
AIT-ADB

COOPERATION

E X H I B I T I O N

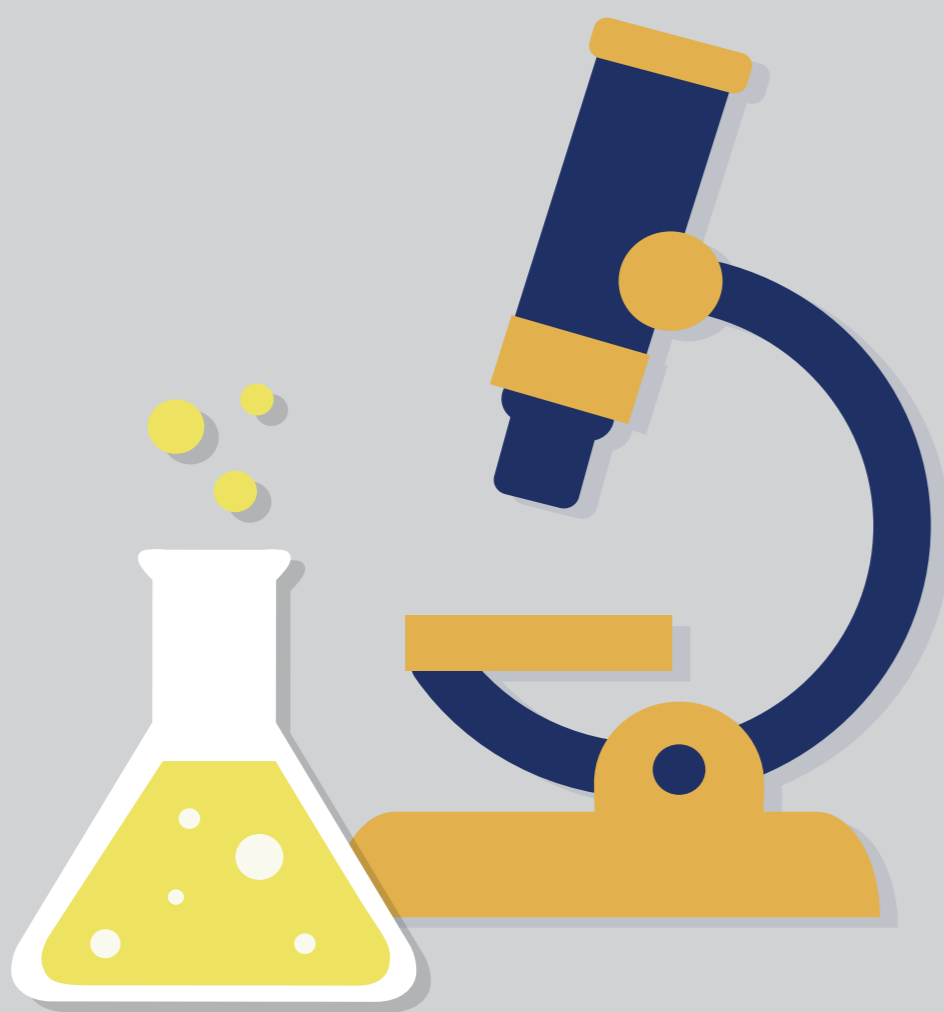
Since 1989, the Asian Development Bank (ADB) has been a cornerstone supporter of the Asian Institute of Technology (AIT). This partnership, spanning over three decades, has been pivotal in advancing education, research, and sustainable development in Asia



AIT-ADB KEY FACTS

62

ADB-FUNDED
research and
capacity building
projects



SENIOR ADB OFFICIALS ON AIT BOARD OF TRUSTEES

- **Mr. Morita Noritada**, Former ADB Director. (Former Trustee)
- **Mr. Jean-Pierre Verbiest**, Former Country Director, Thailand Resident Mission of ADB. (Former Trustee)
- **Dr. Bindu Lohani**, Former ADB Vice President for Knowledge Management and Sustainable Development. (Current Trustee)



Mr. Morita Noritada



Mr. Jean-Pierre Verbiest



Dr. Bindu Lohani



**ADB-JAPAN
SCHOLARSHIP
PROGRAM**
(ADB-JSP) since 1989

14

**ADB-JSP
SCHOLARS**
are currently enrolled

380

SCHOLARS
graduated during
1989-2024

ADB TA-9993 THA: Climate Change Adaptation in Agriculture for Enhanced Recovery and Sustainability of Highlands

PROJECT INVESTIGATORS

- Prof. Mukand S. Babel
- Prof. Anil K. Anal
- Prof. Sangam Shrestha
- Prof. Takuji W. Tsusaka
- Prof. Avishek Datta
- Mr. Voravate Chonlasin

DONOR

Japan Fund for Prosperous and Resilient Asia and the Pacific (Asian Development Bank)

BUDGET

49,542,450 Thai Baht

DURATION

01 December 2021 – 31 December 2024

PROJECT DESCRIPTION

The technical assistance (TA) supports Thailand's recovery from the socio-economic impacts of COVID-19, aiming to reduce poverty, income inequality, and vulnerability to climate change. It focuses on enhancing the resilience of highland communities and ecosystems. The TA builds capacities to assess vulnerabilities, demonstrate climate-smart agriculture practices and digital traceability technologies for agri-food products, and helps local governments integrate climate change concerns into agricultural planning. Specifically, it aims to enhance food security in Nan province using local wisdom, stress-tolerant crop varieties, and value addition.



Demonstration site for Keyline Water Management

OBJECTIVES

1. Build technical and institutional capacities to assess climate change vulnerabilities
2. Demonstrate Climate Smart Agriculture (CSA) practices and digital technologies for traceability of agri-food products
3. Support local governments to integrate climate change concerns in agricultural planning

IMPACT

Improved agricultural competitiveness in highlands in Thailand

EXPECTED OUTCOMES

Enhanced enabling environment for adoption of CSA practices in project areas in Thailand

BENEFICIARIES

1. Farmers and communities
2. Governments at different levels
 - Local
 - Provincial
 - National
3. Private sectors
4. Academia

Capacity building workshops for local government officials



Demonstration on biochar production



Pumpkin processing



Discussion with local farmers



Discussion with Governor, Nan Province

CONTACT INFORMATION

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 Asian Institute of Technology
<http://ccaa.ait.ac.th>



AIT
 Asian Institute of Technology

Agro-Meteorological Forecasts and Advisories through Mobile Application and Social Media for Climate-Smart Agriculture in Thailand and Vietnam – AFAS



PROJECT INVESTIGATORS
Dr. Sushil Kumar Himanshu

DONOR
Asian Development Bank (through Landell Mills Ltd.)

BUDGET
3,014,901 Baht

DURATION
Jan 2024 – Jan 2027

PROJECT DESCRIPTION

Agro-meteorological Forecast and Advisory System (AFAS), a digital technology aimed at providing small-holder farmers with essential agro-meteorological forecasts and agronomic advice, thereby facilitating the adoption of climate-smart agriculture practices.

AFAS comprises three technical components: a short-term and seasonal climate forecast system, agronomic advisories based on the crop calendar, and digital tools for user interaction, including a mobile app and social media platforms.

OBJECTIVE

- Deploy a fully-operational AFAS based on developed and tested state-of-the-art forecasting, mobile app and social media
- Improve adaptive capacity and decision-making power of smallholders and agribusinesses in climate-smart agriculture through the use of the AFAS system in Thailand and Vietnam.
- Document and demonstrate challenges, opportunities and lessons learned in using AFAS services through effective communication, policy dialogues and scientific research
- Demonstrate suitable business models for the AFAS system and similar high-tech solutions for climate-smart agriculture in the GMS region

IMPACT

Initially a baseline study is conducted to study the socio-economic and technical aspects of AFAS for smallholder farmers in Nakhon Phanom (TH) and Can Tho (VT).

The survey consists of 150 farmers including women and young farmers.

The following will be the overall impact of AFAS:

- Enhanced decision-making capacity of farmers based on forecasts and influences for making multiple decisions.
- Improved participation and knowledge on forecasts
- Improved youth participation and info dissemination
- Influenced farmers in decision-making through forecasts that led to direct socio-economic benefits
- Govt. and Non-Govt. bodies interested in investing for AFAS

EXPECTED OUTCOMES

Following the baseline survey there are a series of events, including stakeholder engagement meetings, training and demonstration sessions, regional demonstration sessions, and an end-line survey.

Following are the expected outcomes:

- 1) A fully functional mobile app available for farmers
- 2) App installed and used by at least 300 farmers

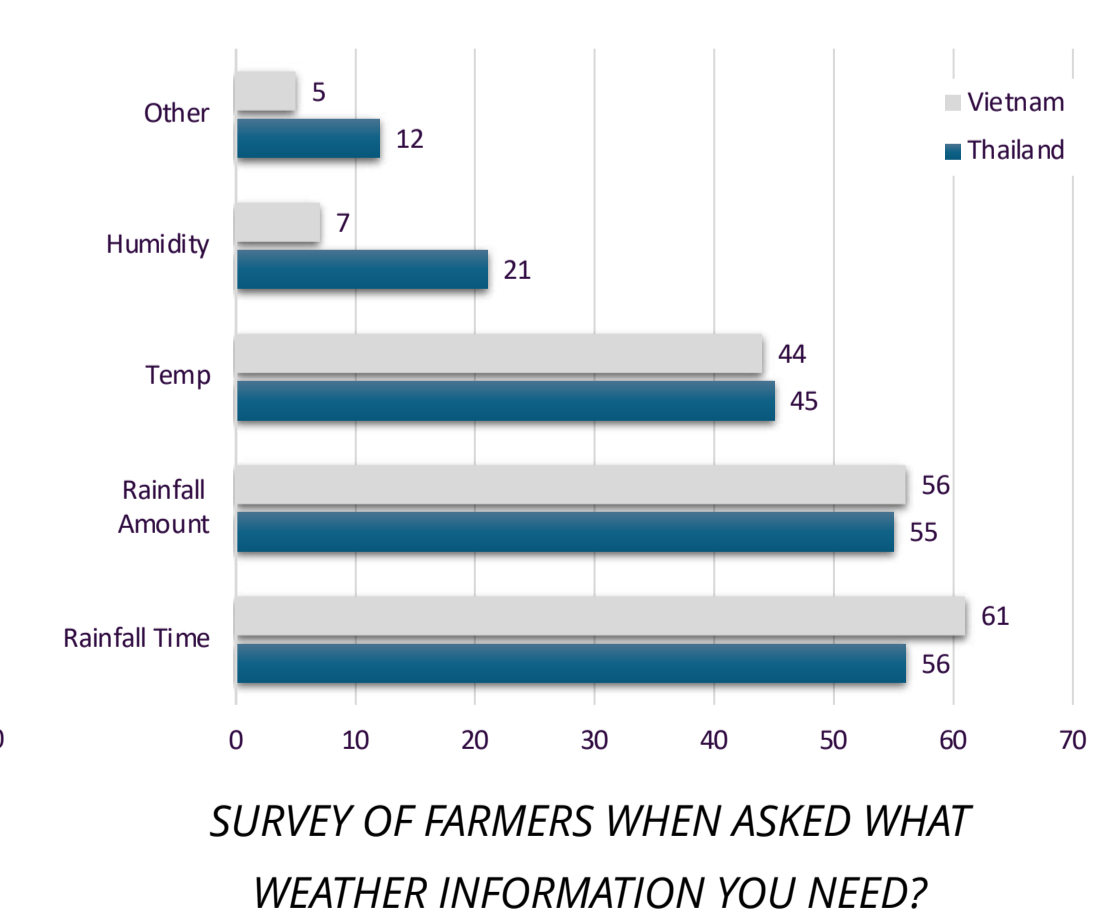
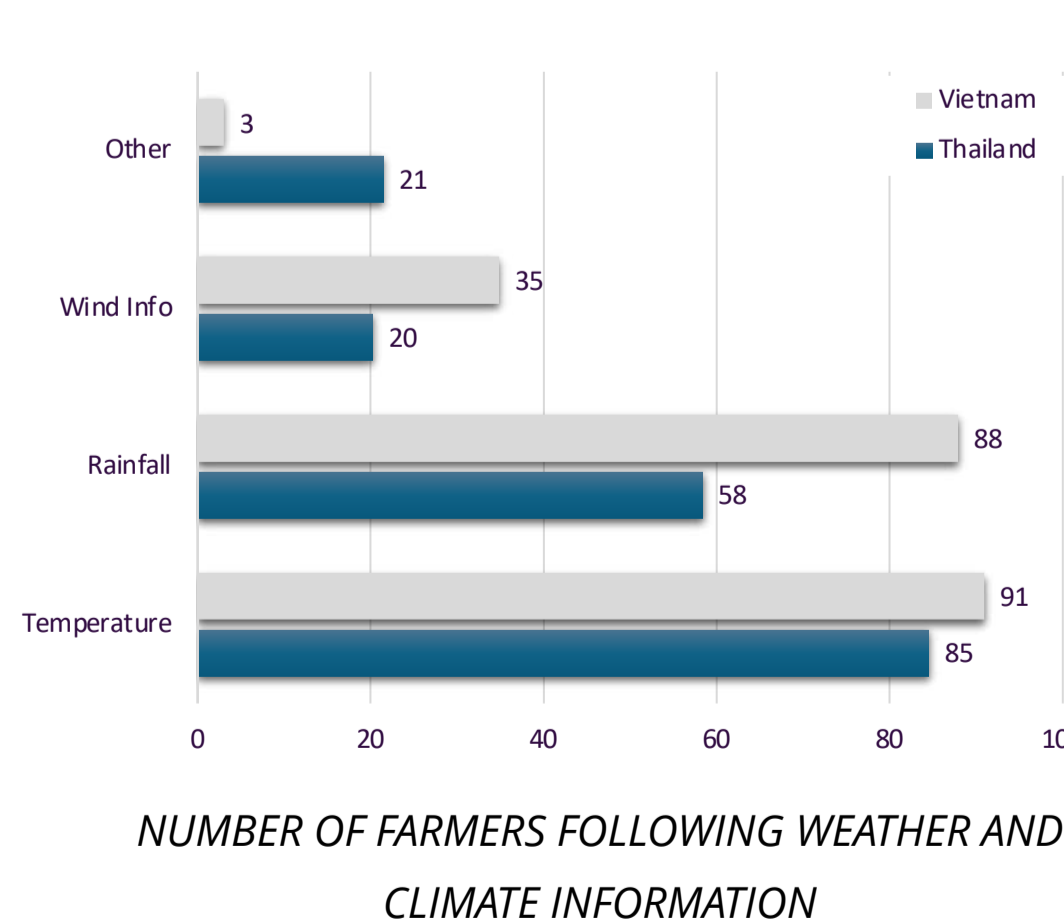
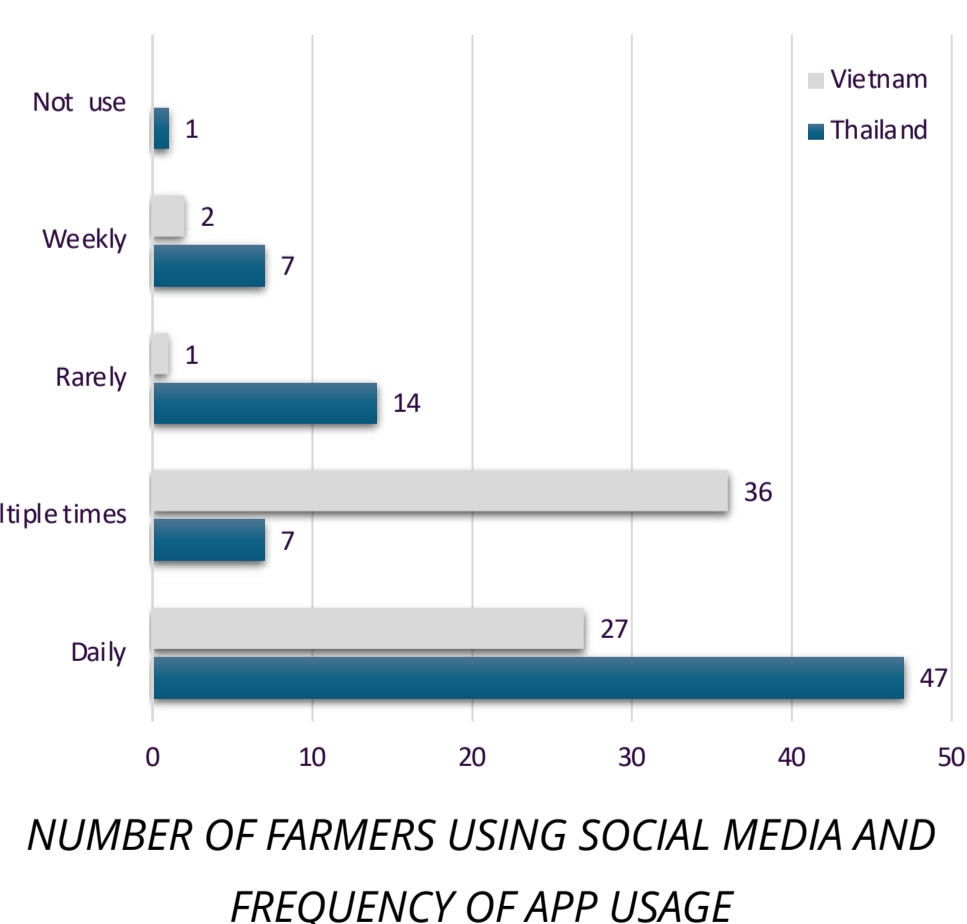
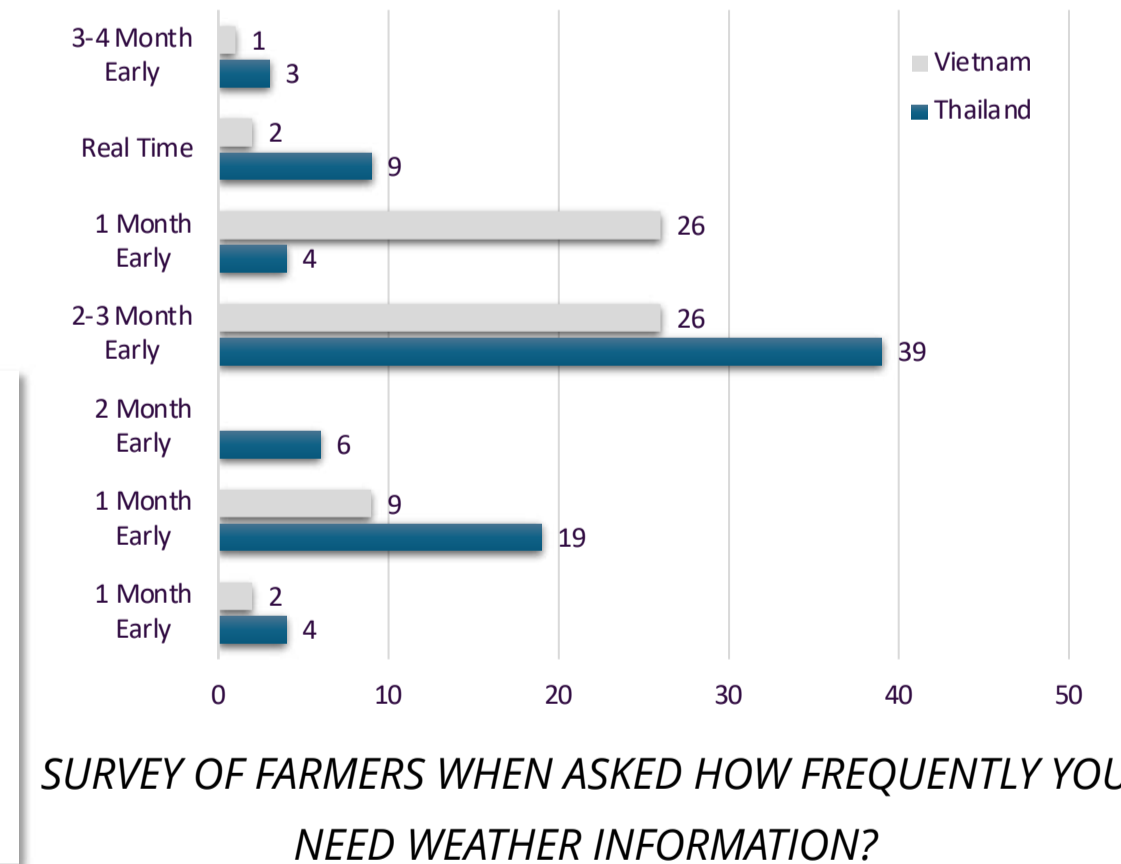
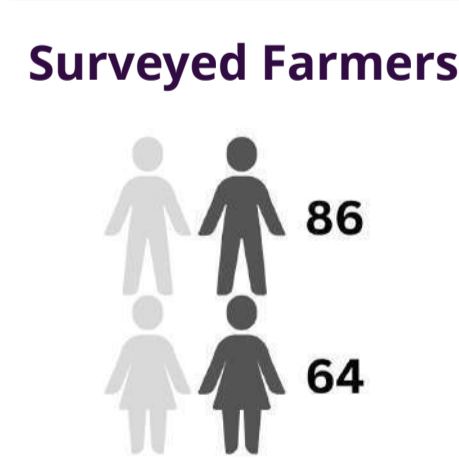
Other expected outcomes:

- 1) Engagement of 5 agribusinesses using AFAS
- 2) Reaching at least 2500 active users using AFAS
- 3) Documentation and demonstration of benefits and impacts of the AFAS (through policy dialogues, social media campaigns, and scientific articles)
- 4) Development of business models for CSA

BENEFICIARIES

- The project beneficiaries includes smallholders, youth farmers, farmer networks, governmental agencies, women unions, and agribusinesses.

S/N	Beneficiaries	Direct	Indirect
1	Smallholder Farmers	300+	2500+
2	Youth Farmers	60+	500+
3	Women & Women Union	100+	1000+
4	Agribusinesses	05	-



CONTACT INFORMATION

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AIT-ADB RECENT PROJECTS

AIT SOLUTIONS (formerly AIT Consulting)

2015-2017
US\$ 1.5 million

AFGHANISTAN: WESTERN BASINS WATER RESOURCES MANAGEMENT PROJECT

Department of Foreign Affairs and International Trade (DFAIT), Canada with Cowater International Inc, and the Afghan Ministry of Energy and Water

June 2015: 30 Afghan students from Ministry of Energy and Water arrived under ADB program funded by the Canadian Department of Foreign Affairs, Trade and Development (DFATD).



30 Afghan engineers and associated professionals working in the Western Basins regions of Afghanistan received funding to study for Master's degrees at AIT in:

- Agriculture System Engineering
- Agri-Business Management
- Construction Engineering and Infrastructure Management
- Environmental Engineering and Management
- Mechatronics
- MBA-Energy Business
- Regional and Rural Development Planning
- Remote Sensing and GIS
- Urban Water Engineering and Management
- Water Engineering and Management

Former Canadian Ambassador to Thailand H.E. Ms. Donica Pottie with the students.

The overall project goal was to improve rural livelihoods through strengthened integrated water resources management; improved irrigation service delivery; and enhanced agricultural practices to increase the productivity of irrigated agriculture in the Western Basins of Afghanistan (Badghis, Ghor and Herat provinces), mainly comprising the Hari Rud River Basin which includes Herat, and the Murghab River Basins.

AIT-ADB RECENT PROJECTS

AIT GEOINFORMATICS CENTER

2014-2023
80 million THB

1. Applying Space Based Technology and Information and Communication Technology to Strengthen Disaster Resilience (2015-2018), 42.5 million THB
2. Climate Change Risk Assessment, ADB-Vietnam (2018-2019), 16 million THB
3. Southeast Asia Urban Services Facility (Indonesia: Support for Emergency Assistance on Rehabilitation & Reconstruction in Central Sulawesi) (2020-2023), 15 million THB
4. ADB-RESTEC Project (2014-2016), 5.6 million THB
5. Assam ADB: Remote Sensing and GIS Applications of Flood Modeling and Management (2016-2020), 1.1 million THB

AIT EXTENSION

2012-2024
32.5 million THB

1. Integrated Approaches to Urban River Corridor Management Experiences from Southeast Asia (ADB Nepal) (2023-2024), 1.3 million THB
2. Enhance Organization Efficiency through Effective Human Resource Management and Leadership in Hydropower Industry (2023), 600,000 THB
3. 23 other Projects

YUNUS CENTER AIT

2022-2024
0.5 million THB

1. Sustainable Development of Agriculture and Livestock Management

SCHOOL OF ENVIRONMENT RESOURCES AND DEVELOPMENT

2012-2020
4 million THB

1. ADB Innovation Support (2017-2020), 2 million THB
2. Capacity Development of the Assam Power Utilities, (2012-2014), 294,684 THB
3. Gender Inclusive Capacity Development (2012-2013), 244,285 THB
4. Training on Design and Management of Domestic Biogas System (2012-2013), 1.3 million THB

AIT-ADB PAST PROJECTS

GMSARN

January 2001



ESTABLISHMENT OF THE GREATER MEKONG SUBREGION ACADEMIC AND RESEARCH NETWORK (GMSARN) SPONSORED BY ADB, JICA, UNESCO, ASEAN FOUNDATION (JAPAN-ASEAN SOLIDARITY FUND) AND AIT IN 2001

The Greater Mekong Subregion (GMS) consists of Cambodia, China (Yunnan & Guaxi Provinces), Laos, Myanmar, Thailand and Vietnam. The Greater Mekong Subregion Academic and Research Network (GMSARN) is composed of eleven of the region's top-ranking academic and research institutions. GMSARN carries out activities in the human resources development, joint research, and dissemination of information and intellectual assets generated in the GMS. GMSARN seeks to ensure that the holistic intellectual knowledge and assets generated, developed and maintained are shared by organizations within the region. Primary emphasis is placed on complementary linkages between technological and socio-economic development issues.

3R KNOWLEDGE HUB

June 2009



3R KNOWLEDGE HUB, IMPLEMENTED BY ADB AND JOINTLY HOSTED BY AIT, UNEP RRCAP AND UNESCAP AT AIT

The environmentally sound practices of “reduce, reuse and recycle,” or “3R,” was promoted in the Asia-Pacific region through the 3R Knowledge Hub – joint initiative of AIT, the Asian Development Bank, the United Nations Environment Programme Regional Resource Centre for Asia and the Pacific and the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP).

ADB-Japan SCHOLARSHIP PROGRAM (JSP)



June 2024: Students Anthony O. Maputi, Tilasmi Aryal, and Md. Julhaz Hossain from AIT were awarded the ADB-Japan Scholarship Program "Thesis of the Year Award 2024."

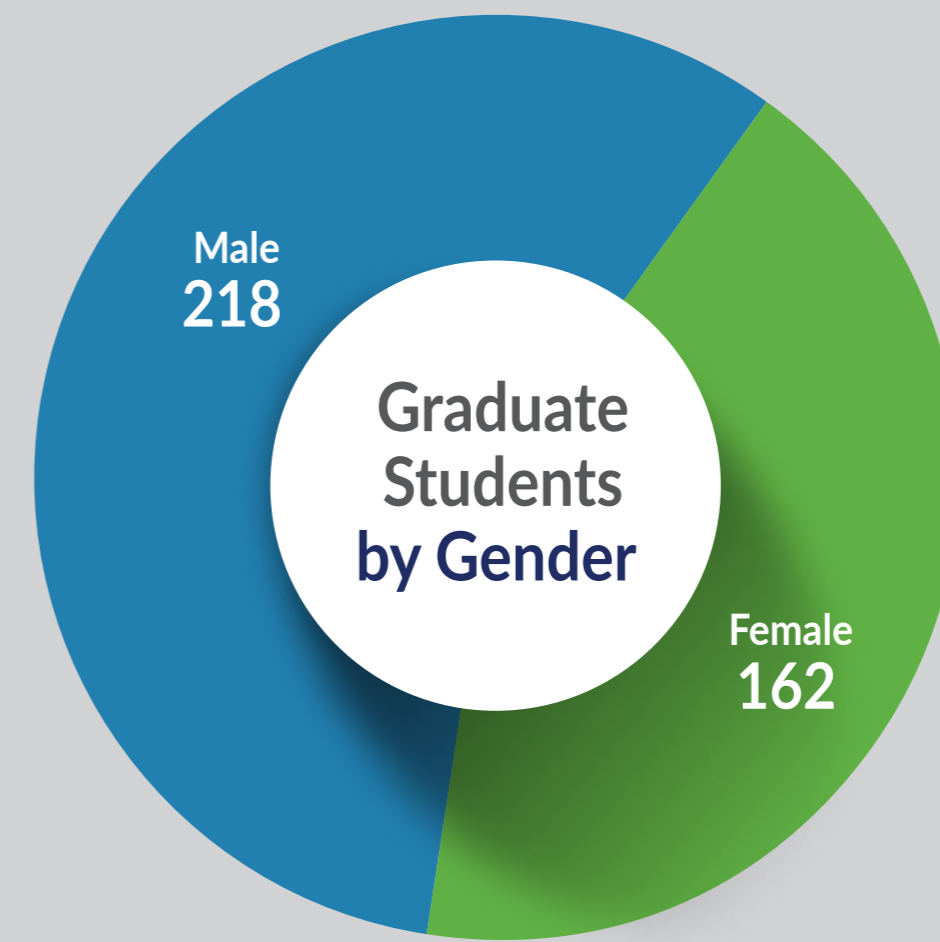


August 2023: 11 ADB-JSP scholars receiving their scholarship letter.



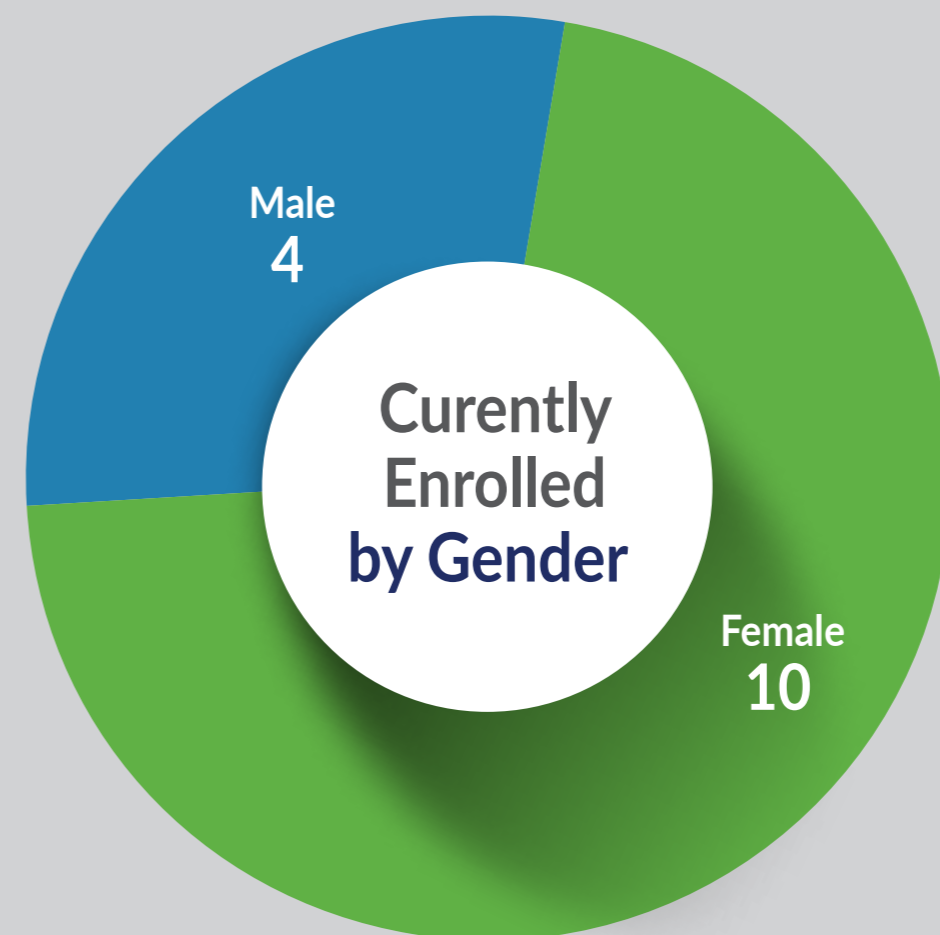
September 2016: ADB officials interact with scholarship recipients.

380 Total GRADUATED from 22 Countries



- Bangladesh 60
- Nepal 45
- Philippines 42
- Myanmar 32
- Sri Lanka 25
- Vietnam 23
- China 17
- Mongolia 17
- Pakistan 17
- Bhutan 13
- Cambodia 13
- Kazakhstan 13
- India 12
- Indonesia 12
- Lao PDR 10
- Afghanistan 9
- Thailand 8
- Uzbekistan 8
- Azerbaijan 1
- Malaysia 1
- Papua New Guinea 1
- Tajikistan 1

14 Currently ENROLLED from 7 Countries



- Bangladesh 3
- Myanmar 3
- Nepal 3
- Pakistan 2
- Bhutan 1
- Philippines 1
- Sri Lanka 1



GOVERNMENT OF KHYBER PAKHTUNKHWA KHYBER PAKHTUNKHWA CITIES IMPROVEMENT PROJECT (KPCIP) LOCAL GOVERNMENT, ELECTIONS & RURAL DEVELOPMENT DEPARTMENT KHYBER PAKHTUNKHWA, PESHAWAR, PAKISTAN




May 2024: Thirty young women from Khyber Pakhtunkhwa Province in Pakistan will receive scholarships to pursue master's programs at the Asian Institute of Technology, funded by ADB (ADF3 grant), during 2024 to 2027.

ADB-JSP SCHOLARS' TESTIMONIALS



“
This master's program made me a responsible global citizen.
”

DENKAR (Bhutan)
Asian Institute of Technology



“
My stay in AIT proved an advantage not only for me, but also for my university students as well as Sri Lanka's entrepreneurs.
”

Ranjika Lalani Perera (Sri Lanka)
Asian Institute of Technology



“
I am really grateful to ADB for my study sponsorship since this support has changed my life in an amazing way.
”

Vo Phuong Oanh (Viet Nam)
Asian Institute of Technology



“
I am happy that now I am working with an organization that, in meaningful ways, thinks about poor and small holder farmers and works for their upliftment.
”

SUMAN GIRI (Nepal)
Asian Institute of Technology



“
I believe I can significantly contribute experience-based insights to the energy policy-making discourse in Bangladesh given my ongoing research activities.
”

Rafia Zaman (Bangladesh)
Asian Institute of Technology



“
In the future, I would like to focus more on technological development in the food industry, food value chain, food safety, and food security issues in Nepal and the rest of the world.
”

Manisha Singh (Nepal)
Asian Institute of Technology



“
By far, choosing ADB-JSP is the best decision I have made. It has contributed a lot to my wellbeing: it expanded my horizon, it made me resilient, it made me see things differently, and it made me a better person.
”

JACQUELINE DAYAO (Philippines)
Asian Institute of Technology



“
I humbly thank the ADB-JSP for this opportunity, since I would hardly be able to complete my journey without the scholarship.
”

Kalumith Upeka Madhavi De Silva (Sri Lanka)
Asian Institute of Technology



“
My academic experience at AIT covered a broad range of relevant topics, out of which my interest focused on the dynamics of structure and earthquake engineering.
”

Hasan Tariq (Pakistan)
Asian Institute of Technology (AIT)



“
My sincere gratitude to the ADB-JSP and AIT for helping me unleash my inner potential and propel myself toward a successful future.
”

Pradeep Baral (Nepal)
Asian Institute of Technology



“
Unequivocally, the opportunity provided by the ADB-JSP enabled me to achieve my goals and aspirations in connection with my people and my country.
”

SHAMIM NOOR (Bangladesh)
Asian Institute of Technology



“
The 2-year study period was a life-enriching experience in my academic career that helped foster my professional growth and development in international arena.
”

Niraj Bhujel (Nepal)
Asian Institute of Technology

AIT-ADB RECENT ENGAGEMENTS



December 2022: The annual Water Security and Climate Change Conference (WSCC 2022) was inaugurated by H.E. Mr. Varawut Silpa-archa, Minister of Natural Resources and Environment, The Government of Thailand, with H.E. Mr. George Schmidt, Ambassador of Germany to Thailand; H.E. Mr. Yuichi Oba, Deputy Chief of Mission and Minister (Economic Affairs), Embassy of Japan in Thailand; H.E. Dr. Suwit Khunkitti, Vice Chairperson, AIT Board of Trustees; President Kazuo Yamamoto; Ms. Neeta Pokhrel, Chief of the Water Sector Group at the Asian Development Bank and Prof. Mukand S. Babel, AIT.



August 2023: Mr. Arnaud Cauchois ADB Country Director of Nepal visited AIT.



June 2023: ADB Delegation comprised of Mr. Sameer K Khare, Executive Director; Mr. Anouj Mehta, Country Director for Thailand; and Dr. Srinivasan Ancha, Principal Climate Change Specialist and Climate Change Focal Point for Southeast Asia visited AIT to explore potential collaboration in the areas of water and climate-related issues.



February 2019: Dr. Bindu N. Lohani, former Vice President of Finance and Administration, ADB delivered a lecture to the AIT community and stakeholders on “Revisiting Development Process in Asia: How can fast growing economies of today adopt, adapt and leapfrog.”



November 2019: ADB published a book titled ‘Infrastructure Financing in Asia’ and a Book Launch Event was held at AIT’s Robert B. Banks Auditorium.



May 2023: AIT President Prof. Kazuo Yamamoto, paid a courtesy visit to ADB President Masatsugu Asakawa in Manila, Philippines.



March 2019: Dr. Bambang Susantono, Vice President for Knowledge Management and Sustainable Development of ADB delivered a special seminar at AIT titled “Towards Sustainable Infrastructure Development in Asia and the Pacific.”



September 2016: Visit of Mr. Masashi Tanabe, Alternate Executive Director for Japan, and Mr. Tatsuya Kanai, Senior Advisor, Office of Cofinancing Operations (OCO), Asian Development Bank (ADB).



January 2021: ADB and the Government of Thailand announced a US \$2 million technical assistance grant to help promote the adoption of climate-smart agriculture in highlands of northern Thailand.

From the ARCHIVES



February 2007: ADB delegates, Vice President Ursula Schafer-Preuss, Knowledge Management and Sustainable Development (ADB) and her husband Dr. Wolf Preuss (former AIT trustee), and Dr. Jean-Pierre Verbiest, Country Director, ADB Thailand Resident Mission, visited AIT.



November 2004: Mr. Daan Boom, Principal Knowledge Development Specialist from the Regional Sustainable Development Department of ADB, Manila visited AIT and met with President Louis Armand (right).



October 2004: A high level delegation from ADB, led by Mr. Tadao Chino, ADB President, visited AIT.



May 2003: Mr. Paul L. Chang (right), Principal Education Specialist, Mekong Department, ADB, visited AIT.

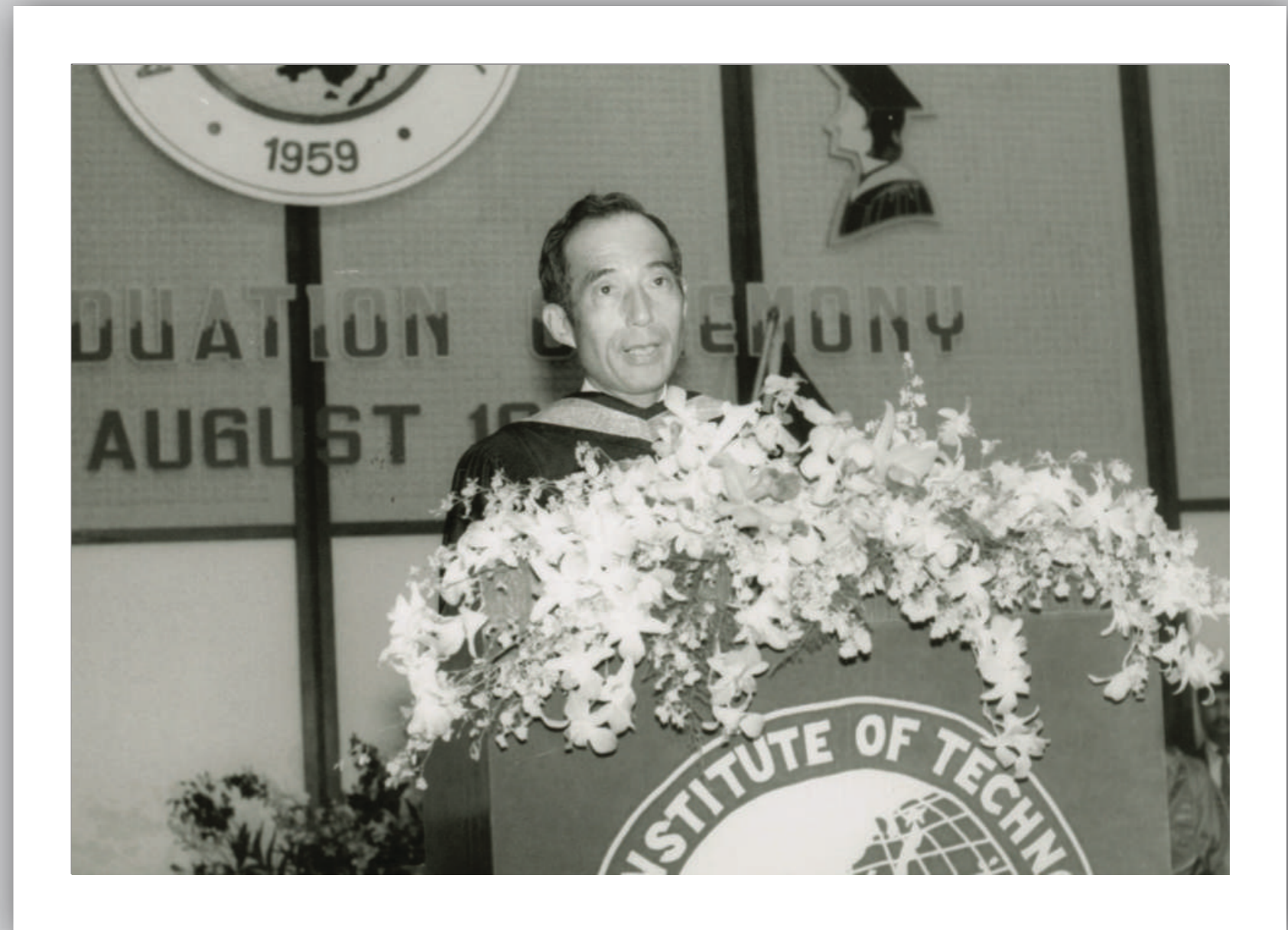


November 2002: A delegation from ADB, including Mr. Osamu Tsukahara, Executive Director for Japan; Mr. Megumi Araki, JSF & JSP Coordinator, Office of Cofinancing Operations; and Ms. Teresa N. Carreon, Executive Assistant, visited AIT.



August 2002: The Greater Mekong Subregion Academic and Research Network (GMSARN) held its third joint meeting of the International Board and Council of Advisors at AIT.

AIT Honorary Doctorate Degrees AWARDED TO ADB PRESIDENTS



In 1988, AIT conferred the Honorary Degree of Technology on
Mr. Masao Fujioka,
then President of ADB,
in recognition of his outstanding and continuing contribution to the
economic, social, and technological development of the Asia-Pacific region.



In recognition of this long-standing partnership,
AIT conferred the Honorary Degree of Technology on
Mr. Tadao Chino,
then President of ADB, in 2000,
honoring his vision and contributions to the Asia-Pacific region.

Technical Training for 100 Women Energy Professionals in South Asia (SAR100)

WePOWER – SAR100 South Asia Regional Infrastructure Connectivity (SARIC) Large Systems Program

PROJECT DESCRIPTION

WePOWER-SAR100, a professional training series for mid-career women engineering professionals from the South Asian Region (SAR) designed to equip them for leadership, ensuring gender diversity in the energy sector. Highly selective pilot program granted scholarships to 101 mid-career women. Academically rigorous innovative training program with real-world knowledge from a pool of internationally recognized experts. SAR100 provided specialized technical training and networking opportunities to women engineers and empowered them for senior management roles. WePOWER-SAR100, 8-months program systems consisted of 10 hybrid modules, delivered in 3-week cycles, and a capstone program at the AIT campus in Thailand. This hybrid model bridged geographical distances, empowering students and teachers to learn and teach.

PROJECT INVESTIGATORS Faiz Hassan Shah, Executive Director	BUDGET 14,239,463 THB from Yunus, 2,200,000 THB from (SERD-Energy program) Total 16,439,463 THB	DURATION Start Date – 10 June 2023 Completion Date – 8 March 2024	DONOR Department of Foreign Affairs and Trade (DFAT), Australia
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BENEFICIARIES

101 mid-career women engineering professionals from the South Asian Region (SAR) representing Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka.



Study visit during Capstone Week

OBJECTIVE

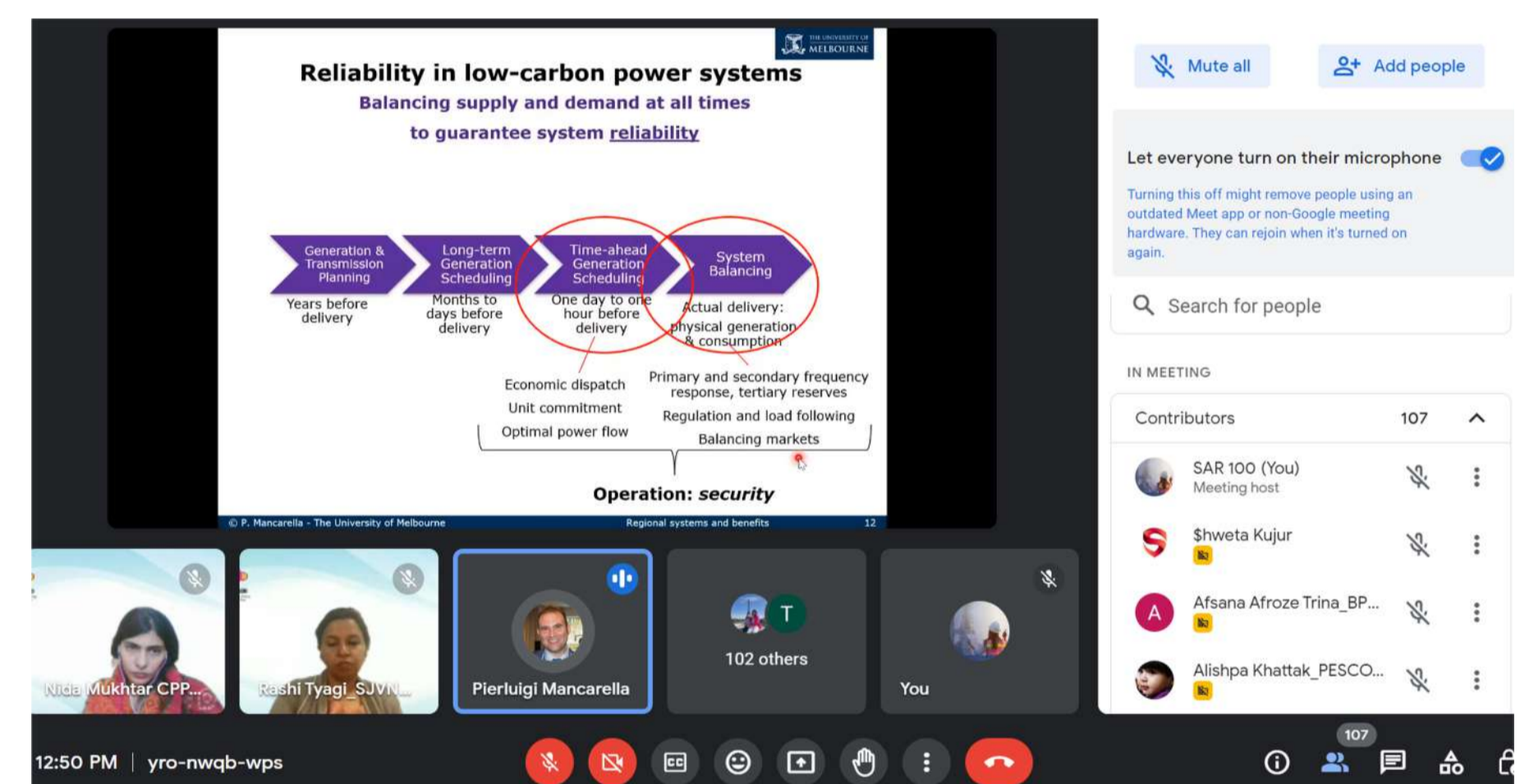
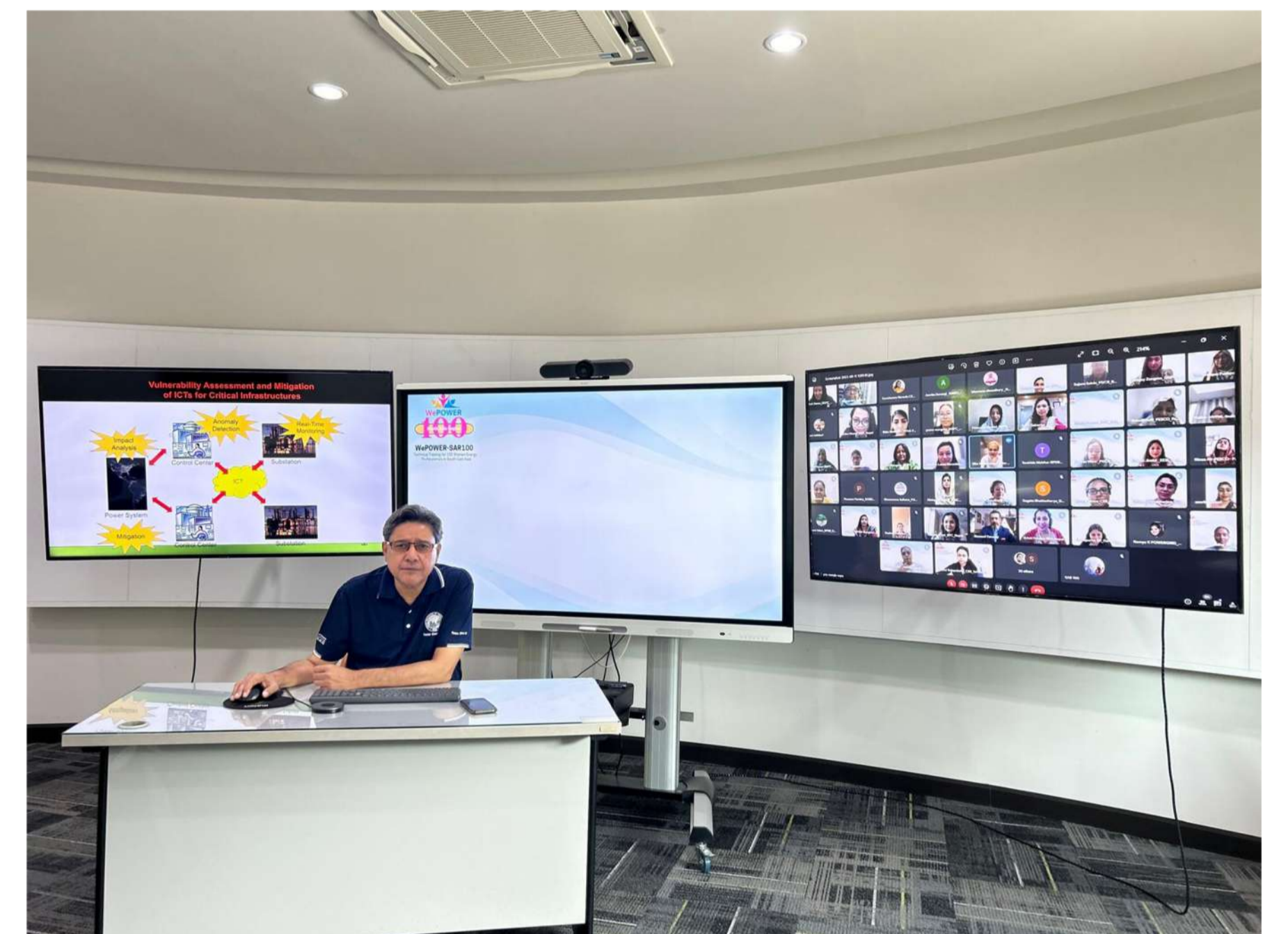
To equip mid-career women engineering professionals for leadership roles in the emerging energy integration and energy space.

KEY ACHIEVEMENTS

Yunus Center AIT's WePOWER-SAR100 Regional Knowledge Hub at AIT facilitated certificates to 101 women engineers from the SAR100 regional training program, equivalent to 16-professional credits. This equals attending 150 hours of intensive classroom lectures, 140 hours of practical training sessions, and co-developing a capstone project presented at AIT in March 2024.

101 participants	
women engineers in the energy sector of South Asian Region	
66 trainers Leading authorities in the energy and power sector from 16 countries across four continents	30 hours Capstone project preparation
150 hours Intensive classroom lectures	16 credits Professional certification
140 hours Practical training sessions	13 members Yunus Center AIT's WePOWER-SAR100 Regional Knowledge Hub

Smart Classroom



WePOWER SAR100 Program Celebrates Women Engineers in South Asia



WePOWER SAR100 Program Award Ceremony



CONTACT INFORMATION

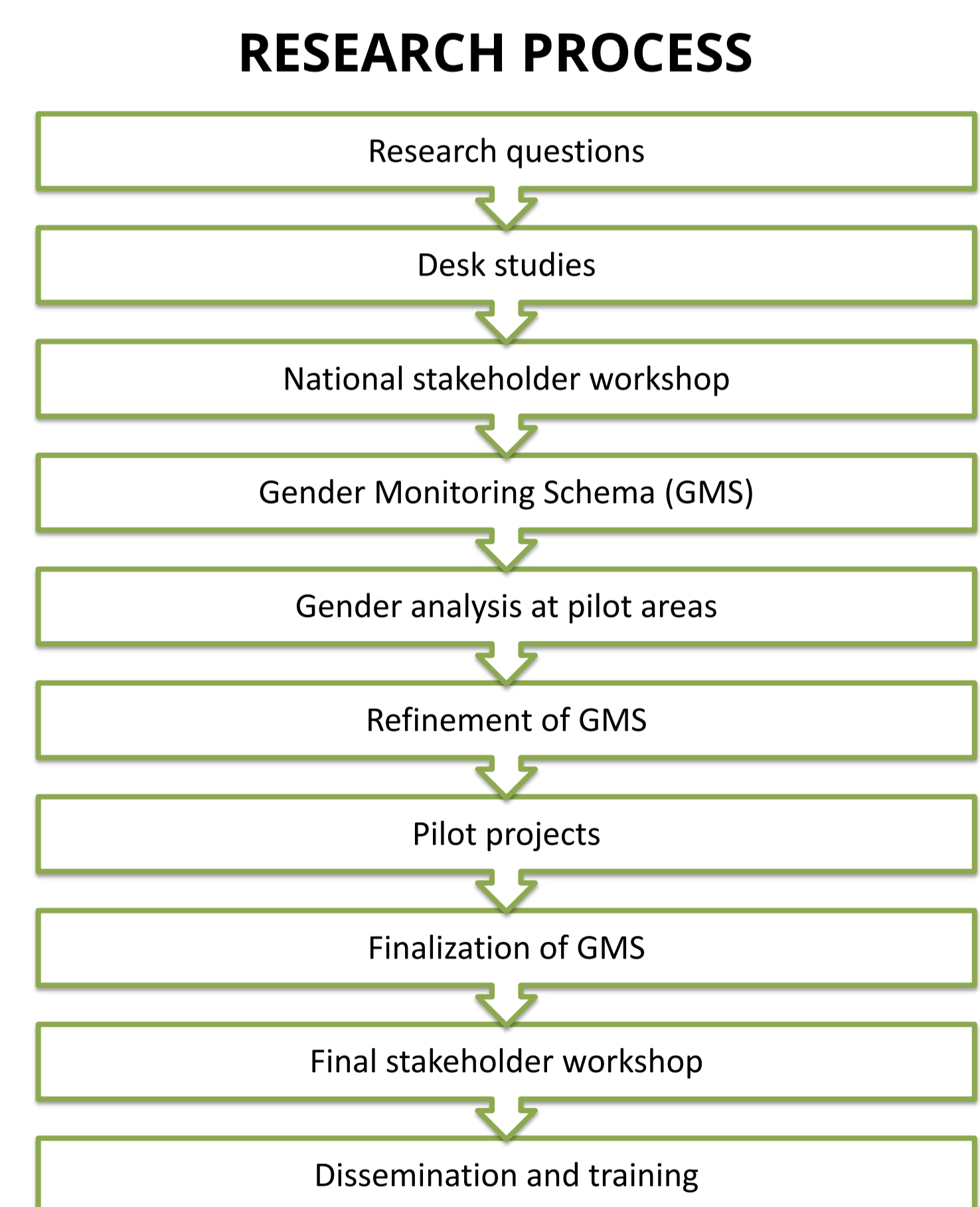
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 Location – B109, AITCC
 Website - www.yunuscenterait.org

Making Nbcs in Aquaculture in Southeast Asia Monitoring More Gender Responsive: What Gets Measured, Gets Done (Gena Project)

PROJECT DESCRIPTION

The GeNA project aims to develop a Gender Monitoring Schema (GMS) to capture the processes by which women and men participate in and benefit from Nature-based Climate Solutions (NbCS) aquaculture and provide a transformative process for greater equity and sustainability despite climate change.

<p>PROJECT INVESTIGATOR</p> <p>Prof. Kyoko Kusakabe Professor and Chair, Gender and Development Studies, Department of Development and Sustainability</p>	<p>BUDGET</p> <p>28,363,034 THB</p>	<p>DURATION</p> <p>1 September 2023 – 30 September 2027</p>	<p>DONOR</p> <p>IDRC-AQUADAPT, Canada</p>
<p>BENEFICIARIES</p> <p>Women play a large part in aquaculture production in Asia, but their roles are often not recognized or accounted. The lack of sex-disaggregated and gender data in aquaculture is well-documented.</p> <p>At the same time, several indicators and guidelines have been developed to monitor gender equality in fisheries/ aquaculture. However, most schemes are not designed to monitor the processes and impact pathways of women's empowerment in aquaculture.</p> <p>Given women's engagement in NbCS aquaculture in Southeast Asia, this form of aquaculture would benefit from having a gender monitoring tool that can capture the processes and contexts of women's and men's roles and relationships in production. To be transformative, the tool should also help amplify women's voices in NbCS aquaculture.</p>	<p>METHODS</p> <ul style="list-style-type: none"> • Desk reviews • Stakeholders' meetings • Develop, pilot Gender Monitoring Schema • Trainings • Dissemination <p>PILOT PROJECTS</p> <ul style="list-style-type: none"> • Rice-fish farming in Thailand and Cambodia • Seaweed farming in the Philippines <p>PARTNERS</p> <p>The project is led by the Gender in Aquaculture and Fisheries Section (GAFS) of the Asian Fisheries Society and managed from Gender and Development Studies Program at the Asian Institute of Technology (AIT), Thailand.</p> <p>Research partners for pilot study:</p> <ul style="list-style-type: none"> • University of the Philippines Visayas (UPV) and UPV Foundation, Inc., Philippines • Cambodian Institute for Research and Rural Development (CIRD). 	 <p>Rice-fish farming in Thailand. Source: Malasri Khumsri</p>  <p>Rice fish farming in Cambodia. Source: Prak Sereyvath</p>	



CONTACT INFORMATION

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 Pathum Thani 12120, Thailand
 Website: <https://gena-project.ait.ac.th/>



University of the Philippines
VISAYAS



IDRC-CRDI
International Development Research Centre
Centre de recherches pour le développement international



In partnership with
Canada

Reduce, Reuse, Recycle to Protect the Marine Environment and Coral Reefs (3RproMar)

PROJECT DESCRIPTION

The 3RproMar project aims to enhance regional cooperation and knowledge management addressing marine litter and plastic pollution in ASEAN. The project focuses on improving the knowledge base for effective interventions, narrowing data gaps, and supporting informed decision-making. Key activities include enhancing the knowledge platform, building partnerships, and capacity building for waste data management. Beneficiaries include local government units, experts, academics, and the informal sector.

PROJECT INVESTIGATORS Dr. Guilberto Borongan, Huno Solomon Kofi Mensah Asian Institute of Technology Regional Resource Centre for Asia and the Pacific (AIT RRC.AP)	BUDGET 3,994,845 THB	DURATION Start Date: 1 Nov 2022 Completion Date: 30 Jun 2025	DONOR GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit)
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BENEFICIARIES

The 3RproMar project directly benefits solid waste focal points and officers at local government units (LGUs), national and regional thematic experts, academics, and informal sector groups by enhancing their technical capacity in waste data management and monitoring. Indirect beneficiaries include the ASEAN Working Group on Coastal and Marine Environment (AWG-CME), waste collection companies, waste generators (NGOs, CSOs), and the private sector.



Demonstration site to show that marine plastic debris is transboundary in nature. Photo taken at Guimaras Island, Philippines.

OBJECTIVE

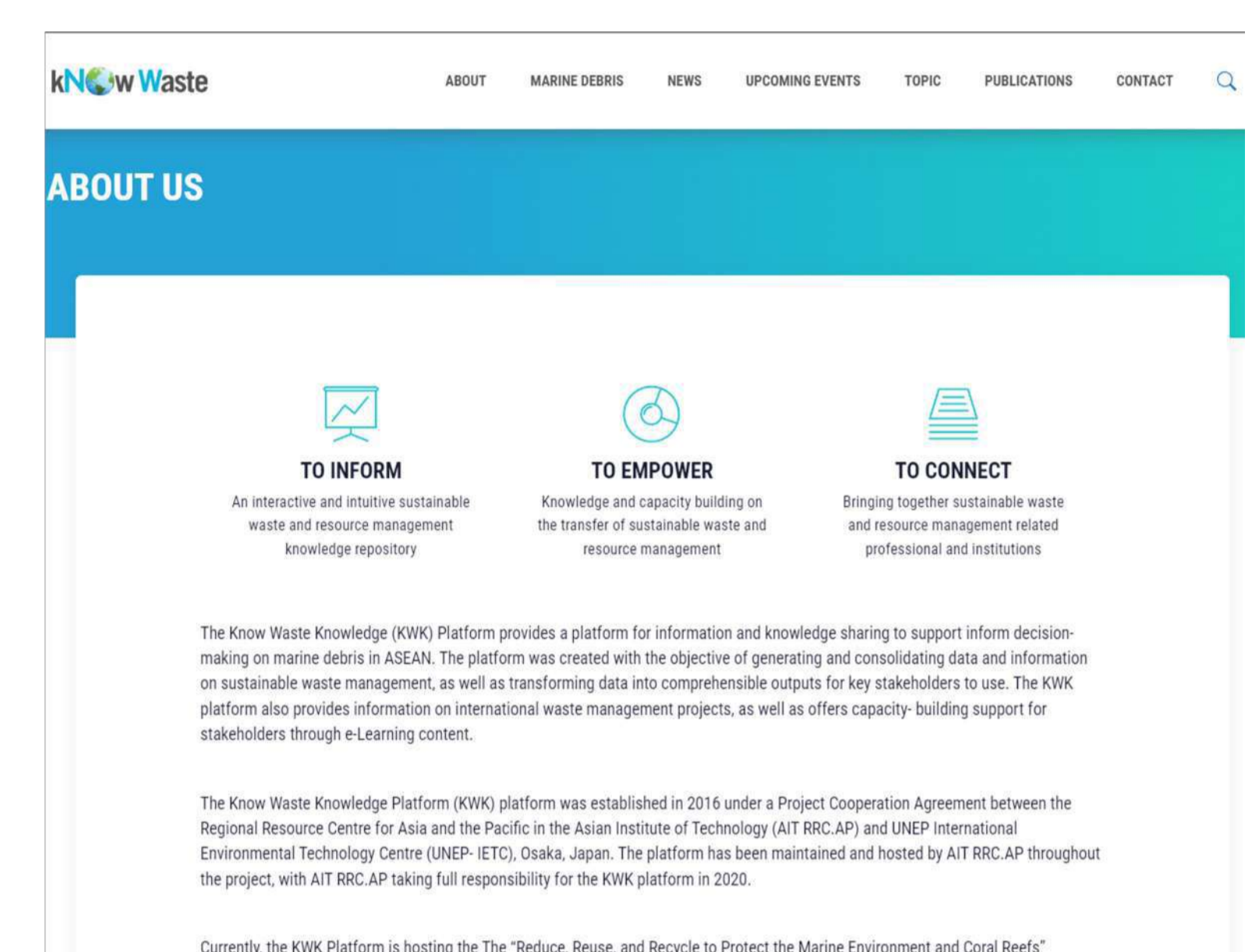
To provide a common platform for information and knowledge sharing to enhance capacity for informed decision-making in combating marine litter in the ASEAN region.

IMPACT

The 3RproMar project significantly enhances knowledge and capacity for informed decision-making, narrowing the data and information gap between science and policy. It identifies practices that can be rapidly adopted by local stakeholders, thereby promoting effective interventions for marine litter reduction. Knowwaste (<https://knowwaste.net/>) Knowledge Platform supported by this project provides regional information on plastic waste. The project also focuses on studying gaps in the current data management on plastic waste and disseminating it to stakeholders through workshops and webinar. The project is aligned with some of the goals of 'ASEAN Regional Action Plan for Combating Marine Debris.'

EXPECTED OUTCOMES

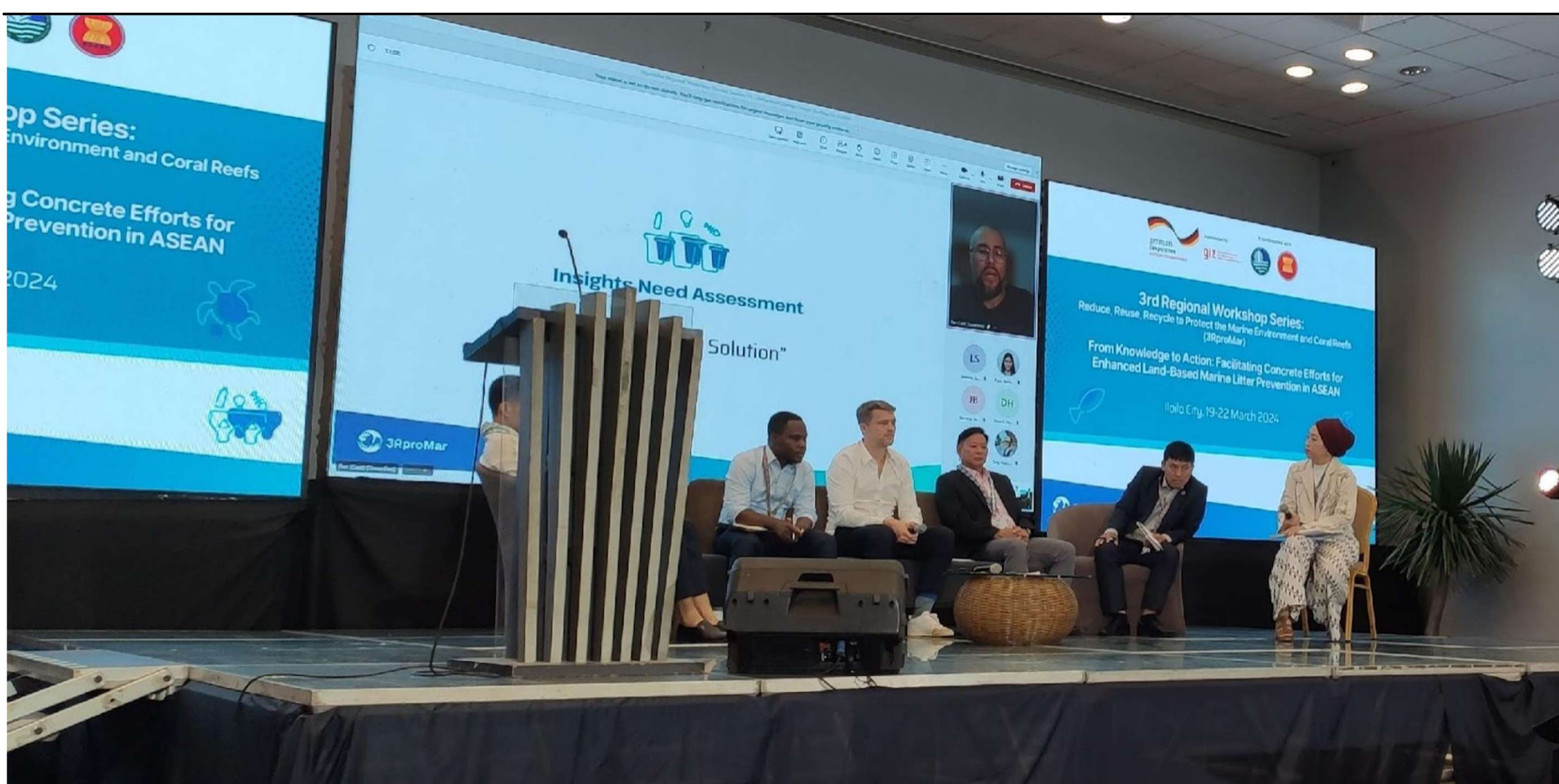
- The 3RproMar project aims to deliver several key outcomes:
- Enhanced knowledge platform with improved features for data visualization and user interface,
 - Established partnerships for effective data sourcing and endorsement on plastic waste
 - Increasing capacity among ASEAN Member States (AMS) focal points on waste data management.
 - Disseminate knowledge on marine debris and circular economy through integrated knowledge products, policy briefs, reports, and e-learning courses..



Knowwaste (<https://knowwaste.net/>) Knowledge Platform



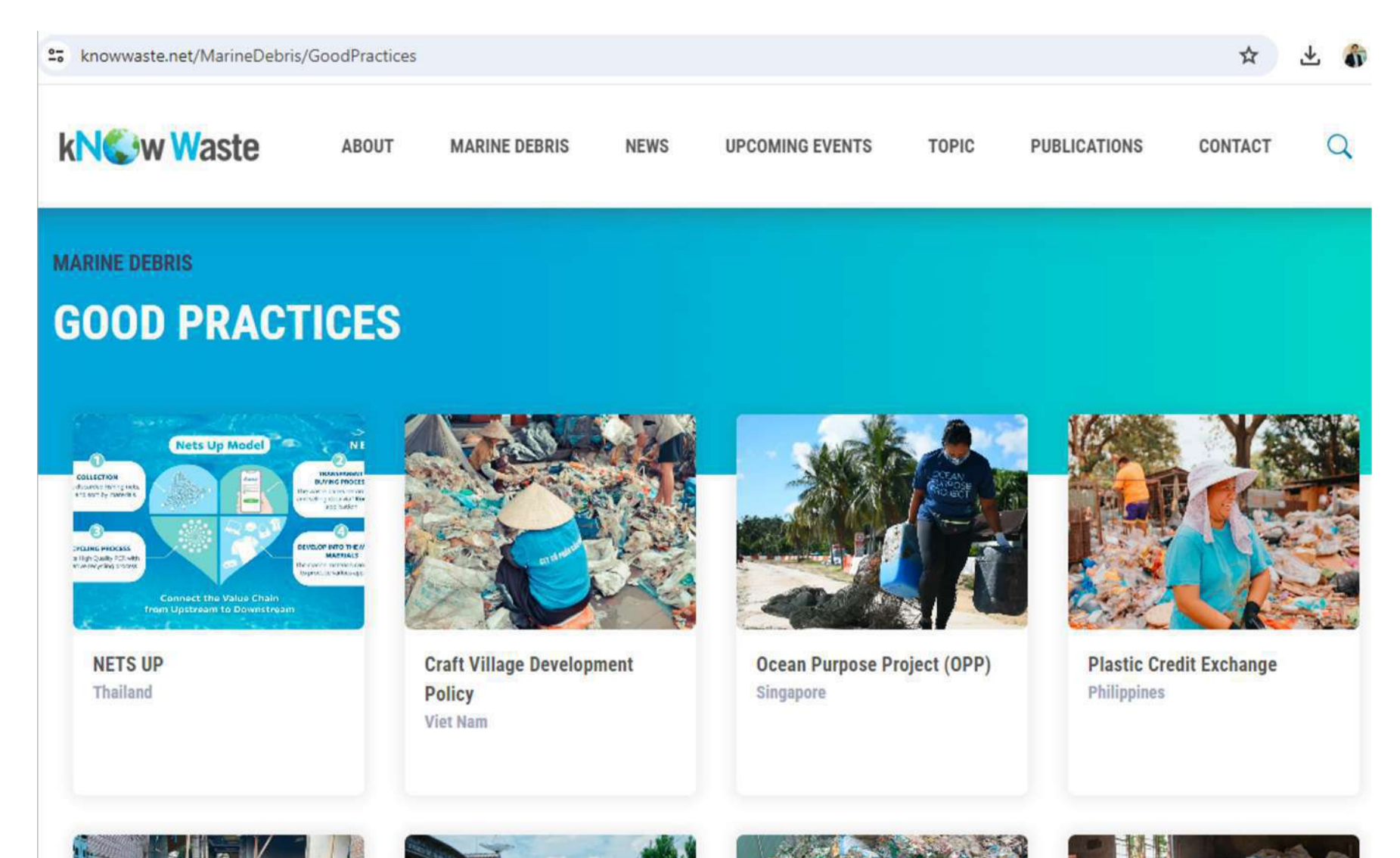
The 3rd Regional Workshop Series: Reduce, Reuse, Recycle to Protect the Marine Environment and Coral Reefs (3RproMar) panel discussion on Knowledge Platforms



AIT-RRCAP engages in discussion with regional expertise on Behavior Change in plastic waste which is one of the key component of ASEAN Regional Action Plan for Combating Marine Debris.



AIT-RRC.AP has been working on compiling the data and information gap of ASEAN under this project.



AIT-RRC.AP also works to collect and share good practices to tackle plastic waste through different approaches such as recycling, upcycling, beach-cleanup, etc.

CONTACT INFORMATION

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Applications of Digital Technologies for Sustainable Development

PROJECT DESCRIPTION

AIT is implementing a few Asian Development Bank (ADB) supported projects in its Developing Member Countries (DMCs) using earth observation data and AI tools for sustainable development. AIT is supporting the deployment of cloud-based platforms to process earth observation data and produce actionable data products for land use management, coastal planning, and disaster risk reduction. AIT conducts training courses in DMCs to build in-country capacities.

PROJECT INVESTIGATORS Dr. Manzul Kumar Hazarika	BUDGET 83,000 USD	DURATION Start Date: 12 Feb. 2024 Completion Date: 30 Nov. 2024	DONOR Asian Development Bank (ADB)
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BENEFICIARIES

This project focuses on local capacity building to promote the operationalization of cloud-based infrastructure and foster capacity across government agencies of the ADB's Developing Member Countries (DMCs). This enhances the potential for Earth Observation (EO) data to support decision-making and policy development.



OBJECTIVE

This assignment aims to demonstrate the capability of EO-based services to provide valuable and actionable information for various applications and to enhance the capacities of DMCs in utilising EO technology.

IMPACT

Using the cloud-based infrastructure, including Cloud SEOS, WASDI, and Geohazard Exploitation Platform (GEP), AIT is providing the following services:

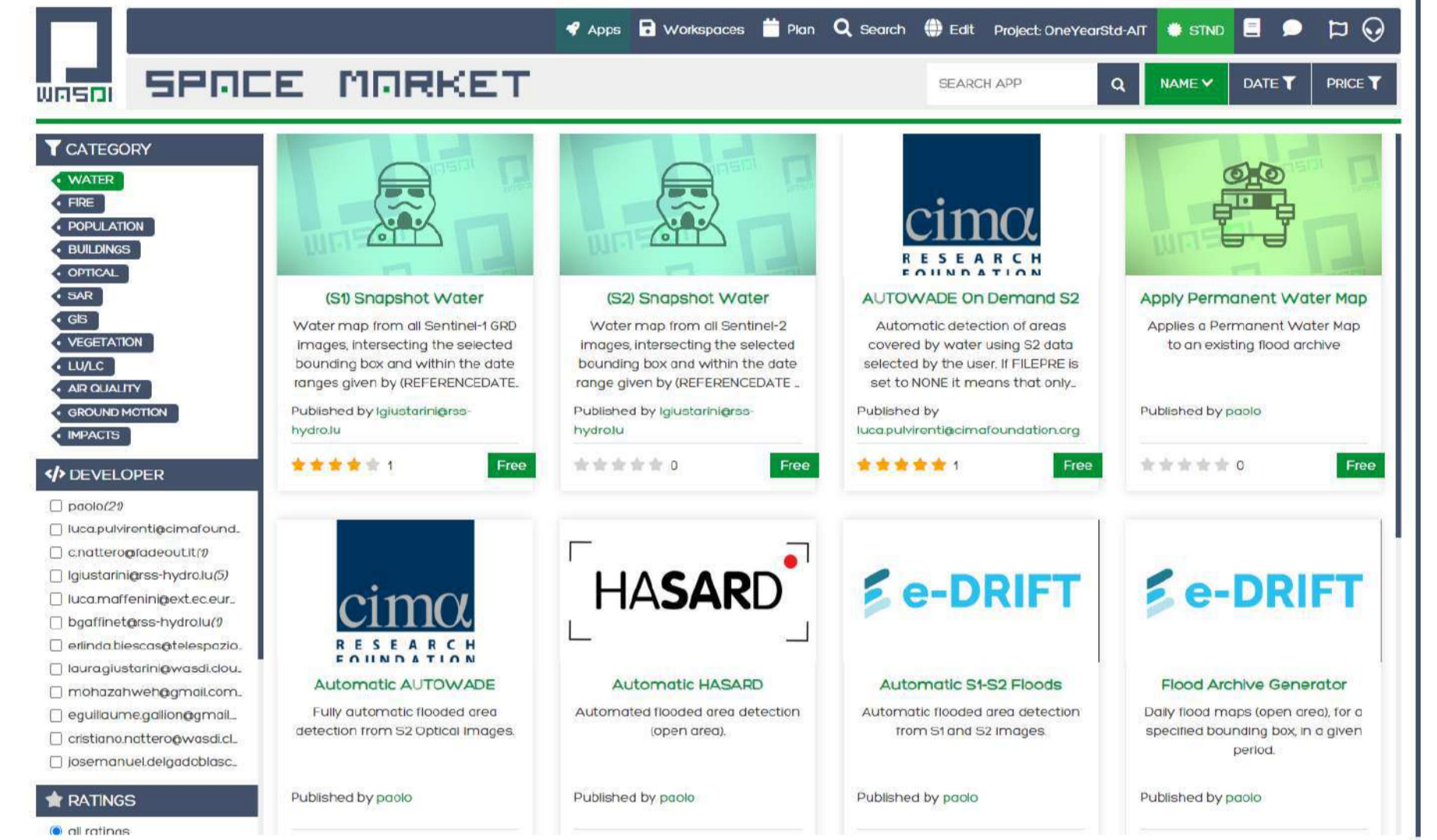
- Support the operationalisation of Cloud SEOS for coastal and agriculture applications.
- Support to disaster risk reduction needs in both pre- and post-disaster scenarios.

We shall also work with the ADB to identify stakeholders in DMCs and conduct training for technology transfer and knowledge building.

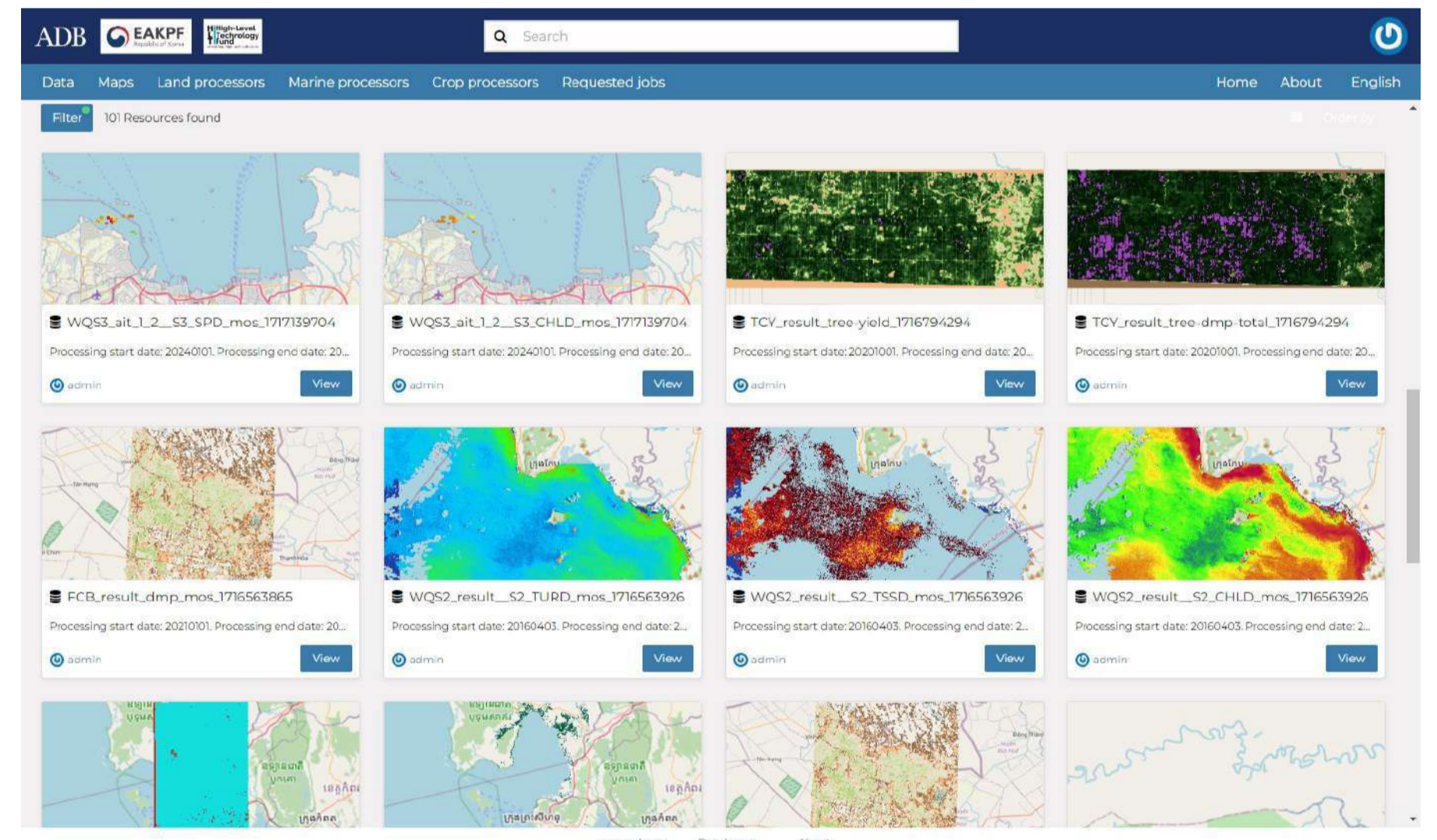
EXPECTED OUTCOMES

By exploiting open and globally available EO data and advanced AI-based algorithms, the project has provided information on the following applications as examples.

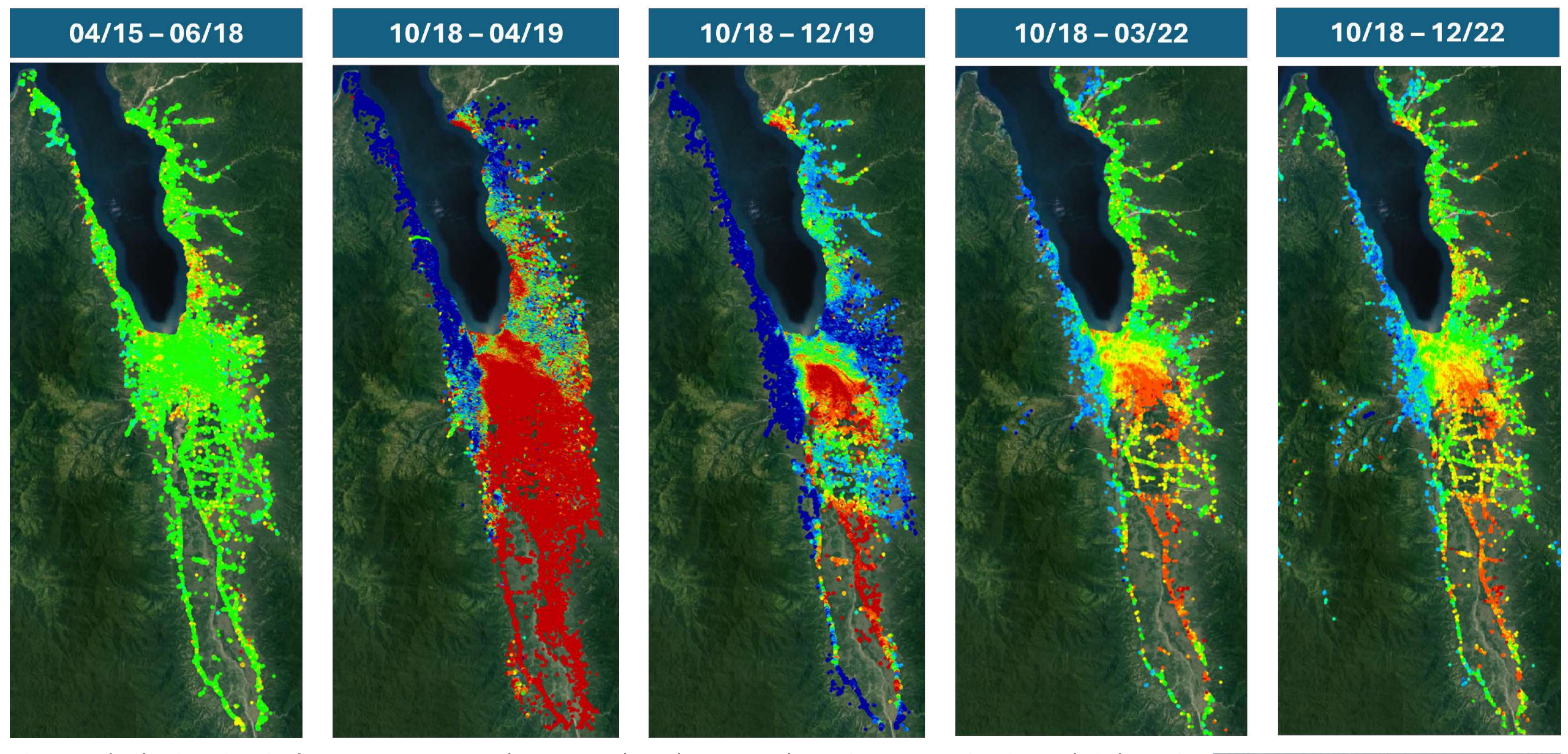
- Mangrove mapping in Cambodia and identification of the areas with the highest loss between 2017 and 2021.
- Flood frequency mapping in the Khulna district, Bangladesh, between 2015 and 2024 to support the identification of nature-based solution water storage.
- Monitoring of ground movement, building stability, and reconstruction after the 2018 earthquake in Central Sulawesi, Indonesia.



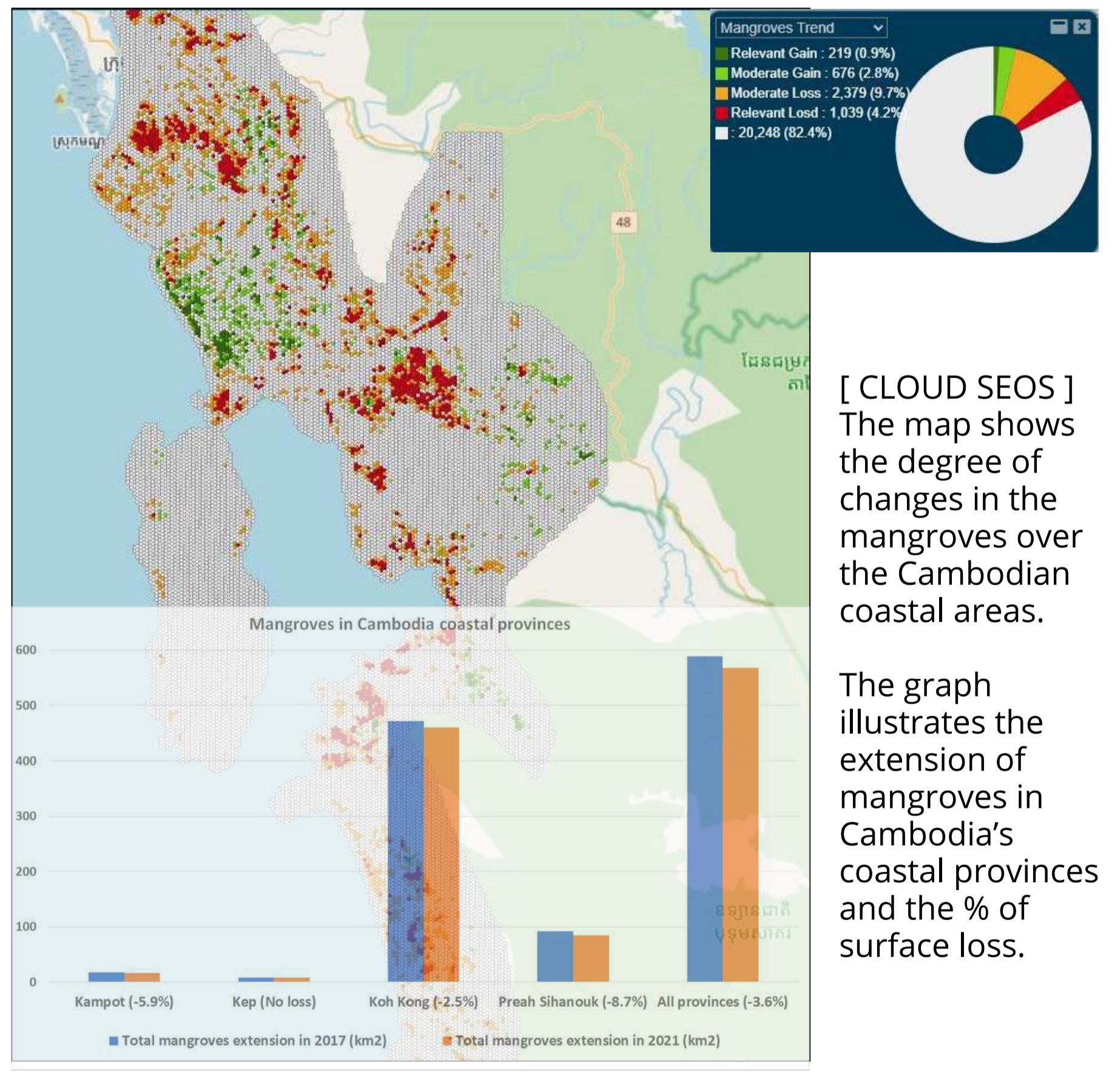
[WASDI] A simple and intuitive interface of the platform, includes a marketplace that provides a wide range of tools for disaster applications.



[CLOUD SEOS] An interactive web interface built on the GeoNode framework, including processors for land, coastal, and agriculture applications.

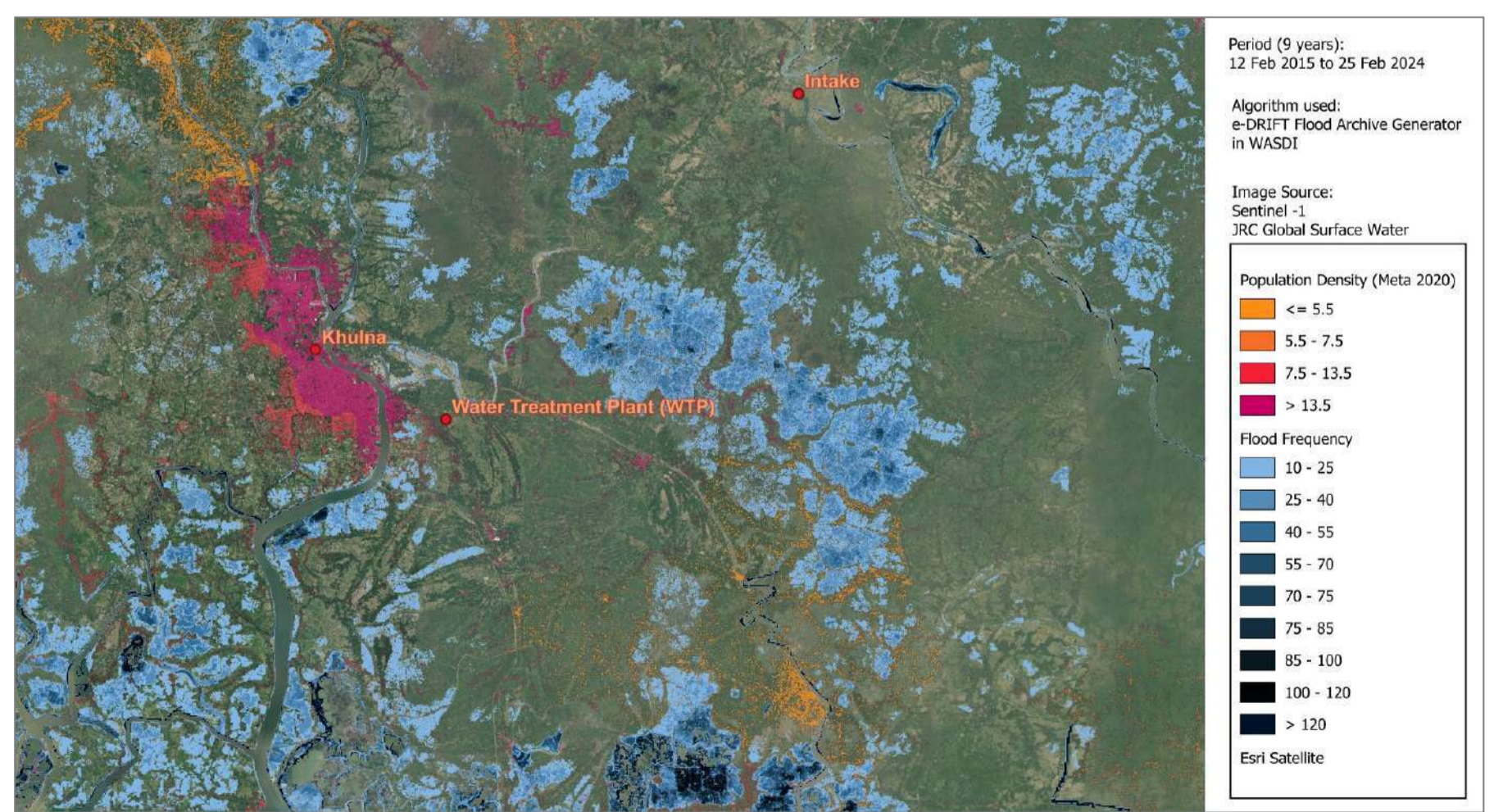


[GEP and Reticus® Displacement] Pre- and post-earthquake ground motion maps in Central Sulawesi, Indonesia. The map series shows the ground movement along the line of sight (LOS) in a descending orbit based on the Sentinel-1 data covering the period from April 2015 to December 2022. The map revealed significant movement following the earthquake, which is expected to gradually decrease over the subsequent years, eventually returning to near pre-earthquake conditions.



[CLOUD SEOS] The map shows the degree of changes in the mangroves over the Cambodian coastal areas.

The graph illustrates the extension of mangroves in Cambodia's coastal provinces and the % of surface loss.



[WASDI] Flood frequency map in Khulna, Bangladesh. Sentinel-1 time series data (2015-2024) was processed using the e-DRIFT flood archive generator app.

CONTACT INFORMATION

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Regenerative Agriculture in ASEAN: Promoting Nature-Positive Solutions for Rice Production

PROJECT DESCRIPTION

This project aims to transition rice production in Cambodia, Lao PDR, and Thailand toward regenerative agriculture to enhance climate resilience and sustainability. Led by AIT, the initiative will review existing data on GHG emissions, water use, soil biodiversity, and farmer incomes to identify effective nature-positive practices, demonstrate those to farmers, and explore scaling-up opportunities. The project seeks to improve soil health, protect water resources, increase farmer profitability, empower communities, and share knowledge across Asia. The project aims to transform rice production, reduce food import dependency, and enhance regional food security resilience in ASEAN countries.

PROJECT INVESTIGATORS

Principal Investigator : Professor Avishek Datta
 Co-Principal Investigators : Dr. Farhad Zulfikar
 Dr. Sushil Kumar Himanshu

BUDGET

300,000 USD

DURATION

Start Date : 01 August 2023
 Completion Date : 31 July 2025

DONOR

The Rockefeller Foundation, USA

BENEFICIARIES

The direct beneficiaries of this project will be farmers involved in field testing and training activities, researchers engaged in empirical research, and policymakers engaged through stakeholder meetings and policy briefs. The indirect beneficiaries will include farmers who will be able to learn from the experiences of the engaged farmers, policymakers in departments other than agriculture (such as environment, social impact, among others) and from countries other than the project countries, and researchers who will be able to access the research framework and findings through the peer-reviewed published research from this project.



OBJECTIVE

The project aims to address the urgent need for alternative rice production systems based on regenerative agriculture principles in the Association of Southeast Asian Nations

IMPACT

The proposed project intends to enable transition of rice production systems toward climate resilience and regeneration by

1. Reviewing existing status of GHG emissions, water productivity and quality, soil biodiversity preservation and soil regeneration ability, farmer profitability and empowerment from rice production in the ASEAN member states of Cambodia, Lao PDR, and Thailand
2. Identifying promising nature-positive agricultural practices that could minimize GHG emissions associated with rice production
3. Generating empirical evidences for selected nature-positive and regenerative solutions for rice production
4. Gauging pathways for selected solutions in the ASEAN agriculture sector via highlighting the benefits of proposed solutions to soil health, climate and water resources, soil biodiversity, ecosystem resilience, farmer profitability, and community empowerment

EXPECTED OUTCOMES

The expected outcomes of this project is to extrapolate the potential to transform rice production in ASEAN countries, reduce their dependence on food imports, and strengthen the region's resilience to future food security crises via two major engagements

- Stakeholder engagement
- Media outreach, workshops, advocacy

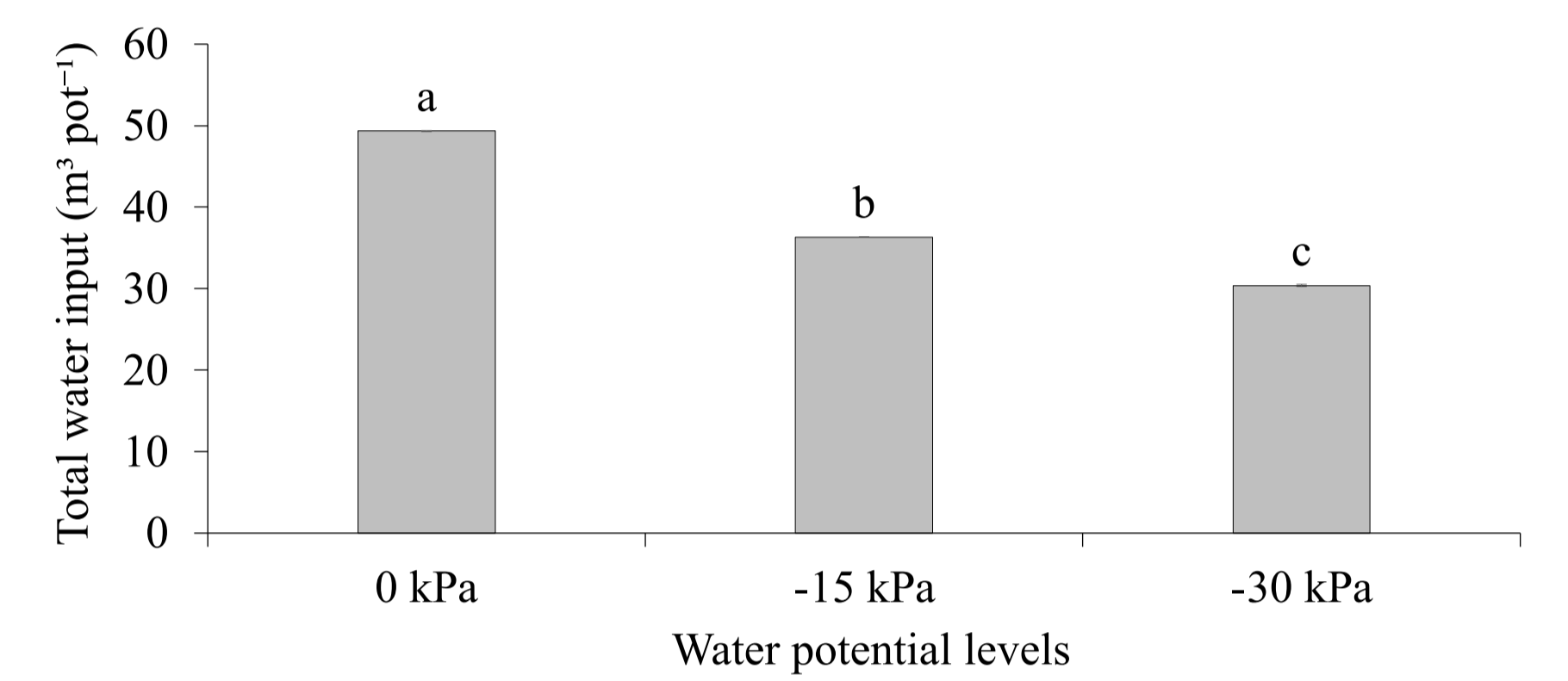


Fig. 1. Effect of water potential levels on total water input of rice. Data are means of four replications. Vertical bars represent standard error values. Bar columns with different letters are statistically significant based on Tukey's honest significant difference test at $P \leq 0.05$.

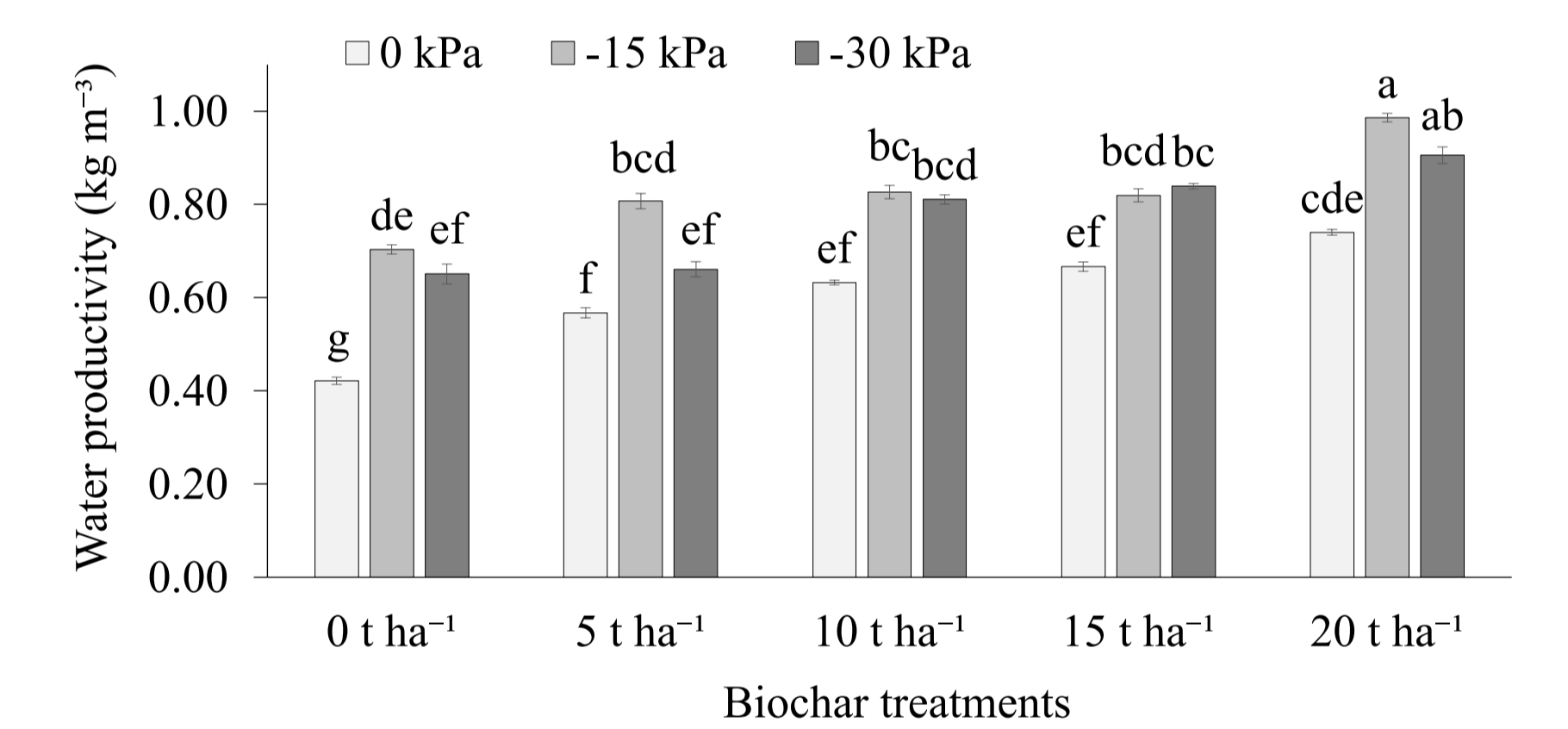


Fig. 2. Interactive effect of biochar treatment and water potential level on irrigation water productivity of rice. Data are means of four replications. Vertical bars represent standard error values. Bar columns with different letters are statistically significant based on Tukey's honest significant difference test at $P \leq 0.05$.

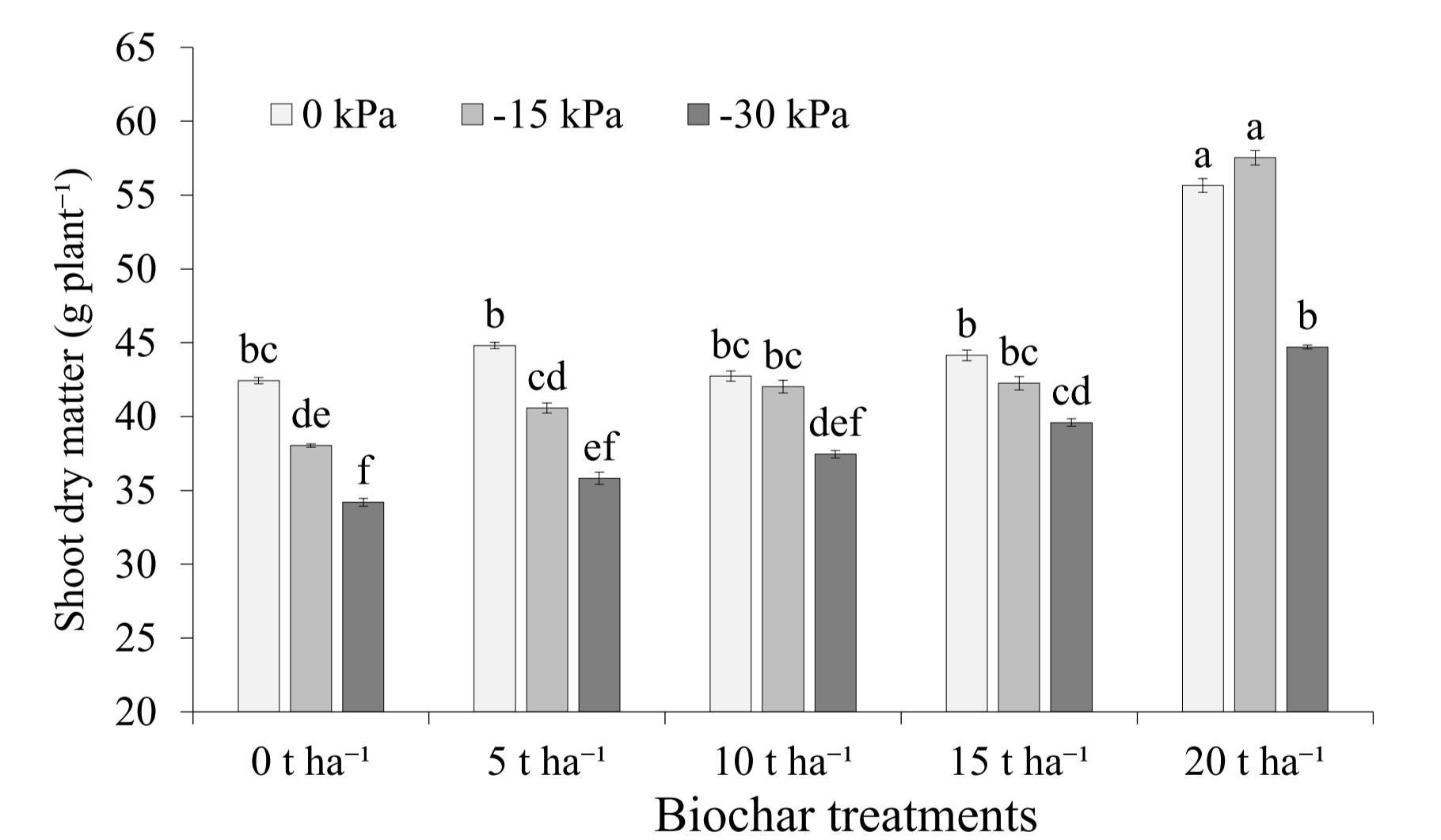


Fig. 3. Interactive effect of biochar treatment and water potential level on shoot dry matter of rice. Data are means of four replications. Vertical bars represent standard error values. Bar columns with different letters are statistically significant based on Tukey's honest significant difference test at $P \leq 0.05$.

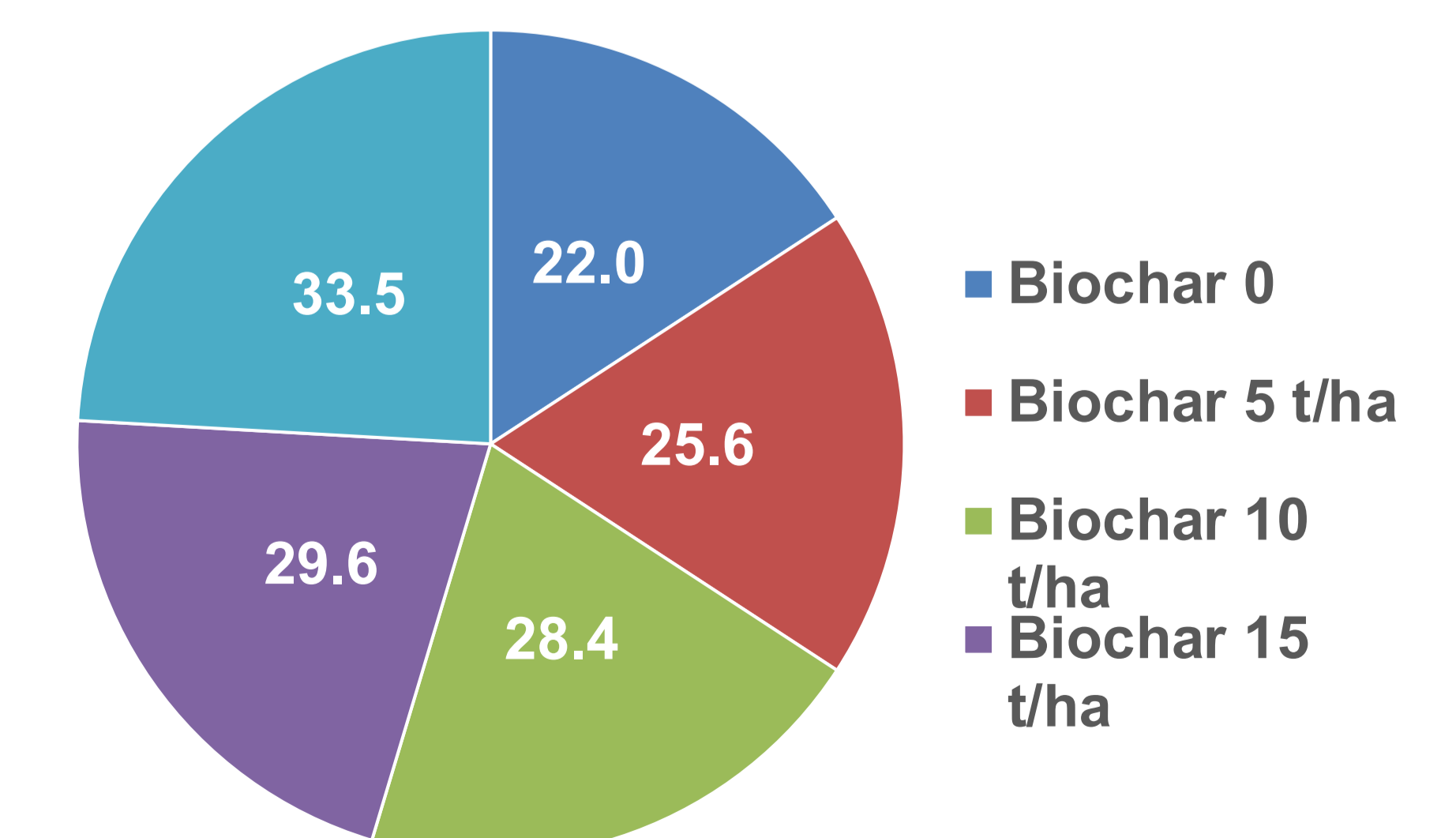


Fig. 4. Yield (g/plant) responses of rice against five levels of biochar doses.



Experimental site at AIT for generating empirical evidences on nature-positive solutions for rice production combining alternate wetting and drying irrigation and biochar application

CONTACT INFORMATION

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Climate Resilient Infrastructure for Social Transformation and Adaptation (CRISTA)

PROJECT DESCRIPTION

The **Climate Resilient Infrastructure for Social Transformation and Adaptation (CRISTA)** project aims to support and enable local authorities in Nepal in decision-making for climate-induced risk management of critical infrastructure (road and power) by providing an innovative solution comprising of (1) robust data on critical infrastructure and climate risks, (2) web-based geospatial computer dashboard and (3) an associated mobile application for the local communities.

PROJECT INVESTIGATORS Dr. Indrajit Pal Associate Professor Disaster Preparedness, Mitigation and Management	BUDGET USD 150,000	DURATION January 2024 to February 2025	DONOR Asian Disaster Preparedness Center The World Bank
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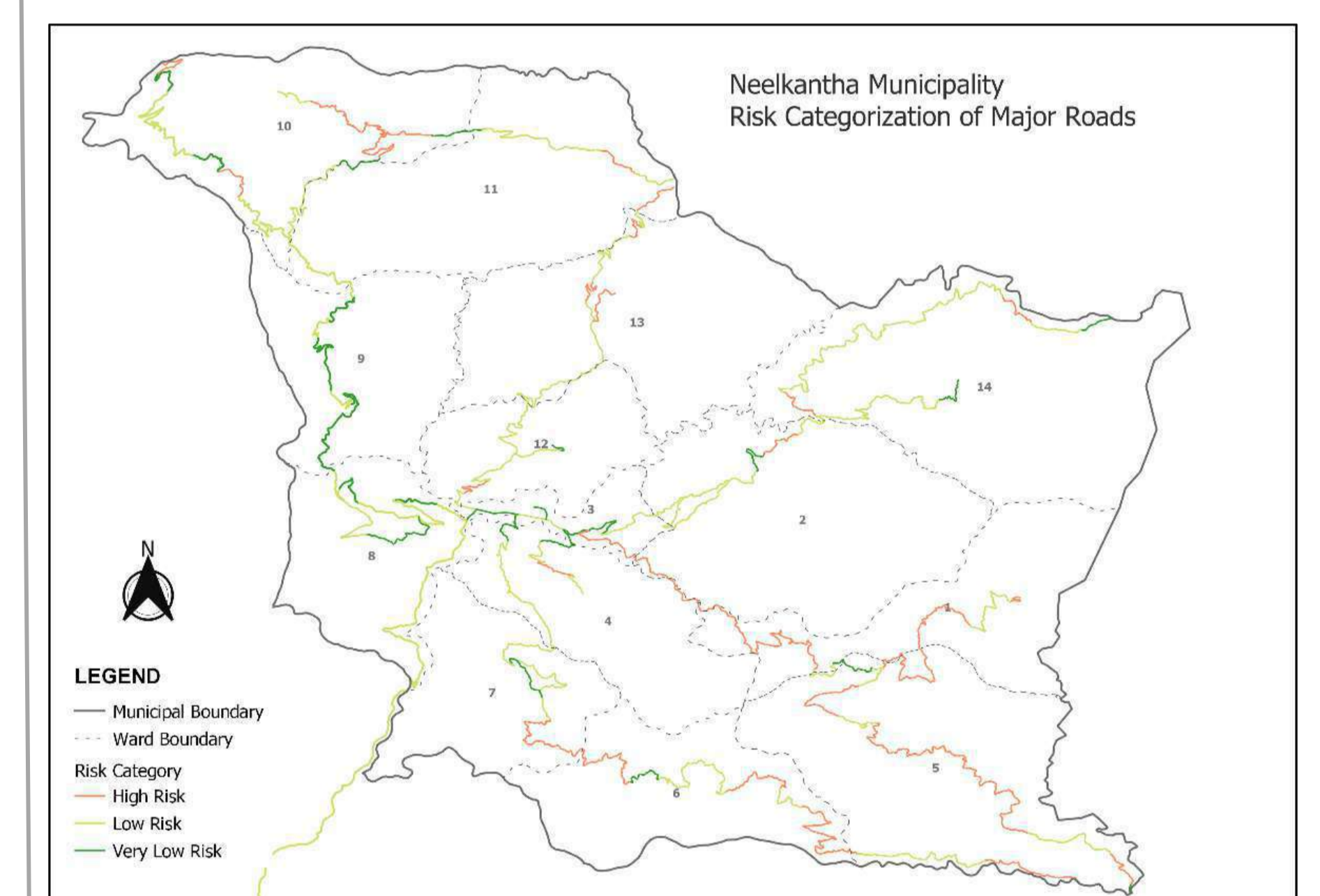
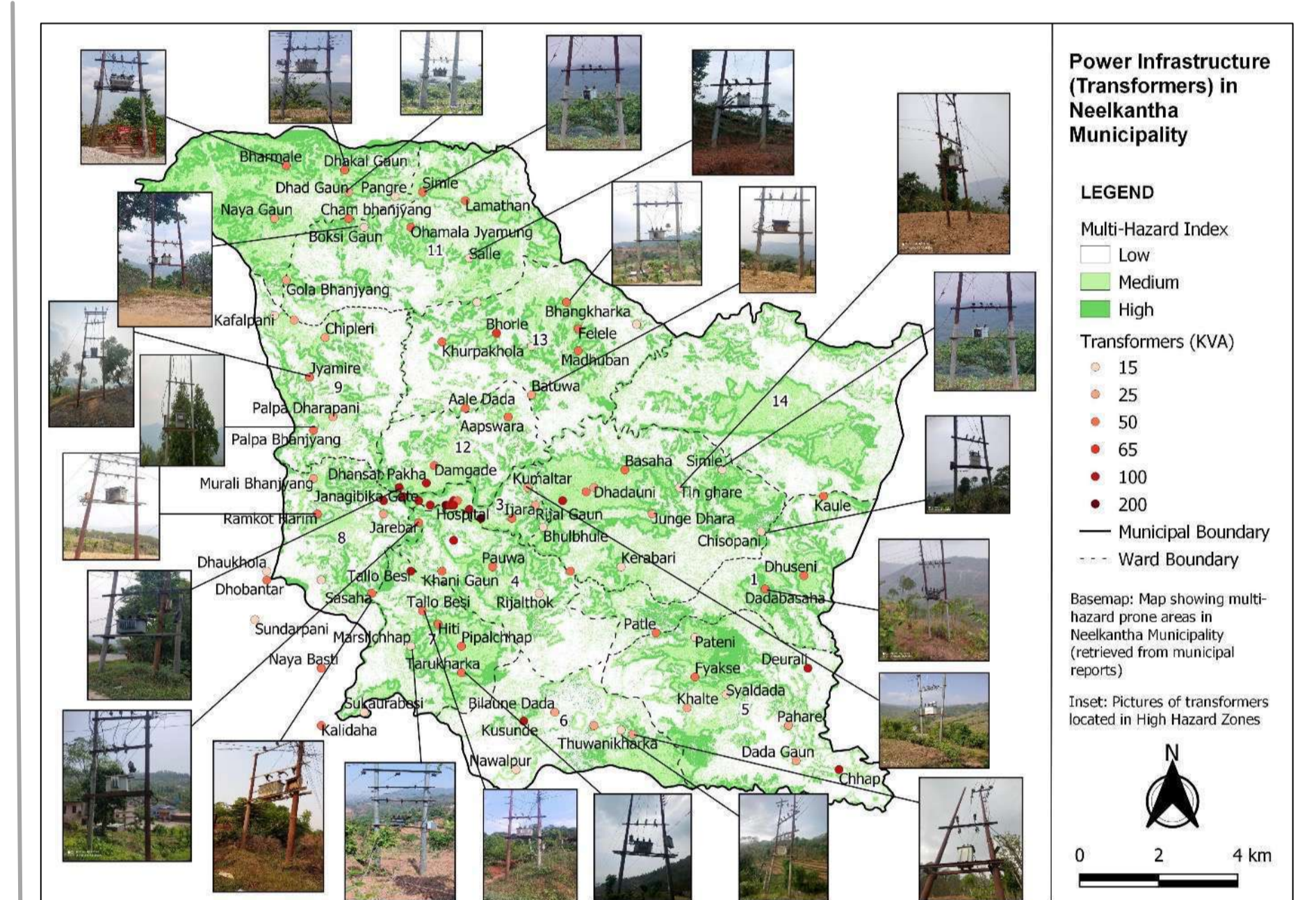
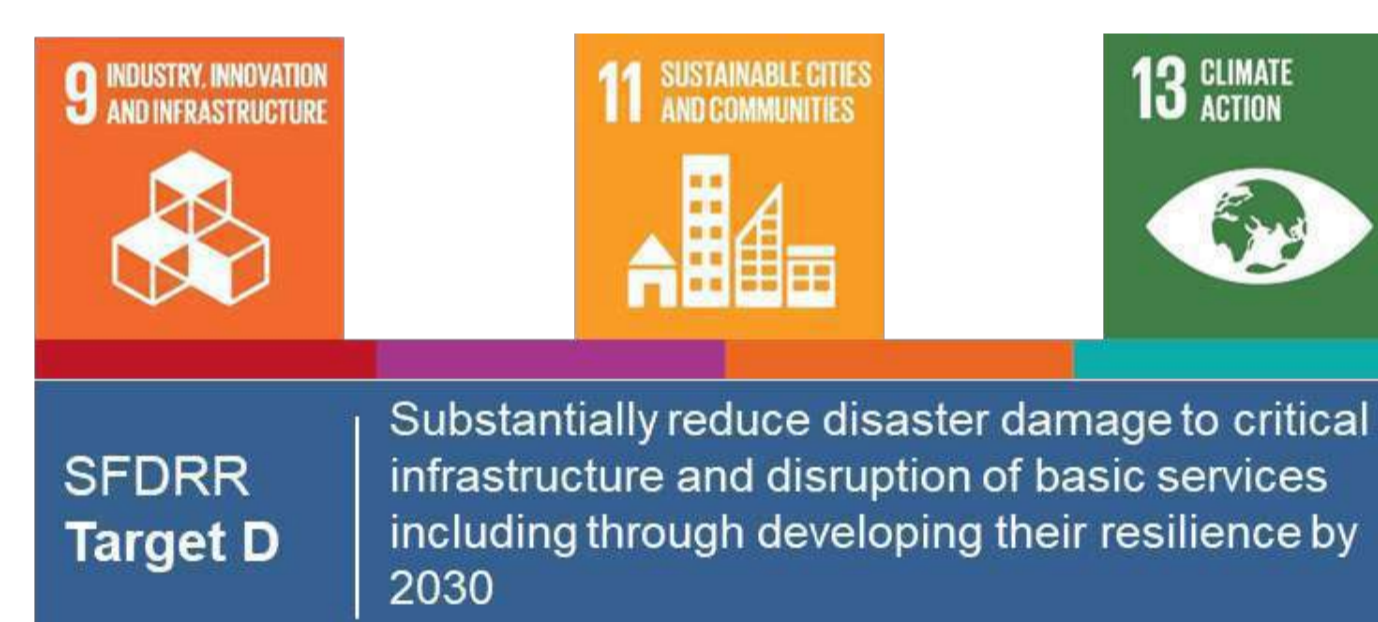
BACKGROUND

- Globally, disasters result in about **\$18 billion per year in direct damages** to power and transport infrastructure in LIC and LMIC¹.
- Climate proofing existing infrastructure in Asia will cost an additional **\$41 billion per annum**².
- Nepal ranks among the lowest** in terms of coverage and quality of critical infrastructure³.

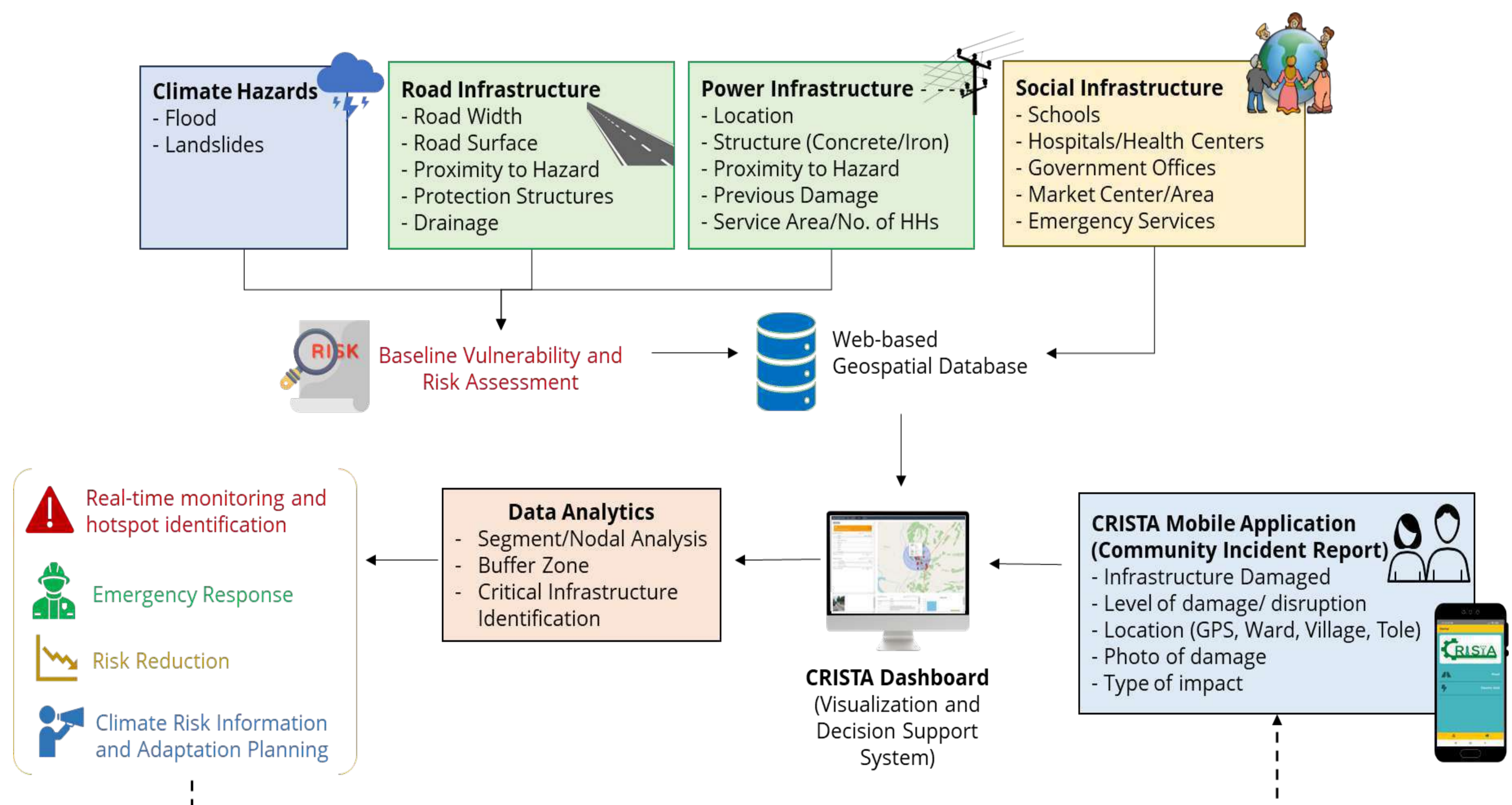


OBJECTIVE

- Develop a robust decision-support system for climate resilient CI for monitoring climate-induced vulnerabilities and damages to CI systems.
- Support in data driven and evidence-based decision making to enhance the preparedness and response capacity of critical infrastructure management authorities.
- Enhance knowledge and capacity of local communities and authorities; and sensitize them on climate-induced risks to CI systems and how it implicates sustainable development.



CRISTA SYSTEM



1. Hallegatte, S., Rentschler, J., & Rozenberg, J. (2019). Lifelines: the resilient infrastructure opportunity. <https://doi.org/10.1596/978-1-4648-1430-3>
 2. ADB. (2017a). Meeting Asia's Infrastructure Needs. Asian Development Bank. <https://doi.org/http://dx.doi.org/10.22617/FLS168388-2>
 3. The World Bank. (2020). Infrastructure in Asia and the Pacific. www.worldbank.org

INTRODUCTION

The Global Water & Sanitation Center, a center of excellence that aims to provide innovative and sustainable solutions for water and sanitation challenges in Asia and beyond. GWSC aspires to be the Transformative Sanitation Technology Hub in Asia, connecting government agencies, researchers, civil society experts, businesses and manufacturers, and end-users to facilitate the adoption of non-sewered sanitation solutions.

DIRECTORS	BUDGET	DURATION	DONOR
Prof. Sangam Shrestha Dean of School of Engineering and Technology Prof. Thammarat Koottatep Professor of Environmental Engineering and Management	USD 14,000,000	Start Date - 26/September/2022 Completion Date - 31/October/2026	Bill & Melinda Gates Foundation

BENEFICIARIES

Technical support to International Financing Institutions, Development partners and Governments for planning, designing, implementation, monitoring and evaluation of CWIS programs



OBJECTIVE

Our seven Hubs are systematically designed to deliver different services to the government, international financial institutions, and development partners.

VISION

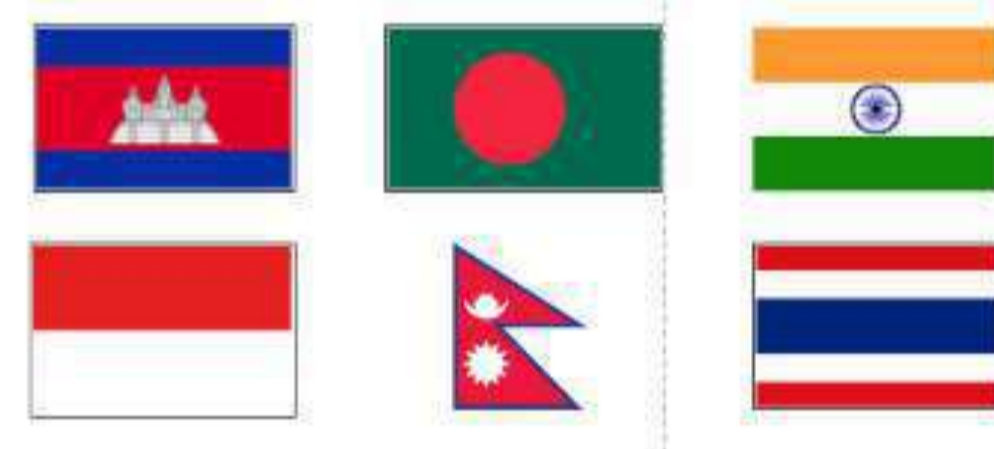
To accelerate the access to reliable, inclusive and sustainable WASH for all in Asia, by 2030

MISSION

To assemble & run a catalytic platform aggregating bright minds, expertise, innovations to solve for challenges and the inequities in WASH sector.

IMPACT

Influenced foreign investment of **\$1.2 billion** into the sanitation sector across regions such as Bangladesh, Cambodia, India, Indonesia, Nepal and Thailand.



Transformative Technology Commercialization Hub



30 Reinvented Toilet technology to improve sanitation infrastructure in Yogyakarta and Surakarta, Indonesia, aligning with their City Sanitation Strategies and ensuring compliance with discharge and reuse standards.

Data Innovation Hub



Strengthening of public data systems for sanitation in Bangladesh, to build a robust and reliable nationally owned integrated public data systems for sanitation to support GoB planning, resource mobilization, budgeting, service delivery, monitoring & evaluation and reporting.

Technical Assistance Hub



TA Hub is a platform and vehicle to scale citywide inclusive sanitation (CWIS), a public service approach summarized by SDG 6.2 outcomes. The TA not only delves on the technical aspects but also explores community engagement and governance structure in sanitation.

Performance and Proficiency Testing Hub



Our labs offer a range of services, including testing the performance of wastewater treatment products, conducting proficiency testing and performing wastewater, sludge and fecal sludge analysis. Our labs are accredited by ISO 17025:2017 and ISO/IEC 17043:2010

PROJECT SPOTLIGHT

Bill & Melinda Gates Foundation, Pijar Foundation and Tahir Foundation on a three-year project in Yogyakarta and Solo, Indonesia. This project aims to demonstrate the potential of Reinvented Toilet Technology by implementing Aquonic systems for school sanitation improvement. The project proposes the installation of Aquonic technology in 15 strategic chosen locations in Yogyakarta and Solo following the SSK or as recommended by the local governments.

Strengthening of Public Data Systems for Sanitation
 GWSC role to support the Government of Bangladesh's flagship Strengthening of Public Data Systems programme aiming to catalyze SDG 6.2 outcomes. This involves establishing a centralized & distributed Sanitation Data Command Center, housing an integrated ecosystem of national and sub-national data systems including National Sanitation Dashboard and Integrated City/Municipal Information System for planning, effective service delivery and monitoring & evaluation.

Developing a Citywide Inclusive Sanitation Package under the Concept of Urban-Rural Convergence for Udaipur, Dharmanagar & Bishramganj in the State of Tripura, India
 This project has been kick-started in response to the Asian Development Bank's (ADB) request to conduct a feasibility study in Tripura to identify contextualized and innovative sanitation interventions, apart from the ADB's ongoing activities related to sanitation in Tripura.

Faecal Sludge Management (FSM) and Greywater Management (GWM) project in seven Bangladeshi towns
 In the FSM and GWM Project, GWSC has conducted Non-sewered Sanitation planning, encompassing a comprehensive analysis of demographics, waste generation, service coverage, infrastructure design, treatment options, costing, financing, and implementation. The Government of Bangladesh (GoB) is working on a project to improve sanitation in seven towns: Bhola, Faridpur, Jhalokathi, Kushtia, Magura, Narail, and Pirojpur.

A Situational Analysis to Identify the potential Interventions for Improving Sanitation Condition of Selected Areas (zones 2, 3, 6, and 10) of Dhaka North City Corporation, Bangladesh.
 The project aims to conduct a comprehensive assessment of the existing sanitation conditions in Zone 3, Zone 10, Zone 2, and Zone 6 within the Dhaka North City Corporation (DNCC) area. This assessment will cover various aspects of sanitation, including both sewer systems (SS) and non-sewered systems (NSS), as well as decentralized solutions and greywater management.

CONTACT INFORMATION

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

PROJECT DESCRIPTION

Asian Institute of Technology, along with RWTH Aachen University, Indian Institute of Technology Madras, Technische Universität Dresden, and United Nations University – Institute for Integrated Management of Material Fluxes and Resources, are collaborating to address climate change with a focus on water security and adaptation. The ABCD Centre aims to achieve the Sustainable Development Goals, particularly SDG-6 and SDG-13, which ensures sustainable water and sanitation management and climate adaptation. This partnership promotes academic exchange, innovative cooperation, and lasting societal impact.

PROJECT INVESTIGATORS

Prof. Mukand S. Babel
Dr. Dibesh Khadka

BUDGET

14,030,480 Thai Baht

DURATION

May 2021- December 2025
(with possibility of extension up to 2030)

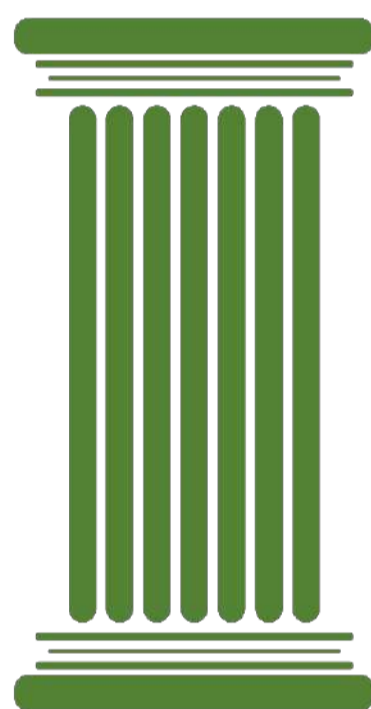
DONOR

German Academic Exchange Service (DAAD)
Deutscher Akademischer Austauschdienst

BENEFICIARIES

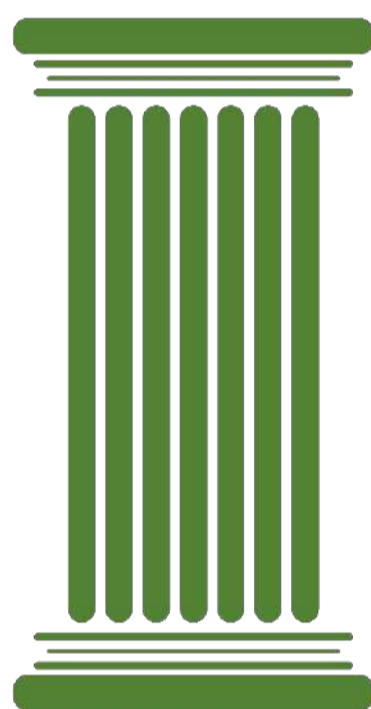
1. Students
2. Researchers
3. Practitioners

Teaching



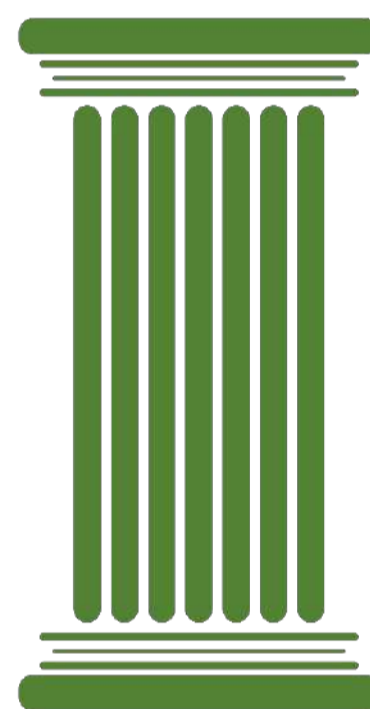
- Development of a new Joint Master Programme on **Water Security and Global Change**
- Integration of existing programmes

Research



- Educating responsible future environmental leaders
- Mobility funds
- Funded stays for postdocs
- Initiation and implementation of joint projects

Knowledge Transfer



- Dialogue beyond academia
- Transfer workshops, seminars, conferences

OBJECTIVE

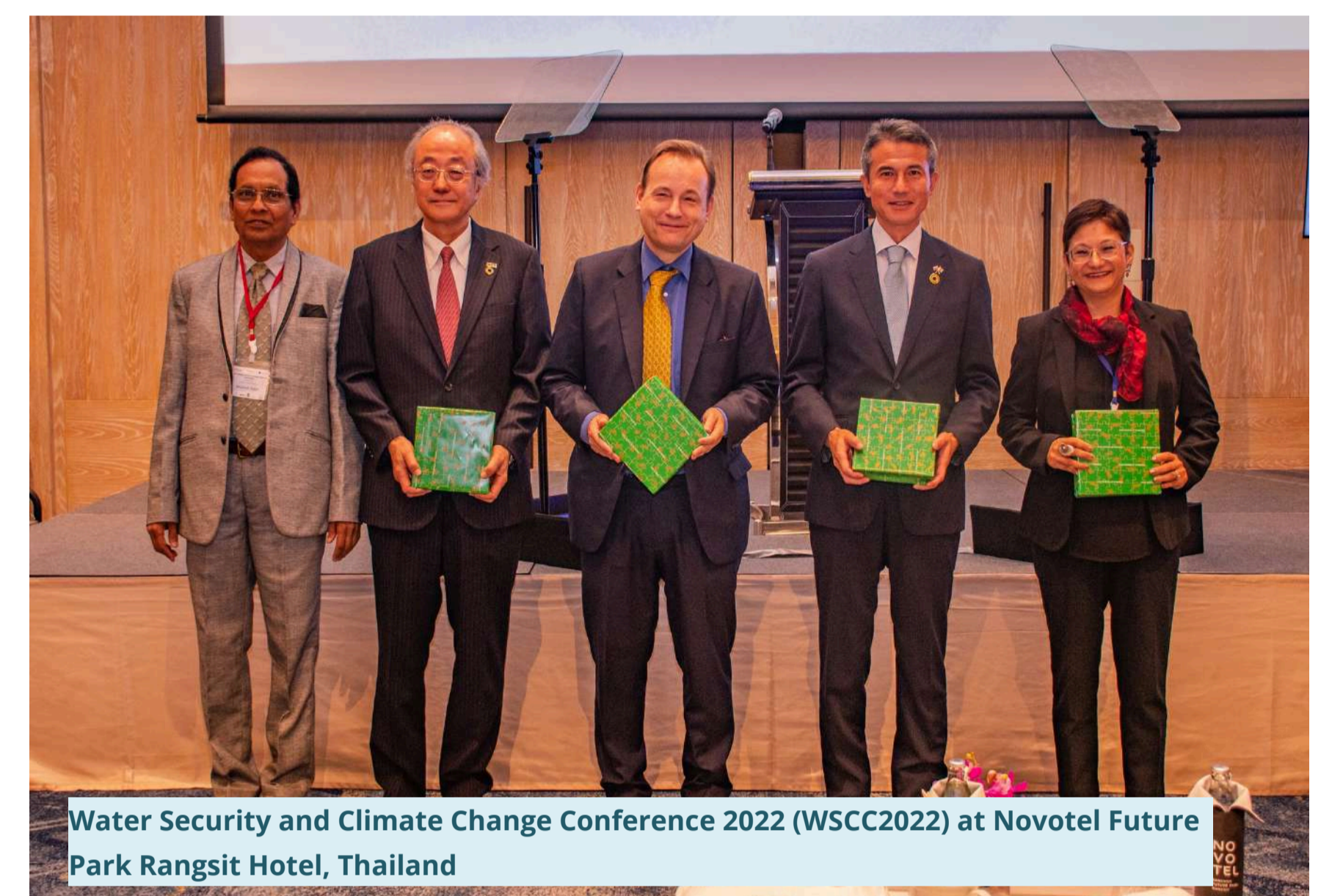
1. Establish a global hub for water security and climate adaptation
2. Educate responsible future environmental leaders
3. Enable transfer through a new dialogue between science and global society

IMPACT

1. Educate skilled leaders for climate protection
2. Drive innovative research and global collaboration
3. Translate scientific findings into real-world solutions

EXPECTED OUTCOMES

1. The Centres provide study and doctorate opportunities in relevant disciplines.
2. The Centre's graduates are qualified for the local and international employment market in the areas of climate protection and environmental conservation.
3. There is established research capacity for matters regarding climate and the environment.
4. An established Centre network allows for joint research endeavors, for addressing overarching issues, for synergy effects and for improved visibility.
5. New scientific findings are transferred into practice.
6. The climate and environmental footprints of education, research and international cooperation are reduced.



Water Security and Climate Change Conference 2022 (WSCC2022) at Novotel Future Park Rangsit Hotel, Thailand



Water Security Assessment Tool (WATSAT) Training Workshop at the Institute of Engineering (IoE), Kathmandu, Nepal



Water Security and Climate Adaptation (WSCA) workshop at the Indian Institute of Technology (IIT) Madras, India.



[ABOVE] Water Security Assessment Tool (WATSAT) Training Workshop at the Indian Institute of Technology-Banaras Hindu University (IIT-BHU), Varanasi, India

[BELOW] Special session at the 18th World Water Congress in Beijing, China

CONTACT INFORMATION

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<https://abcd-centre.org>

Promotion of Action Against Marine Plastic Litter in Asia



PROJECT INVESTIGATORS

Dr. Takuji W. Tsusaka
Prof. Anil Kumar Anal

DONOR

United Nations Environment
Programme

BUDGET

5,100,000 THB

DURATION

01 Jun '23 - 30 Sep '24

PROJECT DESCRIPTION

The project aims to promote science-based and evidence-driven action to reduce and prevent plastic pollution in Asian riverine ecosystems with a focus on Thailand, Cambodia, Sri Lanka, Vietnam, and Pakistan.

OBJECTIVES

- Strengthen the regional capacities on the development and implementation of tools and protocols relevant to plastic pollution monitoring
- Reinforce the identification of regional funding opportunities and capacities on development of bankable project proposals
- Promote regional knowledge sharing among project countries

SUMMARY

AIT, in collaboration with the United Nations Environment Programme (UNEP), has contributed to promoting science-based and evidence-driven actions to reduce and prevent the influx of plastic litter into Asian rivers. This was achieved through the formulation of bankable project proposals in countries in Asia and by strengthening regional, national, and local capacities for an enhanced systematic approach to plastic pollution management.

03

GOOD HEALTH
AND WELL-BEING



07

AFFORDABLE
AND CLEAN ENERGY



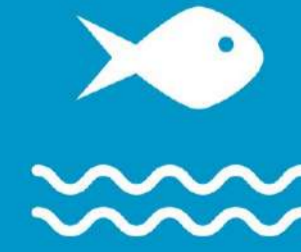
09

INDUSTRY, INNOVATION
AND INFRASTRUCTURE



14

LIFE BELOW WATER



12

RESPONSIBLE
CONSUMPTION AND
PRODUCTION



CONTACT INFORMATION

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Prof. Anil Kumar, Anal, anilkumar@ait.ac.th

Dr. Sayaka Ono, sayaka.ono@un.org



AIT
Asian Institute of Technology

Telehealth Monitoring and Assistive Systems for Elderly and Disabled People

PROJECT DESCRIPTION

As the global population of elderly and disabled individuals continues to grow, innovative solutions are urgently needed to improve their safety, mobility, independence, and well-being, while reducing caregiving burdens and enhancing healthcare outcomes. This project addresses these needs through advanced research in the area of Information and Communication Technologies (ICT), comprising four key components: a wearable Raman spectroscopy system for non-invasive blood glucose monitoring, fall detection systems using video analytics, deep learning, and radio frequency signals to promptly alert caregivers, bimanual rehabilitation technologies to aid physical therapy and promote better recovery, and a cloud-based platform for managing and analyzing health and rehabilitation data to provide valuable insights and facilitate personalized care.

<p>PROJECT INVESTIGATORS</p> <p>Dr. Chutipon Anutariya (Main PI) Dr. Chaklam Silpasuwanchai (Co-PI) Dr. Mongkol Ekpanyapong (Co-PI) Dr. Attaphongse Taparugssanagorn (Co-PI)</p>	<p>BUDGET</p> <p>14,847,715.90 THB</p>	<p>DURATION</p> <p>36 months</p>	<p>DONOR</p> <p>Broadcasting and Telecommunications Research and Development Fund for Public Interest (BTFP) Office of the National Broadcasting and Telecommunications Commission (NBTC)</p>
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OBJECTIVES

The objective of this project is to research and develop a telehealth monitoring and assistive system for elderly and disabled individuals. This project focuses on developing various systems, including non-invasive blood glucose monitoring, fall detection, bimanual rehabilitation, and data analytics and visualization. By integrating these systems, the project aims to improve the quality of life for the elderly and disabled, enhance safety, and reduce the caregiving burden. The research outcomes will be shared with healthcare institutions, the Ministry of Public Health, and other relevant organizations for broader implementation.

IMPACT

- Advancement of Research and Development**
The project advances and showcases research and development in ICT and Artificial Intelligence (AI) to address practical challenges in healthcare and well-being. Specifically, the project advances the field of telehealth and assistive technologies.
- Enhanced Quality of Life**
The telehealth monitoring and assistive system improves the quality of life for elderly and disabled individuals.
- Reduced Caregiving Burden**
The system automates health monitoring and provides remote consultation capabilities, reducing caregiver stress.
- Data-Driven Insights**
The integration of data analytics and visualization tools provides insights into health patterns and needs.
- Broad Implementation**
The research outcomes will be disseminated and shared with healthcare and medical experts, the Ministry of Public Health, and other relevant organizations.

EXPECTED OUTPUTS & OUTCOMES

The project comprises 4 Work Packages (WP) aiming at developing a comprehensive telehealth monitoring and assistive system for elderly and disabled individuals. Each work package focuses on a specific area of innovation, integrating advanced technologies to enhance health monitoring, safety, and rehabilitation.

- WP1: Non-invasive Blood Glucose Monitoring System**
This package builds a wearable Raman spectroscopy system for non-invasive blood glucose monitoring, enabling continuous and accurate health tracking. It provides a reliable means to manage chronic conditions such as diabetes (Figure 1).
- WP2.1: Enhanced Fall Detection**
This package implements advanced video analytics and deep learning techniques to develop an effective fall detection system. The system can promptly identify and alert caregivers to falls, significantly improving emergency response times and ensuring timely assistance (Figure 2.1).
- WP2.2: Radio Frequency-Based Fall Detection**
This package utilizes radio frequency signals and deep learning algorithms to further enhance fall detection capabilities. This system complements the video analytics approach, ensuring robust fall detection even in environments where visual data is limited (Figure 2.2).
- WP3: Bimanual Rehabilitation Technologies**
This package develops an innovative bimanual rehabilitation system that aids in the physical therapy of elderly and disabled individuals. The system promotes better recovery outcomes through tailored exercise programs, facilitating more effective rehabilitation (Figure 3).
- WP4: Cloud-Based Data Management Platform**
This package establishes a cloud-based platform for managing, analyzing, and visualizing health and rehabilitation data. It collects data from other work packages, providing valuable insights and facilitating personalized care plans, and hence enhancing healthcare providers to make informed decisions and deliver high-quality care.

BENEFICIARIES

The primary beneficiaries of this project, also known as the target group, include elderly individuals, disabled people, and patients recovering at home. These groups will benefit directly from the project's innovations and improvements in telehealth monitoring and assistive systems. The project's primary objective is to enhance the quality of life for these individuals by providing continuous health monitoring, timely interventions and reducing the risk of emergencies.

Direct Beneficiaries

- Elderly Individuals**
 - Improved safety and independence through advanced health monitoring and fall detection systems.
 - Enhanced ability to manage chronic conditions such as diabetes with non-invasive monitoring technologies.
- Disabled Individuals**
 - Increased mobility and rehabilitation support through bimanual rehabilitation systems and data-driven insights.
 - Better access to healthcare services and emergency assistance via telemedicine and assistive technologies.

Indirect Beneficiaries

- Families and Caregivers**
 - Reduced caregiving burden and stress due to automated health monitoring and remote consultation capabilities.
- Healthcare Providers**
 - Access to detailed health analytics and visualization tools to improve patient care and decision-making.
 - Enhanced ability to provide personalized treatment plans based on real-time data and continuous monitoring.

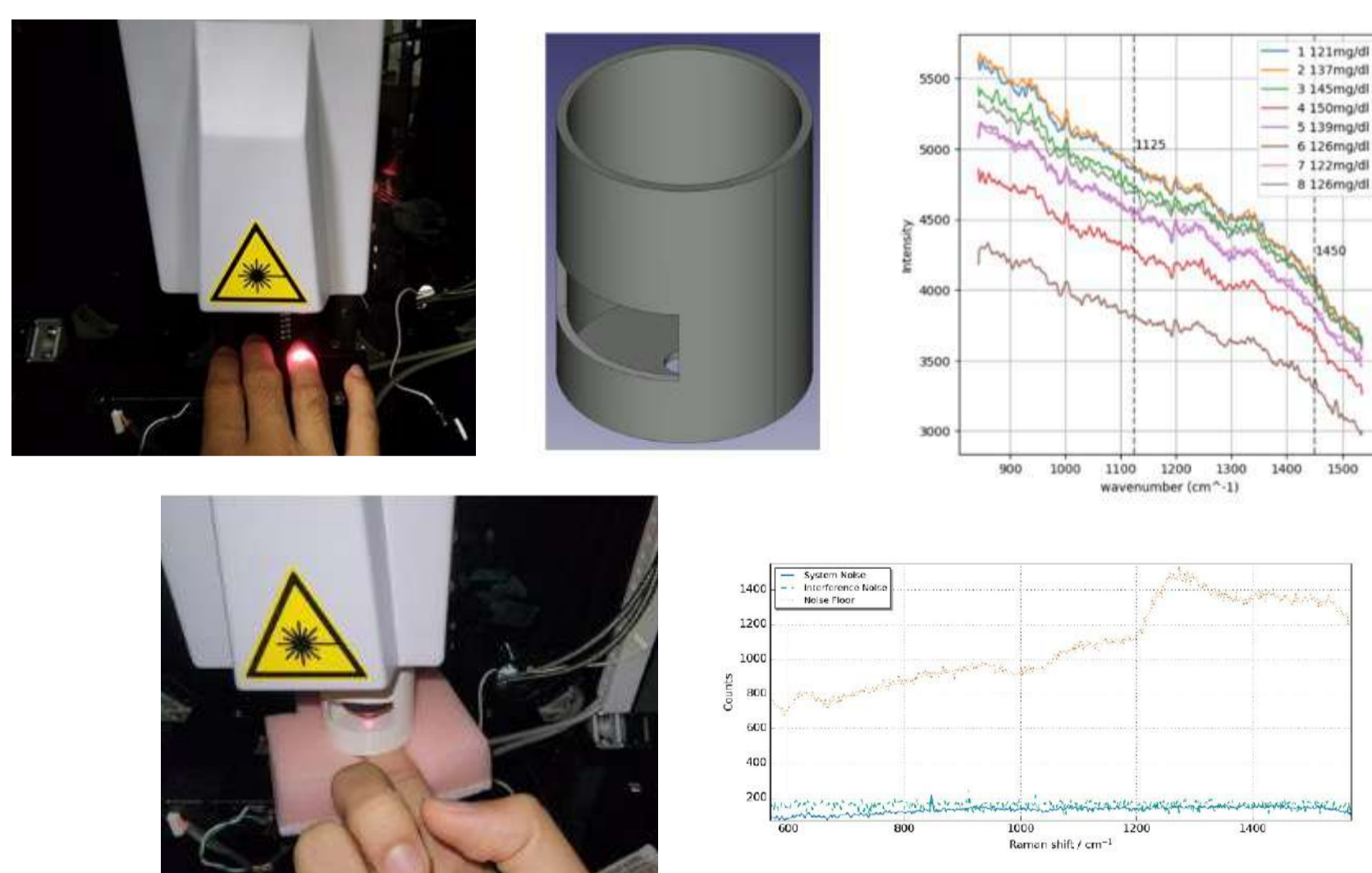


Figure 1 Raman Spectroscopy System and Measurement

This figure depicts certain experiments of the Raman spectroscopy laser machine used for non-invasive blood glucose monitoring and displays the measurement results obtained from the system.

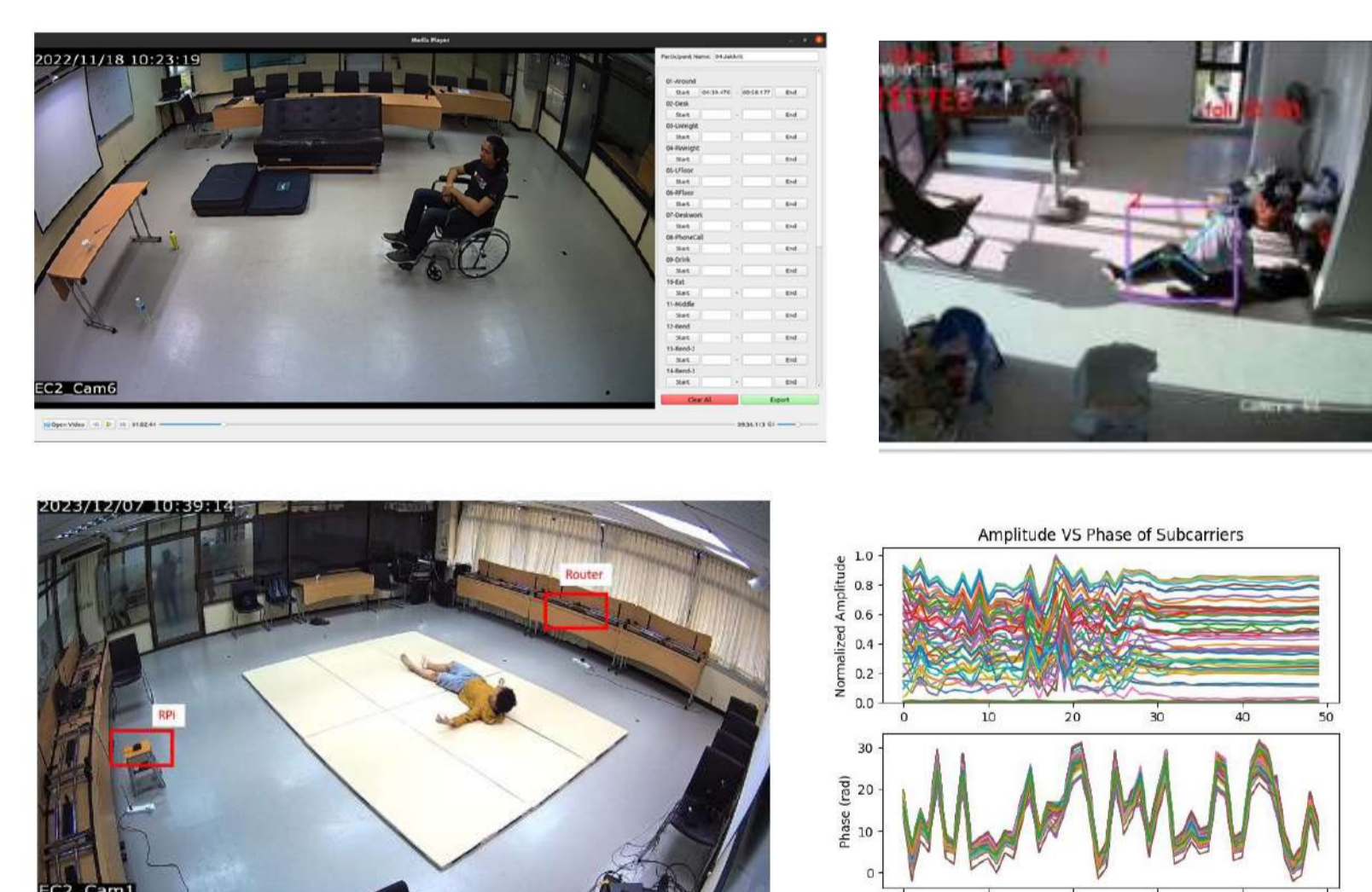


Figure 2.1 Fall Detection Training Data Set using Video Analytics

This figure illustrates the data set used for training the fall detection system using video analytics, including images of people simulating falls and the corresponding data analysis.

Figure 2.2 Fall Detection Training Data Set using Wi-Fi Signals

This figure depicts the dashboard designed to visualize fall activity history, including fall timelines, scatter plots, and other relevant data visualizations to monitor and analyze fall incidents.

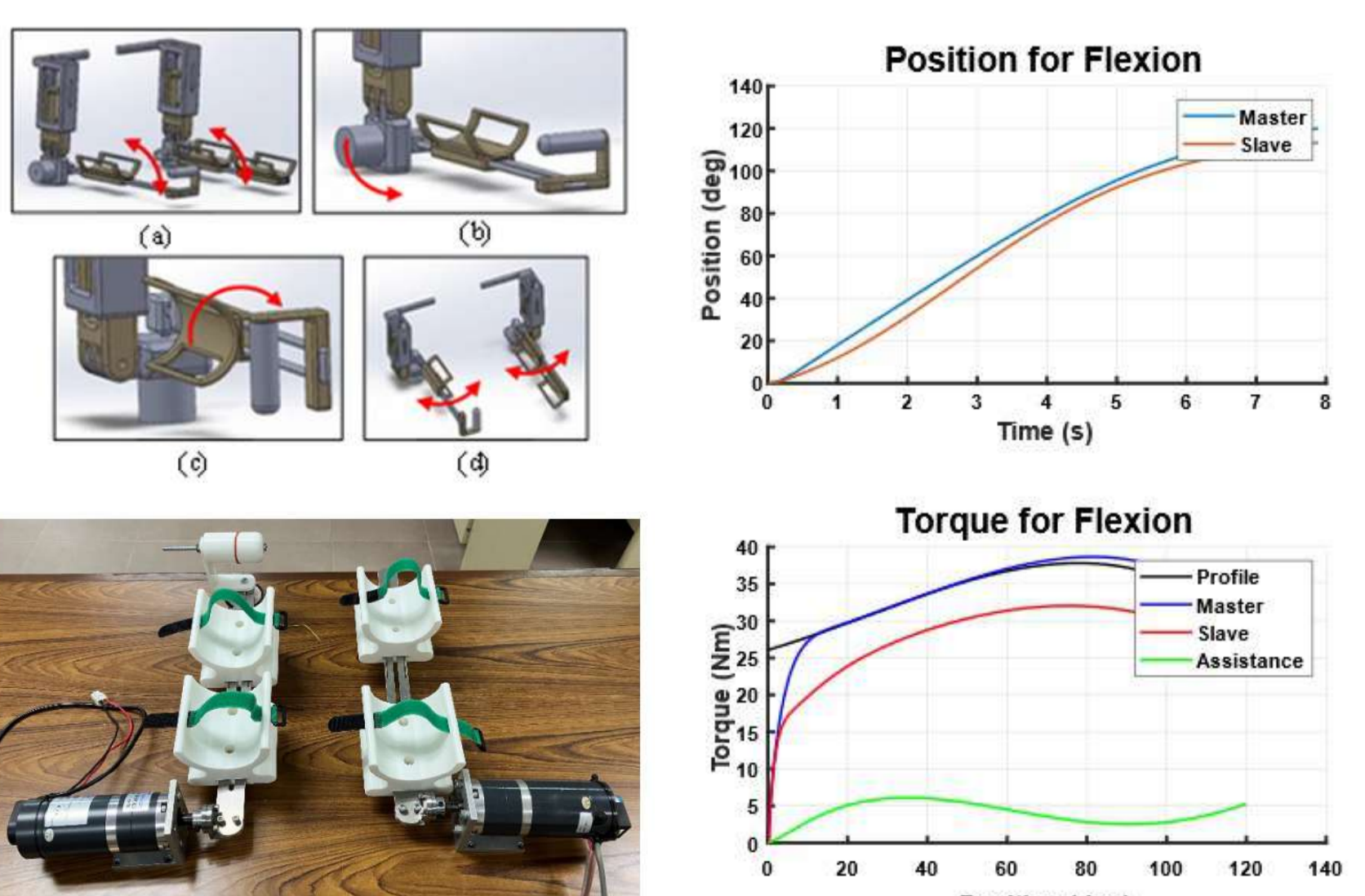


Figure 3 3D Printed Bimanual Arm Robot and Torque Profile Analysis

The 3D printed bimanual arm robot developed for rehabilitation purposes, along with graphs displaying the torque profile, degree angle of motor for both the master and slave arms during various exercises.

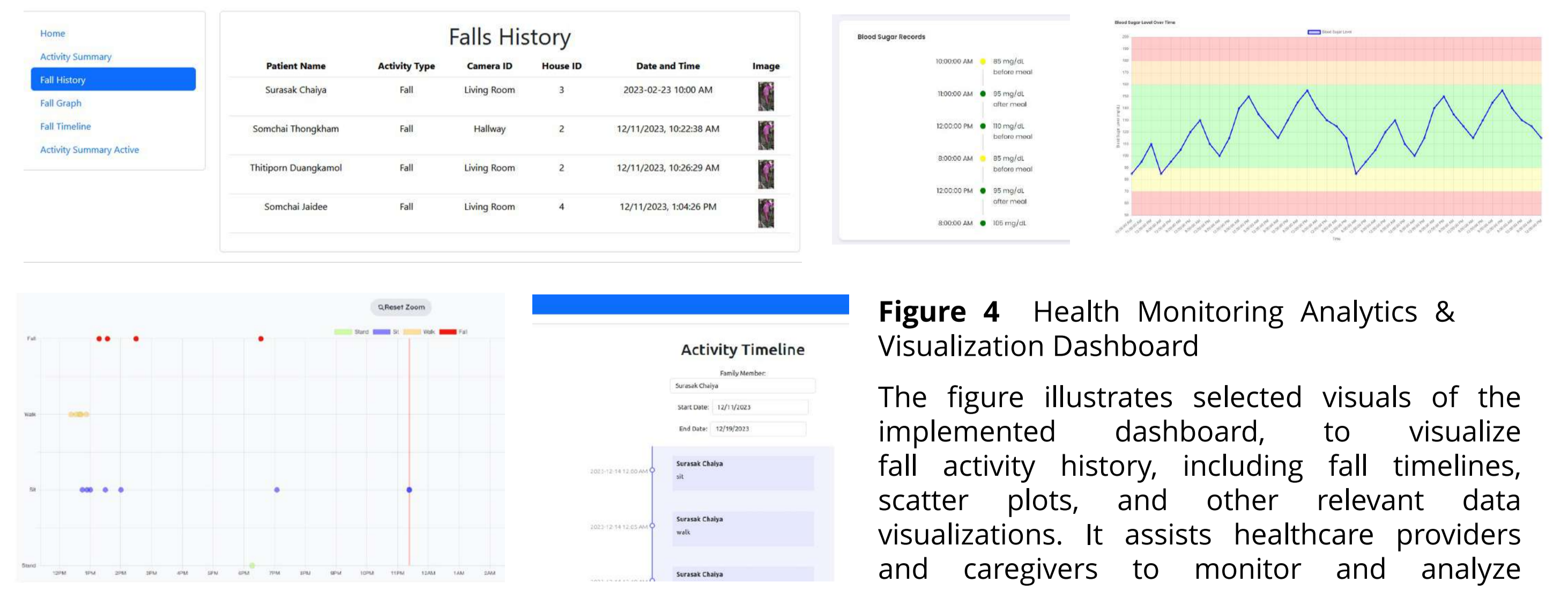


Figure 4 Health Monitoring Analytics & Visualization Dashboard

The figure illustrates selected visuals of the implemented dashboard, to visualize fall activity history, including fall timelines, scatter plots, and other relevant data visualizations. It assists healthcare providers and caregivers to monitor and analyze fall incidents and blood sugar level records.

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