beneficiaries and to build a skilled workforce.

Collaborating Institutions: Asian Institute of Technology (AIT), Thailand; Aston University, UK; Chulalongkorn University, Thailand; Panyapiwat Institute of Management (CP-ALL), Thailand; University of the Thai Chamber of Commerce, Thailand



CLIMATE CHANGE ADAPTATION IN AGRICULTURE FOR ENHANCED RECOVERY AND SUSTAINABILITY OF HIGHLANDS: CLIMATE-SMART AGRICULTURE CONSULTING FIRM (ADB-JFPR)



During 2021, fieldwork resumed and a baseline survey was designed and conducted in 8 selected villages in Nan Province, Thailand. This joint Asian Development Bank-Japan Fund for Poverty Reduction (ADB-JFPR) Technical Assistance (TA) project aligns with the aim of improving agricultural competitiveness in highlands. The TA is expected to enhance the environment for adoption of climate-smart agriculture in project areas. There are four specific outputs from this project: (i) the capacity to assess improvements in climate change vulnerability of highland agriculture; (ii) gender-responsive, climate-smart agricultural practices prioritized and demonstrated; (iii) enhanced agricultural product quality, value addition, and market linkages; and (iv) strengthened capacity of local governments and communities to address climate change.

🌐 <https://www.adb.org/projects/53099-001/main>
🌐 <https://bit.ly/3P92o4P>



IMPACT ASSESSMENT OF THE SMART FOOD INITIATIVE



Smart Food crops generate higher incomes (poverty reduction), nutrition security and food security), and soil fertility. During 2021, several publications were produced based mainly on meta-analysis of a systematic literature review (registered in the PRISMA protocol) on

the efficacy of millet-based meals in reducing various life-style related diseases.

🌐 <https://www.smartfood.org>



3 GOOD HEALTH AND WELL-BEING



ENSURE HEALTHY LIVES AND PROMOTE WELL-BEING FOR ALL AT ALL AGES

In 2021, AIT continued implementing measures designed to ensure the health and wellbeing of its community, including organizational quarantine and partnering with Thammasat University Hospital. The Institute also encourages its students and staff healthy living habits alumni will take back and pass on to their compatriots. Actions included research

and dissemination projects on haze monitoring, acid deposition, and air and soil pollution in Southeast Asia and especially on their detrimental effects on elderly populations under COVID-19 conditions. AIT researchers were active in reporting their findings in these areas, while AIT's medical clinic continued supporting the daily health and wellbeing of the community.

REAL-TIME HAZE MONITORING AND FOREST FIRE DETECTION INFORMATION CENTRIC NETWORKS (SEA-HAZEMON@TEIN)



The SEA-HAZEMON project was awarded under the 3rd call of the Asi@Connect research program funded by the European Union and National Research and Education Networks (NRENs). The project aims to deploy low-cost haze monitoring sensors called Canarin in Southeast Asia along with real-time analysis to provide timely warnings directly to affected areas. Project members have been trained to design, set up, and maintain networks of Canarin sensors in haze-affected areas of their respective country. The air quality sensor network is an important application of the Internet of Things (IoT) for environmental monitoring, not only providing warnings for affected community members but detecting occurrences of open burning. The project was successfully set up as an IoT platform for haze monitoring with big data analytics. With support from our project partners, Canarin sensors have been deployed at more than 100 sites in Thailand, Laos, the Philippines, and Indonesia. Deployment sites cover several areas including urban, rural, and remote areas.

Project partners include the Thailand Research Education Network Association, Asian Institute of Technology (Thailand), Silpakorn University (Thailand), Mahidol University (Thailand), the Upper ASEAN Wildland Fire

Special Research Unit (Thailand), Kasetsart University (Thailand), Institut Teknologi Bandung (Indonesia), the University of the Philippines at Los Banos, the National University of Laos, UPMC Paris-Sorbonne University, the IT University of Copenhagen, and ICTP (Italy)

hazemon.in.th



SEA-HAZEMON: Real Time Haze and Air Quality Monitoring Platform

¹<https://interlab.ait.ac.th/HAZEMON>



Deployment of Canarin sensor in Doi Chang PaPae, Lamphun, Thailand



Training of officers from forest fire control units in Chiang Rai Province, Thailand on setting up and maintaining Canarin sensor nodes



Online workshop on IoT - Big Data Analytics, 27-28 May 2021

SUPPORTING AIT STUDENTS DURING COVID-19

As of 13 September 2021, the first anniversary date of the AIT Organizational Quarantine (OQ), 298 students across the globe (359 as of 31 December 2021) resided in the safe and affordable quarantine facility on the AIT campus. AIT partnered with Thammasat University Hospital to provide testing and treatment for AIT OQ occupants at its three dedicated dormitory buildings safely barricaded as the OQ. Since its inception, while a small number of students tested positive in the OQ, they immediately received medical treatment and recovered fully.

The Institute also designated a dormitory building to serve as quarantine facilities for community members who test positive for COVID-19 and are assessed for

home isolation by their monitoring hospitals. This facility is known as Community Organizational Quarantine (COQ). Close contact involving very high risk such as shared accommodation of positive cases are also required to remain in COQ for a specified period for close self-monitoring. Other close contact with high risk such as sharing transport or interaction can self-isolate in their own rooms if living alone or in the designated community self-isolation (CSI) dorm if staying in shared units. Ordinary contacts such as being in areas visited by positive cases can self-isolate in their own unit or home and monitor their health for a week. Facilities visited by positive cases are immediately deep-cleaned, sanitized, and disinfected.



21ST SESSION OF THE SCIENTIFIC ADVISORY COMMITTEE ON THE ACID DEPOSITION MONITORING NETWORK IN EAST ASIA (EANET SAC21)



The 21st Session of the Scientific Advisory Committee of the Acid Deposition Monitoring Network in East Asia (SAC21) was organized virtually on 26-28 October 2021 to discuss scientific and technical matters related to EANET activities. Over 60 members of the Scientific Advisory Committee or their representatives from participating countries joined the meeting. The Draft EANET Data Report 2020 was adopted, showcasing various results and trends in the region since 2000. In addition, the Draft Report on the Inter-laboratory Comparison (ILC) Projects 2020 and the overview of the National Monitoring Plans of Participating Countries for 2021 were also presented. In the meeting, the SAC21 members were invited to share their comments from a scientific viewpoint on the draft Annex to the EANET Instrument for consideration and approval at EANET IG23 in November 2021. AIT's Regional Resource Center for Asia and Pacific (RRC.AP) actively participated in and strongly supported the organization of the EANET SAC21 meeting. Further information is available at

- 🌐 <https://www.eanet.asia/news-sac21>
- 🌐 <http://www.rrcap.ait.ac.th/Pages/event.aspx>
- 🌐 <https://bit.ly/3PvyZSl>



ASEAN DISSEMINATION WORKSHOP ON THE SUBSTITUTION AND ESM OF MERCURY-CONTAINING MEDICAL MEASURING DEVICES



AIT's Regional Resource Center for Asia and Pacific (RRC.AP) convened a regional ASEAN Dissemination Workshop on the Substitution and Environmentally Sound Management (ESM) of Mercury-containing Medical Measuring Devices on 28 September 2021. The workshop was a wrap-up activity of the Japan-ASEAN Integration Fund (JAIF) project titled "Development of Capacity for the Substitution and the Environmentally Sound Management (ESM) of Mercury-containing Medical Measuring Devices implemented in the Philippines and Indonesia." The project contributes to the prevention of adverse impacts of mercury on human health and the environment in the ASEAN region. The ASEAN dissemination workshop aims to disseminate key outcomes and findings from the project along with experiences of international organizations to all 10 ASEAN member states, lessons learned, and the way forward. The ASEAN Dissemination workshop was attended by 47 participants from ASEAN member states and other international organizations. Focal persons and technical officers from environment agencies from seven ASEAN member states (Brunei Darussalam,

Cambodia, Indonesia, Laos, Myanmar, the Philippines, and Singapore) were represented. Other institutions participating in the workshop included the EX Research Institute Ltd. (EXRI), Nomura Kohsan Ltd., the Basel and Stockholm Convention Regional Center—Southeast Asia (BSCRC-SEA), BAN Toxics Philippines, the Minamata Convention Secretariat, the ASEAN Secretariat, UNEP's Regional Office for Asia and the Pacific (ROAP), and the UNEP Global Mercury Partnership (UNEP GMP).

Project activities exploring ground situation assessments of the phasing out and management of mercury-containing medical measuring devices (MCMDs) and the subsequent development of Technical Guidelines for the substitution and ESM of MCMDs were presented by the Department of Environment and Natural Resources (DENR) and BAN Toxics for the Philippines and the Ministries of Environment and Forestry (MOEF) and Health (MOH) and BSCRC-SEA for Indonesia. These activities were in line with Article 11 of the Minamata Convention. Information on activities on related mercury management projects in the region along with mercury



waste management technology and experiences in Japan were presented by EXRI, Nohmura Kohsan UNEP ROAP, and UNEP GMP, respectively.

- 🌐 <http://www.rrcap.ait.ac.th/Pages/event.aspx>
- 🌐 <https://jaif.asean.org/jmt-news/asean-dissemination-workshop-on-the-substitution-and-the-environmentally-sound-management-esm-of-mercury-containing-medical-measuring-devices>



🔍 ASSESSMENT OF ENVIRONMENTAL INEQUALITIES OF AIR POLLUTION OF VULNERABLE SOCIOECONOMIC GROUPS IN THE WORLD OF WORK IN BANGKOK



This project contributes to the understanding of the relationship between socioeconomic deprivation and air pollution exposure through an Environmental Justice Index of air quality developed by combining air pollution protection and socioeconomic indexes with multi-stakeholders.

The project aims to:

- ▶ Map air pollution hotspots and examine their correlation with health conditions and wellbeing among selected socioeconomic groups in Bangkok;

- ▶ Develop an Environmental Justice Index of air quality for different socioeconomic groups in the informal economy; and
- ▶ Recommend strategies for mitigating air pollution burdens, promoting sustainable urban planning, and improving social and health protection for vulnerable socioeconomic groups exposed to unhealthy levels of urban air pollution.

🔍 REDEFINING AGE-FRIENDLY AND RESILIENT CITIES: LESSONS FROM SWISS AND ASEAN CITIES' RESPONSES TO COVID-19



The project evaluated demographic, social, and physical determinants of urban health risks and resilience in the Bern and Bangkok urban areas with a particular focus

and reflection on policies and initiatives with a significant impact on elderly populations in the COVID-19 pandemic context.

🔍 CONTRIBUTION OF INSIDE AND OUTSIDE-CITY AIR POLLUTION SOURCES TO PM2.5 CONCENTRATION IN BANGKOK



An emission inventory for 2019 was developed for the Bangkok Metropolitan Region (BMR). Major sources of PM2.5 emission were open burning, motor traffic, and industry. The WRF-CAMx instrument will be used to

estimate PM2.5 concentration in Bangkok that can be linked to sources both inside and outside BMR as well as outside Thailand, thus making air quality management more efficient and sustainable.



PUBLICATIONS IN PEER REVIEW JOURNALS ON AIR AND WATER QUALITY (IMPACTS OF COVID-19 ON AIR QUALITY IN INDIA)



Dr. R.L. Verma of AIT's RRC.AP was lead author of a peer-reviewed article on "Impacts of COVID-19 on Air Quality in India" published in Aerosol and Air Quality Research. Details of the article are available at: <https://doi.org/10.4209/aaqr.200482>. Dr. Verma also co-

authored a peer-reviewed article on "Spatio-Temporal Analysis of Surface Water Quality in Mokopane Area, Limpopo, South Africa" published in Water. Details of the article are available at: <https://aaqr.org/articles/aaqr-20-07-covid-0482>

AIT COMMUNITY HEALTH SERVICES

AIT has a 24-hour medical clinic to support the health and wellbeing of the AIT community. It provides its employees and students with mandatory medical insurance to meet most of their medical needs. AIT strictly implements a no-smoking policy outside designated smoking areas and a no-alcohol sale policy to ensure the wellbeing of the community. As part of the Institute's commitment to promoting the health and wellbeing of its community, a free medical check-up for AIT Social Security members was provided on 18 March 2021 at the AIT Korea House, and health promotion privileges have been provided by the B-Care Hospital for AIT

employees and their dependents at discounted rates for the medical health check-up and with special benefits to AIT Social Security members since April 2021. Various COVID-19 vaccination opportunities were provided to members of the AIT community with support from Thammasat University Hospital (TUH) and the Ministry of Foreign Affairs. AIT has ensured that all members of the AIT community were administered at least two vaccines, with many given boosters by the end of 2021. Efforts were also made by the AIT COVID-19 Task Force to protect and ensure the safety of AIT community members from potential COVID-19 outbreaks on campus.



ENSURE INCLUSIVE AND EQUITABLE QUALITY EDUCATION AND PROMOTE LIFELONG LEARNING OPPORTUNITIES FOR ALL

In response to the continuing threat presented by the COVID-19 pandemic, in 2021, AIT delivered a carefully-calibrated mix of hybrid and in-person interactions in all its divisions, research centers, courses, and dissemination and extension channels. Despite unavoidable limitations, the Institute contributed to quality education by developing innovative educational projects and curriculum, offering workshops and

co-hosting webinars, participating in international conferences and symposiums, and publishing research in peer-reviewed journals in areas such as disaster risk reduction, sustainable development, agriculture and aquaculture, and climate resilience around the region. Specific collaborations involved AIT teams with higher education institutions in Myanmar, Thailand, China, and Vietnam.

DISASTER EDUCATION FOR INTEGRATING THE SENDAI FRAMEWORK FOR DISASTER RISK REDUCTION (SFDRR) AND THE SDGs IN ASIA



The project has co-developed a model multidisciplinary post-graduate course curriculum on disaster risk management and sustainable development for the Asian region. In addition, the project successfully ran a pilot multidisciplinary certificate course for Higher Education Institutions (HEI) Network members. The project team identified and mapped twenty effective interventions in Disaster Risk Reduction (DRR) in the Asian region in a book titled "Disaster Risk Research, Science, and Innovation for Sustainability: Asian Case Studies." Through a curriculum workshop, webinars, and international conferences, the project has significantly contributed to promoting the sustainability paradigm in post-graduate education and research for disaster resilience.

Most notably, the second series of international symposiums on Disaster Resilience and Sustainable Development became a regional platform for hundreds of individuals from diverse domains to discuss various dimensions of higher education systems in the Asia-Pacific region with a focus on DRR and the SDGs. The

2021 symposium collaborated with 21 institutional partners, reaching 337 participants through four keynote sessions and 21 technical sessions, providing a vibrant platform for policymakers, academics, researchers, development practitioners, private sector actors, and relevant stakeholders. The conference has also made a significant contribution to disaster research through the publication of special issues of journals such as "Risk and Resilience Paradigm for Sustainable Development" in *Progress in Disaster Science* and "Disaster Risk Reduction and Resilience Building for Sustainable Society" in the *International Journal of Disaster Resilience in the Built Environment (IJDRBE)*. In addition, three volumes of proceedings are in press: "Multi-hazard Vulnerability, Climate Change, and Resilience Building", "Disaster Risk Science and Technology," and "Multi-Hazard Vulnerability and Resilience Building: Cross Cutting Issues."

 <https://prospernet.ias.unu.edu/projects/past-projects/disaster-education-for-integrating-sfdr-and-sdg-in-asia>



Opening and Closing Ceremony brochure of the 2nd International Symposium on Disaster Resilience and Sustainable Development



Onsite control room of the Virtual DRSD Conference



Onsite control room of the Virtual DRSD Conference

SUPPORT TO AQUACULTURE CURRICULUM DEVELOPMENT, CAPACITY DEVELOPMENT, NATIONAL AND INTERNATIONAL NETWORKING PLUS SYSTEM IMPROVEMENTS AT YANGON UNIVERSITY, MYANMAR



Yangon University (YU) is the oldest university in Myanmar, with a history dating back to 1878. However, a formal academic program in Fisheries and Aquaculture started in YU only in 2019 with an undergraduate program. AIT's Aquaculture and Aquatic Resources Management (AARM) was invited to support Yangon University in revising the undergraduate program and developing an advanced curriculum for the Aquaculture Masters Program. This project was supported by German Development Aid (GIZ), German MYSAP Software, USAID, and the Myanmar Fisheries Federation. The focus was to strengthen the pedagogical, research, and management capacity of the Department of Fisheries and Aquaculture (DFA) and the competence of the YU faculty to coordinate research and development activities with national and international institutions. However, due to COVID-19 pandemic-related travel disruptions, only the Inception Workshop could be conducted physically, and all other activities were conducted in virtual mode. All 22 courses for the BSc curriculum were revised with support from several international resource persons, followed by a series of faculty training workshops organized via Zoom. Additional topics on gender issues, climate change impacts, and labor-related challenges in Myanmar were incorporated into the revised curriculum. A Needs Assessment Workshop was conducted on 19 January 2021 to prepare the curriculum for new Masters courses in DFA, and a curriculum plan was compiled.

However, the development of the full curriculum for the Masters courses could not be completed due to unexpected political changes in Myanmar. Major outcomes of this project were to develop a full-fledged curriculum for undergraduate courses, a comprehensive plan for Masters courses, intensive training for YU faculty on teaching methods and developing technical expertise relevant to specific domains, and creating an international network for supporting Yangon University in offering programs for fisheries and aquaculture. Details are available at:

<https://www.aitaquaculture.org/curriculum-development.htm>





☒ STAKEHOLDER MEETING TO ESTABLISH A NEW AQUACULTURE RESEARCH STATION AT YANGON UNIVERSITY, MYANMAR



AIT has supported the Fisheries and Aquaculture Department of Yangon University (YU) by helping to establish an academic program of international standards. AIT's AARM faculty attended a stakeholder meeting on 16 July to discuss YU's new Aquaculture Research Station as part of this drive. A follow-up meeting

was held on 22 September 2021 as an information-sharing session on aquaculture research facilities with the faculty from YU's Department of Fisheries and Aquaculture (DFA) and various aquaculture industry leaders from Myanmar.

☒ THREE-MONTH INTERNSHIP IN AQUACULTURE FOR TWO STUDENTS FROM Ubon Ratchathani University, Thailand MONTHS



Two undergraduate student interns from the Aquaculture Program of Ubon Ratchathani University, Thailand attended the aquaculture internship program for three months at AARM-AIT. The interns had extensive experience of major aquaculture practices, aquaculture technologies, recirculating aquaculture

systems, nutrition and feed technology, and hands-on training about monosex tilapia production in the AARM hatchery. The students also had several field visits to catfish hatchery, tilapia cage culture, shrimp hatchery, and organic shrimp farms in Thailand.



☒ ASEAN FISHERIES EDUCATION NETWORK INSTITUTIONAL MEMBERS MEETING 2021



The ASEAN Fisheries Education Network (ASEAN-FEN) is an international alliance of nearly 20 universities established in 2015 and offering fisheries and aquaculture courses in the ASEAN region. AIT is a consortium member that enables several student and faculty exchange programs among member universities. ASEAN-FEN is also part of an EU-funded project that has developed a new Masters Program in Aquatic Health

Management. The annual Institutional Members Meeting was held on 9 June 2021 and attended by 48 faculty members from participating universities to discuss the organization of the International Fisheries Symposium (IFS) 2021 hosted jointly by Nha Trang University, Can Tho University, and Nong Lam University, Vietnam in fully virtual mode (e-IFS2021) in December 2021.



7TH INTERNATIONAL CONFERENCE ON AQUACULTURE ENGINEERING, CHINA



The 7th International Conference on Aquaculture Engineering was organized jointly by the Chinese Society of Agricultural Engineering and the Chinese Society of Academic Degrees and Graduate Education, Huazhong Agricultural University, Wuhan, China on 15 October 2021. The virtual keynote address on the

development of aquaculture engineering and digital innovations in South East Asia was presented by Dr. K.R. Salin, AARM-AIT.

🌐 <https://bit.ly/3DVo3J0>



5 GENDER EQUALITY



ACHIEVE GENDER EQUALITY AND EMPOWER ALL WOMEN AND GIRLS

AIT functions as a regional center of excellence in stressing the importance of gender as an ethical and pedagogical concern. This year the institute displayed its capacity to convene international organizations and partner governments to advocate globally for gender equality and inspire girls and women to shatter the glass ceiling in the domains of science and technology. In 2021, its Yunus Center was active in empowering women food entrepreneurs in Thailand to create employment and income opportunities for local

communities and supporting sustainable peace-building and common understanding through shared values, trade, and cooperation. Areas of practical concern also included activism to end gender-based violence against women and promoting climate risk financing for agriculture in ASEAN. A source of considerable pride and sense of achievement for AIT was that in 2021, 48% and 45% of newly enrolled students in each semester were female.

EMPOWERING WOMEN FOOD ENTREPRENEURS IN SOUTHERN THAILAND



Empowering entrepreneurs at grassroots level is key to the mission of the Yunus Center at AIT (YCA). The economic downturn resulting from the COVID-19 pandemic further exacerbated already strained incomes in the south of Thailand. YCA won a grant from the United Nations Development Program (UNDP) supported by the Government of Japan to design and implement a fast-tracked project for empowering women entrepreneurs in Yala, Thailand's southernmost province. Through the project, 50 low-income women were trained and mentored in developing and rolling out community-based food businesses operated by women's groups.

Despite severe COVID-19 related mobility constraints during 2021, this initiative was coordinated by YCA and implemented in time and on budget by a local team fielded by Yunus Thailand. Today, 10 of these women-led businesses are now stable in their marketplace across 8 districts over Yala Province, creating employment and income opportunities for local communities as well as building resilience in inter-community food value chains and supporting sustainable peace-building and common understanding through shared values, trade, and cooperation.





AIT WOMEN STUDENTS AND ALUMNI

In 2021, 706 new students joined AIT, including 35 exchange and visiting students. In the January 2021 semester (including the March term), of the 121 new students enrolled, 48% were female. In the August 2021

semester (including the June and October terms), of the 585 new students, 41% were female. In 2021, 522 students graduated, of whom 45% were female.

WORKSHOP :16 DAYS OF ACTIVISM: END GENDER-BASED VIOLENCE AGAINST WOMEN

The SU's Gender and Culture Committee organized a self-defense workshop on 10 December 21, Human Rights Day, to promote the theme of "16 Days of Activism: End Gender-Based Violence Against Women." The workshop was facilitated by AIT students who are highly-trained and have won awards in their respective fields.

The workshop was supported by the School of Environment, Resources and Development (SERD) Dean's Office. SU's Gender and Culture are thankful to the school and the students who volunteered to make the event successful.



INNOVATIVE CLIMATE RISK FINANCING FOR THE AGRICULTURE SECTOR IN ASEAN



The aim of this project is to strengthen the resilience of agricultural value chains through innovative climate risk financing in the ASEAN region. Integrating sustainability standards for agriculture as incentive schemes for climate risk financing involves:

- ▶ Preparing a gender analysis

- ▶ Identifying potential unintended negative impacts and measures to adequately address the gender analysis; and
- ▶ Developing concrete measures for the gender-responsive and transformative design of the methodological approach and results framework, including a justification for the gender marker.

PILOTING SOCIAL BUSINESS RURAL MODELS: GPSC (Global Power Synergy Company Ltd)



As a result of YCA's outreach efforts to companies and SMEs on the potential for social business as a resilience strategy for social impact initiatives, GPSC, Thailand's leading power producer, reached out to YCA for exploring collaboration opportunities. Hybrid-format workshops were held with GPSC followed by a face-to-face strategy session in which a collaboration agenda was finalized.

Work is now underway to identify host locations for a community-based pilot project in the area of new partners for exploring social business opportunities and co-designing social business solutions as a demonstration of social business partnerships between corporates and communities.



🌐🤝 WOMEN AND GIRLS AROUND THE WORLD INSPIRED BY AIT FACULTY FOR CAREERS IN SCIENCE



To push forward the global discussion and action for gender equality, AIT played host to an online event to mark International Day of Women and Girls in Science on 11 February 2021. "Inspiring Career Paths: Successful Stories of Women in Science Shattering the Glass Ceiling," an international webinar co-organized by AIT, the Embassy of France in Thailand, Embassy of Mexico, and UN Women Asia and the Pacific, attracted audiences of young people logging on from Europe, North America and Asia. Women scientists from around the world, including four AIT faculty members, shared their personal stories and journeys on becoming successful in their fields of science via the event co-organized by the Office of International Affairs. The main panel discussion was moderated by Prof. Kyoko Kusakabe from the Gender and Development Studies program. She was joined by Prof. Joyashree Roy from the Department of Energy, Environment and Climate, and Prof. Nguyen Thi Kim Oanh from the Environmental Engineering Management program. The main panel discussion was followed by thematic break-out sessions, where Prof. Kanchana Kanchanasut, from Computer Science and

Information Management program, also joined in to share her personal and professional experiences with participants attending online from around the world. Speakers included: Prof. Joyashree Roy (Economics of Pollution and Climate Change); Prof. Nguyen Thi Kim (Air Quality Engineering and Management); Prof. Kanchana Kanchanasut (Computer Science); Prof. Ali Guarneros-Luna (NASA Aerospace); Dr. Nicole Ngo-Giang-Huong (Molecular Epidemiology and Pathogenesis of Infections); Dr. Flavie Goutard (Epidemiology in Tropical Countries); Dr. Valerie Verdier (Plant Pathology and Food Safety); Asst. Prof. Chularat Wattanakit (Chemical and Biomolecular Engineering); Dr. Sirinan Kulchat (Chemistry and Smart Material); Assoc. Prof. Phiangphak Sukkharak (Botany). Moderated by Prof. Kyoko Kusakabe (Gender and Development Studies).

🌐 <https://bit.ly/3cijejq>

🌐 <https://ait.ac.th/2021/03/challenging-gender-role-can-women-be-good-engineers/>





6 CLEAN WATER AND SANITATION



ENSURE AVAILABILITY AND SUSTAINABLE MANAGEMENT OF WATER AND SANITATION FOR ALL

In 2021, AIT took part alongside UNESCO and Chulalongkorn University in celebrating World Water Day and advocating for the sustainable management of regional freshwater resources, especially in the Mekong River Basin. The new Global Water and Climate Adaptation Center- Aachen-Bangkok-Chennai-Dresden (ABCD) and CASTT Adaptation Academy bode well for AIT and its international partners to tackle climate change in the Asia-Pacific region. Other research, pedagogical, and dissemination initiatives addressed implementing

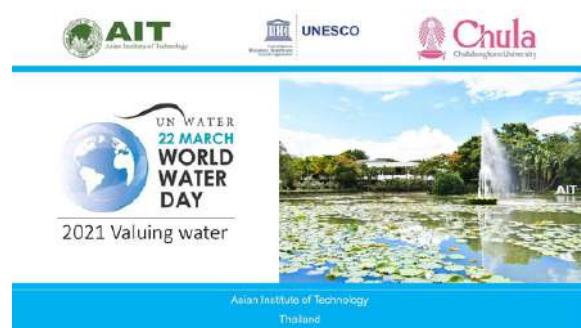
countermeasures to the worldwide spread of marine plastic litter, monitoring the health of waterways using geospatial technology, strengthening groundwater governance in rapidly urbanizing areas, safeguarding trans-boundary aquifers, and mapping groundwater resilience to climate change and human development in Asian cities. Closer to home, AIT's achievements include its own wastewater treatment plant and the reuse of treated wastewater and stored rainwater in campuswide greenery maintenance.

WORLD WATER DAY 2021 CELEBRATION WITH UNESCO, CHULALONGKORN UNIVERSITY, AND AIT



AIT, UNESCO, and Chulalongkorn University jointly celebrated World Water Day 2021 on 22 March 2021 in the AIT Conference Center via a hybrid platform to raise awareness of the importance of freshwater and to advocate for the sustainable management of freshwater resources. The theme for each year focuses on topics that are in line with the targets of SDG 6. The theme for 2021 was "Valuing Water." The event also comprised five different launching ceremonies for several initiatives and products. The first was the official launch of the World Water Development Report 2021 by Dr. Benno Boer before distinguished guests. The other four initiatives included a Dual Degree Program with Colorado State University (CSU), a new Degree Program in 'Water Security and Global Change,' Water Engineering and Management (WEM) Real-time Weather and Hydrologic Monitoring Systems, and a Water Security Assessment Tool.

<https://bit.ly/3IGernU>





PROMOTION OF COUNTERMEASURES AGAINST MARINE PLASTIC LITTER IN SOUTHEAST ASIA AND INDIA (UNEP COUNTERMEASURE PHASE II)



GIC-AIT has been working on behalf of the United Nations Environment Program (UNEP) to improve the health of Asian waterways with applications of geospatial technology. This effort began in 2019 with the development of a regional model for monitoring and assessing plastic leakage in the Lower Mekong River Basin. In 2021, efforts were expanded to create a web-based plastic litter identification platform powered by artificial intelligence called pLitter. The model at the heart of the platform is trained with data collected through an innovative, multi-pronged approach consisting of roadside litter monitoring with vehicle-mounted cameras, canal monitoring with both CCTV cameras and unmanned aerial vehicles (UAV), and terrestrial litter instance recording with a custom mobile application for smart devices. Pilot studies for these data collection methods were carried out in Ubon Ratchathani, Chiang Rai, and Pathum Thani (Thailand).

Plastic litter is derived from a multitude of products of varying shapes, colors, conditions, and sizes. With such a high degree of diversity, it is essential to develop a robust training dataset that is representative of the types of plastic litter found in our surroundings to adequately train the pLitter model. A significant part of the project thus involves citizen scientists both within AIT in the region at large to provide diverse inputs for the plastic litter conditions unique to their cities and to annotate the plastic litter found in our datasets. This outreach approach brought a number of

benefits, including promoting awareness for the plastic litter problem affecting Asian waterways, introducing students to a new AI-based approach for fighting plastic pollution, and increasing the bank of annotations available to the pLitter model. In total, AIT's GeoInformatics (GIC) held six online webinars in 2021 for universities with environment-focused programs in Thailand, Sri Lanka, Laos, and Cambodia, resulting in the annotation of thousands of images for training the pLitter plastic litter identification model. All GIC-AIT's datasets, reports, and findings related to the CounterMEASURE Project will be published by UNEP and openly shared with groups such as the Global Partnership on Marine Litter to assist efforts aimed at preventing marine litter and plastic pollution.

- 🌐 [CounterMEASURE GIS Web Platform: https://platform.countermeasure.asia](https://platform.countermeasure.asia)
- 🌐 [Video: Plastic Detection from Vehicle-Mounted Cameras: https://youtu.be/vKwlo96Tddg](https://youtu.be/vKwlo96Tddg)
- 🌐 [CounterMEASURE Program: https://countermeasure.asia](https://countermeasure.asia)
- 🌐 [pLitter Web Platform for AI-based Plastic Litter Identification: https://plitter.org](https://plitter.org)
- 🌐 [Dashboard: Mobile Application for Macroplastic Survey: https://arcg.is/1yDHym0](https://arcg.is/1yDHym0)





WATER RESOURCE MANAGEMENT IN THE MEKONG RIVER BASIN (WATER-MEKONG), FUNDED BY THE UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT (USAID), THAILAND



The objective of the project is to enhance the US Department of Interior's International Technical Assistance Program (DOI-ITAP) support for water resources management in the Mekong River Basin by having AIT install 10 automated telemetry equipment stations at designated locations to measure HYDRO-MET parameters, e.g., water level, precipitation, temperature, humidity, and pressure. Project activities include:

- ▶ Coordinating the procurement and installation of 10 automated telemetry equipment stations at 10 locations in the Mekong River Basin to measure HYDRO-MET parameters, e.g., water level, precipitation, temperature, humidity, and pressure.
- ▶ Installation and effective execution of automated telemetry equipment stations and associated equipment, instruments, or software.
- ▶ Prepare project performance and financial reports.

🌐 <https://bit.ly/3O9ILs2>



STRENGTHENING GROUNDWATER GOVERNANCE IN RAPIDLY URBANIZING AREAS OF THE LOWER MEKONG REGION (GIRA), FUNDED BY THE STOCKHOLM ENVIRONMENT INSTITUTE (SEI)-ASIA: THAILAND, LAOS, CAMBODIA, AND VIETNAM



The project aims to evaluate the current state of groundwater governance in the Lower Mekong Region (LMR) and recommend ways to improve or strengthen groundwater governance based on evidence-based understanding of groundwater availability, use, and potential conflicts under multiple stresses in the future focusing on vulnerable and marginalized groups. The project's objectives are:

- ▶ Groundwater resource assessment and its contribution to sustainable development;
- ▶ Diagnosis of current state of groundwater governance; and
- ▶ Assessment of groundwater vulnerability to multiple stresses (climate, land use, demographic and socioeconomic change) and the resultant risk of water insecurity.

🌐 <https://bit.ly/3yYx6Hh>





⌚ MAPPING GROUNDWATER RESILIENCE TO CLIMATE CHANGE AND HUMAN DEVELOPMENT IN ASIAN CITIES (GROUNDWATER-ASIA), FUNDED BY ASIA-PACIFIC NETWORK (APN) FOR GLOBAL CHANGE RESEARCH, THAILAND, VIETNAM, NEPAL, AND PAKISTAN



The aim of the project is to improve understanding of the impacts of climate change and human development on groundwater resources and local demand. The project will develop policy recommendations for sustainable groundwater development and management that will support adaptation and build resilience. There are four key objectives:

- ▶ To develop a framework for the assessment of resilience of groundwater to climate change and human development in urban environments;
- ▶ To assess the impact of climate change and human development on groundwater recharge and quality of four Asian cities;
- ▶ To map resilience of groundwater to climate change and human development in four Asian cities; and

▶ To develop evidence-based guidance on assessing how groundwater can support adaptation and build resilience to climate change.

🌐 <https://www.groundwaterasia.org>



🌐 PANELIST ON “TRANSBOUNDARY AQUIFER EXPERIENCES ACROSS THE WORLD: WHAT CAN WE LEARN FROM EACH OTHER? IN UNESCO INTERNATIONAL CONFERENCE ON TRANSBOUNDARY AQUIFERS ° ISARM2021



UNESCO's Intergovernmental Hydrological Program (IHP) organized the Second International UNESCO Conference on Transboundary Aquifers (ISARM2021): Challenges and the Way Forward." The conference was a milestone in advancing knowledge on shared groundwater resources. More than 200 experts participated from all around the world. The conference provided a unique opportunity to understand progress made over the past 10 years. It contributed to the achievement of SDG 6 and the monitoring of Indicator 6.5.2 on transboundary cooperation. Several high-level debates explored how science can influence policy for the sustainable management of transboundary aquifers resources and looked at evolution in water cooperation.

The panel looked at 4 different transboundary aquifer case studies from around the world. It explored the enabling and limiting factors of transboundary cooperation, highlighting the importance of technical assessment, capacity, regional

mandates, management, and governance. A case on "Strengthening the Cooperation of Transboundary Aquifers in the Lower Mekong Basin" representing different transboundary aquifers in the Lower Mekong Basin was presented and discussed in the session.

🌐 <https://isarm2021.org>





WATER RESOURCES SYSTEMS [CE74.13, 3(3-0)], SCHOOL OF ENGINEERING AND TECHNOLOGY (SET), AUGUST SEMESTER 2021



The objective of this course is to provide a systems approach to the planning, management, and operation of water resources infrastructure in the environment. This course provides in-depth understanding of simulation, optimization, and multi-criterion decision-making as well as engineering economics, all key ingredients of successful water systems analysis.

On completion of this course, students will be able to apply basic economic analysis (i.e., engineering economic and

microeconomic analysis) to water resources infrastructure planning and management, apply operations research techniques (linear and dynamic programming) to various water resources allocation problems, and understand and appreciate how water resources systems models can be used in the planning and management of decision-making processes.

2ND REGIONAL WORKSHOP ON MAPPING GROUNDWATER RESILIENCE TO CLIMATE CHANGE AND HUMAN DEVELOPMENT IN ASIAN CITIES, ASIAN INSTITUTE OF TECHNOLOGY, THAILAND



The second regional workshop on Mapping Groundwater Resilience to Climate Change and Human Development in Asian Cities was successfully held on Wednesday 29 September 2021 at AIT in collaboration with the Institute for Global Environmental Strategies (IGES), Japan, the Department of Groundwater Resources (DGR), Thailand, the Division of Water Resources Planning and Investigation for the South of Vietnam (DWRPIS), the International Waterlogging and Salinity Research Institute (IWASRI), Pakistan, the and Center for Research in Environment Energy and Water (CREEW), Nepal. The virtual workshop was the continuation of the first regional workshop conducted in August 2019 at AIT. The project is funded by the Asia-Pacific Network (APN) for Global Change Research, an intergovernmental network that promotes policy-oriented research and capacity-building activities related to global change in the region. This workshop is one of the activities of the project titled "Mapping Groundwater Resilience to Climate Change and Human Development in Asian Cities with the financial support of the APN for Global Change Research. This intensive interactive workshop

was attended by more than 45 participants representing a range of government institutes, universities, international organizations, and research organizations from India, Indonesia, Japan, Nepal, Pakistan, Thailand, and Vietnam.

 <https://groundwaterasia.org/second-regional-workshop-on-mapping-groundwater-resilience-to-climate-change-and-human-development-in-asian-cities>





🌐 TRAINING ON STRENGTHENING COMMUNITY WATER RESOURCES MANAGEMENT WITH SCIENCE AND TECHNOLOGY FOR THAI PROVINCES ALONG THE MEKONG RIVER, HYDRO-INFORMATICS INSTITUTE AND ASIAN INSTITUTE OF TECHNOLOGY



The training on Strengthening Community Water Resources Management with Science and Technology for Thai Provinces along the Mekong River is one of the activities of the Water Resources Management in the Mekong River Basin supported by the US Department of the Interior (DOI) and USAID and was jointly implemented by AIT's Water Engineering and Management program and the HydroInformatics Institute (HII), Thailand on July 6, 2021.

The main objective of the training was to build and enhance the capacities of local government officials and local community to use, repair, and maintain Automated Telemetry Stations for improved water resources management. Some 47 local government officials and

local community leaders from Loei, Nong Khai, Bueng Kan, Nakhon Phanom, Mukdahan, and Ubon Ratchathani provinces participated in the training.



🌐 PLENARY TALK ON “WATER SECURITY AND GLOBAL CHANGE: RECENT RESEARCH AND DIRECTION FOR THE FUTURE” AT THE 5TH INTERNATIONAL CONFERENCE OF ADVANCES IN CIVIL ENGINEERING (ICACE), CHITTAGONG UNIVERSITY OF ENGINEERING & TECHNOLOGY (CUET), BANGLADESH



The 5th International Conference of Advances in Civil Engineering (ICACE) was organized by Chittagong University of Engineering & Technology (CUET), Bangladesh on 4 March 2021. The conference aims to bring together leading academics, researchers, scholars, professionals, and decision-makers from around the world working in various fields of civil engineering to exchange new ideas, share knowledge, and explore recent developments. The plenary address on “Water Security and Global Change: Recent Research and Direction for the Future” covered a wide range of water-related issues and focused on global drivers of water insecurity and emerging needs in water security research. The key messages include:

- ▶ Water security research is central to meeting the 2030 SDGs;
- ▶ Water security research is well framed. However, action-oriented research is essential to develop and implement solutions; and

► Emerging water security research calls for greater participation from all stakeholders and the use of technological avalanches such as Big Data and AI.

🌐 <https://www.cuet.ac.bd>



Water Security and Global Change: Recent Research and Direction for Future

5th International Conference of Advances in Civil Engineering (ICACE)
March 4, 2021

Dr. Sangam Shrestha
Professor & Program Chair, Water Engineering and Management
Department Head, Department of Civil and Infrastructure Engineering
Asian Institute of Technology

5th International Conference on Advances in Civil Engineering (ICACE)
March 4-6, 2021



COMPARATIVE RISK ASSESSMENT OF HYDROLOGICAL HAZARDS AND ADAPTATION POLICY IN THE JIULONG RIVER AND CHAO PHRAYA RIVER BASINS (RB3)



The project designed an adaptive management policy for hydrological hazard risks in the Jiulong River and Chao Phraya river basins. The aim is to recognize future trends in precipitation in order to identify key exposure and vulnerabilities of social, natural, built systems, and

integrated risk, identify pre-and post-disaster mitigation and adaptation strategies, devise pathways and measures at spatial scales, assess the impacts of floods on water sources, water supply systems, and reservoirs, and propose appropriate adaptation strategies.

SUSTAINABLE USE OF WATER ON CAMPUS

AIT has had its own wastewater treatment plant since July 2012, a system that collects all sewage water from the campus, which amounted to 174,478 m³ in 2021, and all treated water was released back to AIT's canal system and reused for garden use on campus. AIT has a closed-loop canal system, with rainwater stored for the summer and all

landscaping and greenery maintained using this water. This helps save clean water in accordance with and with support from Thai Law. In addition, AIT has its own reservoir within the campus, with an area of 92,893 m², storing rainwater to be used during the dry season.





NEW PROJECT RECEIVES €2.8M GRANT FROM DAAD GERMANY TO STUDY WATER SECURITY AND CLIMATE CHANGE

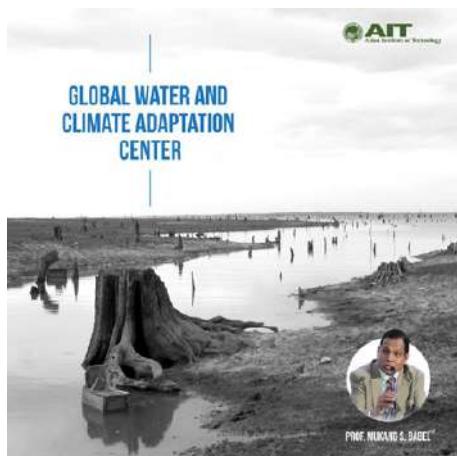


A new 'Global Water and Climate Adaptation Center' was established in 2021 at AIT to work on how climate change affects the hydrological cycle and consequently, water management. The Center will also look into adaptation solutions to lessen the adverse impacts of climate change on natural and human systems. Selected from 53 initial applicants from around the world, a select consortium comprises RWTH Aachen University, Asian Institute of Technology in Bangkok, Indian Institute of Technology Madras (IITM), Technische Universität Dresden (TU Dresden) and United Nations University - Institute for Integrated Management of Material Fluxes and of Resources (UNU-FLORES). The partners will work together under the DAAD-funded "Global Water and Climate Adaptation Centre: Aachen - Bangkok - Chennai - Dresden (ABCD)" project (ABCD Project) to conduct research on water security and climate adaptation, to educate responsible future environmental leaders, and to enable the transfer of research results into practice and policy in South Asia and South East Asia. Leading the ABCD project from the AIT side is Prof. Mukand S. Babel of the Water Engineering

and Management program, School of Engineering and Technology. AIT will provide its expertise in three key areas: 1) Research-collaborative research in interdisciplinary teams in three thematic clusters, 'Water Security, Water Resources Management, Safe Water Supply and Water Treatment', 'Ecosystem Resilience and Nature-Based Adaptation Measures', and 'Traditional Knowledge, Local Economies and Societal Acceptance'; (2) Education-development of a joint master's degree program on "Water Security and Global Change"; and (3) Outreach-knowledge transfer to water related agencies and governments in the region, said Prof. Babel. The project funded by the German Academic Exchange Service (DAAD) will be conducted under the aegis of Germany's Federal Foreign Office for the establishment of global centers for the interdisciplinary networking of science, politics, business, and civil society.

🌐 <https://bit.ly/3yzbQHI>

🌐 <https://bit.ly/3PsnjQ4>



**Global Water and Climate Adaptation Centre.
Aachen - Bangkok - Chennai - Dresden (ABCD-Centre)**

RESEARCH

Water Security and Water Resources Management
Ecosystem Resilience and Nature-Based Adaptation
Transfer Strategies for Climate Adaptation

SUSTAINABLE DEVELOPMENT GOALS

6 CLEAN WATER AND SANITATION
14 LIFE BELOW WATER
13 CLIMATE ACTION

This project is funded by the DAAD with funds from the German Federal Foreign Office

TECHNISCHE UNIVERSITÄT DRESDEN
RWTH AACHEN UNIVERSITY
AIT Asian Institute of Technology
UNU-FLORES
University of Bangkok
DAAD



7 AFFORDABLE AND CLEAN ENERGY



ENSURE ACCESS TO AFFORDABLE, RELIABLE, SUSTAINABLE AND MODERN ENERGY FOR ALL

In 2021, AIT conducted research on renewable energy and energy conservation technologies. Collaborative projects included energy modeling using historical, macroeconomic, and demographic data as well as a study of consumers' willingness to pay for cleaner energy. The Institute also developed e-learning modules to ensure effective dissemination of key content. With international support and participation,

the 2021 Youth Energy Academy combined innovative theoretical approaches, practical solutions, and site visits focused on renewable energy technologies and their contribution to meeting energy-related challenges such as regional sustainable hydro-power development and transmission. AIT also increased the share of solar power generation and installed EV-charging stations on campus.

DEVELOPMENT OF SDG7 ROADMAP FOR ESCAP MEMBER STATES USING THE NATIONAL EXPERT SDG TOOL FOR ENERGY PLANNING (NEXSTEP)



The UN Economic and Social Commission for Asia and the Pacific (ESCAP) has developed an integrated tool – the National Expert SDG Tool for Energy Planning (NEXSTEP), to support the development of national SDG7 roadmaps. Energy modeling using historical energy data, macroeconomic factors, demographic parameters, and other data is an essential component of NEXSTEP. Under this project, the development of SDG7 roadmaps using NEXSTEP is rolled out to ESCAP member states, subregions, and cities. National and sub-national SDG7 roadmaps have been developed for the following countries and regions: (i) National SDG7 roadmap for Bhutan and (ii) Sub-national SDG7 roadmaps for Surat Thani Province and Chiang Rai Province in Thailand. An important part of this roadmap development is the capacity building process, in which participants are trained on using NEXSTEP to develop SDG7 roadmaps. This training not only helps existing users to navigate the process but also supports new users to develop their own roadmaps with or without

support from ESCAP. SDG7 Roadmap Development using NEXSTEP is an online, interactive, and easy to use training program. This training allows participants to complete short virtual trainings and provide users and participants ongoing support throughout the roadmap development process. Through 10 different modules, this online training course guides users and participants through a step-by-step process of energy and emissions modeling, guidance on how to undertake economic analysis and policy analysis, sourcing data and information required to undertake modeling and analysis tasks, how to interpret the results of modeling, how to develop different scenarios for the 2030 energy transition, and how to develop policy recommendations from scenarios and links to different resources.

[🌐 <https://energy-elearning.unescap.org>](https://energy-elearning.unescap.org)

[✉ \[extension@ait.ac.th\]\(mailto:extension@ait.ac.th\)](mailto:extension@ait.ac.th)



**Energy Transition Pathways for the 2030 Agenda
Sustainable Energy Transition
Roadmap for the Province of
Surat Thani, Thailand**

NEXSTEP
National Expert SDG7 Tool for Energy Planning

Developed Using National Expert SDG7 Tool for Energy Planning (NEXSTEP)

UN Economic Commission for Asia and the Pacific
ESCAP

NEXSTEP
National Expert SDG7 Tool for Energy Planning



TFEC projection, by sector, 2030

WILLINGNESS TO PAY STUDY FOR CLIMATE MITIGATION THROUGH INCREASING THE MIX OF RENEWABLE SOURCES OF POWER: THE CASE OF THAILAND (EXTENDED STUDY)



The project examines attitudes toward various policies on energy and sustainable development, and in particular, consumers' willingness to pay (WTP) for energy- and SDG-related goods and services in Thailand.

The project covers a series of surveys on policy issues and discrete choice analysis to gauge WTP based on questionnaire surveys. The questions focus mostly on power generation.

In addition to conventional survey designs, the project employs an experimental survey design to investigate the effects of framing the climate issue in terms of WTP.

- WTP is a measure of the expense a consumer is willing to commit to paying for goods or services, a measure often used when a market does not exist and consumer expenditure cannot be directly observed.
- A series of household surveys was conducted in Thailand from May to August 2020. Some 250 samples were randomly tailored in six administrative zones of Bangkok based on a multistage sampling technique.

The survey instrument included socio-demographics, electricity usage, attitudinal and environmental concerns, and Discrete Choice Experiment (DCE) questions.

- Results showed a diversity of socioeconomic aspects of the sample used in this survey. The electricity usage of respondents was lower than their annual electricity consumption. A positive attitude toward renewable energy (RE) such as solar cells, wind power, biomass, and hydro power was also noted, while air pollution was the main environmental concern expressed by respondents in Bangkok.
- The DCE survey found consistency in the preference toward solar energy over other renewable energy types. However, this overall preference was in a negative finding as respondents were unwilling to pay for a switch to renewable energy. However, respondents prefer a higher RE share and are willing to accept a 2-5% increase in prices.





🌐🤝 DEVELOPMENT OF AN E-LEARNING CAPACITY-BUILDING MODULE AND CONTENT ON THE USE OF THE NEXSTEP TOOL FOR SDG7 ROADMAPS AND IMPLEMENTATION AND LOCALIZATION



The UN Economic and Social Commission for Asia and the Pacific (ESCAP) and AIT signed an agreement on 3 February 2021 whereby the Partner Institution agreed to implement project activities, including the development of an e-learning capacity-building and content on the use of the NEXSTEP tool for SDG7 Roadmaps and SDG7 implementation and localization. Expected outcomes of the partnership are: (i) development of a comprehensive package of content for an e-learning capacity development portal for NEXSTEP; (ii) design and production of content in alignment with the requirements of the iLearn e-learning portal; (iii) preparation of a summary of findings, observations, and recommendations for further improvement of e-learning instructions on SDG7 implementation; (iv) reviewing and contributing to e-learning content for national and

subnational government officials and other stakeholders in SDG7 localization; and (v) providing substantial expert inputs, particularly to the aims of SDG7 and stakeholder engagement as well as strategies for SDG7 localisation for cities and local governments. The highlights of this partnership have two aims: (i) developing the materials and content needed to develop the e-learning module; and (ii) liaising with the team behind the selected online e-learning portal to ensure smooth implementation of the content onto the portal. The online courses (see screenshots below) developed under this project, can be found at:

🌐 <https://energy-elearning.unescap.org>

✉ extension@ait.ac.th

The screenshots show the ESCAP Energy e-learning platform interface. The top navigation bar includes links for Home, About, Courses, News & Events, Forum, Knowledge Products, Partners, and Contact Us. Below the navigation is a large banner image of a city skyline at night.

Module 1: Agenda 2030 and SDG Localization

This module covers the Sustainable Development Goals and their relationship to the SDG7 Localization Project. It includes a brief introduction and a link to Module 2: Enabling environment and institutions in SDG Localization.

Module 2: Enabling environment and institutions in SDG Localization

This module focuses on the enabling environment and institutions required for SDG7 localization. It includes a brief introduction and a link back to Module 1.

🔍🤝 3RD YOUTH ENERGY ACADEMY 2021



The Regional Resource Center for Asia and the Pacific organized the 3rd Youth Energy Academy (YEA) in collaboration with the Sustainable Energy Youth Network (SEYN), Yunus Thailand and other partners with the support from Konrad Adenauer Stiftung (KAS). YEA gathered 20 young women and men from five countries into six teams for an innovative program that combined theoretical and technical virtual sessions and tours with practical in-person joint activities. The week considered the concepts of decentralized renewable energy technologies and their contribution to addressing energy-related challenges in communities. This year, YEA also awarded a small grant prize of €1,000 to support one of the teams' project ideas.

During the week from 11 to 17 October 2021, YEA participants discussed various aspects of co-designing, organizing, and building small-scale solar energy systems with the goal of fostering leadership and a can-do attitude toward youth-led projects in communities. With on-site support from YEA Alumni Mentors, participants engaged with various tools and activities to understand the real-life problems faced by communities, explore solutions, design business models, and look into financing and mobilizing resources for implementing their project ideas. The workshop challenged participants to work as a team, be creative, and try new approaches without fear of failure. Virtual tours to projects in the vicinity of AIT helped teams to gather insights (business models,



challenges, successes) from real projects implemented in communities.

On the last day, participants were invited to pitch their refined project ideas using the tools learned during the Academy and competed for an award. With a jury panel including practitioners from GIZ, C40 Cities, Yunus Thailand, and Grameen Shakti, the Pico Streamers team from Pakistan was awarded the prize for their project on the Design and Implementation of Pico-hydro Turbines in Utror Valley, Pakistan.

- 🌐 <http://www.rrcap.ait.ac.th/Pages/event.aspx> or
- 🌐 <https://www.climatechange.rrcap.ait.asia/energy-academy>



SUSTAINABLE HYDROPOWER DEVELOPMENT [CE74.9007, 3(3-0)], SCHOOL OF ENGINEERING AND TECHNOLOGY (SET), JANUARY SEMESTER 2021



The objective of this course is to provide students with updated knowledge of hydropower planning, development, and management along with their socioeconomic and environmental impacts. The course provides methods and tools for assessing impacts from hydropower development and planning hydropower projects in the best possible way at local, national, and regional levels.

On completion of this course, students will be able to: (i) apply principles of sustainability in planning, development, and management of hydropower projects; (ii) assess the socioeconomic and environmental impacts of hydropower development and management; and (iii) apply the methods and tools learned for planning sustainable hydropower projects.

ANALYSIS OF GRID CODES AND REGULATIONS TO SUPPORT TRANSMISSION STABILITY AND RELIABILITY, REGIONAL POWER TRADE AND VRE INTEGRATION IN SOUTHEAST ASIA



The objective of these tasks was to recommend a minimum grid code for Southeast Asian countries to be adopted by ASEAN member states to: (i) improve stability and reliability of the domestic grids and interconnections in Southeast Asia; (ii) facilitate bilateral and multilateral power trade in the region; (iii) increase the ability of power grids in SE Asian countries to accommodate higher levels of variable renewable energy (VRE); (iv) compare the recommended grid code to the grid code adopted by the Greater Mekong Subregion (GMS); and (v) analyze the gap between Southeast Asian countries' existing grid codes and the recommended grid code. The aim is to:

- ▶ Provide high quality postgraduate education on energy supply systems in countries with many isolated areas and insular systems;
- ▶ Establish a number of Masters courses combining the experience of EU and Asian countries with huge renewable energy potential;
- ▶ Focus on Southeast Asian Countries; and
- ▶ Support management of energy resources in isolated power systems, increase energy efficiency, utilize renewable energy sources, energy storage, demand side management, and demand response, and grid maintenance techniques and financial and economic tools for energy access to isolated areas.



YOUTH ENERGY ACADEMY – RRCAP



YCA's partnership with the Regional Resource Center for Asia-Pacific (RRCAP), Konrad Adenauer Stiftung (KAS), and the Sustainable Energy Youth Network (SEYN) is entering its third year. As part of this social innovation initiative for young community workers, students, and professionals, YCA continues to deliver the Social Business component of the Youth Energy Academy (YEA). During YEA's third iteration, YCA contributed content and facilitated learning sessions on business development and sustainability attended by 19 young renewable energy entrepreneurs and professionals from five countries across Asia engaged in building innovative solutions to provide access to energy. The YEA program is expected to be further scaled-up in 2022, bringing in more young entrepreneurs connected through a continuously growing alumni network.

Youth Energy Academy



SUSTAINABLE ENERGY CONSUMPTION ON CAMPUS

In 2021, AIT's overall electricity consumption was 9,399,600 kWh, down by 7% from the previous year, of which 35% was used for chiller operations, 27% for academic use, 17% for residential purposes, and 21% other facilities operations. AIT has an installed capacity of 50 kW rooftop photovoltaic (PV) units with an average solar electricity generation capacity of 200 kWh/day, which supplies power to the Institute's library. In 2021, the PV system generated 62,987 kWh of electricity. AIT also extended its solar energy generation of 4.2 kW to a 12-kW rooftop PV in October 2019 in one of the academic buildings, with average solar electricity generation of 50 kWh/day. In 2021, the PV system generated 13,244 kWh of electricity. AIT is currently coordinating with local partners and companies over the feasibility of generating the major part of its power consumption from renewable solar energy by installing



PV systems throughout the campus. Two AC/DC electric vehicle fast-charging stations were installed at AIT in collaboration with EA (Energy Absolute) in 2018, the only facility of its kind in AIT and vicinity. The installation of two EV-charging stations at AIT is intended primarily for research purposes and to encourage the community to use electrical vehicles, a small step toward a carbon-neutral smart campus. On 8 December 2021, the AIT Sustainability Policy was announced, with a target of reducing non-residential electricity use by 15% in 2026 from 2022 levels, increase local renewable electricity generation (and possible storage) to 15% by 2026 from 2022 levels, reduce fossil fuel consumption by 15% by 2026 from 2022 levels, reduce overall energy expenditure by 12% by 2026 compared to 2022 levels, and be carbon neutral by 2040.





8 DECENT WORK AND ECONOMIC GROWTH



PROMOTE SUSTAINED, INCLUSIVE AND SUSTAINABLE ECONOMIC GROWTH, FULL AND PRODUCTIVE EMPLOYMENT AND DECENT WORK FOR ALL

IT was active throughout 2021 in collaborating with international researchers and institutions in expanding job creation and income generation sustainably through the Green Office initiative, the Yunus Professional Masters in Social Business & Entrepreneurship, and participation in the Executive Masters in Development Policy and Practice to induct and train future leaders in the social business field

alongside self-identified entrepreneurs. Other efforts included an international webinar on entrepreneurship in seaweed cooperatives, partnering the FAO in promoting aquaculture innovations across the region and beyond, and promoting agricultural product quality, value addition, and market linkages in regional highlands and Asian Special Economic Zones.

VIRTUAL WORKSHOP ON OPPORTUNITIES AND CHALLENGES FOR A BLUE ECONOMY IN THE ASIA-PACIFIC REGION DURING COVID-19



A two-day (2-3 February) workshop was jointly organized by the Energy and Resources Institute (TERI), Konrad Adenauer Foundation (KAS), and Asian Institute of Technology (AIT). The workshop aimed to examine the numerous opportunities and challenges that stand before the Asia-Pacific Blue Economy framework and exert considerable influence on regional cooperation, resource security, science and technological cooperation, and sustainable development in the region. The virtual workshop specifically discussed and examined opportunities and challenges for the Asia-Pacific Blue Economy framework that impinge

on regional cooperation, resource security, scientific and technological cooperation, and sustainable development. The focus of the discussions was to deliberate on interlinkages and potential cooperation in the geopolitical, economic, and sustainable development landscape of the region. Furthermore, four doctoral students from AIT's Water Engineering and Management program participated as young panel discussants in different sessions of the Virtual Workshop.

 <https://bit.ly/3ze5RK9>



UPDATING KNOWLEDGE ON THE GREEN OFFICE



Green Office auditing and training was conducted online for 12-15 staff members of Friedrich-Ebert-Stiftung (FES). Before the training and auditing, trainer and AIT Vietnam Center (AITCV) staff visited the FES Hanoi office. The team observed all working rooms, warehouse, IT room, and surroundings (garden).

Five years ago, AITCV organized training and consulting services regarding the Green Office and was granted a certificate. At the time, service focused on updating knowledge on the green office, including transportation, stationary used, the working environment and landscape, green purchasing, etc.).

Due to the complexities introduced by the COVID-19 pandemic, all workshops on updating knowledge on the Green Office were conducted online using the Zoom Platform. During the workshop, participants were encouraged to interact with the trainer and facilitator. Five training sessions were conducted through such meetings.

<https://bit.ly/3uOgyQJ>





YUNUS PROFESSIONAL MASTERS IN SOCIAL BUSINESS & ENTREPRENEURSHIP



YCA's signature program, the Yunus Professional Masters (YPM) in Social Business & Entrepreneurship, officially launched in March 2021, admitted its first cohort in the Fall semester. YPM is accredited jointly by AIT's School of Environment, Resources, and Development (SERD) and School of Management (SOM). The degree combines mainstream sustainability courses from SERD, MBA courses from SOM, and a Social Business Practicum co-delivered by YCA and YT. Equipped with academically robust fundamentals and exposed to practical aspects of business, YPM students have

the opportunity to attend masterclasses by Professor Yunus. In the final Sandbox semester, YPM students prepare social business plans that will launch them into a lifelong journey of social business entrepreneurship. The YPM pace is swift and rigorous and attracts students with trans-disciplinary interests who are self-directed, goal-oriented, and motivated to make a difference in society. The first YPM cohort has proven its mettle, with all students publishing at the international level and their projects being recognized within and outside AIT.

Yunus Professional Masters in Social Business and Entrepreneurship

Hosted by the Yunus Center AIT
offered jointly by the School of Environment, Resources & Development and the School of Management, with the Yunus Thailand Foundation

[Apply Now](#)



We welcome prospective students to study with us, fellow faculty, researchers, partners and collaborators to collaborate with us, and community members to engage in our action research, as we achieve our common goal of sustainable development."

- Professor Shobhakar Dhakal
(Vice President for Academic Affairs)

MASTERS IN DEVELOPMENT POLICIES & PRACTICES – GRADUATE INSTITUTE, GENEVA



YCA continued to host the Southeast Asia regional module of the Graduate Institute, Geneva's Executive Masters' program on Development Policy and Practice (DPP) for the 2021-22 academic year amidst pandemic-related challenges.

This year, 13 DPP scholars from Cambodia, Laos, Myanmar, Vietnam, and the UK came through the program. The program was held virtually because the AIT campus was closed. The next iteration will see DPP scholars and international faculty return to AIT for the South Asia module.





🌐🤝 OYW LEADERSHIP PROGRAM – CP GROUP



YCA's aim of promote social business role models in Thailand's private sector continued to gain momentum, led by YCA partners of the Yunus Thailand Foundation. The pandemic provided the backdrop for ongoing work with the CP Group, which involves building awareness and competencies of identified future leaders in the social business field and incubating impact-driven

"intra-preneurial" ventures for member companies of the group. Every year, the Yunus-supported leadership program prepares CP group nominees to represent Thailand on the international stage at the One Young World (OYW) Summit. The program was piloted in 2020 and inducted its second cohort in 2021.

🌐🤝 THREE ZEROS CLUB – YUNUS CENTER NETWORK



YCA is part of the latest youth movement launched by Professor Yunus to encourage a move toward a World of 3 Zeros: Zero Poverty, Zero Unemployment, and Zero Net Carbon Emissions through the social business approach. Poverty is combatted primarily through addressing issues of inequality, which is by definition a multidimensional challenge. Unemployment arises from an expectation that there is someone who will provide jobs, whereas Prof. Yunus is convinced that everyone is born an entrepreneur, and given the opportunity, will create gainful livelihoods for themselves. Climate change is an existential challenge for the world, and young people must mobilize to keep carbon emissions in check. The 3 Zero Clubs launched by Professor Yunus in 2021 empower young people to take charge of their future by building or becoming part of vibrant empathy



networks. YCA is a designated mentor for 3 Zeros Clubs in Thailand. The first AIT club was initiated in December 2021.

🌐🤝 INTERNATIONAL WEBINAR ON ENTREPRENEURSHIP DEVELOPMENT OF SEAWEED BUSINESS BY COOPERATIVES



AIT organized an International Webinar on Seaweed Business on 28 January 2021 in collaboration with the Department of Fisheries, Ministry of Animal Husbandry Dairy & Fisheries, Government of India, the Laxmanrao Inamdar National Academy for Cooperative Research and Development (LINAC)-National Cooperative Development Corporation (NCDC), the Department of Agriculture, Cooperative & Farmers' Welfare, Ministry of Agriculture & Farmers' Welfare, Government of India, and NEDAC, Bangkok. The webinar was attended by more than 500 participants from the research and industry sectors from 21 countries including Australia, Bangladesh, Cambodia, Canada, France, Iceland, India, Indonesia, Ireland, Italy, Myanmar, New Zealand, the Philippines, Singapore, South Africa, Thailand, Trinidad and Tobago, the UK, the US and Venezuela. Seaweed forms an important segment of the fisheries and aquaculture industry in maritime nations, contributing substantially to the incomes and livelihoods of coastal communities. Seaweed also provides a range of ecosystem services, including mitigating the impacts



of climate change while providing nutritious food in addition to a variety of industrial and pharmacological applications.

🌐 <https://www.youtube.com/watch?v=UyaW5wZf0dw>

🌐 <https://www.ncdc.in/documents/whats-new/5409180821Booklet-Seaweed-Farming-Entrepreneurship.pdf>



AARM-AIT – FAO PARTNERSHIP ON AQUACULTURE INNOVATIONS



AARM-AIT partnered with the Food and Agricultural Organization (FAO) of the United Nations on various projects reviewing and documenting path-breaking aquaculture innovations in the Asia-Pacific region with potential for further upscaling across the region. Three Letters of Authorization (LoA) were signed for different projects.

 <https://www.aitaquaculture.org/ait-fao-partnership.htm>

Documenting Aquaculture Innovations in Asia

The project's objective was to prepare country reviews to identify some of the most successful aquaculture innovations in six selected Asian countries (China, India, Indonesia, the Philippines, Thailand, and Vietnam). Six regional review reports were prepared as part of this project highlighting aquaculture innovations with socioeconomic and environmental impacts on improving farm productivity and supporting climate change mitigation and adaptation in Asia. The final report highlighting specific aquaculture innovations with potential for dissemination in the Asia-Pacific region is being published as an FAO Technical Paper.

 <https://www.fao.org/asiapacific/events/detail-events/en/c/1720>

Digital Aquaculture Innovations

The project's objective is to document innovations in digital aquaculture technologies and organize Virtual Consultation Workshops jointly with FAO on showcasing these innovations. Three expert consultation workshops were organized, collaborating with 30 researchers and industry leaders involved in developing and practicing innovative aquaculture technologies integrated with information and communication technology tools in the Asia-Pacific region.

 <https://www.aitaquaculture.org/ait-fao-partnership.htm>

Innovations and Good Practices in Health Management in Aquaculture

This project aims to review innovations and good practices in aquatic animal health management and develop a comprehensive report on best practices in aquatic health management in the Asia-Pacific region. The project's main focus was to highlight successful cases globally, eliminating antimicrobial use (AMU), and mitigating antimicrobial resistance (AMR) with potential for dissemination in the Asia-Pacific region. A Virtual Consultation Workshop involving international experts was jointly organized with FAO on 26 October 2021 to finalize the showcasing of aquatic health management. The final report was presented in an International Consultation Workshop organized by FAO on 24 November 2021 as part of the TCP/RAS/3702 Project: Supporting Mitigation of Antimicrobial Resistance Risk Associated with Aquaculture in Asia.

 <https://www.fao.org/asiapacific/events/detail-events/en/c/1809>

SUB-ACCOUNT: CLIMATE CHANGE ADAPTATION IN AGRICULTURE FOR ENHANCED RECOVERY AND SUSTAINABILITY OF HIGHLANDS



The overall project aims to strengthen the capacity of local governments and communities, especially the highland areas of Nan Province, Thailand to address adverse climate change impacts and introduce climate-smart agriculture (CSA) practices and technologies, with four main outputs: (i) capacity to assess climate change vulnerability of highland agriculture improved;

(ii) gender-responsive, climate-smart agricultural practices prioritized and demonstrated; (iii) agricultural product quality, value addition, and market linkages enhanced; and (iv) capacity of local governments and communities to address climate change strengthened. This sub-account caters to Agribusiness Value Chain Improvement activities.



● INCEPTION WORKSHOP ON ASSESSMENT OF GROUNDWATER SUSTAINABILITY IN THE SPECIAL ECONOMIC ZONE OF THAILAND FOR OPERATIONAL GROUNDWATER MANAGEMENT (GISA) ORGANIZED JOINTLY BY AIT AND THE DEPARTMENT OF GROUNDWATER RESOURCES (DGR), THAILAND



An inception workshop for the Assessment of Groundwater Sustainability in the Special Economic Zone of Thailand for Operational Groundwater Management (GISA) joint project was successfully held on 1 December 2021 by AIT and the Department of Groundwater Resources (DGR), Thailand via a virtual platform. The project has been funded by Stockholm Environment Institute (SEI) under the SUMERNET 4 All Program funded by the Swedish International Development Cooperation Agency (SIDA). The main objective of the joint-action GISA project is to assess groundwater sustainability in the Tak Special Economic Zone (SEZ), Thailand for operational groundwater management. The objectives of the inception workshop were to: (i) elicit feedback on the project's objectives, scope, and activities; and (ii) conceptualize and elicit feedback to contextualize the existing Groundwater Sustainability Infrastructure Index (GSII) framework



to be applied in SEZ and to identify opportunities and synergies for collaboration and achieving the project's goals.

🌐 wem.ait.ac.th/inception-workshop-of-gisa-joint-action-project

●握手 HONORARY DIRECTOR OF THE NETWORK FOR THE DEVELOPMENT OF AGRICULTURAL COOPERATIVES IN ASIA AND THE PACIFIC (NEDAC)



Dr. K.R. Salin, from the Aquaculture Program of AIT, was appointed Honorary Director of NEDAC from January 2021. Based in Bangkok, NEDAC is an international network of agricultural cooperatives formed by the UN's FAO, the International Cooperative Alliance (ICA), and

the International Labor Organization (ILO) in 1991. A capacity development project supported by NEDAC was also initiated at AIT.

🌐 <https://nedac.info>

●握手 MEMBER OF THE ADVISORY BOARD, SOUTH-SOUTH AQUACULTURE AND FISHERIES COOPERATION (SSAFC)



SSAFC is a platform for fruitful cooperation in transferring Asian aquaculture experience and know-how to the African region. The Asian network will continually support the African region for the exchange of knowledge via a wide range of annual activities including workshops,

webinars, policy debates, and expos and learning from each other both physically and virtually.

🌐 <https://ssafc.tiikm.com/executive-committee>



INTERNATIONAL VIRTUAL TRAINING PROGRAM ON EMERGING TECHNOLOGIES IN AGRICULTURE AND ALLIED SECTORS FOR COOPERATIVES



An international webinar on emerging technologies in agriculture and allied sectors for cooperatives was organized in collaboration with NEDAC, Bangkok and NCDC, India on 29-30 June 2021. A Lead Technical Session was also held on Advanced Aquaculture Technologies.

 <https://www.ncdc.in/documents/whats-new/0521050621Emerging-Tech-Trg-NEDAC-LINAC-Broc.pdf>

2ND MARINE AQUACULTURE TECHNOLOGY FORUM, TAIWAN



The 2nd Marine Aquaculture Technology Forum was organized by the National Taiwan Ocean University and Worldwide Expo Services (WES) Ltd, Taiwan on 2 December 2021 to establish formal networks among leading aquaculture experts worldwide. The keynote talk on New Aquaculture Development and Pandemics: Enhancing Productivity Through Smart Technologies was presented by Dr. K.R. Salin, AARM-AIT.

 <https://www.accupass.com/event/2110280145191574454217>





9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



BUILD RESILIENT INFRASTRUCTURE, PROMOTE INCLUSIVE AND SUSTAINABLE INDUSTRIALIZATION AND FOSTER INNOVATION

AIT promotes industrial innovation in areas of direct relevance to sustainability in collaboration with regional educational institutions and by taking part in campus-wide and international competitions designed to identify and support innovative entrepreneurial solutions to societal challenges. In 2021, AIT-sponsored projects focused on housing development and community management for low-

income populations, application by AIT Solutions and collaborating institutions from the Netherlands and South Korea of structural engineering software both on- and off-shore, and the publication of an industry magazine dedicated to smart solutions in civil engineering. The Meet the Expert talk series and webinars also addressed greater efficiency in solar panel technology and disaster resilience infrastructure.

HOUSING DEVELOPMENT AND COMMUNITY MANAGEMENT FOR LOW- AND MEDIUM-INCOME POPULATIONS DURING THE COVID-19 PANDEMIC



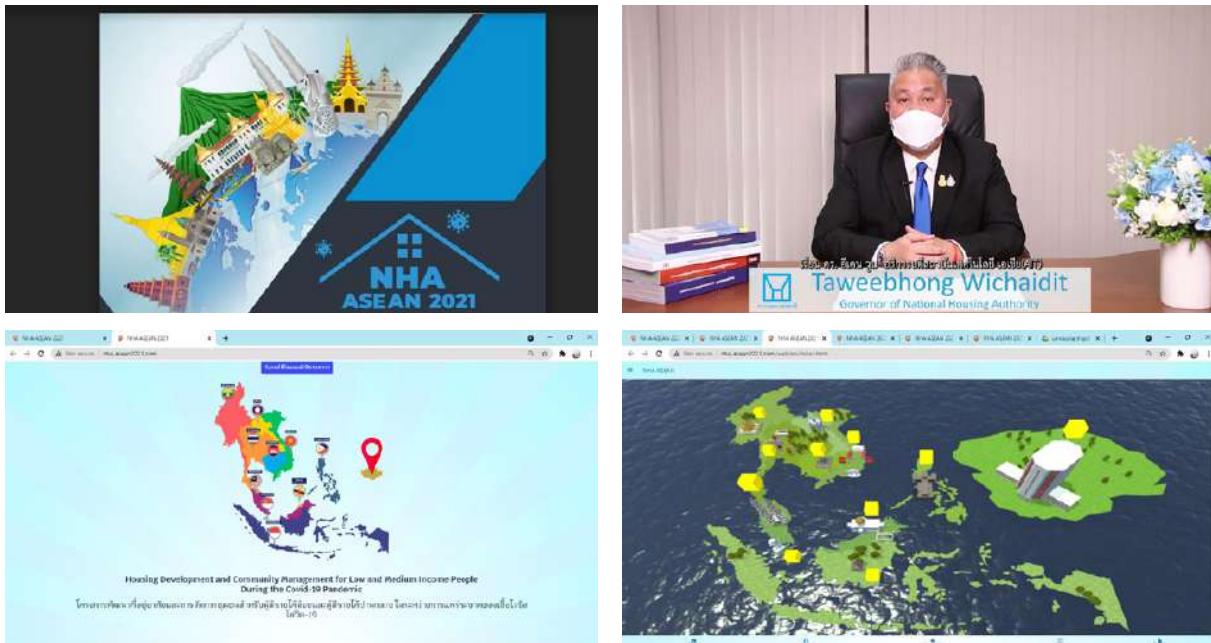
The online event titled Housing Development and Community Management for Low- and Middle-Income People during the COVID-19 Pandemic was jointly organized by the National Housing Authority, Thailand and AIT on 27 September 2021. The event built upon the theme of ASEAN 2021 We Care, We Prepare, We Prosper and brought together information from international and national agencies, government stakeholders, and experts from relevant fields to collaborate and explore policies and solutions to address current housing vulnerability.

This online event was in continuation of the seminar organized in 2020, also jointly organized by the National Housing Authority, Thailand and AIT, which focused on "Building Back Better Housing Solutions Post COVID-19.

The online event provided a platform for exchange of expert ideas as well as local and regional expertise and information in the form of:

- ▶ Expert presentations on research and development in easy-to-adopt housing solutions;
- ▶ Talks on policies encompassing principles of social and economic inclusions; and
- ▶ Knowledge sharing by ASEAN country representatives on initiatives undertaken to alleviate housing vulnerabilities.

Expert presentations, talks on policies, and knowledge sharing activities were designed to encourage dialogue and collaborative exchanges in order to identify policies and legislations needing to be created, implemented, or strengthened to alleviate concerns over housing security and identify steps to be taken in designing innovative housing space that caters to the changing dynamics of financial and housing security of renters and homeowners.



ENHANCEMENT OF STRUCTURAL ENGINEERING SOFTWARE WITH SCG CEMENT-BUILDING MATERIALS CO. LTD. THAILAND



AIT Solutions (AITS) initiated Phase 3 of the Enhancement of Structural Engineering Software in collaboration with SCG Cement Building Materials Co. Ltd., Thailand. This phase is in continuation of the earlier phases, when AITS focused on aspects ranging from initialization of the project and setting design criteria to preparation of the final print drawings, design report, etc. Overall program use also included generating a roof canopy model, including: (i) adding and defining trusses, rafters, etc.; (ii) analyzing truss design; (iii) reviewing truss analysis and design results; and (iv) generating drawing details. The program also included the option of editing trusses and drawing details. In the following phase, AITS focused on improvement to the existing application with emphasis on user interface, design functionality, detailing and drafting, and reporting. The current phase focuses on enhancing the existing version currently running on Visual Basic (VB.NET) C# for user interface and .NET for the CAD Engine. This phase focuses on the development of new features, co-development of software, and knowledge transfer activities.

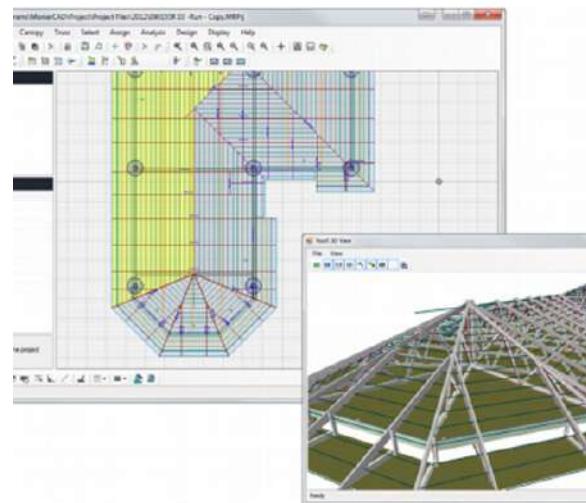


Figure: Screenshot of the software.



ENHANCEMENT OF OFFSHORE STRUCTURAL ANALYSIS SOFTWARE, SOUTH KOREA



AIT Solutions is working with XFINASIT Co. Ltd. South Korea for the enhancement of offshore structural analysis software in order to increase its design productivity by achieving basic requirements, including improving the user interface, upgrading software libraries, and improving software functionalities. The project focuses on:

- ▶ Enhancing the software process for lateral wind load, solid load, pushover analysis, SFD and BMD, and design codes;
- ▶ Improving the AutoCAD embedded software for turbines;

- ▶ Developing ZWCAD-embedded software for turbines;
- ▶ Developing diffraction wave theory programs;
- ▶ Developing web-based programs for OpenFAST;
- ▶ Developing a cloud computing system for turbine analysis;
- ▶ Developing web server programs; and
- ▶ Improving structural analysis programs.

RISKCHANGES SPATIAL DECISION SUPPORT SYSTEM (SDSS) DEVELOPMENT



AIT's GeoInformatics (GIC-AIT_) has been working together with ITC-University of Twente (The Netherlands) to develop a multi-hazard risk assessment platform called RiskCHANGES. The aim is to understand present and future risks and recommend potential risk reduction measures in order to assist in decision-making. Risk CHANGES comprises five modules: (i) a Risk Assessment Module, which performs spatial risk analysis for a range of complexities; (ii) a Data Input & Management Module, which handles data utilized by the platform; (iii) a Cost-Benefit Module, which assists in choosing the best alternative risk reduction measures; (iv) a Multi-criteria

Evaluation Module, which conducts qualitative risk assessment; and (v) a Communication & Visualization Module, which displays maps, risk curves, tables, and graphs related to risk communications. Datasets for selected locations such as at-risk elements, hazard maps, and vulnerability-related information have been uploaded to calculate multi-hazard risks in the platform, which will be expanded in the future.

- ▶ RiskCHANGES spatial decision support system website: riskchanges.org
- ▶ RiskCHANGES application: riskchanges.org/app/#





TECHNOLOGY MAGAZINE: SMARTER SOLUTIONS AND CIVIL ENGINEERING: THE NEXT DECADE AND BEYOND



In 2021, AIT Solutions published two issues of its Technology magazine, the March 2021 and December 2021 issues. Under the theme of Smarter Solutions, the March 2021 issue focused on bringing an industry and societal perspective to the challenges we face in building infrastructures, balancing environment and economic growth, deploying digital technologies, and all of these challenges can be addressed through research-based smarter solutions. The issue provided a glimpse into the multifaceted world of research-based innovative solutions in various sectors by bringing together research, solutions, and discussions from experts and authors in the field of wind engineering, water engineering, nanotechnology, urban environment management, and construction management. Some of the studies discussed in the issue included application of nanotechnology in infrastructure and medicines, satellite-based monitoring and conservation of the earth's freshwater resources, applying the circular economy, rethinking and redesigning our consumption patterns and waste management, and deploying digital technologies for construction management.

Under the theme of Civil Engineering: Next Decade & Beyond, the December 2021 issue focused on some of the technologies and civil engineering processes that may be used by civil engineers for future proofing of our built environment. Some of the topics discussed in the issue included: (i) high-quality modeling, tsunami

simulation, and virtual reality on smart devices to ensure smooth evacuation experience; (ii) resilience-based designs that assess performance quantitatively in a holistic approach in terms of structural and nonstructural components to enable swift recovery after exposure to seismic hazards; and (iii) sustainable practices that can be incorporated in the new working environment as well as the ways digital technologies can provide the needed learning systems to help in training the engineers for the future.

🌐 <http://solutions.ait.ac.th/kps/magazines/>



Technology Magazine

AIT TECH TALKS: STRUCTURAL ENGINEERING – FUTURE PROOFING OUR BUILT ENVIRONMENT



AIT Solutions co-organized with the AIT Enterprises Alliance, AIT Tech Talks: Structural Engineering – Future Proofing our Built Environment. The talk focused on the future trends, innovations, and developments in structural engineering that will guide in designing and developing safe and resilient structures for future generations. The talk joined by over 350 participants from South-East Asia and South Asia involved Keynote Talks and Forum Discussions. Keynote Talks were delivered by Ashraf Habibullah, Founder, President and CEO of Computer and Structures Inc. USA; Ron Klemencic, Chairman and CEO, Magnusson Klemencic Associates, USA; Dr. Naveed Anwar, Vice President-Knowledge Transfer, AIT; Prof. Pennung Warnitchai, Professor, Structural Engineering, AIT, and Prof. C.V.R. Murty, Professor, Indian Institute of Technology-Madras, India.

The topics that were covered in the Keynote Talks and the Forum Discussions included:

- ▶ Beyond Concrete Core Wall Buildings: The Freedom of Performance Based Design!
- ▶ Developments in Structural Engineering: Software and Technologies.
- ▶ Recent Research Studies at AIT on Earthquake Engineering, Vibration Control, and Structural Health Monitoring.
- ▶ Building Competence in Structural Engineers of the Future.
- ▶ Performance-based Seismic Design.
- ▶ Wind Tunnel Testing.
- ▶ Structural Assessment of Existing Buildings.

🌐 <http://solutions.ait.ac.th/ait-tech-talks-structural-engineering-future-proofing-our-built-environment/>



AIT Tech Talks poster



AIT Tech Talks Zoom photos

ANTI-REFLECTIVE COATINGS FOR SOLAR PANELS



Solar energy is one of the most powerful renewable energy sources available to mankind. To harvest solar energy, solar panels are used, and anti-reflective coatings are an essential component in order to minimize optical losses. However, most anti-reflective coatings are complex to design, costly, and degrade with time, leading to reduction in the performance of the panels and increased maintenance costs. This project aims to develop an innovative nano-structured anti-reflective coating for commercial solar panels to improve their performance by reducing optical losses and ensure affordable and clean energy production by reducing both maintenance costs and energy pollution. The goal is to identify an eco-friendly technological solution for the deposition of green and robust anti-reflective coatings on solar panels and demonstrate an economically

viable proof-of-concept for future sustainable business development in the solar energy sector. The project is funded by Neon Infotech SEA Co. Ltd.



MULTI-HAZARD RISK INDEXING OF COASTAL CRITICAL INFRASTRUCTURE: A CASE STUDY FROM THAILAND



Multi-hazard risk assessment of Coastal Critical Infrastructure influences investment decisions and risk-informed planning for sustainable infrastructure development. This research addresses one of the complex Disaster Resilience Infrastructure (DRI) challenges for the critical infrastructure typology as well as risk assessment techniques. Thailand must invest in building such resilient infrastructure as any breakdown in these systems may have devastating impacts on public functioning, safety, and resilience. Clear understanding of different degrees of risk to physical infrastructures and investment decisions by investors, multilateral funding agencies, businesses, and national governments is paramount for the sustainable development of the region. It is therefore important to identify risks to critical infrastructure and to address them by building long-term resilience into the system. The proposed project intends to assess risks to coastal critical infrastructures of Thailand. The study primarily focuses on risk assessment of Thailand's Eastern Economic Corridor.

<https://fellowship.cdri.world/fellowship-batch-2021.php>



Key Informant Interview at Burapha University, Thailand



Interview in Chonburi, Thailand



MEET THE EXPERT TALK SERIES – 2021



The global uncertainty resulting from the COVID-19 pandemic provided a renewed focus for AIT Solutions (AITS) to develop knowledge-sharing programs that will benefit professionals with varied levels of experience. AITS started a Talk Series that brought together leading experts in civil engineering and allied fields to share their experience, tools, practices, and processes. These Talk Series are titled Meet the Expert as it brings together knowledge from experts and practitioners from a range of institutions that include the private sector, international organizations, and academia. The Talk Series started in October 2020, and since then, this platform has provided participants with engaging engineering-related talks, best practices, and innovative and effective problem-solving ideas. This Talk Series has provided participants from Southeast Asia as well as other parts of the world with exposure to diverse knowledge resources over a connected platform. Some of the talks that have been given include:

- ▶ Yahya Jan, President & Design Director, NORR Group: Design of Ciel Tower, Dubai
- ▶ Ron Klemencic, Chairman & Chief Executive Officer, Magnusson Klemencic Associates: "Always Striving for Better"
- ▶ Prof. C.V.R. Murty, Indian Institute of Technology Madras, India: "Shear and Flexure and Earthquake Resistant Structures"
- ▶ Stefano Cammelli, Technical Director, Wind Engineering, WSP UK Ltd.: "Tall Buildings: Wind, Forms, and Structures"
- ▶ Prof. Priyan Mendis, Professor of Civil Engineering, University of Melbourne, Director of Australian Research Council's Center of Prefabricated Buildings, Australia: Prefabricated Modular Construction"

- ▶ Dirk Bondy, President, Seneca Structural Engineering Inc. USA: Strengthening and Repair of Existing Structures Using External Post-tensioning"
- ▶ Antonino Clodoaldo S. Aligaen, Head, Technical Execution Group, Federal Land Inc., Philippines: During the Pandemic: Don't Work Hard, Work Smart"
- ▶ Dr. Erol Kalkan, CEO and Founder, Quakelogic: "Next Generation Structural Health Monitoring and Smart Cities"
- ▶ Dr. Christian Meinhardt, Director, TMD Systems, GERB: "Vibration Control Systems: Supplementary Damping for High-rise Buildings"
- ▶ Prof. Fumio Yamazaki, Professor Emeritus, Chiba University, Japan and Research Fellow at the National Research Institute for Earth Science and Disaster Resilience, Tsukuba, Japan: "Monitoring and Sensing Technologies of Earthquake Engineering in Japan"

🌐 <http://solutions.ait.ac.th/kps/expert-talks>

Why this topic?

- Sustainable infrastructure and built environment - holds the key to designing and implementing projects that are aimed at reducing the negative impacts (e.g. climate change) while enhancing positive effects (e.g. services)
- Infrastructure is more than just roads and buildings, but as an interconnected system
 - Forms the backbone of a functioning society - from connectivity to migration to climate change and touches every aspect of human life.
 - Affects 92% of targets across all the Sustainable Development Goals.
 - It connects populations with education and job opportunities.
 - It drives economic growth and job creation.
 - It can help to reduce inequality and sustain peace.
- Built environment is where we live and spend most of our time.
- A sustainable built environment is circular, designed for longevity, flexibility, adaptability, assembly, disassembly, reuse and recyclability, and considers future climate risks.

Event photos

IMPLEMENTATION OF INTEGRATED GEOSPATIAL PLATFORM, DATABASE, AND APPLICATIONS FOR DISASTER RISK MANAGEMENT IN UTTARAKHAND (DSS – UTTARAKHAND)



In 2013, a destructive cloudburst in the northern Indian state of Uttarakhand prompted the World Bank to provide assistance through the Uttarakhand Disaster Recovery Project. Under this endeavor, AIT's GeoInformatics (GIC-AIT) worked with the Uttarakhand State Government to develop a decision support system for disaster risk management. The system features an online geospatial platform that facilitates monitoring and responding to disasters. The platform accesses a consolidated

database comprising baseline data and model outputs as well as direct-feed, real-time data to facilitate informed decision-making for Uttarakhand's state-run Emergency Operation Centers. AIT-GIC is also engaged in local capacity building for operation and maintenance of the platform.

🌐 <http://dss.geoinfo.ait.ac.th/SaigaiTask>



APPROPRIATE COSTING METHODS FOR CLIMATE CHANGE ADAPTATION IN INFRASTRUCTURE DEVELOPMENT: EXPERIMENTAL STUDIES FOR ROAD AND RELATED INFRASTRUCTURE PROJECTS IN CAMBODIA (CAMI)



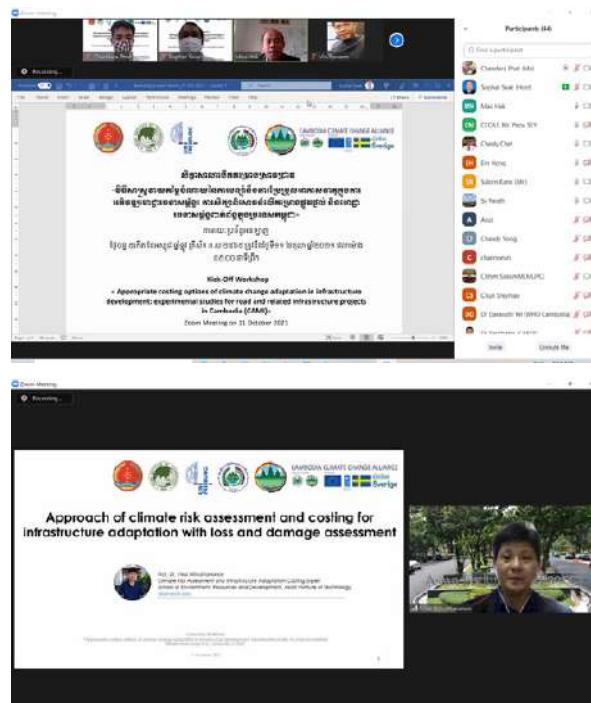
The aim of this project is to enhance the climate resilience capacity of roads and related development sectors in Cambodia. The key project outcome is the analysis of damages and losses and adaptation costs due to impacts of climate change incorporated into development planning of roads and related infrastructure programs in Cambodia.

The project conducts estimations of damages and losses due to climate change affecting roads and analyzes related infrastructures (national and rural roads, bridges, culverts, small scale irrigation systems, and related infrastructures). This includes;

- ▶ Cost and benefit analysis of roads and related infrastructures utilized (for two scenarios: without and with climate change adaptation measures, including climate projections; and
- ▶ Practical tools and methods for Ministry of Public Work and Transport (MPWT) and Ministry of Rural Development (MRD) officers to analyze adaptation-related financial costs affecting roads, small-scale irrigation, and related infrastructures.
- The road network in Cambodia extends over more than 61,000 km, of which 16,292 km is categorized as national and provincial roads and managed and developed by MPWT and 45,242 km as rural roads under mandate of MRD.
- Due to impacts of climate change coupled with poor design and lack of climate-resilient planning consideration, these road networks are severely damaged each year, and many sections of roads are cut off during heavy rainfalls.
- The goal of the project is to "Enhance the climate resilience capacity of roads and related development sectors in Cambodia. The key project outcome is the analysis of damages and losses and adaptation costs due to impacts of climate change incorporated into development

planning of roads and related infrastructure programs in Cambodia."

- We proposed analyzing damages and losses as well as various methods for costing climate change adaptation measures for roads and related infrastructure projects alongside MRD, MPWT, sub-national authorities, and local communities in proposed research sites in Kampong Thom, Pursat, Kratie, Prey Veng and Kampot provinces, including cost and benefit analysis of climate change for road and infrastructure design, maintenance, and performance. This will explore costs for two scenarios (with and without climate change) incurred in their implementation.





PROMOTING ESG BEST PRACTICES FOR SUSTAINABLE MANUFACTURING – USAID



Since December 2020, YCA has co-led the Mekong Sustainable Manufacturing Alliance (MSMA), a strategic regional capacity-building project that promotes Environmental, Social, and Governance (ESG) and sustainable manufacturing best practices in the Apparel, Domestic Appliances, and Food sectors. Beginning with three country studies designed to inform the development of a long-term regional strategy for engaging manufacturers and suppliers with global supply chains with facilities in the region, YCA is now working with lead partners, namely the Institute for Sustainable Communities (ISC) and Elevate, to roll out a cross-credentialed training program for factories and suppliers for major retail brands so as to ensure supply chain integrity and mitigate risk. The three-year MSMA project is supported by specialized inputs from AIT's faculty and experts in the area of gender and development, environmental impact mitigation, and corporate social responsibility.



ESG TRAINING LANDSCAPE & MARKET ASSESSMENT - THAILAND AND VIETNAM
Mekong Sustainable Manufacturing Alliance (The Alliance)

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DISCLAIMER: The authors' views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

WEBINAR ON SUSTAINABLE AQUACULTURE SYSTEMS



Dr. K.R. Salin co-organized a webinar on Sustainable Aquaculture Systems with the Anhui Academy of Agricultural Sciences, China on 13 January 2021 and delivered a presentation on Smart Aquaculture Systems at this meeting, which was attended mainly by academics from AIT and researchers from Chinese universities and research institutes under the Chinese Academy of Sciences. Other presenters from AIT included Dr. Avishek

Datta, Dr. Dong Ha, and Dr. Lumpan Poolsawat from the Department of Food Agriculture and Bioresources. In addition, Dr. Lifat Rahi, Khulna University, Bangladesh and Dr. Kay Lwin Tun, Yangon University, Myanmar also made key presentations in this webinar. The webinar was helpful in establishing a robust academic and research network among scholars in China and Southeast Asia.

VIRTUAL CONSULTATION WITH FISH FEED INDUSTRY AND COOPERATIVES



As a panelist, Dr. K.R. Salin, from AIT's Aquaculture Program, attended the Virtual Consultation with Fish Feed Industry and Cooperatives organized by the Indian Chamber of Commerce (ICC) on 31 August 2021. Aquafeed manufacture and supply is a major segment of the global aquaculture industry as feed accounts for a sizable share (up to 70%) of production costs in aquaculture. India is the world's second largest

aquaculture producer, with several international manufacturers establishing operations in the country. ICC organized this brainstorming session to gather inputs from industry stakeholders and experts on how to strengthen the resilience of India's aquafeed industry in the face of emerging global challenges and make it more accessible to smallholders and cooperatives.



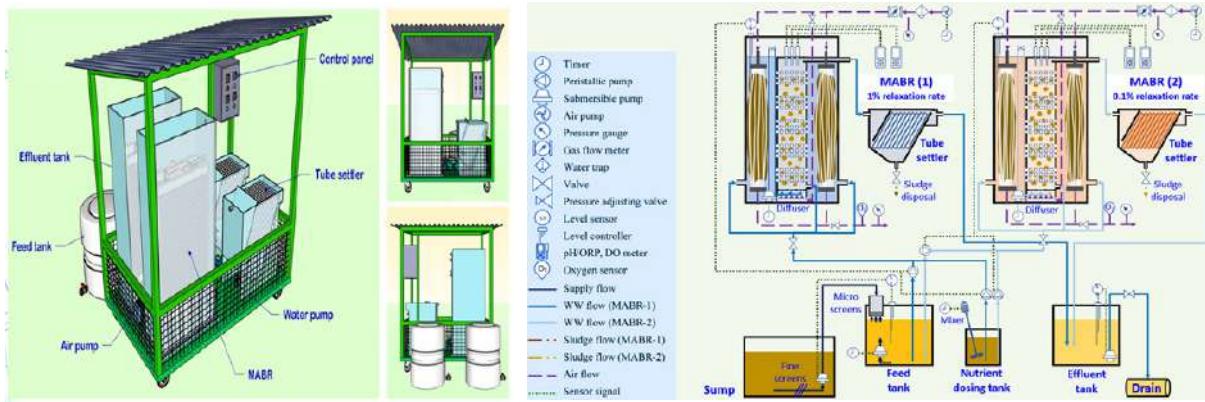
TREATMENT OF WASTEWATER USING PILOT SCALE MEMBRANE AERATED BIOFILM REACTOR (MABR) [AIT- MITSUBISHI V]



The aim of this AIT project is to develop a pilot-scale Membrane Aerated Biofilm Reactor (MABR) capable of removing organic matter and total nitrogen in domestic wastewater that can be scaled up and applied worldwide.

- Membrane Aerated Biofilm Reactors (MABR) is a recently developed biofilm technology providing effective simultaneous nitrification and denitrification in the same reactors;

Reactor Setup at AIT



NANO-ASSISTED BIOREMEDIALTION OF DIFFUSED DIOXINS IN SOIL AND SEDIMENT



This project aims to reduce residual dioxin contamination in soils and sediments from the past use of Agent Orange during the Vietnam War. Dioxins will be removed from contaminated soils and sediments via anaerobic and aerobic metabolism by microorganisms using a novel stepwise procedure of sequential anaerobic-aerobic biodegradation. In anaerobic conditions, certain anaerobic bacteria can remove chlorine atoms from dioxin molecules and convert them into lower chlorinated congeners through reductive dehalogenation. A stepwise process of anaerobic followed by aerobic biodegradation can ultimately destroy dioxins in soils and sediments, eliminating the need for additional steps to handle pre-concentrated dioxins in plants or other media. Nanoscale Zero Valent Iron particles are also reportedly efficient at removing arsenic from environmental matrices. While it is not the main focus of this project, the team will also monitor arsenic before and after remediation to determine whether there are any secondary benefits from using this remediation approach.

Previous experiments conducted at AIT (Binh et al. 2016) showed that sequential anaerobic-aerobic biodegradation could remove 60% of 2,3,7,8-TCDD from contaminated soil after 23 weeks by using enriched indigenous microorganisms from dioxin-contaminated

- This study will conduct identification of effects of membrane structures on the oxygen transfer rate and the removal of COD and nitrogen in pilot-scale MABR systems.
- In addition, the evaluation of effects of combination with GNOF-Chitosan in the improvement of nitrogen removal will also be checked.



sediments in Bien Hoa Airbase alone. Building on past experience, this project will first conduct lab-scale experiments to determine optimal conditions for dioxin removal and then conduct pilot-scale experiments on contaminated soils and sediments onsite at the Bien Hoa Airbase. The aim is to include a range of diffused dioxin levels, from below 1000 ppt to a few parts per billion (ppb). A design for full-scale treatment will be prepared and proposed for future application in bioremediation with consideration of the actual pollution situation and local climate.

 https://aitcv.ac.vn/en/pj_dioxin/



10 REDUCED INEQUALITIES



REDUCE INEQUALITY WITHIN AND AMONG COUNTRIES

AIT works toward reducing inequalities by conducting collaborative research on gender in a context of social, political, economic, cultural, and technological change. The Institute is proud of its record in attracting students from rich and poor countries alike, almost half of them women, many of them on scholarships. In 2021, AIT co-hosted the United Nations World Environment Day Celebration, which promotes

worldwide awareness and action for positive change in how individuals, families, and institutions consume with a view to developing greener models and reducing inequalities across populations. Specific AIT actions included a rural sustainability program and capacity development for agricultural cooperatives in Asia-Pacific and Africa.

STUDENTS FROM 35 COUNTRIES JOINED AIT FOR THE AUGUST 2021 SEMESTER

In 2021, of a total of 4,894 applications received, 706 new students from 43 countries enrolled at AIT, including 35 exchange and visiting students.

In the January 2021 semester (including the March 2021 term), 121 new students enrolled from 24 different countries from five different regions of the world: North America, Southeast Asia and the Pacific, South Asia, Africa, and Europe. Of these, 49% enrolled in the School of Engineering and Technology (SET), 33% in the School of Environment, Resources, and Development (SERD), and 18% in the School of Management (SOM). Approximately 50% of students were women. Of this intake, 21% received scholarships (full subsidy for tuition fees), 43% received AIT scholarships (partial tuition

subsidy), and 36% were self-supporting or supported by external donors.

In the August 2021 semester (including the June and October 2021 terms), 585 new students were enrolled from 35 countries from five different regions: 61% from Southeast Asia and the Pacific, 31% from South and West Asia, 3% from East and Central Asia, and 5% from Europe and Africa. Of these, 42% were enrolled in SET, 30% in SERD, and 30% in SOM. 42% of these students were female. Of this intake, 22% received full scholarships including living allowances, 12% received scholarships for tuition and registration fee only, 2% were funded by external donors, 48% received AIT fellowships, and 16% were self-supporting.



UNITED NATIONS WORLD ENVIRONMENT DAY CELEBRATION



Co-hosted by AIT, this UN flagship day aims to promote worldwide awareness and action for the environment. WED offers a global platform for inspiring positive change. It encourages individuals to think about the way they consume, businesses to develop greener models, governments to invest in repairing the environment, and young people to build a greener future.



🔍🌐 RURAL SUSTAINABILITY PROGRAM – APAC INITIATIVE FOR REGIONAL IMPACT



AIT was engaged in the design and delivery of the key components of the Rural Sustainability Program:

- ▶ Intellectual Exchange - to build an Asia-Pacific consortium of action research institutions engaged in rural-urban sustainability; and
- ▶ Talent Pool Incubation - to launch the APAC Rural-urban Sustainability Fellowship Scheme.

The project aims to build a regional network of action research institutions and action leaders for the attainment of rural sustainability in Asia-Pacific.

- ▶ The collaboration is expected to attain the following:
- ▶ A strong regional consortium of reputable action research institutions in Asia-Pacific and a network of local networks of institutions (educational and international organizations, government agencies, social ventures, nonprofits) developed by members of the consortium in specific countries or regions;

- ▶ A one-year empowerment program on rural revitalization and sustainability comprising online and offline learning opportunities as well as residencies in Hong Kong, Bangkok and selected cities in the region;
- ▶ A corps of Change Fellows from the region ready to provide thought leadership and action plans for tackling sustainability challenges;
- ▶ A refined rural sustainability model built upon successful rural revitalization experiences in the region, including the Lai Chi Wo project;
- ▶ An award competition that recognizes and supports the implementation of outstanding innovations put forth by the Change Fellows in tackling sustainability challenges in the region, and;
- ▶ An Asia-Pacific repository of case studies, sustainability solutions, and landscape reports.

🤝🌐 CAPACITY DEVELOPMENT FOR AGRICULTURAL COOPERATIVES IN THE ASIAN-PACIFIC REGION: AIT-NEDAC PARTNERSHIP



AIT partners with NEDAC on various capacity development initiatives targeting the promotion of agricultural cooperatives and educational institutions in NEDAC member countries: Bangladesh, China, India, Indonesia, Japan, Kenya, Malaysia, Nepal, the Philippines, Sri Lanka, and Thailand. The aim is to:

- ▶ Conceptualize various capacity development plans for NEDAC;
- ▶ Network with NEDAC partner cooperatives on various capacity development programs;

- ▶ Liaise with various universities in NEDAC member countries and support capacity building requirements;
- ▶ Engage AIT students, interns, and research staff in activities connected with the AIT-NEDAC partnership; and
- ▶ Organize joint conferences and workshops (virtual or otherwise) on topics relevant to the sustainable development of agri-aquaculture in NEDAC member countries



11 SUSTAINABLE CITIES AND COMMUNITIES



MAKE CITIES AND HUMAN SETTLEMENTS INCLUSIVE, SAFE, RESILIENT AND SUSTAINABLE

AIT partners with international organizations funding agencies in research, policy, and practice through global assessments, conferences, webinars, and networking in strengthening resilience to climate and disaster risks in South and Southeast Asian cities and hydro-climatic modeling, analyses, and projections, with AIT's GeoInformatics Center acting as the regional data processing hub for such activities.

Other urban infrastructure impacted by this work included structural engineering reviews of hospitality facilities in tourism-dependent Thailand, bridge testing in the Philippines, community housing rehabilitation in Thailand, and elevated highway design in Sri Lanka. Related activities included an international symposium on disaster resilience and sustainable development, training workshops, and webinars.

TRAINING PROGRAM FOR STRENGTHENING CITIES' RESILIENCE TO CLIMATE AND DISASTER RISKS



The three-day virtual training workshop on Strengthening Cities Resilience to Climate and Disaster Risks was convened on 23-25 June 2021, gathering participants from Bangladesh, China, Indonesia, India, Malaysia, Nepal, Pakistan, the Philippines, Singapore, Thailand, and Vietnam. The online training workshop aimed to assist cities and local governments in building greater resilience to climate and disaster risks through integrating climate change adaptation and disaster risk reduction into wider city development plans and strategies.

AIT's RRC.AP organized this training workshop in close collaboration with the UN's Office for Disaster Risk Reduction (UNDRR), the United Nations Environment Programme (UNEP), and the Educational Partnerships for Innovation in Communities - Network (EPIC - N).

The workshop included theoretical sessions (focusing on Global Frameworks for Urban Resilience, Building Resilience in Cities and Local Level, Tools for Assessing Cities' Resilience, ECO-DRR in Cities and Watershed

including case studies, Engaging Academia in Strengthening Cities' Resilience, and Resilient City Action Plan Development, Implementation and Evaluation), interactive discussions, group activities and practical reflection on existing approaches, models, case studies, and experiences in strengthening cities' resilience to disasters.

<http://www.rrcap.ait.ac.th/Pages/event.aspx>





WEBINAR ON MAKING CITIES RESILIENT 2030: ENGAGING ACADEMIA AND FAITH ACTORS TO STRENGTHEN CITIES' RESILIENCE



The AIT Regional Resource Center for Asia-Pacific (RRC.AP) in partnership with the United Nations Office for Disaster Risk Reduction (UNDRR), the United Nations Environment Program (UNEP), the Educational Partnerships for Innovation in Communities – Network (EPIC-N), and World Vision International organized a Webinar on Making Cities Resilient 2030 (MCR2030): Engaging Academia and Faith Actors to Strengthen Cities Resilience.

The webinar convened on 25 November 2021 was attended by 59 participants from 19 countries globally, including Australia, Bangladesh, Bhutan, Cambodia, China, Costa Rica, India, Indonesia, Japan, Kenya, Laos, Lebanon, Myanmar, Nepal, the Philippines, Sri Lanka, Thailand, the UK, and Vietnam. Webinar content was presented by eight distinguished speakers from the UN Office for Disaster Risk Reduction, the UN Environment Program, World Vision, the Educational Partnerships for Innovation in Communities – Network (EPIC-N), and two fellows from the KAICIID International Center for Inter-religious and Intercultural Dialogue.

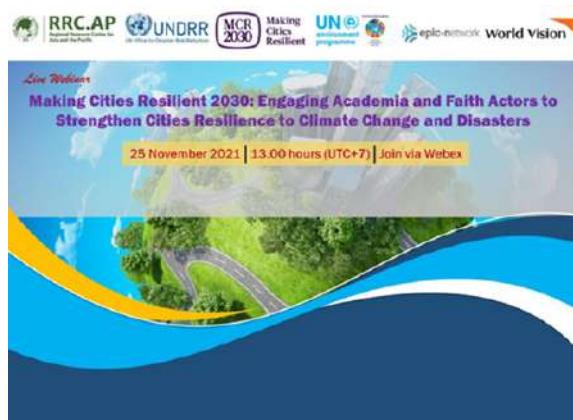
The 105-minute webinar was moderated by Armen Rostomyan, AIT RRC.AP, who set the scene by reminding participants that to achieve the objectives of the Sendai Framework, the Paris Agreement, and the 2030 Agenda for Sustainable Development, it is crucial to engage all stakeholders, including academia and faith actors, at all levels. Armen Rostomyan further emphasized the role of academia in all phases of the disaster management cycle

as well as the role of faith actors in strengthening cities' resilience to climate change and disasters, especially in conflict-affected countries, as many faith actors enjoy a high degree of trust and influence in their communities, including a unique network available for information dissemination as well as access to hard-to-reach areas.

Dr. Naoya Tsukamoto, Director of AIT's RRC.AP, formally opened the webinar by delivering a short welcome address.

<http://www.rrcap.ait.ac.th/Pages/event.aspx>

<https://www.climatechange.rrcap.ait.ac.th/mcr2030webinar>



GEOTECHNICAL FORENSIC INVESTIGATION AND STRUCTURAL ENGINEERING REVIEW FOR THE HOSPITALITY & CATERING TRAINING CENTER HOTEL BUILDING IN MAE SOT, THAILAND



AIT Solutions conducted geotechnical and structural forensic investigation for the Hospitality & Catering Training Center (HCTC) to determine the causes of distress that occurred at the HCTC hotel building in Mae Sot, Thailand. The tasks carried out as part of the project included:

Geotechnical Engineering Work

- ▶ Project development, site visit, and review of project documents: Developing and coordinating a forensic investigation program to acquire additional geotechnical data for developing a conceptual remediation plan;
- ▶ Geotechnical Field Investigation: Drilling six exploratory drillings to characterize subsoils and collect samples for the geotechnical laboratory testing of soils. Cracks in the building were also mapped and an elevation survey was conducted to document the current conditions of the building;
- ▶ Geotechnical Laboratory Testing: Soil samples collected from the site were tested to develop parameters for geotechnical analyses;
- ▶ Geotechnical Analyses: Soil parameters obtained from the laboratory were used in testing to determine the causes of the building's movement and to predict potential future settlement of the building; and
- ▶ Geotechnical Forensic Investigation Report: Presented findings regarding the causes of the building's movement, adequacy of existing micro-piles, and future performance of the building.



Structural Engineering Work

- ▶ Conducted a review of architectural and structural drawings of the building;
- ▶ Created computer models of the structure with varying complexities and refinements for developing an understanding of the response;
- ▶ Carried out simulations of superstructure under gravity and seismic loads considering existing and potential future settlements of the foundation;

- ▶ Reviewed primary structural components for their strength capacity for public safety; and
- ▶ Provided findings and recommendations as part of the structural forensic investigation report.

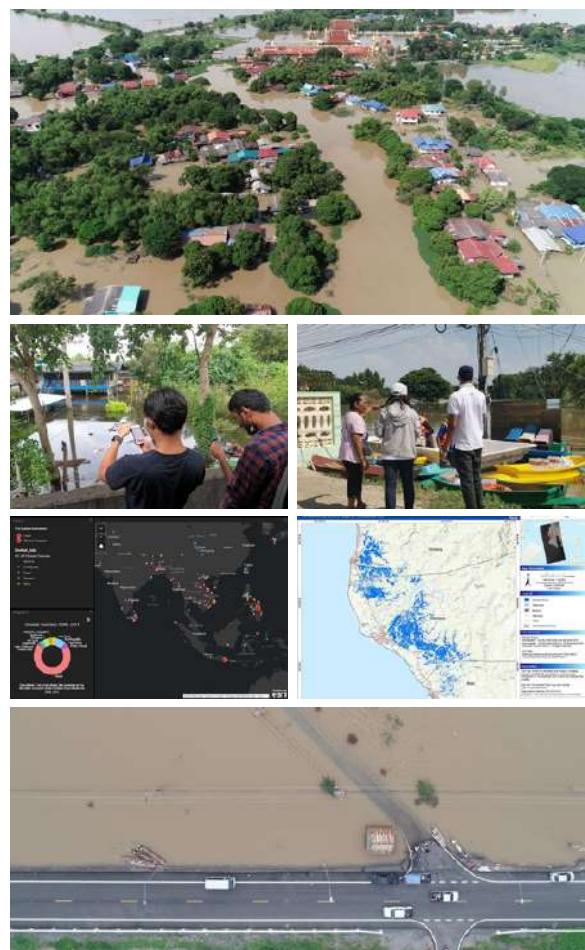
SENTINEL ASIA PROGRAM – PRINCIPAL DATA ANALYSIS NODE



AIT's GeoInformatics Center (GIC) is the regional data processing hub of the Sentinel Asia program for emergency mapping following a disaster in the Asian region. It also regularly contributes as Project Manager to the International Charter for Space and Major Disasters to coordinate emergency mapping efforts of catastrophic disasters in the region. Under both initiatives (Sentinel Asia and International Charter), GIC receives satellite images acquired through emergency observations and creates value-added products (VAP) to help disaster affected countries in their emergency response and recovery efforts. The satellite-based products coupled with the available GIS data (such as OpenStreetMap) and other local data from respective countries are being integrated to assist national government agencies in their emergency response and recovery efforts. Initial VAPs are made available to local agencies within 24 hours of activation, while further products are provided as additional satellite data becomes available.

GIC-AIT has created a wide range of value-added products for Sentinel Asia as well as the International Charter for disasters covering floods, volcanic eruptions, earthquakes, landslides, cyclones, glacial lake outburst floods, and oil spills. In 2021, GIC-AIT responded to 32 activations in 14 Asian countries by both the Sentinel Asia Program and the International Charter. While flood was the most frequent disaster type, others included earthquakes, landslides, oil spills, and volcanic eruptions. For additional information, see the GIC-AIT disaster response portal at:

🌐 <https://portal.geoinfo.ait.ac.th/portal/apps/sites/#/gic-ait-disaster-response-portal>





● SESSION ON HYDRO-CLIMATIC MODELING, ANALYSES, AND PROJECTIONS IN SOUTH ASIA: CHALLENGES AND OPPORTUNITIES' OF THE AGU FALL MEETING 2021, NEW ORLEANS, LA

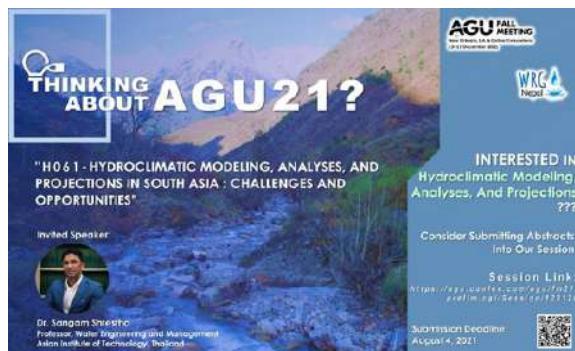


The American Geophysical Union's (AGU) Fall Meeting is the most influential event in the world dedicated to the advancement of earth and space sciences. Every year, the AGU Fall Meeting convenes over 25,000 participants from over 100 countries to share research and network. Researchers, scientists, educators, students, policymakers, enthusiasts, journalists, and communicators attend the AGU Fall Meeting to better understand our planet and environment as well as our role in preserving its future. The meeting is a results-oriented gathering rooted in celebrating and advancing positive individual and collective outcomes. The session on Hydro-climatic Modeling, Analyses, and Projections in South Asia: Challenges and Opportunities' intended to provide a collective view on: (i) current trends in hydro-climatic research; (ii) evaluating knowledge and innovative approaches to filling data gaps; and (iii) identifying opportunities for research in hydrology and climate science in the region.

The topic of the presentation by Dr. Sangam Shrestha, the invited speaker, was Future Changes in Hydro-climatic Extremes in the South Asian River Basins: Evidence from Modeling Studies. The speaker dealt with

findings that climate variability and rapid urbanization are increasing the frequency and intensity of hydro-climatic extremes across South Asia. Further, complex terrains and data scarcity pose both challenges and opportunities in hydro-climatic analyses, modeling, and projections. In response, there have been considerable efforts devoted to hydro-climatic research over the past decades in the region. However, a significant challenge remains in integrating the sparse dots of knowledge.

● <https://www.agu.org/Fall-Meeting>



● WIND TUNNEL TESTING OF ICONIC CABLE-STAYED BRIDGE IN LUGUS, SULU PROVINCE, PHILIPPINES



AIT Solutions worked closely with project engineers to conduct a wind tunnel study of the Iconic Cable Stayed-bridge in Lugus, Sulu Province, Philippines. As part of the project, AIT Solutions conducted:

Section model test for aerodynamic stability identification to:

- ▶ Check the vortex-induced vibration of bridge deck and the possibility of torsional flutter;
- ▶ Predict and estimate full bridge response by combining test results with information on 3D vibration modes in the bridge; and
- ▶ Modify the geometry of bridge sections in case of unacceptable wind effects.

Section model test for aerodynamic force coefficient to:

- ▶ Obtain aerodynamic coefficients for lift, drag, and torsional moment components of bridge deck; and
- ▶ Predicted equivalent static wind-induced forces and moments with load combinations.



Wind tunnel model of bridge for aerodynamic stability test



SURVEY AND CREATE A COMMUNITY DATABASE FOR THUNG SONG HONG COMMUNITY REHABILITATION, NATIONAL HOUSING AUTHORITY, THAILAND



This project, undertaken on behalf of the National Housing Authority, Thailand focused on conducting a survey and creating a community database for the Thung Song Hong community rehabilitation project. Activities carried out as part of the project included:

- ▶ Conducting a survey and analyzing basic information on residents and their environmental, economic, social, and physical conditions. Preliminary primary data such as age, occupation, income, financial status, resident status, etc., was collected;
- ▶ Conducting a survey and studying information of the Thung Song Hong Housing Community Project and urban rehabilitation development theory to understand the basic nature of the project and its surroundings, including the social, environmental, and economic overview of residents;

- ▶ Conducting a survey of residents' primary needs for participation in the Thung Song Hong Community Project by collecting and analyzing primary data such as housing preferences and community urban development and rehabilitation; and
- ▶ Conducting small group meetings to verify the results of the survey, discuss related social and economic issues, and use survey data to create a geographic information system in order to make it easier for data analysis to identify the population by group.

STRUCTURAL DESIGN REVIEW OF ELEVATED HIGHWAY, ROAD DEVELOPMENT AUTHORITY, SRI LANKA



AIT Solutions is providing Advisory Services to the Road Development Authority, Sri Lanka for the Ingurukade Junction to the Galle Face Elevated Highway. As part of these Advisory Services, spot checks, independent modeling of selected sections, and a review of designs of identified bridges are being conducted. The main components of the project include:

- ▶ Providing advisory support to the Port Access Elevated Highway (PAEH) civil works contract;
- ▶ Reviewing structural design submitted by the Contractor and advising on any changes;

- ▶ Reviewing Contractor's design of a sample bridge module;
- ▶ Conducting an overall review of drawings and construction methodology submitted by the Contractor;
- ▶ Conducting spot checks on complete bridge design; and
- ▶ Assisting with other matters related to structural design.



STRUCTURAL PERFORMANCE-BASED DESIGN PEER REVIEW OF CIRCULO VERDE PHASE 2, PHILIPPINES



AIT Solutions conducted a Structural Performance-based Design Peer Review of Circulo Verde Phase 2. The project consists of a 50-storey residential tower located in Quezon City, Philippines and developed by Ortigas Land, Philippines. The project has an approximate total floor area of 121,263m². The site is located about 1.6 km from the West Marikina Valley Fault (WVF).

Structural peer review work was based on computer models provided and calculation reports from structural consultants. The review was carried out in line with Phase 1 design by project structural engineers to facilitate the design process and minimize multiple design iterations. Specifically, the scope of work carried out included:

- ▶ Reviewing basis of design, earthquake hazard determination, ground motion characterizations, seismic design methodology, seismic performance goals, acceptance criteria, wind tunnel test results, and other documents as necessary;

- ▶ Reviewing linear analysis models used for wind and Service Level Earthquake analyses and nonlinear analysis model used for Maximum Considered Earthquake analysis upon completion of the models by structural consultant and Employer of Record ((EOR));
- ▶ Reviewing design calculations of structural components for wind and Service Level Earthquake submitted by EOR;
- ▶ Reviewing design report for Maximum Considered Earthquake evaluation submitted by EOR;
- ▶ Reviewing final working structural drawings; and
- ▶ Reporting on peer review comments and recommendations.

2ND INTERNATIONAL SYMPOSIUM ON DISASTER RESILIENCE AND SUSTAINABLE DEVELOPMENT (DRSD-2021, ASIAN INSTITUTE OF TECHNOLOGY, 24-25 JUNE 2021)



The 2nd International Symposium on Disaster Resilience and Sustainable Development organized by the Asian Institute of Technology generated discussions on various dimensions of higher education systems in the Asia-Pacific region with a focus on Disaster Risk Reduction and Sustainable Development. The International Symposium focused on various dimensions of existing and future risk scenarios and concerted efforts by the scientific communities to identify new adaptation methods. The International Symposium was held on 24-25 June 2021 in virtual mode. The program included keynote speeches, panel discussions, technical sessions, poster presentations, and academic exhibitions. The Symposium is one of the initiatives of the ProSPER.Net project titled Disaster Education for integrating SFDRR and SDGs in Asia led by the Asian Institute of Technology, Thailand along with partner universities in the Asia-Pacific region.

 www.disaster-sustainability.org





● TRAINING WORKSHOP ON THE ROBUST DECISION SUPPORT (RDS) FRAMEWORK BY THE STOCKHOLM ENVIRONMENT INSTITUTE (SEI) AND AIT'S ASIA CENTER



The training workshop on Robust Decision Support (RDS) was successfully conducted on April 8-9, 2021 on the AIT campus via a virtual (hybrid) platform. The RDS training by the Stockholm Environment Institute (SEI) was delivered to the team working on the Strengthening Groundwater Governance in Rapidly Urbanizing Areas of the Lower Mekong Region (GIRA) project. Participants in the event were project personnel and young researchers from Thailand, Laos, Cambodia, and Vietnam involved in the project. Dr. Thanapon Piman and Uttam Ghimire from SEI conducted the training workshop with the main objective to build an understanding of the RDS concept, demonstrate applications of RDS to water resources management, and discuss how to use RDS in the GIRA project. The GIRA project is funded by the Stockholm Environment Institute (SEI) under the SUMERNET 4 All Program, which is funded by the Swedish International Development Cooperation Agency (SIDA). Study areas for the project are the cities of Vientiane (Laos), Khon Kaen (Thailand), Siem Reap (Cambodia), and Can Tho (Vietnam).



🌐 wem.ait.ac.th/training-workshop-on-robust-decision-support-rds-framework-by-sei

● EPIC-N COLLABORATIVE PROJECT BETWEEN THA KHLONG MUNICIPALITY AND AIT



AIT working in partnership with Tha Khlong Municipality and supported by the Educational Partnerships for Innovation in Communities Network (EPIC-N) is carrying out a collaborative project on GHGs Estimation from Waste Management Practices in Tha Khlong Municipality to address specific issues (e.g., waste management, disaster risk reduction, traffic congestion, livelihoods etc.), which the municipality is currently dealing with. Under this project, the municipality can seek enhanced operational and management practices by introducing technological solutions, required skills and innovation in their day-to-day work. The specific objectives of this project for which EPIC-N has provided funding include:

(i) continuing the dialogue between AIT and the Municipality; (ii) learning about ongoing projects under the Municipality as well as different aspects of these projects; (iii) identifying an area of intervention where the Institute could assist the Municipality in implementing a project or take part in action research while dealing with issues handled by the Municipality; and (iv) providing the Municipality with advice or research and study outcomes on dealing specific issues.

🌐 <https://bit.ly/3yDKMXU>

✉ extension@ait.ac.th



🌐🤝 WEBINAR ON BIG EARTH DATA FOR THE SUSTAINABLE DEVELOPMENT GOALS



The Digital Belt and Road Program (DBAR) initiated in 2016 by the Chinese Academy of Sciences aims to improve environmental monitoring, promote data sharing, and support policymaking using big data on earth observations. With strong regional collaboration, DBAR has committed to focusing its research effort on investigating indices and indicators to feed into the United Nations Agenda 2030 and the Sustainable Development Goals (SDGs) and deliver an open access data platform for researchers, policymakers, and the public for tracking and studying developments and changes in the Belt and Road Region.

As a main partner of the DBAR International Center of Excellence (DBAR ICoE Bangkok), AIT actively leads and participates in various academic activities, including

funded research projects and regional and national seminars within the scope of DBAR. To further facilitate knowledge and experience exchanges between AIT and the DBAR program, the AIT Belt and Road Research Center jointly hosted this Webinar Series on Big Earth Data for the Sustainable Development Goals along with partners, namely the National Research Council of Thailand (NRCT), Mahidol University (MU), and DBAR.

🌐 <https://bit.ly/3IAcJVO>

🌐 [Appendix 3-1 DBAR Capacity Building-photo](#)

🌐 [Appendix 3-1 DBAR Capacity Building-program](#)

🔍 APPLICATION OF BIG EARTH DATA IN SUPPORT OF THE SUSTAINABLE DEVELOPMENT GOALS IN THAILAND



Big earth data is currently used to fill in missing data and provide new sources of data for the evaluation of selected SDG indicators. This study also applies and contextualizes proposed new scientific methodologies and frameworks for evaluating the SDGs on the basis of

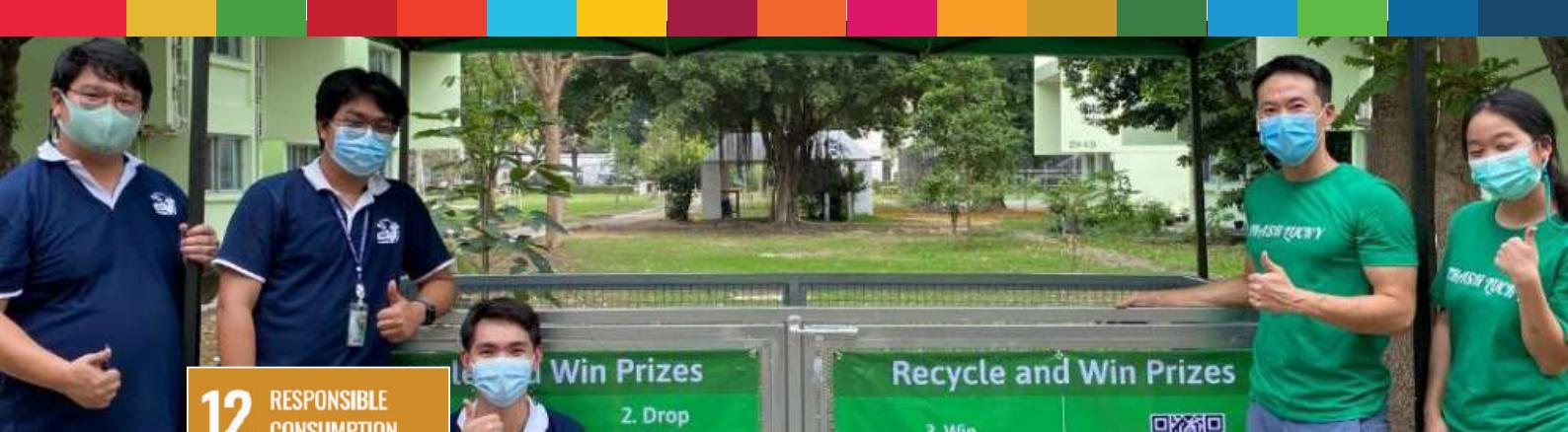
Big Earth Data technologies and models. Implications and recommendations for the integration of big data and technology in policy formulation and implementation toward SDG achievement will be suggested.

🌐🛒 STUDENT UNION FOOD FAIR

On 13 November 2021, following the COVID-19 outbreak, the long-awaited day-long for the August 20-21 Food Fair was organized and took place successfully. This year, the event emphasized zero waste and eco-friendly

concepts very strongly. Without the full participation of the student community and cordial management's support, it would not have been possible to hold this event successfully.





12 RESPONSIBLE CONSUMPTION AND PRODUCTION



ENSURE SUSTAINABLE CONSUMPTION AND PRODUCTION PATTERNS

AIT actively promotes responsible consumption and production by holding multiple events on campus and beyond. In 2021, it sponsored studies aiming to quantify plastic types present at dumpsites and to develop eco-friendly technology for foam waste reusability. AIT held a webinar on youth empowerment and low-carbon lifestyles and on eco-designs for

small enterprises across Asia, including aquaculture production, groundwater sustainability, and changes in energy demand. On-campus dissemination saw a Trash Lucky draw, a hands-on demonstration workshop on plastic recycling, and the donation of used plastic items, including power banks, phone batteries, power cables, and earphones to the Less Plastic Thailand program.

PLASTIC CATEGORIZATION AND ANALYSIS OF RESIDUAL WASTE FROM DUMPSITE (AIT- INSEE I)



This study aims to classify and quantify the types of plastics among remaining solid waste fractions present at different sampling locations and analyze residual wastes at the Khlong Sam dumpsite, Thailand.

The objectives of the study are to classify and quantify types of plastics among remaining solid waste fractions present at different sampling locations at a dumpsite in Thailand and to quantify microplastics leaching from the dumpsite to nearby water bodies.

The second phase of the project involves analysis of residual waste samples obtained from the Khlong Sam dumpsite.





CIRCULAR SYSTEM INNOVATION FOR POLYURETHANE FOAM: CATALYTIC APPROACH TO UPCYCLE FOAM WASTE FROM MATTRESSES AND BEYOND



The goals of this AIT-led project are the development of an eco-friendly and economically viable technology and the exchange of knowledge necessary for addressing the reusability of polyurethane (PU) foam waste, which otherwise would be disposed of in landfills due to the lack of efficient recycling technology. The partnership between AIT, Circularity Co. Ltd., the world's first circular economy-based mattress subscription business start-up in Thailand, and the University of Cambridge aims for hybrid PU foam upcycling technology based on nanotechnology in order to revolutionize the PU waste recycling process and explore circular economy business innovation opportunities in the Thai context. In parallel, the captured know-how will be disseminated among engineering students through new curriculum as well as industry practitioners. The project is supported by the UK Royal Academy of Engineering (RAE) through the Engineering & Transforming Systems through Partnership program, the National Science and Technology Development Agency (NSTDA), Thailand, and Circularity Co. Ltd., Thailand.

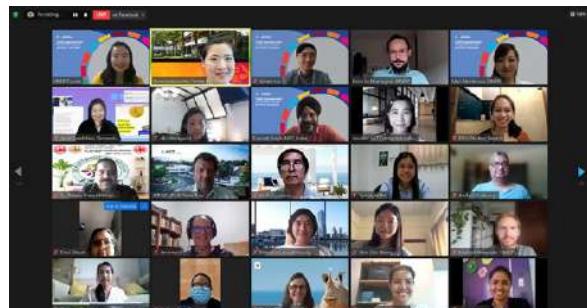


🌐 <https://www.nornnorn.com/news/2021/3/12/nornnorn-wins-grant-from-royal-academy-of-engineering-for-polyurethane-foam-upcycling-research>

YOUTH EMPOWERMENT: SUSTAINABLE LIFESTYLES AND GREEN CAMPUSES



AIT's Entrepreneurship Center (EC) provided support to the United Nations Environment Program (UNEP) and GO4SDGs Initiative for organizing and co-hosting a webinar on Youth Empowerment: Sustainable Lifestyles and Green Campuses in Zoom and Facebook.



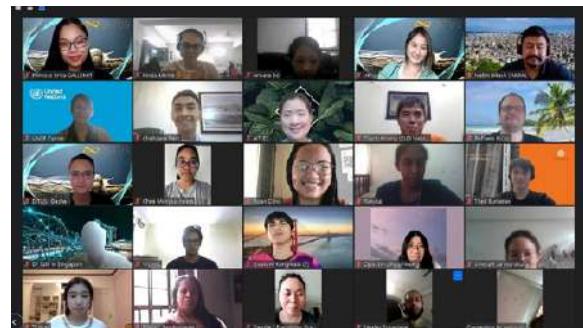


🌐🤝 GREEN STARTUP TOOLKIT



The Green Startup Toolkit was funded by the United Nations Environment Program under the Asia-Pacific Low Carbon Lifestyle Challenge program, which aims at building a vision of sustainable lifestyles, developing tools and incentives for achieving such lifestyles, and empowering individuals and startups with enabling knowledge to adopt such lifestyles. The toolkit provides a set of guidelines and a green startup roadmap to support and motivate startups and SMEs considering being green and sustainable. This project has a direct impact on the Sustainable Development Goals, particularly SDG 12: Responsible Consumption and Production. The Green Startup Toolkit was launched on 5 August 2021 as an online event.

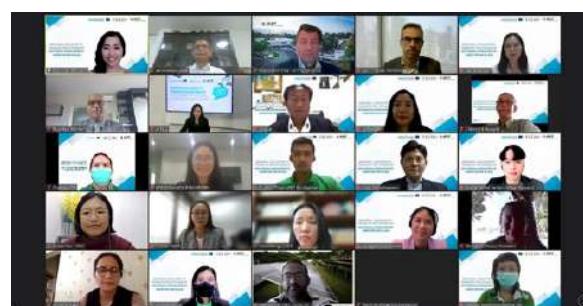
🌐 <http://www.greenstartups.ait.ac.th>



🌐🤝 REGIONAL DIALOGUE TO PROMOTE THE UPTAKE OF ECO-DESIGN APPROACHES TO GREEN SMES IN ASIA



This webinar was jointly organized by the EU SWITCH Asia Regional Policy Advocacy Component (RPAC) in partnership with the Thailand Environment Institute (TEI) and (AIT). The webinar examined SMEs in 18 Asian countries in South and Southeast Asia, namely Afghanistan, Bangladesh, Bhutan, India, Nepal, Pakistan, Sri Lanka and the Maldives in South Asia and Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Thailand, Vietnam in Southeast Asia in addition to China and Mongolia. The webinar focused on the implementation of Eco-design SMEs in eight sectors: Electronics, Construction, Alternative Energy & Development (e-Vehicles), Agriculture (resource-efficient use), Services (tourism and logistics), Textiles, Packaging, and Household.



🌐🤝 GLOBAL RECYCLING EDUCATION INITIATIVE – IVL



Supported by Indorama Ventures (IVL), YCA team members organized an internal competition for sustainability initiatives among Thai educational institutions, which expanded into a collaboration for designing and managing a global recycling education initiative for IVL that focuses on schools, youth groups, and universities across the world. The initiative aims to create bolt-on learning materials on plastics recycling and recycling entrepreneurship that can be seamlessly integrated by participating teachers and institutions into existing learning activities. The learning materials

for the global campaign are targeted at three groups: schoolchildren, youth groups, and undergraduate university students. One of the Yunus Masters scholars is working with the Yunus team and IVL managers to develop appropriate content for 17 lesson plans guided by an international expert advisory group through an iterative design process. Once developed, the materials will be submitted to independent validation by a senior international expert panel. The campaign is expected to reach a quarter of a million people by the end of 2022 by leveraging the Yunus global network.



AARM-AIT RECEIVES SUPPORT FROM MANIT GENETICS CO. LTD., THAILAND



Manit Genetics Co. Ltd. is one of Thailand's largest integrated tilapia aquaculture companies and is owned by Mr. Amorn Luengnaruemitchai, a distinguished AARM alumnus. The Company donated 1.5 million baht as a kind gesture toward his alma mater for infrastructure development in the AARM Laboratory and Fish Production Unit. This fund was used to renovate the AARM Fish Production Unit, a semi-commercial fish hatchery and farming unit of AARM. A new Tilapia Hatchery Unit was established, and several research facilities for tilapia and shrimp were also completed.



 <https://www.aitaquaculture.org/manit-genetics.htm>

 <https://bit.ly/3yFDHpG>

VIRTUAL AQUACULTURE WORKSHOP I-FLOCS 2020: INNOVATIVE BIOFLOC TECHNOLOGIES FOR SUSTAINABLE PRODUCTION OF TILAPIA AND SHRIMP



AIT's Aquaculture and Aquatic Resources Management (AARM) Program organized a Virtual Workshop on innovative applications of Biofloc technology in the sustainable farming of tilapia and shrimp in diverse farming environments. This training was organized jointly with the Network for the Development of Agricultural Cooperatives in Asia-Pacific (NEDAC), a regional forum established by the Food and Agricultural Organization (FAO) of the United Nations, linking the top farmer cooperative organizations in 12 countries. The training was also a part of the International Conference on Fisheries and Aquaculture (ICFA), which was held as a Virtual Conference. The technical sessions were led by some of the world's best-known resource persons in the field, including practical aspects of currently available shrimp and tilapia farming technologies. Special sessions were also held on intensive Biofloc



technologies for tilapia and indoor shrimp farming. This Workshop had 30 participants from 9 countries and 12 resource persons.

 <https://www.aitaquaculture.org/ait-ifloc-aquaculture-workshop.htm>



☒ ASSESSMENT OF GROUNDWATER SUSTAINABILITY IN THE SPECIAL ECONOMIC ZONE OF THAILAND FOR OPERATIONAL GROUNDWATER MANAGEMENT (GISA), FUNDED BY THE STOCKHOLM ENVIRONMENT INSTITUTE (SEI)-ASIA UNDER THE SUMERNET 4 ALL PROGRAM, TAK SEZ, THAILAND



The main objective of the joint-action GISA project is to assess groundwater sustainability in Special Economic Zones (SEZ) in Thailand for operational groundwater management. The project's objectives are:

- ▶ To conceptualize and contextualize the existing Groundwater Sustainability Infrastructure Index (GSII) to be applied in SEZs for the assessment of groundwater sustainability;
- ▶ To apply the Groundwater Sustainability Infrastructure Index (GSII) in Tak SEZ for the assessment of groundwater sustainability; and
- ▶ To recommend strategies for enhancing guidelines and policies for improved operational groundwater management in SEZs.



🌐 wem.ait.ac.th/inception-workshop-of-gisa-joint-action-project

☒ ⓘ CHANGES IN ENERGY DEMAND INDUCED BY TECHNOLOGICAL AND SOCIAL INNOVATIONS (EDIT-AIT)



Bangabandhu Chair Prof. Joyashree Roy has made presentations to a global audience of students, policy makers and think tank members, and researchers to discuss how climate mitigation action (SDG 13) is linked to all other 16 SDGs. It is important to realize that any developmental action in one area also impacts policy-making in other areas because synergies can advance the sustainable development agenda while pursuing climate action. Professor Roy has published book chapters and journal papers on similar thematic areas. These are accessible at:

🌐 <https://www.bangabandhu-chair-ait.org/news-update>

The projects Professor Roy is leading also focus on multiple SDGs:

1. SDG 14: <https://www.bangabandhu-chair-ait.org/gcri>
(But linked to SDG 9, SDG11, SDG 8, SDG 17)
2. SDG 7 : <https://www.bangabandhu-chair-ait.org/edit-ait>
(linked to SDG 8,9, 10,12,17, SDG 13)
3. SDG 9: <https://www.bangabandhu-chair-ait.org/cdri>
(linked to SDG13)



RECYCLING DEMONSTRATION WORKSHOP FOR AIT FACULTY AND STUDENTS

On 15 December 2021, the Precious Plastic Bangkok (PPB) team organized an educational lecture event and held a plastic recycling demonstration workshop for faculty and students from the Asian Institute of Technology. This activity received a great deal of attention from teachers and students. The match between the PPB project and AIT coursework about plastic waste management and utilization increases the value of plastic and can generate incomes for the community. Team members also participated in making products from recycled plastic and learned about recycling machines. We would like to thank Precious Plastic Bangkok for educating us and for being the motivation for recycling plastic.



AIT AND THE LESS PLASTIC THAILAND PROGRAM

On 23 December 2021, 20kg of plastic bottles were donated by AIT to the Less Plastic Thailand program. This will equal around 80 PPE suits to be produced by these plastic bottles. These bottles were collected by our plastic waste management programs and Naturally Acceptable and Technologically Sustainable (NATS) team. In total, around 235 PPE suits were produced from our waste. Thank you very much to the NATS team for supporting plastic recycling and helping the medical personnel during the pandemic.



AIS E-WASTE PROJECT

Electronic waste (or e-waste) is waste from electrical and electronic equipment using electricity or magnetic fields for non-standard work. Electronic waste not properly disposed of contributes to long-term negative impacts on the environment, society, ecosystems, and human health. According to the 2017 global electronic waste report, e-waste in Thailand now exceeds 400,000 tonnes and shows a tendency to continually rise. In response, the AIS E-Waste project was initiated with the aim of educating populations on the effects of improper disposal and, in partnership across sectors, collect e-waste for proper and sustainable disposal for a better environment and less residual electronic waste in Thailand. AIT joined the program in 2021. Following collection, e-waste is separated into parts followed by its component materials, and this material is sent for recycling by importing into the furnace each type of material until it can be reused. This project invites community members to donate e-waste. In AIT, a special e-waste bin is located at the entrance of the EEM

AIS E-WASTE

Bin Location



AIS E-Waste bin is located at the entry of EEM building. The location is nearby NATs lab and next to battery bin (as shown in Figure).

List of Collectable E-Waste

	Mobile / Tablet		Power Bank
	Battery		Power Cable
	Small Talk		

building near the NATs lab and next to a battery bin. The collectable e-waste includes mobiles and tablets, power banks, phone batteries, power cables, and earphones.



▣ AIT TRASH LUCKY PROGRAM

Trash Lucky allows people to convert recyclables into raffle tickets for winning prizes such as gold or shopping vouchers. People can send recyclables to Trash Lucky and earn raffle tickets based on the amount of recyclables they send. Trash Lucky sells recyclables to recycling plants and uses part of the income to fund raffle prizes. Trash Lucky's vision is plastic-free oceans and its mission is to incentivize people to recycle and divert plastics from landfills and oceans. Trash Lucky is a pre-seed startup that has received initial investment and grants from DTAC Accelerate (Batch 7), the Digital Economy Promotion Agency (DEPA), the Government Savings Bank, WWF Thailand, and the Mall Group

The concept behind this program is a Recycle Lucky Draw that lets everyone have fun, try their luck, and help make our world cleaner. This program has been successfully running since October 2020, when AIT community members were invited to register the program and then sort and donate recyclables to Trash Lucky. The chance to earn prizes is based on the amount of plastic, paper, glass, or metal participants recycle. Please register in order to receive an ID before donating your waste and write your ID on the donated waste.



Stations



握手 AIT SUSTAINABILITY CLUB MENSTRUATION PROJECT

AIT's Sustainability Club launched a menstruation project. Menstrual cups were distributed to volunteers. These can be used for 8-10 years and thus reduce waste in landfills. Students were invited to act as assistants and encourage, convince, and guide other women in their use. The Students' Union (SU) Gender and Culture AIT supported this project's budget. Loni Cup also supported the product with promotion. The Club has been continuously sharing the experience and benefits of reducing the use of sanitary pads and of inducing women to use environmentally-friendly products. Volunteer assistants shared their experience and contributed support to using menstrual cups rather than cloth or sanitary pads. AIT community members, especially students, were invited to assist and encourage more women to convince and guide others in their use.





13 CLIMATE ACTION



TAKE URGENT ACTION TO COMBAT CLIMATE CHANGE AND ITS IMPACTS

In 2021, experts from AIT's schools and research units conducted climate-related workshops, talks, seminars, and webinars while students participated in the Hackathon sustainability competition to promote wider understanding of information on the effects of climate change on vulnerable stakeholders to help them make informed decisions about their future. Specific areas addressed included urban water resilience, rice

cultivation, and especially finance mobilization with support from the Project Preparation Facility and the Japanese government based on the experiences of vulnerable groups in (among others) Thailand, Nepal, and the Philippines. Of particular interest to AIT students is a course in concepts, and tools for adaptation to climate change.

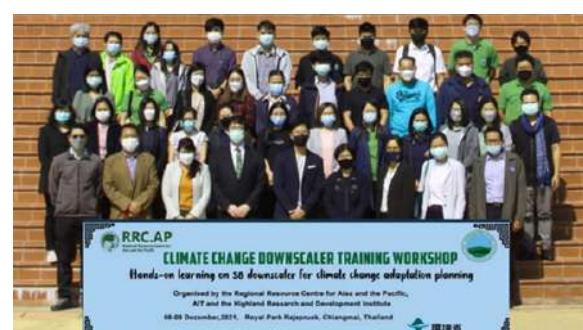
LOCAL LEVEL TRAINING ON CLIMATE CHANGE DOWNSCALING USING THE S8 DOWNSCALER TOOL



This training on climate change downscaling using the S8 downscaler tool was convened by AIT's RRCAP in collaboration with the Highland Research and Development Institute (HRDI) in Chiang Mai, Thailand on 8-9 December 2021. HRDI is a public-funded organization based in Chiang Mai and mandated to promote food security, poverty alleviation, and ecosystem health in mountain regions currently covering 1,066 communities in 20 provinces of Thailand.

The training aimed to strengthen the capacity of the climate research staff and institutions on the use of the S8 downscaler tool along with basic understanding of climate-related atmospheric science, climate change, climate change projections, and downscaling techniques to build a strong knowledge foundation on climate change downscaling. Simultaneously, the training aimed to provide participants with the tools they need to analyze scientific data and information gathered on the ground so they can make informed decisions about their future as well as expand communication among stakeholders at the local level to improve climate adaptation knowledge and planning.

The training was delivered in a series of eight sessions over two days and included theoretical sessions focusing on the science of climate change, regional and global



climate change trends, climate models, and overview of S8 tools and practical exercises with the S8DS interface.

🌐 <http://www.rrcap.ait.ac.th/Pages/event.aspx> or
<https://bit.ly/3kzPK16>



🌐🤝 SUSTAINABILITY HACKATHON 2021



The Department of Development and Sustainability in partnership with the AIT Entrepreneurship Center Hackathon 2021 titled "Finish the Unfinished – Tackling Common Problems for Good" in hybrid mode. The aim of the 2021 Hackathon was to develop solutions toward achieving global sustainability by using a combination of classroom knowledge, real-world experience, global trends, international conventions, global agreements, sustainable financing, digital technologies, indigenous knowledge, and collective strengths.

A total of 26 teams registered for the Hackathon, but only 21 teams with 86 members attended the Hackathon.



🌐🤝 AIT'S RRC.AP CONDUCTED A VIRTUAL ADVANCED TRAINING ON DEVELOPING CONCEPT NOTES FOR THE GREEN CLIMATE FUND (GCF) INCLUDING VIA THE SIMPLIFIED APPROVAL PROCESS (SAP)



AIT's Regional Resource Center for Asia and the Pacific (RRC.AP) convened a virtual advanced training from 18-22 January 2021 on Developing Concept Notes for the Green Climate Fund (GCF) including via the Simplified Approval Process (SAP). The week-long event gathered 31 participants from seven countries in the region working toward accessing the GCF for Climate Change Adaptation. Country teams included representatives from respective National Designated Authorities (NDAs), Direct Access Entities (DAEs), Executing Entities, and other project stakeholders.

Working across time zones, country teams joined from Cambodia, Indonesia, the Federated States of Micronesia, Niue, Papua New Guinea, the Philippines, and the Republic of the Marshall Islands. The virtual advanced training reconvened country teams from an introductory training held in Bangkok, Thailand in November 2019.

Theoretical sessions built upon the early-stage project formulation tools introduced in the introductory training and focused on other elements of a GCF concept note to advance proposals toward a ready-for-submission

Of the 21 teams, 58% were drawn from AIT students and 42% from 15 institutes outside AIT. Altogether, 21 teams presented 21 solutions for solving sustainability problems, and the top four teams were selected for prizes.

🌐 <https://dds.ait.ac.th/sustainability-hackathon-2021>

🌐 https://dds.ait.ac.th/wp-content/uploads/sites/19/2021/10/SHack2021_EN.pdf

🌐 <https://photos.app.goo.gl/9RJP8T81Jh85vty9>

draft. Following a series of practical self-paced exercises and virtual report back sessions and consultations for feedback, the virtual training closed successfully while noting avenues for continued support to finalize concept notes for accessing the GCF, including via dedicated support by the Institute for Global Environmental Strategies (IGES).

🌐 <https://www.climatechange.rrcap.ait.ac.th/cnd2019>





AIT'S RRC.AP ORGANIZED A SESSION ON ADAPTING TO CLIMATE CHANGE: STRENGTHENING URBAN WATER RESILIENCE



AIT's RRC.AP organized a session on Adapting to Climate Change: Strengthening Urban Water Resilience on 2 March 2021 during the Water Security and Climate Change Conference (WSCC). The conference was held virtually 1-4 March 2021 and provided a space for scientists, policymakers, and stakeholders from diverse sectors to share their knowledge and experience on water security issues in relation to climate variability and change. During the session, panelists shared their research findings on water insecurity dynamics in the

slums of Dhaka, Bangladesh, introduced the audience to the web-based interface for an urban flood warning system applied to the Bangkok area and emphasizing the need to improve urban resilience to floods, noted some of the challenges involved in building urban water resilience in Asia, and stressed that the role of government is key to climate change adaptation, integrated disaster risk management, and water management.

<http://www.rrcap.ait.ac.th/Pages/event.aspx>

AIT'S RRC.AP ORGANIZED AND PARTICIPATED IN SESSIONS OF THE 7TH ASIA-PACIFIC CLIMATE CHANGE ADAPTATION FORUM 2021



AIT's RRC.AP co-organized its first 90-minute session on Collaborating Efforts to Strengthen Cities' Resilience to Climate and Disaster Risks in collaboration with the Institute for Global Environmental Strategies (IGES) on 9 March 2021. The session focused on how to integrate Disaster Risk Resilience (DRR) into national development plans and how academia, local government, and other stakeholders can engage in improving the resilience of cities, leading to a conversation on the challenges faced by cities in assessing disaster risks, developing, and implementing cities resilient action plans, and the need for further enhancement for scalability. The session highlighted three main points for building cities' resilience to climate change and disaster risks: (i) the need for an inclusive and multi-sectoral approach; (ii) collaboration efforts focusing on resource and finance mobilization, knowledge building and exchange, and capacity development via multi-stakeholder engagement from local to regional levels; and (iii) the importance of educational partnerships with city stakeholders in informing planning processes and bridging gaps to address the needs of the most vulnerable groups based on experiences from Kathmandu (Nepal) and Santa Rosa (Philippines).

Similarly, on 12 March 021, AIT's RRC.AP organized its second session on Climate Finance in Flux: How Can Finance Flows Steer Resilience Pathways that Truly Leave No One Behind? The session looked into the role of climate finance in increasing and accelerating inclusive resilience and enabling conditions for increasing inclusion in adaptation practices. The session emphasized that inclusive resilience investment and finance needs to be as diverse as the needs and groups it aims to reach. Moreover, both funding and local implementing entities should be informed on how resources should be shaped and mobilized for inclusion. Finally, capacity building, flexibility, and collaboration with a wide range of stakeholders including marginalized



voices, the private sector, academia, and others are key to ensuring that initiatives are taken seriously and that cost and time requirements for inclusive participation are acknowledged while noting that non-inclusiveness limits resilience outcomes.

<http://www.rrcap.ait.ac.th/Pages/event.aspx>



VIRTUAL MENTORING: ACCESSING THE GREEN CLIMATE FUND'S (GCF) PROJECT PREPARATION FACILITY (PPF)



AIT's RRC.AP with the support from the Green Climate Fund Secretariat convened a two-hour virtual mentoring session on Accessing GCF's Project Preparation Facility (PPF). Ms. Zhengzheng Qu (Project Preparation Specialists, GCF) provided an overview of the PPF, including PPF delivery modalities (PPF Funding and PPF Service), the application process and documents needed, and the submission and approval process. The presentation also referred to available resources, including PPF guidelines by the GCF. The discussion also invited reflections from participants, including by Dr. Peter King of the Institute for Global Environmental Strategies (IGES) as well as participants from the Philippines and Indonesia's project teams about their virtual mentoring activities. The session was attended by 25 participants from Cambodia, Indonesia, the

Philippines, and the Federated States of Micronesia, including individual participants to the Advanced Training held in January 2021.

 <http://www.rrcap.ait.ac.th/Pages/event.aspx>



PRELIMINARY TRAINING: DEVELOPING CONCEPT NOTES FOR THE GCF INCLUDING VIA THE SIMPLIFIED APPROVAL PROCESS (SAP)

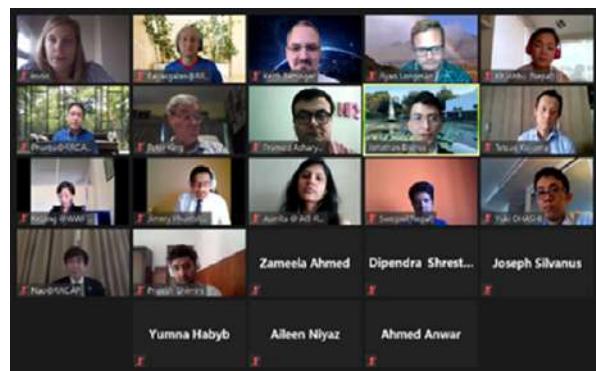


AIT's RRC.AP organized a virtual preliminary training on Developing Concept Notes for the GCF including via the SAP in virtual format over six days from 3 June to 1 July 2021 in collaboration with the Institute for Global Environmental Strategies (IGES) and the SAP Team of the GCF Secretariat. The workshop gathered 13 participants from project teams in South Asia—namely Bhutan, the Maldives, and Nepal—including officers involved in climate change adaptation project formulation. Like previous similar events, the event focused on providing early-stage project formulation know-how and tools for drafting high-quality concept notes for the GCF, including for the Simplified Approval Process (SAP).

The training workshop included three types of sessions. First, plenary sessions included presentations and discussions on topics for high-quality GCF project formulation, with a focus on the SAP. Second, independent group work tasked project teams with collaborating on completing project development activities following explanation videos and tools, virtual collaboration, and real-time virtual consultation with

facilitators. Third, reporting back sessions invited project teams to share their outputs from activities for peer and expert feedback. Lastly, project teams were given the option to schedule independent consultations with experts from AIT's RRC.AP and IGES on a weekly basis during the event.

 <http://www.rrcap.ait.ac.th/Pages/event.aspx>





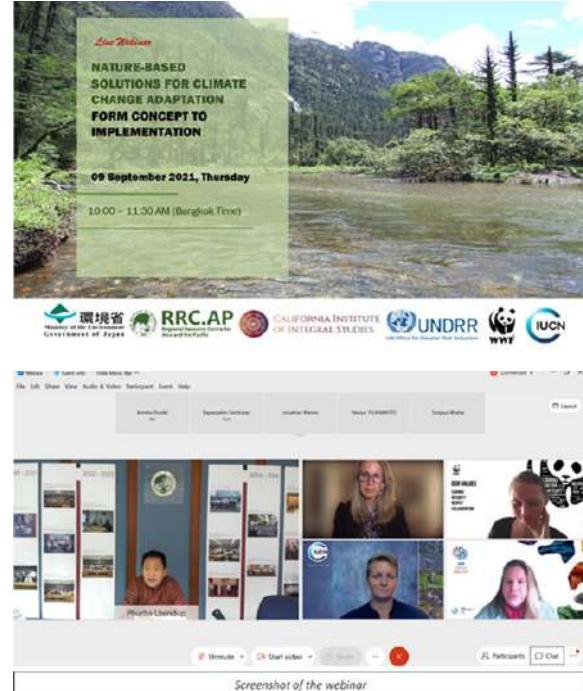
WEBINAR ON NATURE-BASED SOLUTIONS FOR CLIMATE CHANGE ADAPTATION: FROM CONCEPT TO IMPLEMENTATION



AIT's RRC.AP organized a webinar on Nature-based Solutions (NbS) for Climate Change Adaptation: From Concept to Implementation to help identify opportunities for NbS to adapt to climate change, particularly having a common understanding and interpretation of NbS concepts and taking advantage of existing traditional ecological knowledge in NbS application. The webinar provided experiences and highlighted emerging priorities for key donors and implementing agencies in supporting nature-based solutions for adaptation along with the benefits of investing in nature-based solutions.

The 90-minute webinar gathered 175 environment enthusiasts from various affiliations (academia, civil societies, international organizations, local governments, national governments, and the private sector) from 25 countries around the world.

The webinar formally started with a welcome address by Dr. Naoya Tsukamoto, Director of RRC-AP, and continued with moderation from Mr. Phurba Lhendup, Head of the Climate Change Cluster, RRCAP. In his keynote address, Mr Sanjaya Bhatia, Head of Office for Northeast Asia (ONEA) & Global Education and Training Institute (GETI), United Nations Office for Disaster Risk Reduction (UNDRR), stressed Nature-based Solutions (NbS) as one of the approaches for strengthening environmental resilience within the Sendai Framework as well as the need to build the capacity of stakeholders for implementing NbS solutions. The video recording of the webinar can be accessed at:



🌐 https://www.youtube.com/watch?v=tllwQRg_Vy4&ab_channel=RRCAP

🌐 <http://www.rrcap.ait.ac.th/Pages/event.aspx> or <https://bit.ly/3kxzDkz>

CLIMATE CHANGE AND WATER RESOURCES [CE74.18, 3(3-0)], SCHOOL OF ENGINEERING AND TECHNOLOGY (SET), JANUARY SEMESTER 2021



The objective of this course is to provide knowledge and understanding of climate change and its impact on water resources availability, use, and demand. This course provides knowledge and skills on modeling tools and methods for climate change projections and impact assessment in water sectors, vulnerability assessment, and adaptation strategies in managing water at regional, national, and local levels.

On completion of this course, students will be able to:
(i) assess climate variability and climate change, apply

various tools and techniques to construct climate change scenarios at local level from the outputs of General Circulation and Regional Climate Models; (ii) apply climate information tools and methods for climate change impact and vulnerability assessments; and (iii) formulate climate change adaptation strategies to offset negative impacts of climate change on water resources and selected water use sectors.



CLIMATE CHANGE IMPACTS, VULNERABILITY, AND ADAPTATION: CONCEPTS, TOOLS, AND PRACTICES [ED82.06, 3(2-3)], SCHOOL OF ENVIRONMENT, RESOURCES AND DEVELOPMENT (SERD), AUGUST SEMESTER, 2021



This course provides a brief introduction to climate change science, details concepts and methods relevant to climate change impacts, and vulnerability and adaptation assessment. The course provides hands-on activities for using selected tools and techniques to assess impacts, vulnerability, and design and implementation of adaptation strategies for natural and managed resources and systems as well as their use (water, agriculture, ecosystems).

On completion of this course, students will be able to:
(i) analyze climate change vulnerability and adaptation;
(ii) conduct climate change impact, vulnerability, and adaptation assessments; and (iii) apply tools and techniques for climate change impact and vulnerability assessments.

SESSION ON TOWARD A GREEN AND INCLUSIVE SOCIETY,' 1ST MEKONG-JAPAN SDG FORUM, ORGANIZED BY THE MINISTRY OF FOREIGN AFFAIRS, THAILAND AND THE MINISTRY OF FOREIGN AFFAIRS, JAPAN



The Government of Japan and the Royal Thai Government co-hosted the 1st Mekong-Japan SDG Forum in an online format on 20 December 2021. The Forum was co-chaired by Mr. Kano Takahiro, Director-General, Southeast and Southwest Asian Affairs Department, Ministry of Foreign Affairs of Japan, and Ms. Arunrung Phothong Humphreys, Ambassador Attached to the Ministry and Thailand's Mekong Senior Officials Meetings (SOM) Leader, Ministry of Foreign Affairs of Thailand.

The main objective of the session was to discuss common challenges and ways forward for achieving a green and inclusive society along with the SDGs in member countries of the Mekong region and identify an enabling environment for enhancing cooperation between member countries and Japan under the Japan-Mekong Cooperation Framework and other regional initiatives related to the SDGs. In Session 3, under the theme of "Toward a Green and Inclusive Society, participants from Mekong countries and international

organizations raised issues related to climate change and water resources management. With regard to climate change issues, participants concurred that these are important issues the international community should immediately deal with while also consenting to promote cross-regional efforts for the development of the entire Mekong region.

https://www.mofa.go.jp/s_sa/sea1/page24e_000333.html





● 3RD AIT-BNU VIRTUAL WORKSHOP ON CLIMATE CHANGE, WATER RESOURCES, AND ECOSYSTEMS: CHALLENGES AND OPPORTUNITIES, ASIAN INSTITUTE OF TECHNOLOGY



AIT jointly with Beijing Normal University (BNU), Hefei University of Technology (HFUT), and Beijing University of Technology (BJUT) organized the 3rd AIT-BNU Virtual Workshop on Climate Change, Water Resources, and Ecosystems: Challenges and Opportunities on 22 September 2021. The main objective of this workshop was to create a platform to review and present advanced methodologies, current progress and challenges, and future opportunities in water ecosystems management under climate change. The workshop consisted of 28 presentations allocated to four technical sessions: (i) Modeling changing climate in relation to the hydrological cycle (Session A-1); (ii) Climate extremes and impacts on water resources and ecosystem (Session B-1); (iii) Interactions of water resources and ecosystems (Session A-2); and (iv) Risk assessment of ecosystem degradation in a changing environment (Session B-2). More than 130

participants witnessed presentations from 30 academic and research institutions.

🌐 <https://bit.ly/3c1zyoi>



● KEYNOTE ON HYDROMETEOROLOGICAL DISASTERS IN THAILAND: LESSON LEARNED, CHALLENGES, AND WAY FORWARD AT THE OGC ASIA FORUM 2021



The Open Geospatial Consortium (OGC) is an international consortium of more than 500 businesses, government agencies, research organizations, and universities working to make geospatial location information and services FAIR: Findable, Accessible, Interoperable, and Reusable. The forum was organized as part of the Singapore Geospatial Festival 2021 to learn more about emerging standards and innovation related to Disasters, Climate Change, Digital Twins, and more.

🌐 <https://www.ogc.org/about>





✿ LECTURE ON CLIMATE CHANGE IMPACTS ON HYDROCLIMATIC EXTREMES: EVIDENCE FROM MODELING STUDIES FOR PARTICIPANTS IN THE CERTIFICATE COURSE ON MULTIDISCIPLINARY APPROACH TO DISASTER RISK MANAGEMENT, RESILIENCE, AND SUSTAINABILITY, ASIAN INSTITUTE OF TECHNOLOGY



AIT in coordination Keio University, Miyagi University of Education, Andalas University, and Universitas Gadjah Mada under the ProSPER.Net consortium conducted a certificate course on Multidisciplinary Approach to Disaster Risk Management, Resilience, and Sustainability for members of the Higher Education Institute (HEI) on Disaster Resilience and Sustainable Development. The main objective of the training was to enhance the capacity and understanding of young people and early-career researchers about the SDGs and the Sendai Framework for Disaster Risk Reduction (SFDRR). The key message from the lecture included:

- ▶ More than 90% of natural disasters are caused by the hydro-climatic extremes;
- ▶ There is increasing evidence of climate change impacts on hydro-climatic extremes; and

The booklet cover features the logos of the participating universities: Keio University, Miyagi University of Education, Andalas University, Universitas Gadjah Mada, and Miyagi University of Education. The title is centered above a horizontal line, followed by the author's name and affiliation. At the bottom left, it says 'CERTIFICATE COURSE'.

- ▶ Modeling studies show that climate change will exacerbate hydro-climatic extremes in the future.
- 🌐 <https://prospernet.ias.unu.edu/projects/past-projects/disaster-education-for-integrating-sfdr-and-sdg-in-asia>

🔍✿ TECHNOLOGY NEEDS ASSESSMENT PROJECT IV (TNA – IV)



The objective of the Technology Needs Assessment (TNA) project is to support participating developing countries (i.e., the Maldives, Timor Leste, and Papua New Guinea) in identifying and analyzing their national priority technology needs, which can form the basis for a portfolio of climate technology projects and programs to facilitate the transfer of and access to climate technologies. A

TNA presents an opportunity to track an evolving need for new equipment, techniques, practical knowledge, and skills, all of which are necessary to meeting national commitments under the Paris Agreement and reducing the vulnerability of sectors and livelihoods to the adverse impacts of climate change.



☒ • ASSESSMENT ON AGRICULTURAL TECHNIQUES AND TECHNOLOGIES TO MITIGATE THE POTENTIAL NEGATIVE EFFECTS OF CLIMATE CHANGE ON RICE PRODUCTION SYSTEMS IN CLMV COUNTRIES



The ASEAN Secretariat with the support of the ASEAN-Australia Development Cooperation Program (AADCP) Phase II had entrusted AIT to undertake and implement the project titled Assessment of Agricultural Techniques and Technologies to Mitigate the Potentially Negative Effects of Climate Change on Rice Production Systems in CLMV Countries. The expected output of this assessment is to identify: (i) impacts of climate change on the rice production systems in Cambodia, Laos, Myanmar, and Vietnam (CLMV); and (ii) progress on developing techniques and technologies to safeguard the agriculture sector against climate change. The assessment considered emerging issues such as the COVID-19 pandemic, identified common gaps and problems amongst CLMV countries, and answered relevant questions for each CLMV country. In summary, the followings are the key areas that need emphasizing for strengthening rice production systems under climate change impacts in CLMV countries: (i) increasing farmers' awareness, training, communication, and participation in technology adoption process; (ii) promoting diversified cropping systems in rain-fed agriculture; (iii) developing and promoting improved cultivars better suited to future climate through continued agricultural research, development, and extension; (iv) enhancing transportation, storage facilities, communication, and marketing infrastructure; (v) promoting sustainable irrigation technology and suitable varieties; (vi) increasing government investment in the agricultural sector; (vii) developing productive use policy on agriculture and rice production; (viii) promoting agricultural financing and banking, and (ix) strengthening national agricultural research and extension systems.

[✉ extension@ait.ac.th](mailto:extension@ait.ac.th)

Table 6-3 Farmers' adoption rate of techniques and technologies to mitigate the climate change impact on rice production in CLMV countries

Techniques and Technologies	Farmers' adoption rate*			
	Cambodia	Lao PDR	Myanmar	Viet Nam
System of rice intensification (SRI)	H	L	L	H
Alternate wetting and drying (AWD)	L	M	L	M
Improved varieties	H	H	H	H
Stress Tolerant Rice Varieties (STR)	M	L	M	M
Ecological/Integrated pest management	H	M		H
Crop diversification	H	M		H
Good agricultural practice (GAP)		M	L	H
Climate-smart agriculture (CSA)	M	M		M
Soil and Water Conservation (SCW) Practices		L		M
-Conservation Agriculture (zero/minimum tillage farming, crop rotation)		L	L	M
-Green manuring		L	M	M
-Mulching	M	M	M	M
-Composting	H	H	H	M
-Vermicomposting		L	L	M
-Biochar, Bio-fertilizer		L	L	M
Integrated farming (IF)	H	M	M	M
Three reductions three gain (3R3G)				H
One must five reductions (1M5R)				H
Improved input and post-harvest technologies	H	M		M
Value addition and marketing		M		H

* Farmers' adoption rate is estimated based on authors' synthesis on field experience, review papers and project documents. H: High; M: Medium; L: Low.

Table 6-1 Impact and severity of different climatic events to the rice production system in CLMV countries

Extreme climatic events	Severity rate*			
	Cambodia	Lao PDR	Myanmar	Viet Nam
Floods	H	H	M	H
Drought		M	H	M
Land degradation	H	M		M
Soil/riverbank erosion	L	L	H	M
Landslides		L	L	H
Heat waves			H	
Cold waves		M		
Strong wind		L	H	
Pest outbreak & Disease epidemics	M	H		H
Increase temperatures	M	M	H	M
Low river levels	L	M	Y	H
Irrigation water shortage	M	M		L
Sudden heavy rainfall	L	L	H	H
Salinity	L		Y	H
Submergence	L		Y	L
Cyclone/Storm surge		M	M	
Sea level rise			L	L

*Severity rate is estimated based on authors' synthesis on field experience, review papers and project documents. H: Highly severe; M: Moderate severe; L: Low severe.



14 LIFE
BELOW WATER



CONSERVE AND SUSTAINABLY USE THE OCEANS, SEA AND MARINE RESOURCES FOR SUSTAINABLE DEVELOPMENT

AIT collaboratively addresses river health monitoring and clean-up efforts and promotes good practices in biodiversity protection and river and marine ecosystem maintenance throughout the region. Other areas addressed by AIT experts in 2021 included genetic fish stock improvement, use of digital technologies in aquaculture production, processing, value addition, business creation, marketing, and governance. Antimicrobial use and mitigation were discussed at an AIT/FAO co-sponsored virtual international conference.

AIT organized a virtual program on sustainable Asian aquaculture systems and practices in India, participated in a civic platform on ecotourism and ocean plastic pollution Asia-Pacific, and provided technical assistance to support river basin planning in Laos. The Marine Plastics Abatement (MPA) program supported by the Government of Japan held a virtual celebration for its first batch of 39 Master's graduates committed to reducing marine plastic litter to zero by 2050.



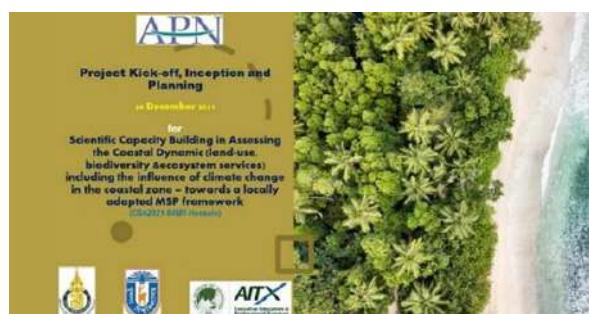
SCIENTIFIC CAPACITY BUILDING IN ASSESSING COASTAL DYNAMICS (LAND-USE, BIODIVERSITY, & ECOSYSTEM SERVICES) INCLUDING THE INFLUENCE OF CLIMATE CHANGE IN COASTAL ZONES: TOWARD A LOCALLY-ADAPTED MSP FRAMEWORK



AIT working under the Asia-Pacific Network for Global Change Research (APN)'s Capacity Development Program (CAPaBLE) is implementing a project on Scientific Capacity Building in Assessing Coastal dynamics (land-use, biodiversity, & ecosystem services) Including the Influence of Climate Change in Coastal Zones: Toward a Locally-adapted MSP Framework in collaboration with Khulna University, Bangladesh and Prince of Songkla University, Thailand. The project aims to enhance scientific capacity and knowledge at local level about planning and decision-making in relation to improving the situation of coastal communities, their resource use patterns, and the vulnerabilities of coastal ecosystems. Project activities are divided into two main parts: (i) research on existing practices and possible adaptation of MSP (marine/maritime spatial planning) to address coastal and marine area management issues at local or sub-national level; and (ii) enhancing or raising knowledge and skills required at local or subnational levels on the science-policy interface, i.e., being able to use required knowledge and tools and

provide possible interventions in decision-making at local level. The project is anticipated to generate science-based knowledge and skills that will contribute to decision-making on development planning, resource utilization, and investment plans at local and sub-national levels and eventually contribute at national level to achieving SDG14 and relevant SGDs.

[✉ extension@ait.ac.th](mailto:extension@ait.ac.th)





AIT RESEARCH PARTNERSHIP WITH GROBEST HOLDINGS CO., HONG KONG: SMART FEEDING SOLUTIONS FOR GROWING THE BEST SHRIMP AND FISH FOR ASIA



Grobest Holdings is a multinational company based in Hong Kong and operating in eight major aquaculture producing countries. Grobest specializes in the formulation and manufacture of aquafeeds, with a significant presence in the Asia-Pacific region. Grobest recognizes AIT's AARM as the key Research and Innovation Center in Thailand. An MoA was signed between AIT and Grobest covering the development and testing of various products, and several research trials have been initiated. With new research units, AARM now has dedicated infrastructure for intensive on-campus shrimp production and research.

 <https://www.aitaquaculture.org/grobest-holdings.htm>



SMART P3BLUEECO-2021, SHASTRI INDO-CANADIAN INSTITUTE, GOLDEN JUBILEE CONFERENCE



Dr. K.R. Salin delivered a Plenary Lecture on the topic of New Paradigms for Sustainable Aquaculture: The Age of Innovations at the SMART P3BLUEECO-2021, Shastri Indo-Canadian Institute- Golden Jubilee Conference on Sustainable Marine Fisheries and Aquaculture: Policies, Packages, and Perspectives in the Blue Economy

Paradigm on 12 March 2021. Kerala University, Dept. of Aquatic Biology and Fisheries, Thiruvananthapuram, India.

 <https://bit.ly/3w1Voym>

GENETICS WORKSHOP: DR. NGUYEN HONG NGUYEN, USC, AUSTRALIA AND DR. LIFAT RAHI, KHULNA UNIVERSITY, BANGLADESH



A workshop on Genomics and Selective Breeding was arranged for AIT masters and doctoral students. Dr. Nguyen Hong Nguyen, University of the Sunshine Coast, Australia, was invited to virtually deliver a special one-day workshop for AARM masters students on 27 April 2021. The workshop covered various selective breeding

approaches for genetic stock improvement of finfish and shellfish. On 30 April 2021, two virtual sessions by Dr. Lifat Rahi, Khulna University, Bangladesh were organized on applying omics technologies impacting modern stock improvement programs in aquaculture.



INTERNATIONAL WEBINAR ON DIGITAL TECHNOLOGIES FOR AQUACULTURE PRODUCTION: USEFUL TOOLS FOR FARM MANAGEMENT



The Aquaculture Program of AIT organized an international webinar titled Digital Technologies for Aquaculture Production: Useful Tools for Farm Management on 28 July 2021 jointly with the World Aquaculture Society-Asian Pacific Chapter (WAS-APC). This workshop aimed to bring together leading professionals in aquaculture academia, research, and business to discuss the use of digital technologies at global and regional levels in aquaculture production, processing and value addition, business and marketing, and governance. The meeting was attended by nearly 400 participants from over 50 countries.

<https://www.was-apc.org/?p=3206>



INTERNATIONAL CONFERENCE ON FISHERIES AND AQUACULTURE (ICFA 2021)



The Aquaculture Program of AIT co-organized ICFA 2021, the 8th international Conference on Fisheries and Aquaculture on 19-20 August 2021 as Co-Chair. Due to COVID19 restrictions, this conference was held virtually.

<https://aquaconference.com/icfa-2021>



INTERNATIONAL CONSULTATIVE WORKSHOP ON INNOVATIONS IN AQUATIC HEALTH MANAGEMENT: TOWARD REDUCTIONS IN ANTIMICROBIAL USE (AMU) AND MITIGATION OF ANTIMICROBIAL RESISTANCE (AMR)



A consultative workshop on Innovations in Aquatic Health Management: Toward Reductions in Antimicrobial Use (AMU) and Mitigation of Antimicrobial Resistance (AMR) was organized jointly with the UN's FAO on 26 October 2021. This workshop was part of the AIT-FAO

project on Aquatic Health Management. The workshop attracted nearly 30 international experts and highlighted some of the most successful cases on aquatic health management innovations globally for dissemination in the Asia-Pacific region.



EVALUATION OF TILAPIA PERFORMANCE IN ECONOMIC DIETS SUPPLEMENTED WITH LUCTA ADDITIVES



The aim of this project is to test whether Lucta products have any positive effects on growth and survival of tilapia and economic analysis and to test three Lucta products in two different doses in terms of growth, survival, and economics. The following issues were considered:

- ▶ Mycotoxins in feed and feed ingredients is a common problem;
- ▶ This has negative impacts on digestibility of feed and other toxicity in fish, hampering growth and survival;

▶ The company's products were tested in animals as well as salmon as the Company now plans to expand to tropical fish, including tilapia, which is becoming popular worldwide as a seafood item with good taste and nutrients; and

▶ Tilapia is grown commercially in tropical countries and exported worldwide, especially to the US and Europe.

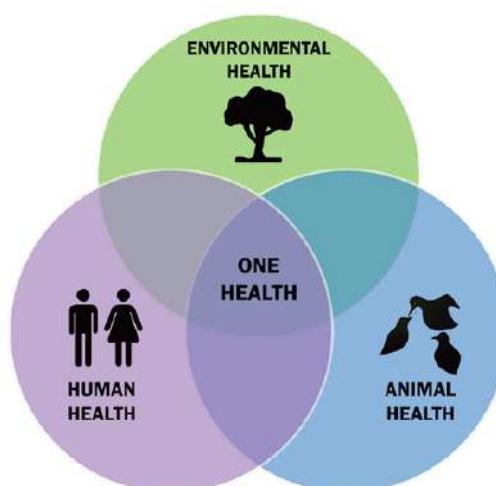


Experimental Facility

DOCUMENTATION OF INNOVATIONS AND GOOD PRACTICES IN HEALTH MANAGEMENT IN AQUACULTURE (AQUA-HEALTH INNOVATIONS)



- ▶ Review of innovations and good practices in aquatic animal health management in the Asia-Pacific region;
- ▶ Review report on innovations and good practices in aquatic health management;
- ▶ Technological innovations and practices contributing to reductions in antimicrobial use and mitigation of antimicrobial risk in aquaculture;
- ▶ Alternatives to the use of antimicrobials in aquaculture;
- ▶ Virtual consultation workshop on Innovations and Good Practices in Aquatic Animal Health Management; and
- ▶ Dissemination of outcomes at FAO workshop (TCP/RAS/3702) during World Antimicrobial Awareness Week, 24 November 2021.





STUDENT INTERNSHIPS: THREE-MONTH VIRTUAL AQUACULTURE INTERNSHIP PROGRAM FOR STUDENTS FROM SKUAST, KASHMIR, INDIA



A Virtual Aquaculture Internship Program on Sustainable Asian Aquaculture Systems and Practices was organized for 55 students from the Sher-e-Kashmir University of Agricultural Sciences and Technology (SKUAST), Kashmir, India from 27 April to 15 July 2021. Although a physical training program was initially planned, the internship was conducted online due to pandemic-related travel restrictions.

🌐 <https://www.aitaquaculture.org/pdf/internship280421.pdf>

🌐 <https://www.glorystreturnstokashmir.com/3-month-internship-for-skuast-k-students-begins-at-ait-thailand>

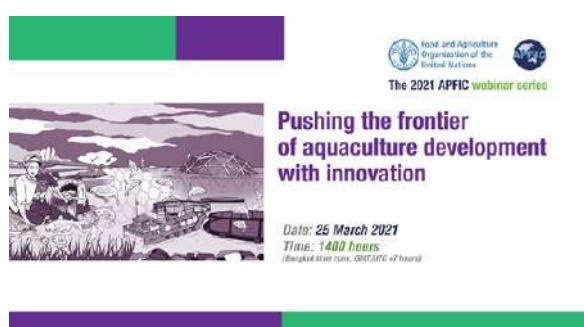


FAO WEBINAR ON PUSHING THE FRONTIER OF AQUACULTURE DEVELOPMENT WITH INNOVATION



Dr. K.R. Salin, invited speaker at the FAO Webinar on Aquaculture Innovation on 25 March 2021, presenting a talk titled Adaptability Versus Flexibility: New Paradigms for Aquaculture Innovations in Asia.

🌐 <https://www.fao.org/asiapacific/events/detail-events/en/c/1720>



PARTICIPATORY CIVIC PLATFORM FOR PROJECT-BASED ECOTOURISM AND THE MITIGATION OF OCEAN PLASTIC POLLUTION IN THAILAND, VIETNAM, AND JAPAN



An online workshop on Ocean Plastic Pollution and Ecotourism in Vietnam, Thailand, and Japan was organized by AIT and Hiroshima Business Management School on 31 October 2021 and funded by the TOYOTA Foundation.

🌐 <http://toyotafound.force.com/psearch/JoseiDetail?name=D19-N-0049>

🌐 <https://bit.ly/3z9tXpk>



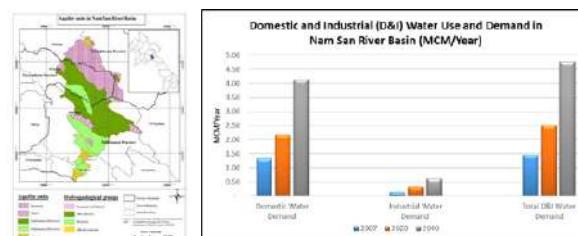
TECHNICAL ASSISTANCE TO SUPPORT RIVER BASIN PLANNING IN PRIORITY RIVER BASINS IN LAOS



Under Component 3.1.1 of the Mekong Integrated Water Resources Management Project (MIWRMP), a World Bank-supported project, the Department of Water Resources (DWR), Laos has engaged the Asian Institute of Technology (AIT) for support in preparing River Basin Management Plans (RBMP), including Water Allocation Plans (WAP), for three priority rivers: Nam Tha, Nam Khan, and Nam San. To accomplish the overall objective, the project consists of four key tasks: Task 1: Revision of the inception report and work plan; Task 2: Preparation of RBMPs, including WAPs for Nam Tha, Nam Khan, and Nam San; Task 3: Preparation of stakeholder consultation plan (SCP) for three target river basins; and Task 4: Development of guidelines for River Basin Management Planning. The overall conclusion is that the project has led to efficient progress toward its overall development aims. Additionally, the project was implemented in a manner such that project work and lessons are sustainable and the River Basin Management Plan (RBMP), Guidelines for Preparation of RBMP, and Stakeholder Consultation

Plan can continue to be implemented and strengthened within Laos over the next few years. Sustainability of the project's impacts, activities, and achievements is very important. Project reports thus reflect on lessons learned and make recommendations for ensuring that chances of sustainability are high and that project's activities can readily be replicated throughout integrated water resources management practices in Laos.

extension@ait.ac.th



MARINE PLASTIC ABATEMENT 1ST BATCH CELEBRATE AND DREAM OF PLASTIC-FREE SEAS



With research highlights showcasing innovations and intensive studies, the first generation of environmental leaders in marine plastic pollution produced by the AIT Marine Plastic Abatement program brought Japan and its global partners' vision of zero plastic litter one step closer to reality. Launched in 2020 with support from the Government of Japan, the one-year Master's program in Marine Plastics Abatement (MPA) held a virtual celebratory event on July 30, 2021 to congratulate the first batch of graduates as well as to express gratitude to those behind their success. The event was joined by Japanese ambassador to Thailand H.E. Kazuya Nashida, AIT President Dr. Eden Woon, AIT Vice President of Academic Affairs Prof. Shobhakar Dhakal, MPA Program Coordinator Prof. Thammarat Koottatep, 39 graduates from the first batch, two student representatives from the second batch, Dr. Wijarn Simachaya, President of the Thailand Environment Institute (TEI), and many other distinguished guests. Addressing the fresh graduates who will lead the region in tackling plastic pollution, the Ambassador Nashida said, "It is important to involve as many people as possible in order to achieve something big, I have high expectations that all of you here who are graduating from AIT, one of the best universities in the world, will not only work hard to achieve your personal goals, but also become leaders who will inspire and influence other people in order to improve the world as much as possible." The MPA program, the first postgraduate program on marine plastic litter in

the region, is supported by the Government of Japan through a financial contribution of 3 million 50 thousand US dollars. The support is part of Japan's Marine Initiative commitment to G20 Osaka Blue Ocean Vision that aims to reduce marine plastic litter to zero by 2050.

<https://bit.ly/3aEq0iU>





PROTECT, RESTORE AND PROMOTE SUSTAINABLE USE OF TERRESTRIAL ECOSYSTEMS, SUSTAINABLY MANAGE FORESTS, COMBAT DESERTIFICATION, AND HALT AND REVERSE LAND DEGRADATION AND HALT BIODIVERSITY LOSS

AIT partners with international institutions in promoting cloud-based technologies to monitor and assess changes in land cover, carbon stocks and emissions, and land availability for forest restoration and climate-smart agriculture. In addition to celebrating International Day of Forests 2021, the Institute delivered a Tech Talks Series on land sustainability. In partnership

with the Living Deltas Research Hub, AIT participated in studies of four delta systems in China, Vietnam, Bangladesh, and India. The Institute also contributed to land resource modeling in Laos covering agrometeorological data, food security, sea level rises, and mangrove destruction along with cutting-edge tools for processing and displaying model data.

FOREST RESTORATION AND WATER USE FOR SMART AGRICULTURE – A CASE STUDY OF CAMBODIA (FRAWASA)



This project is a research collaboration between Lund University, Sweden, Natural Resources Management, SERD-AIT, and the Royal University of Agriculture, Cambodia. FRAWASA is aimed at identifying land cover change in Cambodia and assessing land availability for forest restoration and climate-smart agriculture. It suggests policy interventions for reducing carbon emissions from deforestation and for increasing carbon stocks through forest restoration and smart agriculture. Six high-impact papers have been published in Science of Total Environment, Remote Sensing, Data in Brief, and Environmental Research Letters, and 10 conference presentations were also made. The project also developed tools for supporting policy-making in forest carbon stock assessment, ecosystem productivity, climate-smart agriculture, and forest restoration at scale.

🌐 <https://bit.ly/3hMQKxD>





VIRTUAL SEMINAR ON FOREST RESTORATION AND GLOBAL SUSTAINABILITY



This virtual seminar was organized by the Natural Resources Management (NRM) academic program to celebrate International Day of Forests on 21 March 2021 and to provide a forum for sharing research and thoughts about forest restoration and its contribution to climate change mitigation and global sustainability. Participants included speakers from government and the private and academic sectors along with over 90 online and offline participants. Speakers also included a vice minister from the Ministry of Environment (Cambodia), a professor from Kyoto University (Japan), a regional South Pole director (Bangkok office), and NRM faculty members. One high school in India also attended the seminar. The seminar delivered five talks to 90 online participants and to one class of high school students in India. Proceedings from the seminar were also produced.

 <https://dds.ait.ac.th/idf-2021>



AIT TECH TALKS SERIES : AIT TECH FOR SUSTAINABILITY TALKS: LEVERAGING TECHNOLOGY TO SOLVE SUSTAINABILITY CHALLENGES



This talk was part of the AIT Tech Talks Series on Tech for Sustainability. Current students and two AIT alumni presented technologies to support sustainable development in their respective fields, ranging from a marketplace for managing bamboo forest and its products to support farmers, a climate financial platform to incentivize farmers to reduce the burning of croplands and crop residues in exchange for carbon points, and near-real time technology for monitoring changes in land cover and carbon stocks and for identifying degraded lands for forest restoration at scale and at speed.

 <http://www.aea.ait.ac.th/tech-talk-series-4>





UK RESEARCH AND INNOVATION (UKRI) GLOBAL CHALLENGES RESEARCH FUND (GCRF) – LIVING DELTAS



The Living Deltas Research Hub is the leading delta science and research partnership operating across four delta systems: the Red River, the Mekong Delta in Vietnam, and the Ganges-Brahmaputra-Meghna systems in Bangladesh and India. The Living Deltas Hub project aims to tackle the problem of delta degradation in the face of multiple threats (sea level rises and saline intrusion, mangrove degradation and loss of coastal buffering, climate change, population increases, changes in land use, vulnerable communities' health and wellbeing, and unsustainable engineering interventions such as damming, sand mining, etc.). GCRF also aims at helping delta countries to better achieve their SDG-related Voluntary National Review agendas. The Hub is truly interdisciplinary and brings together the natural and physical sciences, the social sciences, and the arts and humanities on an equal basis in seeking new solutions by building on research already carried out in delta countries to complex, intertwined issues through capacity-building and knowledge co-production towards better delta futures.

AIT is leading the project's Phase 2, which will provide robust characterizations of livelihood risks and produce integrated risk-assessments of socio-ecological delta systems.

- ▶ Index-based Integrated Risk and Resilience Assessment Framework for delta socio-ecological systems (SES);

- ▶ Detailed assessment of delta livelihoods and coping strategies;
- ▶ Delta Health Index (DHI) for assessing delta health;
- ▶ Establishment of coastal system health baseline;
- ▶ GDRlc, evolution for the coastal zone
- ▶ Development of gender-sensitive guiding document with and for communities to monitor poverty, nutrition, and wellbeing;
- ▶ Creation of delta SDG multi-stakeholder participatory group to review policy options;
- ▶ Creation of sustainable development capacity and delivering impacts (including managing the theory of change);
- ▶ Co-production of relevant plans and policies based on local and indigenous knowledge for sustainable delta management;
- ▶ Flood Model for Ganga Brahmaputra Meghna Delta;
- ▶ InVEST Model for Ganga Brahmaputra Meghna Delta; and
- ▶ Cellular Automata Model for Land Use and Land Cover in the Ganga Brahmaputra Meghna Delta

🌐 <https://livingdeltas.org>



Workshop on Impacts of Natural Hazards, Livelihood Challenges, and Adaptation Strategies in Sundarbans, organized in Sagar CD Block



Workshop on Impacts of Natural Hazards, Livelihood Challenges, and Adaptation Strategies



The Honorable Minister in Charge of Department of Sundarban Affairs, Shri Bankim Chandra Hazra participated in the Workshop



Workshop Inauguration



DEVELOPMENT OF CAPACITY AND IMPLEMENTATION OF MODELING FOR THE PREPARATION OF DATA FOR A CLIMATE ATLAS UNDER SAMIS PROJECT IN LAOS (CLIMATE DOWNSCALING)



The goal of the project is to support national institutions in developing their capacity to support information creation and knowledge exchange on agro-meteorological and agricultural production and strengthen land resource information. These outputs will support the development of agro-ecological zoning (AEZ) and the institutional capacities for supporting agricultural policy development and local adaptation. It will seek to achieve this through two key objectives: (i) enhancing monitoring, analysis, communication, and use of agro-meteorological data and information for decision-making in relation to agriculture and food security at national and provincial levels; and (ii) improving monitoring and analysis of agricultural production systems by strengthening Land Resources Information Management Systems (LRIMS) and Agro-Ecological Zoning (AEZ) to support agricultural policies and climate-change adaptation. In particular, the Strengthening Agro-climatic Monitoring and Information Systems (SAMIS) project, which aims to improve adaptation to climate change and food security in Laos, is implementing the following activities: (i) downscaling of high-resolution climate change scenarios in the entire country as well as in all major crop production zones; and (ii) developing an Agro-climate Atlas for all production areas in Laos. GIC-AIT published a peer-reviewed journal article as a result of the climate downscaling activities of

the SAMIS project (see link below). GIC-AIT also led a three-part training course on building climate modeling and downscaling capacities for a core team of officers from the Department of Climate Change (DCC), Laos in support of climate policy implementation in Laos. Course materials addressed the dynamic and statistical downscaling of climate data for Laos as well as a review of Python scripting skills necessary for processing and displaying model output data.

- ▶ Journal article: <https://www.hindawi.com/journals/amete/2021/6630302>
- ▶ FAO SAMIS Program website: <http://www.fao.org/in-action/samis/en>



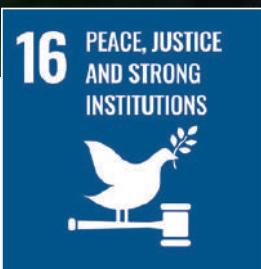
THE 2ND AIT-BNU JOINT VIRTUAL WORKSHOP ON WATER, HEALTH, AND ECOSYSTEMS: CURRENT CHALLENGES AND OPPORTUNITIES (2ND AIT-BNU WORKSHOP)



The International Workshop on Water, Health, and Ecosystems: Current Challenges and Opportunities sought to create a platform for presenting the current state of knowledge regarding advanced methodologies, current progress and challenges, and future opportunities in water health and ecosystems management. Four technical sections included:

- ▶ Assessment of water quality and ecosystem degradation;

- ▶ Remote sensing, field observation, and combined use of multiple technologies;
- ▶ Ecosystem responses to climatic and anthropic influences; and
- ▶ Integrated modeling of water quantity and quality"
- ▶ Over 80 participants from the region and beyond participated in the event.



PROMOTE PEACEFUL AND INCLUSIVE SOCIETIES FOR SUSTAINABLE DEVELOPMENT, PROVIDE ACCESS TO JUSTICE FOR ALL AND BUILD EFFECTIVE, ACCOUNTABLE AND INCLUSIVE INSTITUTIONS AT ALL LEVELS

In 2021, AIT continued to be active in promoting training for government officials in areas such as disaster management and resilience, including institutional and personal capacity for generating and interpreting data central to post-disaster reconstruction programs and conducting adaptation assessments, planning, policy frameworks, and coordination across governance levels in relation to climate change.

The Institute collaborated with the United Nations Framework Convention on Climate Change and research and educational institutions in initiating climate action and support training with the aim of enhancing the capacities of developing countries for conducting vulnerability and adaptation assessments, preparing and reporting information based on such assessments, and implementing national adaptation actions.

SUPPORT FOR EMERGENCY ASSISTANCE ON REHABILITATION AND RECONSTRUCTION IN CENTRAL SULAWESI, INDONESIA: MONITORING AND EVALUATION OF RECONSTRUCTION EFFORTS ENHANCED (ADB PALU SUBSIDENCE MONITORING)

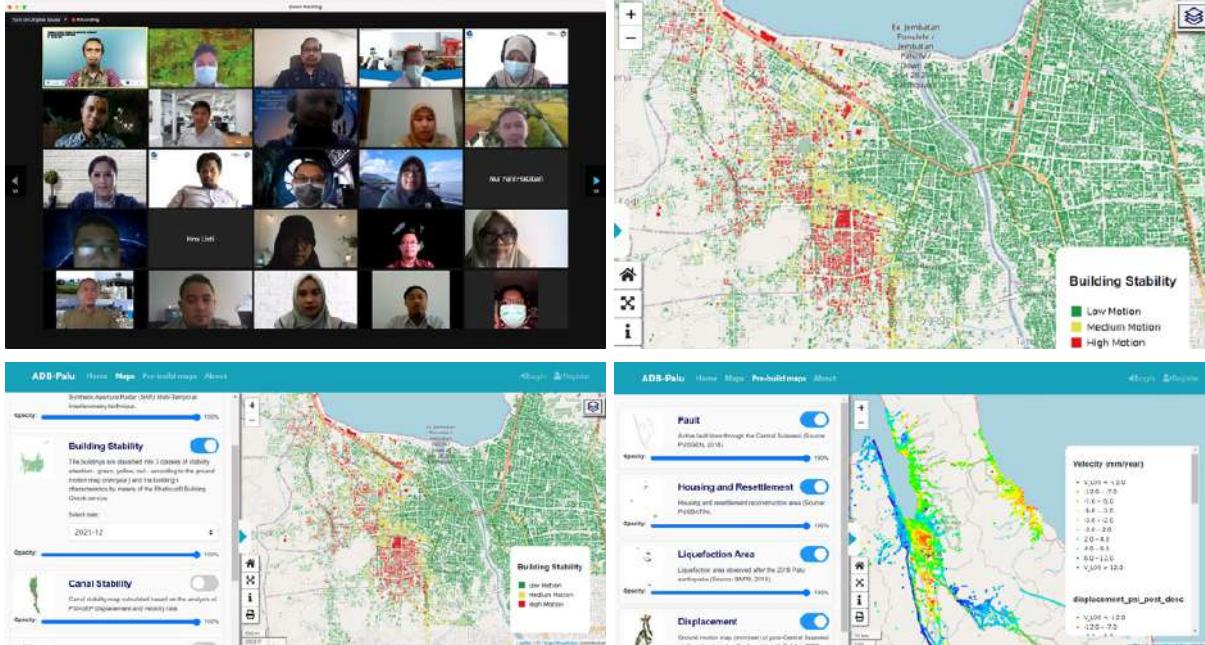


This assignment aims to provide information on the stability of buildings and infrastructures to support reconstruction efforts following the 2018 earthquake in Central Sulawesi, Indonesia. To support the Government of Indonesia's post-disaster reconstruction program, the Asian Development Bank (ADB) provided Emergency Assistance for Rehabilitation and Reconstruction (EARR) support with a grant from the Japan Fund for Poverty Reduction (JFPR). GIC-AIT and the Remote Sensing Technology Center of Japan (RESTEC) jointly secured this project for: (i) regular monitoring of land stability and reconstruction of the area affected by the 2018

earthquake and tsunami; (ii) developing a geospatial platform (GeoPortal) to support the reconstruction monitoring to complement the MPWH's National Disaster Response Information System (NDRIS); and (iii) enhancing the capacity of satellite-based monitoring by local government agencies. Land stability was monitored using Earth Observation (EO) data from synthetic-aperture radar (SAR) sensors from the onset of the 2018 event through mid-2021. The SAR data was processed using P-SBAS and PSI techniques and a number of products were created based on these analyses, including stability maps for buildings, roads,



and irrigation canals. These products, including the analysis, were made available to the public through the Geoportal platform. Training programs are being conducted targeting Indonesian government officials to support institutional capacity development. Three training programs were conducted in 2021 and included



✳️ IMPACTS OF CLIMATE CHANGE ON HYDROLOGY AND WATER RESOURCES: TRAINING COURSE ON CLIMATE CHANGE AND ADAPTATION ORGANIZED BY THE CASTT ADAPTATION ACADEMY ASIA-PACIFIC REGION (UNFCCC, AIT, KACCC)



The UNFCCC secretariat in collaboration with five research and educational institutions has initiated the Climate Action and Support Transparency Training (CASTT) Adaptation Academy. Designed to provide a multi-week training program on the Paris Agreement with a focus on adaptation reporting aspects of the enhanced transparency framework, the Adaptation Academy aims to enhance technical capacity for adaptation assessments, planning, policy frameworks, and coordination across ministries and governance levels to act on climate change. The CASTT Adaptation Academy aims to enhance the ability of developing countries to conduct vulnerability and adaptation assessments, prepare and report in a timely manner information resulting from such assessments and the implementation of national adaptation actions, including their Nationally Determined Contributions (NDCs), national communications, biennial update reports, and biennial transparency reports under the Measurement, Reporting, and Verification (MRV) arrangements of the Convention and the Enhanced Transparency

an Introduction to SAR for Reconstruction Monitoring, Land Stability Monitoring, and Knowledge Sharing and Capacity Building from Earth Observations. The remaining three training courses will take place in 2022.

🌐 <https://pgeo.ait.ac.th>

Framework (ETF) of the Paris Agreement. The goal is to enable systematic, generational step-by-step change in capacity to meet the ambitions of the Paris Agreement, its associated Nationally Determined Contributions (NDCs), and other climate-related commitments.

🌐 <https://unfccc.int/castt-adaptation-academy>

UNFCCC CASTT ADAPTATION ACADEMY ASIA-PACIFIC

CLIMATE CHANGE IMPACTS ON HYDROLOGY AND WATER RESOURCES

Sangam Shrestha
Professor
Water Engineering and Management
Asian Institute of Technology



SUSTAINABLE GROUNDWATER MANAGEMENT UNDER SOCIOECONOMIC AND CLIMATE CHANGE IN THE MEKONG DELTA, VIETNAM (GW-MEKONG) FUNDED BY THE UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT (USAID)



The project aims to: (i) provide robust, science-based evidence on the combined impacts of socioeconomic factors and climate change on groundwater; (ii) propose feasible adaptation options and implementation pathways for groundwater governance to help policymakers make concrete decisions; and (iii) create a knowledge platform for involved stakeholders to exchange information, eventually facilitating the decision-making process. The research team will generate high-resolution future climate data using state-of-the-art regional climate models to evaluate the impacts of climate change on groundwater in the

near (2030s), mid (2050s), and distant (2080s) future. Socioeconomic data and plans will be used to analyze and estimate existing and future groundwater demand in the Vietnamese Mekong Delta (VMD). Feasible adaptation options and implementation pathways will be formulated by analyzing existing measures and their potential barriers and evaluated through the multi-modeling approach.

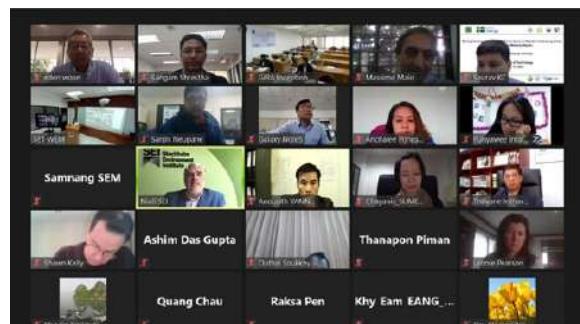
 https://sites.nationalacademies.org/PGA/PEER/PEERscience/PGA_195554

INCEPTION WORKSHOP OF STRENGTHENING GROUNDWATER GOVERNANCE IN RAPIDLY URBANIZING AREAS OF THE LOWER MEKONG REGION PROJECT



An inception workshop of the Strengthening Groundwater Governance in Rapidly Urbanizing Areas of the Lower Mekong Region project was successfully concluded on 19 January 2021 on the AIT campus via a virtual platform. The project is funded by the Stockholm Environment Institute (SEI) under the SUMERNET 4 All Program, which is funded by the Swedish International Development Cooperation Agency (SIDA). The study areas of the project are the cities of Vientiane (Laos), Khon Kaen (Thailand), Siem Reap (Cambodia), and Can Tho (Vietnam). The objective of this virtual inception workshop was to introduce the project and discuss improvements to project design involving boundary partners, particularly the Ministries of Natural Resources and Environment from Thailand, Laos, and Vietnam and the Ministry of Water Resources and Meteorology from Cambodia as well as relevant stakeholders in groundwater development and management in respective countries.

 <https://bit.ly/3yYx6Hh>





**17 PARTNERSHIPS
FOR THE GOALS**



STRENGTHEN THE MEANS OF IMPLEMENTATION AND REVITALIZE THE GLOBAL PARTNERSHIP FOR SUSTAINABLE DEVELOPMENT

In 2021, partnerships linking AIT to organizations working toward the implementation of the SDGs extended to universities, NGOs, international organizations, national governments, regional bodies, civil society organizations, development agencies, and the private sector. Examples included contributing to the *Fourth Forum of Ministers and Environment Authorities of Asia Pacific*, elevating strategic partnerships with United Nations ESCAP (UN ESCAP), Food and Agriculture Organization (FAO) and the Asian Disaster Preparedness Center, engaging with UNEP, UNESCO and ITU on an array of issues topping

the international sustainable development agenda, co-hosting the 2021 Times Higher Education Campus Live Asia Global Conference, participating in drafting further implementation of the Malé Declaration, celebrating the role of the Acid Deposition Monitoring Network in East Asia, and marking Social Business Day 2021, the 2021 Global Social Business Summit, and the 2021 Thailand Social Enterprise Forum with the participation of invited speakers from countries as varied as Bangladesh, Kenya, Liechtenstein, Mexico, Vietnam, and the USA.

AIT CO-HOSTS THE TIMES HIGHER EDUCATION CAMPUS LIVE ASIA GLOBAL CONFERENCE

On 14 December 2021, the Asian Institute of Technology (AIT) co-hosted the 2021 Times Higher Education (THE) Campus Live Asia Global Conference, at which AIT President Eden Y. Woon delivered welcome remarks, followed by Institute participation in several discussions in the widely-attended global forum on the most pressing issues affecting higher education. In addition to academic and professional staff and leaders from universities across Asia, AIT students joined the forum, which highlighted Sustainability Strategies for the Next Generation.



#THEliveasia



🌐🤝 AIT'S RRC.AP WORKING GROUP MEETING ON DRAFTING STRATEGY AND WORK PROGRAM FOR PHASE-VII (2021-2025) OF THE MALÉ DECLARATION (MD WG2021)



AIT's RRC.AP organized a virtual Working Group Meeting on Drafting Strategy and Work Program for Phase-VII (2021-2025) of the Malé Declaration on Control and Prevention of Air Pollution and Its Likely Transboundary Effects for South Asia (MD WG2021) on 8 April 2021. Nearly 30 participants representing National Focal Persons (NFPs) and National Implementing Agencies (NIAs) from the eight member countries of the Malé Declaration, namely, Bangladesh, Bhutan, India, Iran, the Maldives, Nepal, Pakistan, and Sri Lanka, attended the Session. The Regional Facilitator of the Malé Declaration, Mr. J.S. Kamyotra and AIT's RRC.AP as the Secretariat were also present at the meeting. MD WG2021 was convened to facilitate discussion among member countries on the Strategy and Work Program for Phase-VII (2021-2025) implementation of the Malé Declaration. Participants had the opportunity to brainstorm and exchange views on workable arrangements for moving forward. Member countries showed keen interest and



demonstrated support for the continuation of the Malé Declaration Network. The meeting made good progress in drafting the Strategy and Workplan for Phase-VII, including identification of activities to be conducted in 2021, the mechanism for implementation, and financing requirements. The key results of this meeting were presented for further deliberation at an Intergovernmental Meeting held in 2021.

🌐 <http://www.rrcap.ait.ac.th/Pages/event.aspx>

🌐🤝 TWENTIETH ANNIVERSARY OF EANET AND EANET SCIENCE AND POLICY DIALOGUE



EANET 20th Anniversary celebration and the EANET Science and Policy Dialogue were organized back-to-back on 26 November 2021. The virtual event gathered over 100 participants from 30 countries to discuss better air quality for all.

EANET's 20th Anniversary celebration was organized to commemorate significant milestones in the Acid Deposition Monitoring Network in East Asia (EANET) in its 20 years of successful inter-regional cooperation and implementation of activities. EANET was established in 2001 as a regional intergovernmental network to promote cooperation among 13 Participating Countries (Cambodia, China, Indonesia, Japan, Laos, Malaysia, Mongolia, Myanmar, the Philippines, the Republic of Korea, Russia, Thailand, and Vietnam) to address acid deposition problems. Accumulating the progress made by EANET over the last 20 years, a new publication titled Summary of the 20th Anniversary of the Acid Deposition Monitoring Network in East Asia (EANET) has been developed and was launched during the event. Hosted by the Ministry of the Environment, Japan, the celebration was marked by congratulatory remarks by EANET national focal persons and presentation of the Summary of the 20th Anniversary of the EANET.

🌐 <https://www.eanet.asia/news-20th-anniversary-of-eanet/>



The EANET Science and Policy Dialogue online event followed EANET's 20th Anniversary celebrations and was organized to discuss EANET's future direction in partnership with scientists and policymakers. The event was marked by keynote addresses titled Progress in Improvement, Challenges, and the Way forward for Air pollution Management in East Asia and Bringing Science and Policy Together in Tackling Air Pollution: Lessons Learned from Europe and Asia as well as a Panel Discussion on the theme of Bridging Science and Policy: The Perspective of Future Cooperation on Air Pollution in the Region. Key discussion points included the importance of sound science-based information for



policymakers and the need to improve communication among actors as part of systemic approaches and in line with available funding strategies. EANET's strengths, including the Network's longevity and its large number of participating countries were also noted, highlighting major opportunities for future wider collaboration at

regional and international levels. AIT's RRC.AP supported the EANET Secretariat in organizing these events.

🌐 <http://www.rrcap.ait.ac.th/Pages/event.aspx>

🌐 <https://www.eanet.asia/news-science-policy-dialogue-2021>

✳️🤝 SHOWCASING AIT AND SOCIAL BUSINESS IN THAILAND AND BEYOND



YCA continues to make efforts to mainstream social business concepts and best practices into Thailand's key stakeholders in line with its collaborative framework for Thailand. Despite limitations on travel, YCA actively participated in a number of online events throughout 2021.

Leveraging the opportunity created by hybrid outreach capabilities, YCA co-hosted virtual events on Social Business Day 2021, the Global Social Business Summit 2021, the Thailand Social Enterprise Forum 2021, and the 76th UN General Assembly in addition to numerous invited speaker slots in international events held in Bangladesh, India, Kenya, Liechtenstein, Mexico, Pakistan, the Philippines, Vietnam, and the USA. This active engagement with Thai stakeholders has established YCA as a key social business stakeholder and thought leader.



YCA's Partner Network





🌐🤝 VIRTUAL NATIONAL STAKEHOLDER CONSULTATION WORKSHOP OF JAIF MERCURY-CONTAINING MEDICAL DEVICES MANAGEMENT PROJECT IN INDONESIA



On 12 January 2021, AIT's RRC.AP together with Indonesia's Ministry of Environment and Forestry (MoEF) and Ministry of Health (MoH) and the Basel and Stockholm Conventions Regional Center for Southeast Asia (BSCRC-SEA) organized a one-day virtual National Stakeholder Consultation Workshop for project stakeholders of Indonesia. The workshop was convened as part of the ongoing Japan-ASEAN Integration Fund (JAIF) funded project on the Development of Capacity for the Substitution and the Environmentally Sound Management (ESM) of Mercury-containing Medical Measuring Devices in Indonesia and the Philippines with the support of the Association of Southeast Asian Nations (ASEAN) Secretariat.

A virtual consultation workshop was conducted to present project outputs and to solicit feedback from relevant stakeholders. The workshop was attended by 54 participants from government and NGOs including MoEF, MoH, the Mission of Japan to ASEAN, Japan's Ministry of the Environment, AIT's RRC.AP, the Ministry

of Transportation (MoTransp), the Agency for the Assessment and Application of Technology (BPPT), and the Environmental Management Bureau and Department of Environment and Natural Resources, Philippines. In addition, representatives from local health agencies, hospitals, public health centers, integrated TSD (treatment, storage, and disposal) facilities in Indonesia, the Waste Management Area under the UNEP Global Mercury Partnership, mercury recovery facilities in Japan, and BSCRC-SEA attended the workshop. Opening remarks from the Directors of AIT's RRC.AP, BSCRC, MOEF, and MOH expressed their appreciation and satisfaction about the project and its progress. Project progress, methods, approach, and outputs were presented by Mr. Guilberto Borongan (AIT-RRC.AP) and Dr. Anton Purnomo (BSCRC). Project's outputs were adopted in principle and agreed by participants and stakeholders.

🌐 <https://bit.ly/3aGxRfW>

__*/🌐 AIT'S RRC.AP PARTICIPATED AND PRESENTED AT THE 2ND GLOBAL WASTE MANAGEMENT CONFERENCE



AIT's RRC.AP participated and presented at the 2nd Global Waste Management Conference (<http://www.globalwastemanagementconference.com>), which was held in virtual format with the theme of Integrating People, Planet, and Profit in Managing Waste and Resource Recovery on 22-23 March 2021. The Malaysian Industry-Government Group for High Technology (MIGHT) and the Confexhub Group, Malaysia organized the conference. Participants included policymakers, international experts, and global industry practitioners who met to strategize, chart directions, and craft new blueprints for achieve their aims through actions such as (among others): (i) waste and resource management data; (ii) waste management and resource recovery infrastructure utilizing Fourth Industrial Revolution (4IR) technologies such as big data, artificial intelligence (AI), automation, and the internet of things; (iii) financing options for investment in modern waste and resource management; and (iv) identify global good practices. Mr. Guilberto Borongan and Mr. Solomon Huno of AIT's RRC.AP participated in the conference. Mr. Borongan gave



one of the plenary addresses on the theme of Citizen Civil Mindedness in Managing Waste and 3Rs during the opening and plenary sessions. Similarly, Mr. Borongan was privileged to moderate Session 3: SMART Waste Collection Technologies, which highlighted exciting innovations and practices shared with experts in waste management and circularity.

🌐 <http://www.rrcap.ait.ac.th/Pages/event.aspx>



INCEPTION WORKSHOP ON MERCURY-CONTAINING MEDICAL DEVICES MANAGEMENT PROJECT IN THE PHILIPPINES



AIT's RRC.AP together with the Philippines Department of Environment and Natural Resources (DENR) and BanToxics conducted an inception workshop for the Philippines under the Japan ASEAN Integration Fund (JAIF) funded project on the Development of Capacity for the Substitution and the Environmentally Sound Management (ESM) of Mercury-containing Medical Measuring Devices in the Philippines on 28 April 2021. The inception workshop was conducted as a follow-up to a successful project kick-off meeting held on 7 April 2021, where the core working group discussed and approved the project work plan and methodology. Among other objectives, the project aims at engaging broader key stakeholder groups while also increasing awareness on the need to support environmentally sound management (ESM) of mercury-containing medical measuring devices in the Philippines, discuss and engage broader key stakeholder groups in the project, and increase awareness of the need to support the objectives of the project. Approximately 120 participants represented public environment and health agencies, trade and industry agencies, the Bureau of Customs, and medical associations. Also in attendance were representatives from academia, NGOs, international as well as local institutional consultants, experts from Japan, the Mission of Japan to ASEAN, the ASEAN Secretariat, and the JAIF Monitoring Team (JMT).

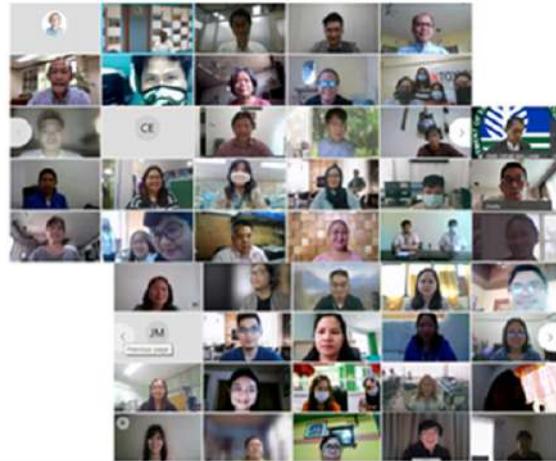
The Environmental Management Bureau, DENR, and the Department of Health of the Philippines expressed their gratitude to Ban Toxics and AIT's RRC.AP for facilitating the implementation of the project. They underscored the relevance of the project to the country and its health facilities. The Embassy of Japan in Indonesia expressed

the Government of Japan's commitment to building capacity in the Philippines and other ASEAN countries for implementing the Minamata Convention.

Dr. Naoya Tsukamoto, Director of AIT's RRC.AP emphasized its key role in mercury waste management in the region and expressed confidence that with the support of all stakeholders, this effort will lead to better policy-making and planning and implementation of ESM of mercury waste in the region.

 <http://www.rrcap.ait.ac.th/Lists/EventCalendar/DispForm.aspx?ID=424 or>

 <https://bit.ly/3z39yly>



AIT'S RRC.AP ASSISTED AND SUPPORTED THE COORDINATION OF EANET'S WORKING GROUP MEETING, 20-22 APRIL 2021



AIT's RRC.AP assisted and supported the coordination of the Acid Deposition Monitoring Network for East Asia Working Group Meeting 2021 Session-1 (WG2021-1) on 20-22 April 2021. Around 70 participants, including members from EANET participating countries (Cambodia, China, Indonesia, Japan, Laos, Malaysia, Mongolia, Myanmar, the Philippines, the Republic of Korea, Russia, Thailand and Vietnam) joined the Session. The United Nations Environment Program (UNEP) and the Asia Center for Air Pollution Research (ACAP), which

serve as the Secretariat and the Network Center (NC) for EANET, respectively, and AIT's RRC.AP were also present at the meeting. WG2021-1 was established following the decision of Intergovernmental Meeting IG22 in November 2020 to facilitate discussion among participating countries on the necessary arrangements for the expansion of the scope of the EANET Instrument. Participants had the opportunity to share their views on the initial draft text of the Supplementary Document to the EANET Instrument and to review other key



documents such as the proposed arrangements for the EANET project fund. Discussions held in the meeting will continue during WG2021-2 in August 2021. AIT's RRC.AP worked closely with the EANET Secretariat in UNEP on organizing the WG2021-1 virtual meeting.

🌐 <http://www.rrcap.ait.ac.th/Pages/event.aspx>



🌐 🤝 AIT'S RRC.AP GAVE THE INITIAL PRESENTATION ON AIT CENTERS SPECIAL EXPERTISE AND PROJECTS



AIT's RRC.AP gave the initial presentation on AIT Centers Special Expertise and Projects on 17 June 2021 via Zoom. The purpose of the presentation was to brief and advertise within the AIT community and its partners the capabilities and expertise of the AIT Centers by presenting its areas of interest, services, and know-how. The presentation was a mixture of introduction to the Centers with a focus on special capabilities and project outcomes.

Dr. Naoya Tsukamoto, Director of AIT's RRC.AP, briefed participants on the history, background, project activities, and operational costs of RRC.AP, and Dr. Ram Lal Verma discussed the success story of the Air Pollution Cluster project and the Malé Declaration on Control and Prevention of Air Pollution and its Likely Transboundary Effects for South Asia. Dr. Verma also reported a significant decrease in air pollution during the COVID-19 pandemic as a result of lockdown and closure of commercial activities that limited the movement of populations.

The virtual presentation was attended by about 30 participants (faculty, staff, students, etc.). A Q&A session was conducted following each presentation. The series of presentations from the seven AIT's Institute-wide Centers was to be conducted every two weeks starting on 17 June 2021. Activities were initiated by the office of the Vice President of Knowledge Transfer (VPKT), Prof. Naveed Anwar.

🌐 <http://www.rrcap.ait.ac.th/Pages/event.aspx>



🌐 🤝 AIT'S RRC.AP SUPPORTED AND ASSISTED THE ACID DEPOSITION MONITORING NETWORK IN EAST ASIA (EANET) AWARENESS WORKSHOP IN 2021



The 2021 EANET Awareness Workshop was organized virtually on 6 September 2021 in partnership with the Republic of Korea. The event gathered over 200 participants from 16 countries and focused on international cooperation on acid deposition and air pollution. The workshop aimed at increasing public understanding of regional acid deposition issues while reflecting on the work of EANET over the last 20 years. During the panel discussion on International Cooperation, panelists highlighted EANET's success, challenges, opportunities, and best practices. The Awareness workshop also featured a Special Session on Sharing Experience from the Republic of Korea in Acid Deposition and Air Quality Management. AIT's RRC.AP supported the EANET Secretariat in organizing the event.

🌐 <https://www.eanet.asia/news-eanet-awareness-workshop-in-2021>

🌐 <http://www.rrcap.ait.ac.th/Pages/event.aspx>





⊕握手 CAPACITY DEVELOPMENT PROGRAM ON AIR QUALITY MANAGEMENT AND EMISSION REDUCTION OF PM2.5 IN ASIAN COUNTRIES



The AIT Regional Resource Center for Asia and the Pacific (AIT-RRC.AP) organized a virtual training workshop on the Capacity Development Program on Air Quality Management and Emission Reduction of PM2.5 in Asian Countries on 13-17 September 2021. The workshop aimed at building the capacities of Asian countries for better management of air quality and to enhance the technical capabilities of these countries to support national efforts for addressing air pollution, including emissions reduction in particulate matters such as PM2.5. A major focus of the workshop was to attract participants from member countries of intergovernmental networks operating in the Asia region, namely the ASEAN Agreement on Transboundary Haze Pollution, the Acid Deposition Monitoring Network in East Asia (EANET), the Malé Declaration on Control and Prevention of Air Pollution and its Likely Transboundary Effects for South Asia, the Asia-Pacific Clean Air Partnership (APCAP), and the Asia-Pacific Network for Global Change Research (APN). More than 200 participants from 29 Asian countries and other parts of the world participated in the training workshop. Participants included policymakers, air quality managers, technical staff, air quality professionals, academics, young researchers,

and students. Workshops proceedings were divided into five Modules: Air Quality Monitoring, Emission Inventory Development, Air Quality Modeling, Impact Assessment, and Mitigation Policies. During the 5-day training workshop, a total of 18 lectures were delivered by globally known experts from India, Japan, Thailand, Indonesia, China, Malaysia, Nepal, the Philippines, and the UK. A Certificate of Participation was awarded to participants. The feedback received from participants showed they learned a great deal from the workshop and were satisfied with its content.

- 🌐 <http://www.rrcap.ait.ac.th/apn>
- 🌐 <http://www.rrcap.ait.ac.th/Pages/event.aspx>
- 🌐 <https://bit.ly/3IFIAnd>



⊕握手 23RD SESSION OF THE INTERGOVERNMENTAL MEETING ON THE ACID DEPOSITION MONITORING NETWORK IN EAST ASIA (EANET IG23)



The 23rd Session of the Intergovernmental Meeting on the Acid Deposition Monitoring Network in East Asia (IG23) was convened virtually on 24-25 November 2021 to make important decisions on the expansion of the scope of EANET, among other topics. The event gathered over 70 representatives from EANET participating countries (Cambodia, China, Indonesia, Japan, Laos, Malaysia, Mongolia, Myanmar, the Philippines, the Republic of Korea, Russia, Thailand, and Vietnam), the EANET Secretariat, and the EANET Network Center. Following the decision of the previous Intergovernmental Meeting (IG22) in November 2020, EANET countries have been working relentlessly on expanding the scope of EANET to include other atmospheric environment-related substances. This historical progress required EANET to develop a supplementary document to the EANET Instrument to define the scope of expansion and the target substances to be included in EANET activities. IG23 has now adopted the text of the Supplementary Document (Annex) to the Instrument for Strengthening the Acid Deposition Monitoring Network

in East Asia. IG23 has also approved several important documents, including the EANET Project Fund and Project Guidelines, the Work Program and EANET 2022 Budget, and the Summary of the 20th Anniversary of EANET publication, a new outreach document detailing EANET's past achievements and future opportunities. AIT's RRC.AP worked closely with the EANET Secretariat at UNEP on organizing the IG23 virtual meeting.

- 🌐 <http://www.rrcap.ait.ac.th/Pages/event.aspx>
- 🌐 <https://bit.ly/3P8Ek1V>





TRAINING PROGRAM NO. 3 OF LABORATORY MANAGEMENT FOR MERCURY SURVEY AND MONITORING



The Waste and Resource Management Cluster of AIT's RRC.AP together with the United Nations Office for Asia and the Pacific, Bangkok (UNEP ROAP), the UN's Industrial Development Organization (UNIDO), and IDEA Consultants Inc., Japan conducted a three-day virtual online training on Laboratory Management for Mercury Survey and Monitoring. The training was a part of slated activities under the ongoing project, namely Promoting the Minamata Convention on Mercury by making the most of Japan's knowledge and experience. The project aims to support participating countries in improving their national mercury-related information base toward implementing mercury management, especially in the areas of information exchange, awareness and education, research, development, and monitoring. The virtual training program was held to provide enabling support to laboratories as well as strengthen their readiness to participate in the forthcoming laboratory proficiency testing of the project.

The virtual training event opened with remarks from officials from UNEP ROAP, the Department of

Environment, UNIDO, and the Ministry of Environment, Japan. Short notes and presentations were also given by experts from the Asia-Pacific Mercury Monitoring Network (APMMN), the South Africa Mercury Monitoring Network (SAMNet), the Nippon Instruments Corporation (NIC), and IDEA Consultants Inc., Japan. The program was attended by over 140 participants from more than 36 countries and comprised professionals and scientists from public and university laboratories now undertaking mercury analysis (or that will do so in the near future) for monitoring, survey, or research purposes. Training was provided in laboratory management essentials related to mercury survey and monitoring in three sessions over three days. Training Session 1 focused on key elements of atmospheric sampling and analysis, while Sessions 2 and 3 focused on multimedia sampling analysis and advancement to qualified labs, respectively. Participants expressed their deepest satisfaction about the training and the desire for continued engagement, capacity building, and training on mercury monitoring, survey, and analysis.

 <http://www.rrcap.ait.ac.th/Pages/event.aspx>

NATIONAL CONFERENCE – THAILAND AND THE SUSTAINABLE DEVELOPMENT GOALS: LEARNING AND BOOSTING IMPLEMENTATION TOGETHER



The UN 2030 Agenda for Sustainable Development and its 17 SDGs represent an urgent call to action in a global partnership to end poverty, protect the planet, and ensure that everyone enjoys peace and prosperity. This Conference discussed the status of the SDGs in Thailand and demonstrated how, by working together, we can take steps to enhance their implementation.

The National Research Council of Thailand (NRCT), the UN's Resident Coordinator's Office (Thailand), and the UN Economic and Social Commission for Asia and the Pacific (UNESCAP) in collaboration with the National Economic and Social Development Council (NESDC) of Thailand Mahidol University, AIT, and the Digital Belt and Road (DBAR) organized the virtual Conference on 27 May 2021 (Session 1) and 2 June 2021 (Session 2).

The Conference's five aims were successfully met and are documented in the respective sections of the final report. The five aims were to:

- ▶ Raise awareness among Thai stakeholders of the 2030 Agenda and its SDGs, especially concerning follow-up and review mechanisms;
- ▶ Review the state of Thailand's implementation of the SDGs;
- ▶ identify Thailand's priority SDGs, current data gaps, and potential approaches to strengthening follow-up and review, including proxy indicators and data sources;
- ▶ Identify priority research areas; and
- ▶ Capture lessons learned from Thailand that can be shared regionally and globally.

 <http://www.dbeltroad.org/index.php?m=content&c=index&a=show&catid=85&id=663>
 [Appendix 1-1 National Conference-photo day 1-2](#)
 [Appendix 1-2 National Conference-program day 1-2](#)



INTERNATIONAL CONFERENCE – THAILAND AND THE SUSTAINABLE DEVELOPMENT GOALS: THE ROLE OF INTERNATIONAL AGENCIES



The 3rd conference offered an opportunity to learn about approaches and programs by international agencies in support of Thailand's implementation of the SDGs. Representatives from a broad spectrum of international agencies with offices in Thailand described how their programs contribute to the achievement of the SDGs in Thailand, and, in cases where these programs have a wider reach, regionally. They also offered thoughts on lessons learned. Participants heard experiences from international development institutions, environmental groups, development NGOs, and others. These presentations provided the National Economic

and Social Development Council (NESDC) with a fuller understanding of the various roles being played by the international community in contributing to the achievement of the SDGs in Thailand, key lessons learned through their work, and awareness-raising among Thai and regional participants more generally.

 <https://bit.ly/3P7tPw1>

 [Appendix 2-1 National Conference-photo day3](#)

 [Appendix 2-2 National Conference-program day3](#)

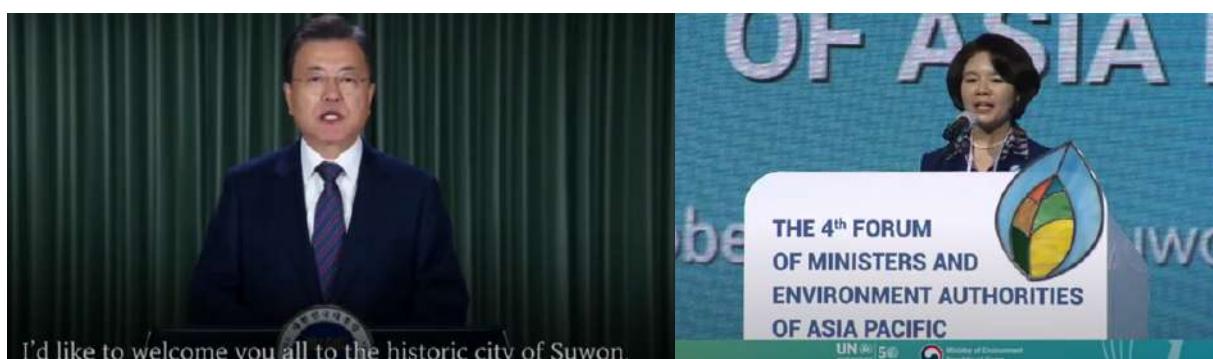
AIT CONTRIBUTES TO FOURTH FORUM OF MINISTERS AND ENVIRONMENT AUTHORITIES OF ASIA PACIFIC TO STRENGTHEN SDGS



The Asian Institute of Technology took part in the Fourth Forum of Ministers and Environment Authorities of Asia Pacific to highlight the critical role that universities play in achieving the SDGs. The two-day Fourth Forum of Ministers and Environment Authorities of Asia Pacific was held on 6-7 October 2021 as a hybrid event with participants participating online from the Asia and onsite in host the Republic of Korea. The forum was jointly organized by the Ministry of Environment of the Republic of Korea and the United Nations Environment Programme (UNEP). Over 400 delegates from governmental and international organizations participated in the invitation only forum. AIT President Dr. Eden Woon made a statement on the critical role that universities play in attaining the Sustainable Development Goals (SDGs), stating that "AIT has been constantly striving for solutions and recommendations on world critical matters to the UN agencies throughout the years." The Forum embodied

the process of consultation on a draft political declaration, addressing the theme of the Fifth Session of the United Nations Environment Assembly 'Strengthening Actions for Nature to Achieve the Sustainable Development Goals in Asia and the Pacific', and also served as a platform for the Member States and other stakeholders to contribute regional perspectives to the resumed Fifth Session of the United Nations Environment Assembly - UNEA-5.2 -which is to be held from 28 February to 2 March 2022, as well as to the Special Session of the United Nations Environment Assembly to mark the 50th Anniversary of UNEP on 3-4 March 2022 in Nairobi, Kenya. To open the Forum, the President of Republic of Korea H.E. Moon Jae-in emphasized the importance of coexisting with nature and galvanizing international cooperation to achieve sustainable development and the SDGs.

 <https://bit.ly/3yHtDwr>





AIT AND UNITED NATIONS ESCAP TAKE PARTNERSHIP TO NEW LEVEL WITH MOU



The Asian Institute of Technology (AIT) and the United Nations Economic and Social Commission for Asia and the Pacific (UN ESCAP) signed a Memorandum of Understanding (MoU) on 7 April 2021 to strengthen their cooperation in the service of developing countries in the Asia-Pacific region. The new collaboration will assist countries of Asia and the Pacific to "build back better" from the COVID-19 pandemic – especially in the context of decarbonizing their economies by 2050, and support the implementation of the 2030 Agenda for Sustainable Development and the achievement of the Sustainable Development Goals (SDGs). Speaking of the MoU, Dr. Armida Salsiah Alisjahbana, Executive Secretary of ESCAP, commented: "In this MOU, we set forth the modality of our further collaboration and engagement to deepen productive collaboration on knowledge and capacity building across the Asia-Pacific region. We are committed to continue assisting countries in our region in these challenging times to build resilient, inclusive, and sustainable societies and meet the 2030 Agenda."

AIT and UN ESCAP have outlined priority areas for the cooperation as follows:

- ▶ Disaster risk reduction, preparedness, mitigation and management;
- ▶ Space applications for sustainable development;
- ▶ Data and statistics, particularly application of new data analytic tools, methods and resources, including, but not limited to, advancing official statistics for the 2030

Agenda for Sustainable Development, civil registration and vital statistics, and oceans statistics;

- ▶ Transport and climate change including energy efficiency in transport;
- ▶ Energy, including on (i) sustainable energy transitions, including in the areas of power system planning, regulation, modeling, and off-grid access (fourth industrial revolution and frontier technologies for power systems integration and renewable distributed energy resources); and (ii) implementation of SDG 7 in Asia and the Pacific;
- ▶ Natural resources for sustainable development; and
- ▶ Policy analysis to enhance fiscal space for building forward better economies.

🌐 <https://bit.ly/3o4xKxL>



AIT JOINS GLOBAL FORCES MARKING UN DECADE ON ECOSYSTEM RESTORATION ON WORLD ENVIRONMENT DAY 2021



The United Nations Decade on Ecosystem Restoration began on World Environment Day 2021 with the theme of 'Reimagine – Recreate – Restore' to promote and align restoration efforts globally. To achieve the Sustainable Development Goals by the year 2030, ecosystem degradation must be reversed, and ecosystem restoration must begin at the global scale. To commemorate World Environment Day 2021, AIT hosted a virtual event that was moderated by Dr. Benno Boer, UNESCO Programme Specialist and included remarks by AIT President Dr. Eden Woon, Dechen Tsering, Regional Director for Asia and the Pacific, UNEP; Takayuki Hagiwara, FAO-RAP; H.E. Pirkka Tapiola, Ambassador of the European Union to the Kingdom of Thailand; Shigeru Aoyagi, UNESCO Asia-Pacific Regional Director; Dindo Campilan, Director of Asia Regional Director and Oceania Hub, International Union for Conservation of Nature (IUCN); Rawin Raviwongse, President of National Science Museum Thailand (NSM); and H.E. Varawut Silpa-archa, Minister of Natural Resources and Environment, Thailand. "This World

Environment Day also marks official start of the UN Decade on Ecosystem Restoration – a ten-year concerted effort to prevent or to reverse the degradation of ecosystems worldwide. This decade could not be timelier. Science tells us the next 10 years will be the most important to prevent the catastrophe of climate change and extinction of up to a million species," said Dechen Tsering.

🌐 <https://bit.ly/3P5aStK>





AIT AND ADPC STRENGTHEN DISASTER PREPAREDNESS AND CLIMATE RESILIENCE FOR ASIA-PACIFIC THROUGH MOU



Asian Disaster Preparedness Center (ADPC) on 15 September 2021 signed a Virtual Memorandum of Understanding (MoU) with the Asian Institute of Technology (AIT) to spearhead disaster preparedness and climate resilience in Asia and the Pacific region. The Memorandum sets forth the framework for a collaborative alliance between the two institutions, and is expected to involve collaborative research for disaster preparedness and climate resilience; joint capacity enhancement activities; namely, training, technical assistance, and technology/knowledge transfer; student internship and staff exchange opportunities; joint development of online learning courses; joint program implementation on mutually agreed thematic areas and policy development, and joint proposals for research projects and postgraduate scholarships..

🌐 <https://www.adpc.net/igo/contents/Media/media-news.asp?pid=1745>

🌐 <https://bit.ly/3azJSUc>



FAO AND AIT STRENGTHEN PARTNERSHIP FOR SUSTAINABLE DEVELOPMENT OF THE REGION



The Food and Agriculture Organization of the United Nations (FAO) renewed its partnership with the Asian Institute of Technology (AIT) through the signing of a Memorandum of Understanding (MOU). Through the partnership, the two institutions will collaborate in the fields of urban food systems, climate change, water, food and energy, agroecology, and innovation / digitization - for the sustainable development of the Asia and Pacific region. AIT has long been collaborating with FAO to contribute its expertise towards the sustainable development of the region and the renewed partnership will last from 2021 – 2026. The work plan of the MOU was developed by experts from both FAO and AIT in the fields of urban food systems, climate change, water, food and energy, agroecology and innovation / digitization. "This will be vital, as a number of important actors are needed to work together to achieve the agri-food systems transformation that will be required to feed the hungry world and leave no one behind," said Jong-Jin Kim, Assistant Director-General and FAO Regional Representative, Regional Office for Asia and the Pacific – as he stressed how FAO is committed to working with a wider range of development partners, including Academia, CSOs and the private sector. The partnership with AIT is particularly important as "both organizations

share vision, interest and commitment to fight hunger and malnutrition particularly in this region – Asia Pacific Region," according to Mr. Jong-Jin Kim. Noting that experts of both institutions in these five fields have jointly developed a work plan, AIT President Eden Woon expressed his gratitude towards AIT professors who were instrumental in developing and finalizing a detailed implementational work plan with FAO.

🌐 <https://www.fao.org/about/leadership/leader-detail/fr/c/1447388/>

🌐 <https://bit.ly/3RzSwTc>





ITU AND AIT DISCUSS COLLABORATION TO ACCELERATE ACHIEVEMENT OF SDGS AND BRIDGE DIGITAL DIVIDE IN ASIA-PACIFIC REGION



AIT and the International Telecommunication Union (ITU) of the United Nations discussed possible collaboration on social and technological development with an aim to eradicate digital divide together with accelerating the achievement of the Sustainable Development Goals (SDGs), at a hybrid seminar titled 'Digital Infrastructure Development' held online on 21 October 2021. The institute hosted ITU Regional Director Ms. Atsuko Okuda and other senior delegates of ITU Regional Office for Asia and the Pacific. AIT President Dr. Eden Woon and Vice President for Knowledge Transfer Dr. Naveed Anwar welcomed the ITU delegates, each stressing that for many decades the ITU and AIT have shared the same mission of supporting the Asian-Pacific region in advancing social and technological development and education. "AIT is extremely pleased that we have the opportunity to establish cooperation with you all for the benefit of this region, in particular, to work together to accelerate the achievement of the Sustainable Development Goals," President Woon said. President Woon also highlighted AIT's contribution to internet education exemplified by the "Mother of the Internet in Thailand", former AIT Vice President of Research Kanchana Kanchanasut, who pioneered electronic mail and the internet in Thailand with the registered ".[dot]th" domain name and was inducted into the Global Internet Hall of Fame by the Geneva, Switzerland, based Internet Society. ITU Regional Director Okuda emphasized the cruciality of future collaboration between ITU and AIT, as Asian-Pacific countries are suffering from the COVID-19 pandemic, and digital technology could contribute to

economic and societal recovery, accelerate SDGs by 2030, and prepare the region for a more prosperous future.

🌐 <https://bit.ly/3uLDrVc>





SUSTAINABLE DEVELOPMENT GOALS DASHBOARD

SCHOOL	DEPARTMENT	PROGRAM	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Website
School of Environment, Resources, and Development	Department of Development and Sustainability	Development and Sustainability																		Development and Sustainability
		Development Planning Management and Innovation																		Development Planning Management and Innovation
		Gender and Development Studies																		Gender and Development Studies
		Natural Resources Management																		Natural Resources Management
		Society and Environmental Governance																		Regional and Rural Development Planning
		Urban Innovation & Sustainability																		Urban Environmental Management
		Climate Change and Sustainable Development																		Climate Change and Sustainable Development
		Environmental Engineering and Management																		Environmental Engineering and Management
School of Environment, Resources, and Development	Department of Energy, Environment, and Climate Change	Marine Plastic Abatement																		Marine Plastic Abatement
		Regenerative Sanitation																		Regenerative Sanitation
		Sustainable Energy Transition																		Sustainable Energy Transition
		Agribusiness Management																		Agribusiness Management
		Agricultural Systems & Engineering																		Agricultural Systems and Engineering
		Aquaculture and Aquatic Resources Management																		Aquaculture and Aquatic Resources Management
		Food Engineering and Bioprocess Technology																		Food Engineering and Bioprocess Technology
		Food Innovation, Nutrition and Health																		Food Innovation, Nutrition and Health
School of Engineering and Technology	Department of Civil and Infrastructure Engineering	Construction, Engineering and Infrastructure Management																		Construction Engineering and Infrastructure Management
		Geotechnical and Earth Resources Engineering																		Geotechnical and Earth Resources Engineering
		Structural Engineering																		Structural Engineering
		Transportation Engineering																		Transportation Engineering
		Water Engineering and Management																		Water Engineering and Management
		Computer Science																		Computer Science
		Data Science and AI																		Data Science and AI
		Information & Communications Technologies																		Information and Communications Technologies
School of Engineering and Technology	Department of Information and Communication Technologies	Information Management																		Information Management
		Remote Sensing and Geographic Information Systems																		Remote Sensing and Geographic Information Systems
		Telecommunications																		Telecommunications
		IoT (Internet of Things) Systems Engineering																		Internet of Things (IoT) Systems Engineering
		Bio-Nano Material Science and Engineering																		Bio-Nano Material Science and Engineering
		Industrial and Manufacturing Engineering																		Industrial and Manufacturing Engineering
		Mechatronics																		Mechatronics
		Microelectronics and Embedded Systems																		Microelectronics and Embedded Systems
School of Management	Management	Management																		Management
		Disaster Preparedness, Mitigation, and Management																		Disaster Preparedness, Mitigation, and Management
SET & SERD	Urban Water Engineering and Management	Urban Water Engineering and Management																		Urban Water Engineering and Management



SUSTAINABLE DEVELOPMENT GOALS DASHBOARD



AIT SUSTAINABILITY REPORT 2021

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