



# JASTIP

## JAPAN-ASEAN SCIENCE, TECHNOLOGY, AND INNOVATION PLATFORM SUMMARY REPORT

**MARCH 2025**

# JASTIP Summary Report

March 2025

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## 1. Outline

The Japan-ASEAN Science, Technology and Innovation Platform (JASTIP) was launched in September 2015 with the support of the Japan Science and Technology Agency (JST). The objectives of the program are 1) to promote interdisciplinary studies on “Environment and Energy,” “Biological Resources and Biodiversity,” and “Disaster Prevention and Risk Reduction,” 2) to increase the visibility of Japan-ASEAN collaborative research to non-academic stakeholders, and 3) to establish a platform for Japan-ASEAN research collaboration on science, technology, and innovation. To this end, four working packages (WPs) have been established (Figure 1). WP1 serves as the headquarters of the program, coordinating interdisciplinary and transdisciplinary studies and connecting JASTIP with various stakeholders, including related research institutes, government sectors, and private sectors. WP2 focuses on “Environment and Energy” research and has established the satellite laboratory at the National Science and Technology Development Agency, Thailand (NSTDA). WP3 focuses on “Bio-Resources and Biodiversity” research and has set up the satellite laboratory at the former Indonesian Institute of Sciences (LIPI), now the National Research and Innovation Agency (BRIN). WP4 focuses on “Disaster Prevention and Risk Reduction”

and has established the satellite laboratory at the Malaysia-Japan International Institute of Technology (MJIIT), University of Technology Malaysia (UTM). In addition, a program named JASTIP-Net was implemented to promote networking among researchers, government sectors and private sectors interested in interdisciplinary and transdisciplinary research and innovation to achieve the SDGs. JASTIP-Net is an open call program for all ASEAN member states, Timor-Leste, and Japan, and is managed in collaboration with the Committee on Science, Technology and Innovation, ASEAN (ASEAN-COSTI).

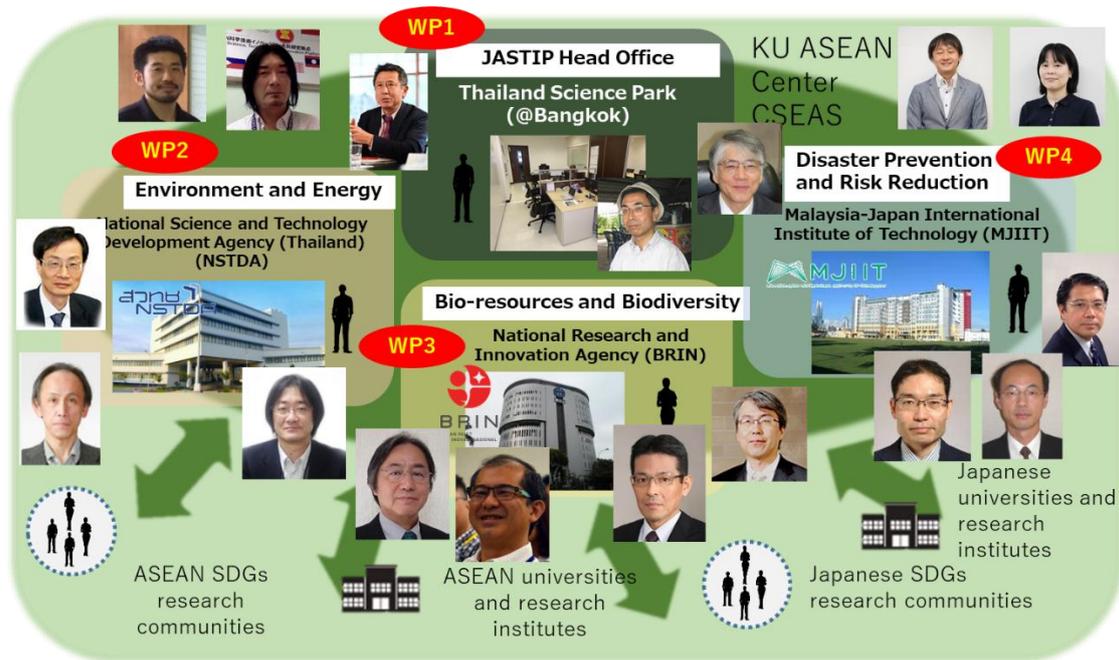


Figure 1 The structure of JASTIP with WP leaders and coordinators

The first phase ended in August 2020, and was extended after a review to the second phase, which lasted from September 2020 to March 2025. The total budget provided by the JST for the period from 2015 to 2024 was 533 million yen (Table 1).

Table 1 JASTIP budget provided by JST

Period	Research budget (thousand J yen)					
	WP1	WP2	WP3	WP4	JASTIP-Net	Total
Sep. 2015 - Mar. 2016	16,923	20,000	20,000	20,000	0	76,923
Apr. 2016 - Mar. 2017	18,730	13,500	13,500	13,500	10,000	69,230
Apr. 2017 - Mar. 2018	18,730	13,500	13,500	13,500	10,000	69,230
Apr. 2018 - Mar. 2019	18,730	13,500	13,500	13,500	10,000	69,230
Apr. 2019 - Mar. 2020	18,730	13,500	13,500	13,500	10,000	69,230
Apr. 2020 - Aug. 2020	7,269	8,000	8,000	7,500	0	30,769
Sep. 2020 - Mar. 2021	10,123	5,600	5,600	5,600	0	26,923
Apr. 2021 - Mar. 2022	11,662	5,600	5,600	11,753	10,000	44,615
Apr. 2022 - Mar. 2023	10,770	4,000	4,000	4,000	8,000	30,770
Apr. 2023 - Mar. 2024	8,277	3,600	3,600	3,600	4,000	23,077
Apr. 2024 - Mar. 2025	6,177	4,300	4,300	4,300	4,000	23,077
Total	146,121	105,100	105,100	110,753	66,000	533,074

## 2. Major achievements

The major achievements of JASTIP during the past 10 years from 2015/2016 to 2024/2025 are summarized below.

### 2.1 Research achievements

The total number of original journal articles published by JASTIP members is 553, of which 297 articles, or 54%, were co-authored by Japanese and ASEAN researchers. The proportion of co-authored articles shows an increasing trend, reflecting the fact that Japan-ASEAN collaboration is becoming deeper and more productive (Figure 2).

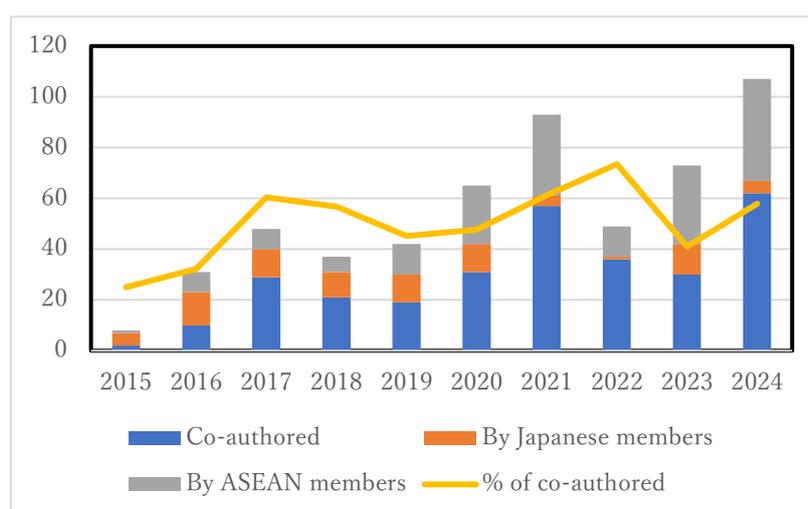


Figure 2 Number of original journal articles by JASTIP members

The total number of oral presentations at scientific conferences, seminars and workshops was 737, of which 42% were co-authored presentations. The proportion of co-authored presentations did not change during the project period (Figure 3).

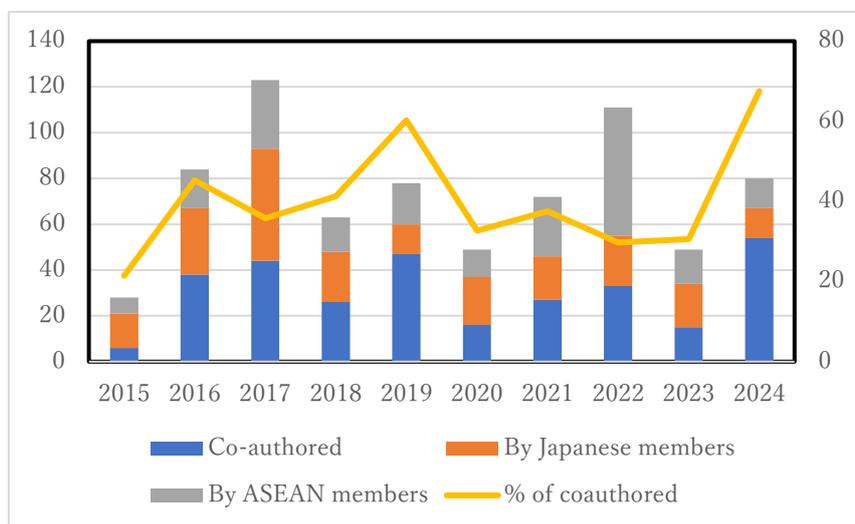


Figure 3 Number of oral presentations by JASTIP members

In addition, a total of 25 patents were applied for in ASEAN and 31 awards received.

Outstanding research achievements are as follows.

In order to promote STI coordination between Japan and ASEAN member states (WP1), we have organized both symposia (see Table 2) and study meetings (see Section 2.8), and have been invited to speak on this topic at various international conferences in ASEAN, especially ASEAN-COSTI meetings (Table 4). Based on these discussions and observations, a book chapter on ASEAN-Japan STI coordination has been published<sup>1</sup>.

1. Sonobe, T. and Saito, C., 2023, "Empirical and empathetic approaches taken by science, technology and innovation coordinators in Southeast Asia", Kerridge, S. *et al.* eds., *The Emerald Handbook of Research Management and Administration Around the World*, pp. 265-279, Leeds: Emerald Publishing Limited.

In the field of energy and environment (WP2), research on the effective utilization of biomass as a renewable resource was intensively promoted. This includes the development of activated carbon for electric double-layer capacitors with high storage capacity by integrating processing technologies for various biomass materials and electrochemical analysis technologies<sup>1,2</sup>, the development of photocatalytic conversion of biomass-derived glucose and lignin or their partial skeletons into high-value-added substances<sup>3,4</sup>, the development of

catalysts for biochemicals to convert biomass into renewable resources<sup>5,6</sup>, the development of methods to convert oil palm biomass into fuels and high value-added chemicals<sup>7</sup>, the development of new photocatalytic nanomaterials for functional enhancement of new functional materials<sup>8,9</sup> and the development of a non-combustion high-efficiency power generation method by improving the solvent modification method developed by the SATREPS project<sup>10</sup>. In addition, we promoted a transdisciplinary research on improving quality of life through the implementation of renewable energy<sup>11</sup>.

1. Goodwin, V. *et al.*, 2023, "Development of Modified Mesoporous Carbon from Palm oil Biomass for Energy Storage Supercapacitor Application", *IOP Conf. Ser. Earth Environ. Sci.*, 1199, 012003.
2. Goodwin, V. *et al.*, 2024, "Biobased Activated Carbon from Palm Biomass Enhancing with Acid Treatment as Supercapacitor Electrode Material", *Sci. Innov. Adv. Mater.*, 4, 67002.
3. Roongraung, K. *et al.*, 2020, "Electrospun Ag-TiO<sub>2</sub> Nanofibers for Photocatalytic Glucose Conversion to High-Value Chemicals", *ACS Omega*, 5 (11), 5862-5872.
4. Suriyachai, N. *et al.*, 2020, "Synergistic Effects of Co-doping on Photocatalytic Activity of Titanium Dioxide on Glucose Conversion to Value-added Chemicals", *ACS Omega*, 5 (32), 20373-20381.
5. Songtawee, S. *et al.*, 2023, "The efficient conversion of D-Fructose to 5-Hydroxymethylfurfural using organic acids as catalytic promoters", *Biomass. Conv. and Bioref.*, 13, 6705-6714.
6. Sanpitakseree, C. *et al.*, 2024, "Unveiling kinetics post rate-determining step in Brønsted acid-catalyzed reactions of fructose: A strategy for 5-hydroxymethylfurfural production from concentrated feedstock", *Chem. Eng. J.* 492, 152190.
7. A. T. Quitain *et al.*, Malaysian Patent (2024), pending.
8. Kansaard, T. *et al.*, 2022, "Structural, optical, and photo-induced catalytic properties of derived-Leucoxene /BiVO<sub>4</sub> composite prepared by sonochemical process", *Optik*, 267, 169665.
9. Kansaard, T. *et al.*, 2024, "Sonochemical synthesis, characterization, and infrared-driven photocatalytic performance of 2%Er/x%Yb co-doped BiVO<sub>4</sub> nanoparticles (x=2-10%)", *Radiat. Phys. Chem.*, 224, 112051.
10. Patent, JP2023/025852.
11. Cravioto, J. *et al.*, 2020, "The Effects of Rural Electrification on Quality of Life: A Southeast Asian Perspective", *Energies*, 13 (10), 2410.

In the field of bio-resources and biodiversity (WP3), we investigated the chemical and pharmacological properties of artemisinin by using endophytic microbes of *Artemisia vulgaris* (Asteraceae) in Japan and Indonesia<sup>1</sup>, and discovered that the endophytic fungi (Colletotricum) found in the bark of *A. vulgaris* had potential activity against the SARS-CoV-2 virus<sup>2</sup>. In addition, angiopteroside was efficiently extracted from a rhizome of *Angiopteris evecta* based on a healer's knowledge of traditional medicine in Kalimantan<sup>3</sup>. We also

conducted industry-academia collaborative research projects with researchers from ASEAN countries. The results have been published as patents, book chapters and research papers<sup>4,5</sup>.

1. Maehara, S. *et al.* 2019, Endophyte composition and Cinchona alkaloid production abilities of Cinchona ledgeriana cultivated in Japan, *Journal of Natural Medicines* 73 (2): 431–438.
2. Maehara, S. *et al.* 2023, Anti-SARS-CoV-2 agents in artemisia endophytic fungi and their abundance in artemisia vulgaris tissue. *J. Fungi* 9 (9): 905.
3. Kamitakahara, H. *et al.* 2019, Two-dimensional NMR analysis of angiopteris evecta rhizome and improved extraction method for angiopteriside. *Phytochem. Anal.*, 30 (1): 95-100.
4. Solihat, N. N. *et al.* 2023, Synthesis of lignin-based biosurfactant derived from kraft black liquor and its effect on enzymatic hydrolysis of pretreated biomass, *Sustainable Chemistry and Pharmacy* 34: 101152-101152.
5. Alam, R. *et al.* 2021, Biodegradation and metabolic pathway of anthraquinone dyes by trametes hirsuta D7 immobilized in light expanded clay aggregate and cytotoxicity assessment, *Journal of Hazardous Materials*, 124176-124176.

In the field of disaster prevention and risk reduction (WP4), we focused on common disaster issues, transboundary disaster issues and transboundary river issues, in addition to human resource development and social implementation in regional policies. We promoted joint research on flood and sediment management in the Philippines<sup>1</sup> and Vietnam<sup>2,3</sup> as a common disaster issue, which resulted in the establishment of the International Organization on Climate Change Adaptation and Disaster Risk Reduction Management Inc. (IO-CCA-DRRM<sup>4</sup>) with Isabela State University (ISU) as its secretariat. We built a network with Indonesia, Malaysia, Thailand and other countries for peatland fires and haze studies and organized a workshop on the relationship between floods and peat fires, the impacts of climate change, and the development of early-warning monitoring methods<sup>5</sup>. We studied transboundary river issues of the Mekong River. In collaboration with Thuy Loi University, we conducted on-site observations and developed hydraulic models to examine long-term changes and future projections of flow and sediment volumes, riverbed degradation, and the impact of saline water on agricultural water<sup>6,7,8</sup>. We also studied the integrated impact assessment of climate change and hydropower operation on streamflow and inundation in the Lower Mekong Basin<sup>9,10</sup>.

1. Bharambe, K., Kantoush, S., Goto, H., Sumi, T., & Saber, M. 2023, “Climate change impacts on spatiotemporal variation of extreme weather and its consequences on dam optimization and risk management in the Cagayan basin, Philippines”, *APN Science Bulletin*, 13(1). doi:10.30852/sb.2023.2347
2. Nguyen, B. Q., Kantoush, S. A., & Sumi, T. 2024, “Quantifying the consequences of unsustainable sand

- mining and cascade dams on aspects in a tropical river basin”, *Scientific Reports*, 14(1), 1178.
3. Binh Quang Nguyen, Sameh Ahmed Kantoush, Doan Van Binh, Mohamed Saber, Ngoc Duong Vo & Tetsuya Sumi, 2024, “Spatially quantifying and mapping the riverbed roughness of a tropical river via acoustic Doppler current profiler (ADCP) measurements to develop a 2-D numerical model”, *Journal of Hydraulic Research*, 62:2, 192-207, doi=10.1080/00221686.2024.2336153
  4. <https://io-ccadrrm.org/>
  5. JASTIP-WP4 Workshop on Transboundary Disasters: Floods, Fire and Haze in Humid Tropics, online, 2023.3.
  6. Binh, D. V. et al., 2021, “Effects of riverbed incision on the hydrology of the Vietnamese Mekong Delta”, *Journal of Hydrological Processes* 35, e14030 (selected as the Top Downloaded Paper).
  7. Doan Van Binh, Sameh Kantoush, Tetsuya Sumi, 2020, “Changes to long-term discharge and sediment loads in the Vietnamese Mekong Delta caused by upstream dams”, *Geomorphology*, Volume 353, 107011, <https://doi.org/10.1016/j.geomorph.2019.107011>.
  8. Doan Van Binh, Sameh A. Kantoush, Mohamed Saber, Nguyen Phuong Mai, Shreedhar Maskey, Dang Tuan Phong, Tetsuya Sumi, 2020, “Long-term alterations of flow regimes of the Mekong River and adaptation strategies for the Vietnamese Mekong Delta”, *Journal of Hydrology: Regional Studies*, Volume 32, 100742, <https://doi.org/10.1016/j.ejrh.2020.100742>.
  9. Steven Ly, Takahiro Sayama, Sophal Try, 2023, “Integrated impact assessment of climate change and hydropower operation on streamflow and inundation in the lower Mekong Basin”, *Progress in Earth and Planetary Science*, Vol. 10, No. 1, pp. 1-20, doi: <https://doi.org/10.1186/s40645-023-00586-8>.
  10. Sophal Try, Takahiro Sayama, Chantha Oeurng, Ty Sok, Steven Ly, Sovannara Uk. 2022, “Identification of the spatio-temporal and fluvial-pluvial sources of flood inundation in the Lower Mekong Basin”, *Geoscience Letters*. Jan. 2022.

## 2.2 Contribution to education and human resources development

In WP1, we concentrated our efforts on developing human resources for science, technology, and innovation coordination (STI coordination). Based on an intensive survey on STI coordination in ASEAN, we implemented a series of workshops under the endorsement of ASEAN COSTI, where invited speakers shared their experiences with the participants. This series of workshops contributed to the building of the human network on STI coordination, and the outcomes are the implementation of a number of training programs (e.g., one implemented in MISTI, Cambodia, 2023) and several practical projects that were submitted and accepted (The Toyota Foundation Initiative Program 2022 - 2024, Watanabe Memorial Foundation Research Grant 2023, and the Japan ASEAN Integrated Fund (JAIF) project 2024 -2026). We also held sessions in several workshops and symposiums, which further

contributed to strengthening the human network on STI coordination in ASEAN and Japan.

In WP2, master course double-degree programs with the University of Malaya (UM) and Chulalongkorn University (CU) began in 2015, and 25 students have been engaged in this program in the energy science field. In addition, a master course double-degree program has also been initiated with the Joint Graduate Schools of Energy and Environment/King Mongkut's University of Technology Thonburi (JGSEE/KMUTT). WP2 acts as secretary in the field of energy in the JICA/SEED-Net program and was also selected as a member of the international joint educational consortium with UM, the National University of Laos (NUOL), Yangon Technological University (YTU), Can Tho University (CTU), and the University of Brunei Darussalam (UBD). We have proactively accepted short-term international undergraduate students, for example from Chiang Mai University, every June to July. Around twenty undergraduate students have also been dispatched and accepted from 30 universities belonging to the ASEAN University Network (AUN) each year.

WP3 has contributed to the hub-functions for researcher exchange and capacity building between Japan and ASEAN institutions, mainly the National Research and Innovation Agency, Indonesia (BRIN, the former Indonesian Institute of Sciences (LIPI)). For instance, we encouraged researchers to visit BRIN's JASTIP Joint Laboratories and Drug Discovery and Development Center. Moreover, to strengthen stable isotope ecology in Indonesia, we invited young BRIN researchers to come to Kyoto University, while Japanese experts visited BRIN to continue supporting the reliable measurement of stable isotopes in Indonesia. Thus, we enhanced the training and collaborative research in Japanese Institutions as well as on-site training. Through these efforts, many lectures and programs which contributed significantly to the development of young researchers were carried out.

WP4 cooperated in lectures for the "Master of Disaster Management (MDRM)" course at MJIT-DPPC. Several topics were provided, including Emergency Response Planning and Communication, Recovery and Reconstruction Management, Geohazard Information for Disaster Risk Assessment, and River Systems and Management. We also provided several webinars during the pandemic period. In addition, we regularly hosted MDRM students and staff in Japan as a "Japan Attachment" for two weeks in the Tokyo-Tsukuba area and in the Kyoto-Osaka-Kobe area. We received many students from Malaysia, Vietnam, Indonesia, Thailand, Cambodia, the Philippines, and Laos for the Graduate School of Engineering, Kyoto University, and seven students from Vietnam, Cambodia and Indonesia and one student from Japan attained Ph.D.'s on several research topics under WP4. We also encouraged WP4

members to participate in the UNESCO-IHP Training course hosted by WRRC-DPRI, Kyoto University, which is registered with the UNESCO-Chair WENDI Kyoto University.

### 2.3 Networking

One of the outstanding functions of JASTIP is to provide opportunities for Japanese and ASEAN researchers to meet and interact with various researchers from different disciplines, nationalities, and experiences. We have regularly organized JASTIP symposia, mainly in ASEAN (Table 2). The total number of participants from the 1<sup>st</sup> to the 9<sup>th</sup> symposia reached more than 1,500. We also organized 10 to 20 international workshops, seminars and symposia on various topics each year, the total number reaching 145 (Figure 4). We were affected by the COVID-19 pandemic for three years from 2020 to 2022, during which most of the workshops and seminars were held online.

Table 2 JASTIP Symposia

Serial No.	Date	Venue	Topic	Participants
1st	14th Dec. 2015	Kyoto	Toward the All-Japan STI Collaboration with ASEAN	70
2nd	11th Jun. 2016	Jakarta	Bioresources and Biodiversity Studies in the ASEAN region	130
3rd	5th Feb. 2017	Bangkok	ASEAN – JAPAN STI Collaboration for SDGs	99
4th	3rd and 4th Jul. 2017	Bangkok	Biomass to Energy, Chemicals and Functional Materials	254
5th	16th to 19th Oct. 2018	Kuala Lumpur	Disaster Risk Reduction and Environmental Sustainability for Social Resilience	95
6th	1st Nov. 2018	Jakarta	Biodiversity, Genetic Resources and Innovative Bioresource Technology	196
7th	24th Oct. 2019	Serpong	Biodiversity, Genetic Resources and Innovative Bioresource Technology toward 2025	200
8th	17th to 19th Jan. 2020	Hanoi	Where Science and Policy Interwine: Dialogue between Scientists and Policy-makers for Sustainable Development in the ASEAN Region	150
9th	13th and 14th Dec. 2021	online	Co-creative Mechanism in STI coordination between ASEAN and Japan: Spice up our scientific projects with STI coordinators	243
10th	16th Dec. 2024	Bangkok	Wrapup	90

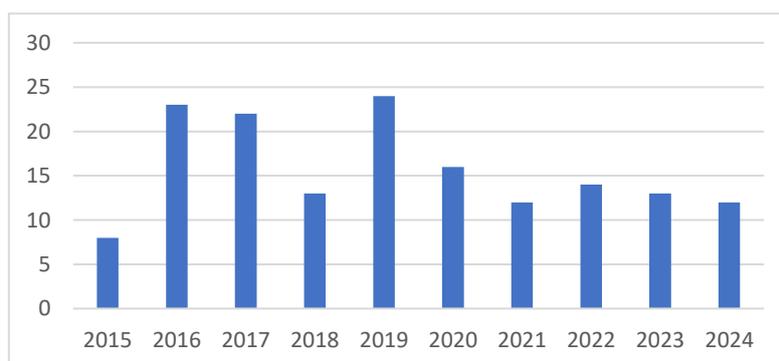


Figure 4 Number of international workshops, seminars and symposia organized by JASTIP members

We also expanded the research network through JASTIP-Net, which provided valuable opportunities to connect with new research partners and to explore new approaches to STI collaboration. Each WP took the initiative to set the research agenda in advance and extended invitations to join the networking activities to Japan and ASEAN researchers and practitioners by open call. After much deliberation, the JASTIP selection committee has finally made a decision regarding adoption. The number of applications received in the first year, 2016, was 21. This number increased significantly throughout the first phase and reached 100 to 200 in the second phase (Figure 5). The applications came from all ASEAN member states and Japan, with Malaysia and Indonesia demonstrating the highest level of interest (Table 3). Regarding the individual WPs, WP2 and WP3 received slightly more applications than WP1 and WP4 (Table 4). We adopted 20 to 40 applications every year, carried out research and organized workshops (Table 5).

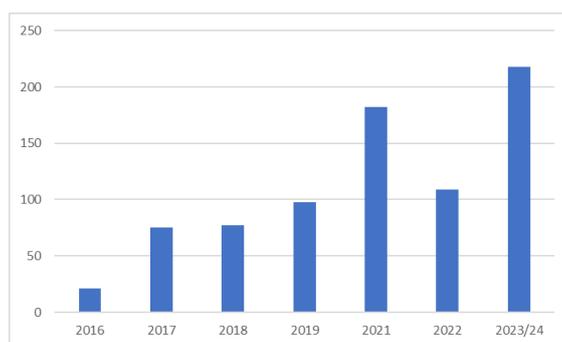


Figure 5 Number of JASTIP-Net applications

Table 3 Number of JASTIP-Net applications by country

Country	2016	2017	2018	2019	2021	2022	2023/24	Total
Malaysia	5	7	35	53	65	60	43	268
Indonesia	4	31	10	12	66	31	90	244
Philippines	0	3	6	7	18	2	32	68
Thailand	5	4	2	6	8	5	23	53
Myanmar	0	17	6	1	9	0	4	37
Japan	7	5	7	2	5	2	4	32
Cambodia	0	3	2	2	6	4	13	30
Vietnam	0	2	7	5	2	2	5	23
Laos	0	3	1	1	3	1	2	11
Brunei	0	0	0	9	0	1	0	10
Singapore	0	0	0	0	0	0	2	2
Timor-Leste	0	0	1	0	0	0	0	1
ASEAN	0	0	0	0	0	1	0	1
Total	21	75	77	98	182	109	218	780

Table 4 Number of JASTIP-Net applications by WP

WP	2016	2017	2018	2019	2021	2022	2023/24	Total
WP1	4	6	13	21	32	18	25	119
WP2	4	21	14	30	56	55	82	262
WP3	8	32	22	27	59	17	77	242
WP4	5	16	28	20	35	19	34	157
total	21	75	77	98	182	109	218	780

Table 5 Number of adopted JASTIP-Net applications by WP

WP	2016	2017	2018	2019	2021	2022	2023/24	Total
WP1	4	3	4	3	11	8	5	38
WP2	4	6	11	11	16	9	6	63
WP3	3	5	4	4	8	5	9	38
WP4	5	6	6	8	6	9	3	43
total	16	20	25	26	41	31	23	182

Regarding the mobility of researchers, JASTIP promotes both movement from Japan to ASEAN and from ASEAN to Japan. The number of trips from Japan to ASEAN and other areas during the 10 years from 2015 to 2024 reached 424 with a total duration of 2,988 days, while the number of trips from ASEAN to Japan and other areas during the same period reached 577 with a total duration of 5,319 days, indicating that the ratio of mobility between Japan and ASEAN is approximately 42% from Japan to ASEAN and 58% from ASEAN to

Japan (Figure 6). These numbers represent trips funded by the JASTIP budget. In addition, we have used other budgets for travel between Japan and ASEAN to support JASTIP activities. Unfortunately, we do not have statistics on these trips. It is also true that mobility between Japan and ASEAN was severely disrupted by the COVID-19 pandemic for the three years 2020, 2021 and 2022.

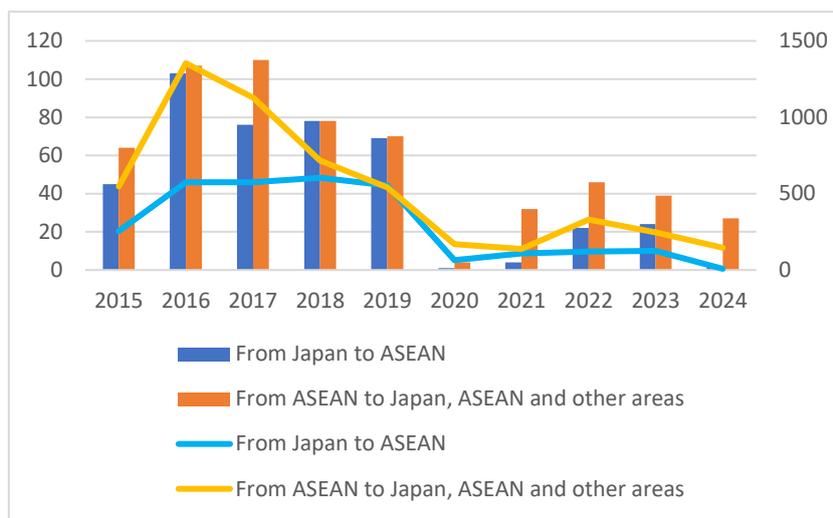


Figure 6 Overseas trips financially supported by JASTIP

Another important point regarding mobility concerns whether it was a member or non-member who traveled. For the Japanese side, about 77% of the researchers who traveled to ASEAN were JASTIP members (Figure 7). For the ASEAN side, the proportion of researchers who were JASTIP members was 56%, much smaller than for the Japanese side (Figure 8). This suggests that the expansion of JASTIP activities is more successful in the ASEAN academic community than in Japan.

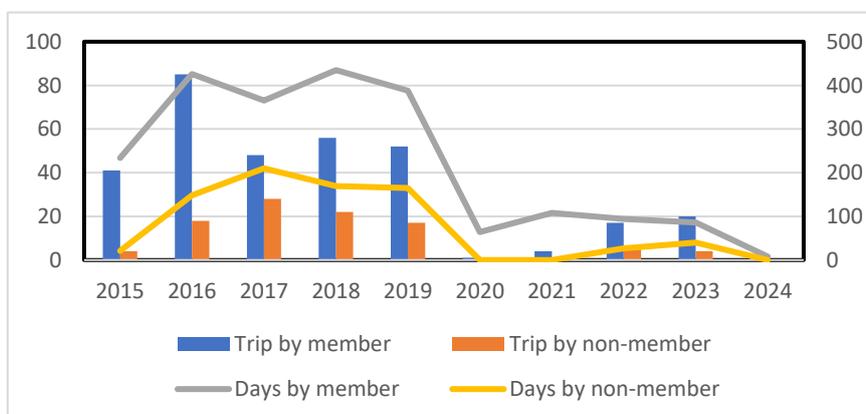


Figure 7 Overseas trips from Japan

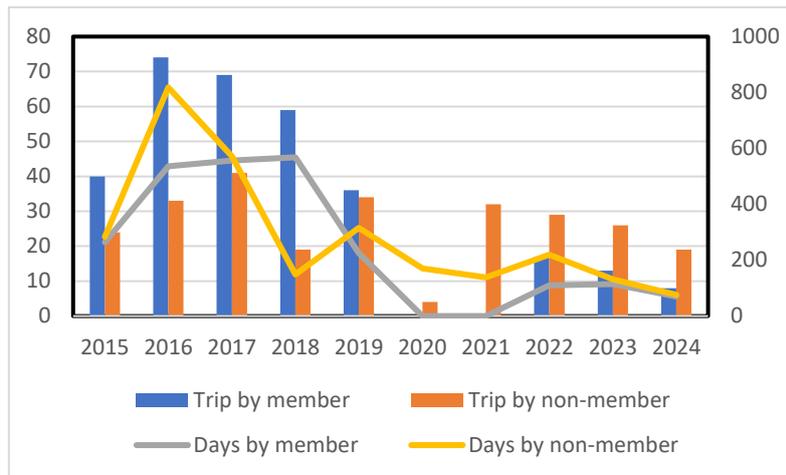


Figure 8 Overseas trips from ASEAN

The number of participants to the joint research projects at the satellite laboratories and through JASTIP-Net reached 955, covering all ASEAN member states and Japan. In ASEAN, large numbers of participants were from Indonesia, Malaysia and Thailand, where the satellite laboratories are located, but we have also mobilized a significant number of researchers in other countries (Table 6).

Table 6 Number of participating universities, research institutes and researchers by country

Country	Number of universities and research institutes	Numer of participants
Japan	24	238
ASEAN		
Brunei	1	4
Cambodia	7	87
Indonesia	59	267
Laos	1	13
Malaysia	26	138
Myanmar	10	22
Philippines	15	29
Singapore	2	3
Thailand	26	112
Timor-Leste	1	3
Vietnam	16	33
Subtotal	164	711
Non-ASEAN		
Papua New Guinea	1	1
Republic of Korea	2	5
Total	191	955

We also established linkages with ASEAN institutions such as the ASEAN Center for Energy (ACE), the ASEAN Coordinating Centre for Humanitarian Assistance on disaster management (AHA Centre), the Economic Research Institute for ASEAN and East Asia (ERIA), the ASEAN University Network (AUN), the ASEAN Foundation, the ASEAN Network on Microbial Utilization (AnMicro) and the ASEAN Center for Biodiversity.

#### 2.4 Research projects as the outcome of JASTIP

The networking mentioned above was the basis of initiatives to establish new research projects. Various activities of JASTIP have successfully resulted in the establishment of the following projects.

##### WP1

- 2018 The Toyota Foundation Research Grant Program  
Establishment of a general method to assess the regional economic cycle of regional revitalization projects and development of an evaluation tool

Leader: Dr. Inagaki Kenji (Kyoto University)

- 2022 The Toyota Foundation Initiative Program  
Mutual learning of science technology innovation coordination to bridge different countries and sectors in Cambodia, Thailand, and Japan towards capacity development program and policy recommendations  
Leader: Prof. Ohgaki Hideaki (Kyoto University)
- 2023 Watanabe Memorial Foundation Research Grant  
Survey on human resource development for science, technology and innovation coordination in the ASEAN region  
Leader: Prof. Ohgaki Hideaki (Kyoto University)  
<http://hdl.handle.net/2433/287767>
- Japan ASEAN Integrated Fund (JAIF) project:  
Human capacity building for science, technology, and innovation coordination between ASEAN and Japan towards grand challenges  
Leader: Assoc. Prof. Choltis Dhirathiti (AUN) and Prof. Ohgaki Hideaki (Kyoto University)

## WP2

- 2018-2022 SATREPS  
Development of advanced hybrid ocean thermal energy conversion (OTEC) technology for low carbon society and sustainable energy systems: First experimental OTEC plant of Malaysia  
Leaders: Prof. Ikegami Yasuyuki (Saga University) and Prof. Dato' Ir Dr. A. Bakar Jaafar (University of Technology, Malaysia)
- 2019-2021 JST SICORP e-ASIA JRP  
Development of algal bioenergy systems for a green and sustainable ASEAN region  
Leaders: Prof. Armando Quitain (Kumamoto University), Prof. Suttichai Assabumrungrat (Chulalongkorn University), Prof. Raymond Tan (De La Salle University), Dr. Siti Zullaikah (Institut Teknologi Sepuluh Nopember)
- 2021 The Toyota Foundation Research Grant Program  
Financial support platform for sustainable circular local economy  
Leader: Prof. Ishihara Keiichi (Kyoto University)

## WP3

- 2019-2021 JST SICORP e-ASIA JRP  
Integrated biorefinery of sugarcane trash

Leaders: Prof. Watanabe Takashi (Kyoto University), Dr. Verawat Champreda (National Center for Genetic Engineering and Biotechnology, Thailand), Dr. Euis Hermiati (Indonesian Institute of Sciences), Dr. Keonakhone Khounvilay (National University of Laos)

#### WP4

- 2021-2022 JST (J RAPID)- DOST(PCIEERD) co-funding  
Urgent post flood survey after Typhoon Ulysses  
Leaders: Prof. Sumi Tetsuya (Kyoto University), Prof. Orlando F. Balderama (Isabela State University), Dr. Carlo Ablan (National Irrigation Administration, Philippines)
- 2020-2022 Asia-Pacific Network for Global Change Research  
Integrated flood and sediment management in river basins for sustainable development  
Leaders: Prof. Sameh Kantoush (Kyoto University), Prof. Nguyen C. Thai (Thuy Loi University), Prof. Vo N. Duong (Da Nang University), Prof. Orlando F. Balderama (Isabela State University)

### **2.5 Engagement in the STI administration and inter-government meetings**

We have established a close collaboration mechanism for information exchange and dissemination with ASEAN COSTI members including the ASEAN Secretariat; Ministry of Transport and Infocommunications (Brunei); Ministry of Industry, Science, Technology and Innovation (MISTI, Cambodia); BRIN (Indonesia); Ministry of Science and Technology (MOST, Lao PDR); Ministry of Science, Technology and Innovation (MOSTI, Malaysia); Ministry of Science and Technology (MOST, Myanmar); Department of Science and Technology (DOST, Philippines); Agency for Science, Technology and Research (A\*STAR, Singapore); Ministry of Higher Education and Science, Research and Innovation (MHESI, Thailand), and Ministry of Science and Technology (MOST, Vietnam), in addition to the Office of National Higher Education, Research and Innovation (NEXCO, Thailand); National Research Foundation (NRF, Singapore), and the National Research Council of Thailand (NRCT).

We participated in inter-government meetings to link academia with STI administration and policy-making (Table 7). These include the ASEAN-Japan Cooperation Committee on Science and Technology (AJCCST), organized by ASEAN COSTI, and several meetings organized by the Ministry of Higher Education, Science, Research and Innovation (MHESI), Thailand, which was responsible for the dialogue with Japan during the period from 2021 to 2024, especially in 2023, the commemoration of the 50<sup>th</sup> year of Japan-ASEAN friendship and

cooperation.

Table 7 Participation in inter-government meetings

Date	Venue	Organizer	Meeting title	Status
2015	Tokyo	MEXT	Japan-ASEAN Collaborative Workshop for Science, Technology and Innovation	Presentation
October 2015	Siem Reap	ASEAN COSTI	AJCCST-7	Observer
May 2017	Brunei	ASEAN COSTI	AJCCST-8	Presentation
June 2018	Bangkok	MHESI	ASEAN STI Forum 2018	Presentation
October 2018	Cebu	ASEAN COSTI	AJCCST-9	Presentation
June 2019	Bali	ASEAN COSTI	AJCCST-10	Presentation
November 2020	Bangkok	MHESI	ASEAN Innovation Roadmap & Bioeconomy Forum	Presentation
June 2021	Online	ASEAN COSTI	ASEAN COSTI	Presentation
June 2021	Bangkok	MHESI	ASTIW-11	Presentation
May 2022	Online	ASEAN COSTI	SCIRD-56	Observer
June 2022	Online	MHESI	Meeting of Special Working Group on ASEAN Innovation Roadmap (2019-2025)	Observer
June 2022	Online	MHESI	Meeting of Expert Group on ASEAN Talent Mobility	Member
June 2022	Bangkok	MHESI	3rd ASEAN Innovation Roadmap Forum: Key Technologies and Innovations in Responding Global Challenges towards Sustainable ASEAN	Presentation
June 2022	Online	ASEAN COSTI	AJCCST-11	Participation
July 2022	Online	MHESI	2nd Circular Economy (CE) Technology Foresight Workshop (MHESI)	Member
May 2023	Bangkok	MHESI	The 1st Meeting of Expert Group on ASEAN Talent Mobility	Member
May 2023	Bangkok	MHESI	EU-ASEAN Policy Dialogue: Building & Managing a Transnational Network for Brain Circulation	Member
June 2023	Brunei	ASEAN COSTI	AJCCST-12	Member
August 2023	Bangkok	MHESI	50th Year of ASEAN-Japan Friendship and Cooperation Commemoration/ASEAN-Japan Dialogue on Science, Technology, and Innovation	Co-Organizer
June 2024	Siem Reap	ASEAN COSTI	AJCCST-13	Presentation
AJCCST: ASEAN-Japan Cooperation Committee on Science and Technology				
ASTIW: ASEAN Science, Technology and Innovation Week				
COSTI: Committee on Science, Technology and Innovation				
MEXT: Ministry of Education, Culture, Sports, Science and Technology, Japan				
MHESI: Ministry of Higher Education, Science, Research and Innovation, Thailand				
SCIRD: ASEAN Sub-committee on S&T Infrastructure and Resources Development				

These efforts resulted in the recognition of JASTIP as a unique project between ASEAN COSTI and Dialogue Partners from Japan, as endorsed at the 1<sup>st</sup> Meeting of the Special Working Group on the ASEAN Innovation Roadmap (AIR) on 14<sup>th</sup> January 2022.

JASTIP concluded the MOU with the General Department of Science, Technology & Innovation, MISTI, Cambodia, one of ASEAN COSTI member offices, on 24<sup>th</sup> May 2022 and extended it on 27<sup>th</sup> March 2025. This MOU aims at supporting the implementation of key actions under Cambodia's Science, Technology & Innovation Roadmap 2030 and developing human resources for STI coordination.

## 2.6 Policy recommendations

We have expressed our opinions on two types of Japanese policy, policy on STI collaboration with ASEAN and policy on STI coordination, based on the experiences and ideas gained from the various activities of JASTIP. Our main arguments about the STI collaboration policy with

ASEAN are as follows.

- The principal of collaboration with ASEAN is joint partnership. This means that our collaboration must be mutually beneficial; we should share the resources, outputs and outcomes of academic activities rather than compete with each other, and the brain circulation of both young talents and seniors should be promoted and well-balanced in both directions, from ASEAN to Japan and from Japan to ASEAN.
- We should invite a wide range of researchers to become involved in Japan-ASEAN STI collaboration, and should not focus only on top-level researchers. The participation of diverse researchers in terms of nationality, age, gender, and institution greatly increases the possibility of achieving science and technology-based innovation. An open and inclusive ecosystem is the key to a successful joint partnership.
- We should establish seamless support systems from research to social implementation to bridge the gap between S&T research and innovation. One of the underlying factors for the lack of such a system is that the sectionalism of line agencies in Tokyo has penetrated to research sites in ASEAN. We should develop an integrated and sustainable platform for Japan-ASEAN STI collaboration in the ASEAN region.

Our main arguments about the STI collaboration are as follows.

- According to a survey by Kyoto University in collaboration with AUN, ASEAN Foundation and the ASEAN secretariat in 2020 to 2021, the connection between the public and private sectors is currently limited, and the community and industry cannot easily find capable scientists and/or proper technologies to solve common social and technological problems. One of the main causes for this is the lack of well-trained coordinators and training systems for coordinators.
- We should establish a sustainable STI Coordination Platform between ASEAN and Japan to foster the next generation of STI leaders and empower them to play a crucial role in consistently promoting collaborative research and cooperative education.
- STI Coordination facilitates collaboration across different cultures, disciplines, and sectors to tackle social issues and create new value. It emphasizes ethics, community awareness, and the integration of scientific discoveries, technological advancements, and insights from the humanities and social sciences.

We have presented these arguments to policymakers and relevant stakeholders on the following occasions.

- Jan. 2018, Seifu-sou, Kyoto University  
Round Table “Shaping new horizons for Japan-ASEAN science and technology

cooperation towards the UN Sustainable Development Goals” by a MEXT officer, STI experts from ASEAN, and the Kyoto University provost

- Sonobe, T. and Saito, C. 2021, “Science, Technology and Innovation (STI) Coordinators in Japan and ASEAN towards Grand Challenges (2020-2021): Summary Report”, STI Coordination project report submitted to ASEAN COSTI.  
<http://hdl.handle.net/2433/263214>
- Sonobe, T. and Saito, C. 2021, “Progress report on new initiatives for an online platform to boost human resource capacity of science, technology and innovation coordinators in Japan and ASEAN toward grand challenges”, *Compendium of Analytical Views for the Ascc Blueprint 2025*: 49–55, ASEAN Blueprint policy report
- OECD. June 2022. *Addressing societal challenges using transdisciplinary research*, OECD Science, Technology and Industry Policy Papers 88  
[https://www.oecd-ilibrary.org/science-and-technology/addressing-societal-challenges-using-transdisciplinary-research\\_0ca0ca45-en](https://www.oecd-ilibrary.org/science-and-technology/addressing-societal-challenges-using-transdisciplinary-research_0ca0ca45-en)  
JASTIP was introduced as a transdisciplinary research program for societal challenges.
- Kono, Y. and Sonobe, T. January 2024, “Collaboration in science, technology and innovation with ASEAN”, Meeting with a member of the Council for Science, Technology and Innovation, Japan.
- Kono, Y. May 2024. Collaboration with ASEAN for science, technology and human resources development: Views from the frontier, The Diet Members’ Office Building, Japan

## 2.7 Collaboration with the private sector

Collaboration with the private sector is indispensable in order to connect research work with social innovation. For this, we have provided opportunities for Japan and ASEAN researchers to introduce their research achievements and for private enterprises to learn about the frontiers of research. These are as follows.

The Kyoto ASEAN Forum held in Kuala Lumpur in September 2016 was attended by universities, research institutions, and private companies to discuss examples and models of industry-academia collaboration. This led to a joint exhibition by Hitachi Zosen Corporation and JASTIP at the Thailand Science and Technology Fair held in Bangkok in August 2018. We exhibited the waste incineration power generation technology developed by Hitachi Zosen Corporation, which contributes to the achievement of the SDGs. The company had the opportunity to introduce the technology directly to the Thai Minister of Science and Technology. A demonstration exhibition of photocatalysis by students of King Mongkut’s

Institute of Technology Ladkrabang was also held.

At the 4th JASTIP Symposium, held in NSTDA in July 2017, an industry-academia collaboration symposium was held, providing an opportunity for interaction not only among universities and research institutions but also with private companies and ASEAN-Japan government officials. This led to Kikkoman Corporation, which has an R&D base in Singapore, to launch joint research with NSTDA (BIOTEC) on the utilization of biological resources. In addition, we provided an opportunity for the Singapore subsidiary of Suntory Limited (BrandZ), whose main product is processed swallow's nest food, to discuss ecological research on swiftlet species with Japanese researchers in order to ensure a stable supply of raw materials.

The 6th JASTIP Symposium and Industry-Academia Innovation Seminar & Business Matching, held in November 2018, was attended by 9 Japanese and 12 Indonesian companies, who presented their businesses and technology seeds. This provided an opportunity to discuss the support of Shimadzu Singapore for the ASEAN Microbiology Utilization Network and the ASEAN Microbiology Database. We coordinated their stakeholders' meeting in February 2020 on the possibility of building a database using Shimadzu's mass spectrometer-based simple identification system for microorganisms. In addition, in March 2021, we arranged for Dr. Enny Sudarmonowati, former LIPI Deputy Director General for Life Sciences, to visit Shimadzu in March 2021 and to discuss specific future exchanges to establish a cooperative relationship between Shimadzu and LIPI and other research organizations that organize training on the use of analytical instruments in ASEAN.

The 7th JASTIP Symposium, held in Serpong in October 2019, was attended by about 100 researchers, beekeepers and distributors from Indonesia, Malaysia, Brunei and other countries, and an industry-academia collaboration workshop on the utilization of stingless bees' honey and propolis in Southeast Asia was held. Some of the outcomes of this workshop were exhibited at the Singapore Week of Innovation and Technology (SWITCH) in November 2019. We were also successful in matchmaking among Malaysian and Indonesian stingless bee researchers and Japanese importers. A JASTIP-Net partner, Dr. Enos Tange Arung, Mulawarman University, assisted in the meeting of the requirements imposed by the Food Sanitation Law, which had been a barrier to the import of honey to Japan. Finally, the trade of honey from Indonesia to Japan was initiated.

We supported Keihanna Science City in its participation in the Innovation Summit and Conference 2018, which was held in Jakarta on November 2018. This resulted in the signing

of a comprehensive cooperation agreement (MOU) between LIPI Innovation Centre and Keihanna Science City Research & Development for Monodzukuri through Marketing (RDMM) Support Centre. The RDMM Support Center manages a consortium with more than 80 private companies to promote collaboration between academia and the private sector and among multiple private sector entities to accelerate business initiation and industrialization.

The e-ASIA JRP “Integrated biorefinery of sugarcane trash” project, launched in 2019, was carried out in collaboration with Mitr Phol, the largest sugar refinery company in Thailand, to provide samples of sugarcane harvest waste and conduct demonstration tests. The e-ASIA JRP project “Development of algal bioenergy systems for a green and sustainable ASEAN region” was carried out in collaboration with Euglena Co., Ltd.

In WP3, starting from 2020, the development and dissemination of advanced wood structure technology and wood material production technology, such as low-cost houses with excellent earthquake resistance using tropical timber and the production of wood boards using natural adhesives, was promoted in collaboration with private companies, and a patent was applied for in 2022. In addition, joint industry-government-academia research projects with Indonesian private companies on a method for treating dye factory effluent and on the decomposition of environmental pollutants using microorganisms isolated from the ASEAN region were promoted.

In WP2, the results of research on the application of photocatalysis technology was transferred to local companies and successfully commercialized as architectural coatings. It is also noteworthy that a member of WP2 has initiated a start-up company called Rhinoflux, an energy company founded at Kyoto University with the mission of “unlocking the value of vast dormant resources by science.” The company aims to achieve carbon-negative energy production to contribute to a future where the more electricity humanity generates, the more CO<sub>2</sub> is captured from the atmosphere.

In 2022, some members of JASTIP participated in the InaRIexpo (Science and Technology Fair) held in Indonesia. This exhibition was planned and implemented as a side event of the G20 Science and Technology Ministers Meeting. We presented our activities and “CubiTan,” which was developed by a Kyoto University professor and commercialized by Atomis Inc. and Yachiyo Engineering Co., Ltd. The technology of “CubiTan,” which stores gas materials in a small volume without the use of high pressure, attracted the attention of many stakeholders,

including researchers, investors, private companies, and government officials. This exhibition resulted in the signing of an MOU between Yachiyo Engineering and BRIN. We have participated in the National Science and Technology Fair in Thailand for many years, and Yachiyo Engineering participated in the Fair in 2023 and 2024 with JASTIP and Kyoto University. The same product was presented at the Fair and the possibility of signing an MOU with NSTDA is now being discussed.

In 2024, WP1 arranged a meeting between the Siam Cement Group Chemical Company (SCGC) and the EneCoat Company (one of the Kyoto University startups). The two parties are now preparing for further collaboration. WP1 is also engaged in regular discussions with Bangkok Bank for the support of activities involving Japanese SMEs (small and medium enterprises) in Thailand in cooperation with local universities. This collaboration led to further collaboration with the Association for Overseas Technical Cooperation and Sustainable Partnership (AOST), which resulted in the establishment of endowed chairs and the construction of new curricula on zero emission technologies at the Thai-Nichi Institute of Technology (TNI).

## **2.8 New Japan-ASEAN cooperation initiatives**

### **International internship: Industry-Academia-Government Consortium KANSAI**

<https://kyokai-kinki.jp/archives/1302>

This initiative aims at linking universities, technical colleges and private companies in the Kinki region and forming a platform to promote the efficient and smooth implementation of internships for ASEAN undergraduate and graduate students in Japanese companies. This contributes to securing and developing excellent international human resources for the next generation, building networks with overseas universities, developing industry-university cooperative research, and strengthening the international competitiveness of Japanese companies.

### **Japan-ASEAN STI Coordination Initiative toward Grand Challenges**

Since 2018, JASTIP has focused on building human resource capacity to promote interdisciplinary collaboration. This is achieved by connecting various stakeholders from ASEAN and Japan to address global and regional challenges through a concept known as “Science, Technology, and Innovation Coordination” (STI Coordination). JASTIP implemented the ASEAN-Japan Joint Project on STI Coordinators in Japan and ASEAN toward Grand Challenges from 2020 to 2022 under the official endorsement of ASEAN COSTI. A series of 11 online study group meetings were organized and more

than 700 participants from 15 countries, including 10 AMS, registered to participate in the meetings.

We are currently advancing human resource development programs through three initiatives: the Toyota Foundation's "Mutual Learning of Science, Technology, and Innovation Coordination" in Cambodia, Thailand, and Japan; the 2023 Watanabe Memorial Foundation for the Advancement of New Technology Survey on Human Resource Development for Science and Technology Innovation Coordination in the ASEAN Region; and the Japan-ASEAN Integration Fund (JAIF) project "Human Capacity Building for Science, Technology, and Innovation Coordination between ASEAN and Japan towards Grand Challenges" (under submission). These efforts aim to cultivate the next generation of STI leaders who can drive cross-cultural, interdisciplinary, and inter-sectoral collaboration in organizations across ASEAN and Japan.

### **3. Self-appraisal**

#### **3.1 Outstanding achievements**

- Science and technology research and its contribution to societal innovation

We have promoted research in the fields of environment and energy, bio-resources and biodiversity, and disaster prevention and risk reduction, and have produced a significant number of research outputs, particularly in the form of internationally co-authored journal articles (see Section 2.1). Some of these have led to the production of new products and the creation of new business through academic-private sector collaboration (see Section 2.7).

- Networking and new projects

We provided various opportunities for researchers and non-academic stakeholders in Japan and ASEAN, including symposia, workshops, and joint research, to find new research partners and new research topics (see Section 2.3), some of which resulted in the establishment of new research and/or training projects (see Section 2.4).

- Prof. Ohgaki: Face-to-face annual meetings are some of the events that they would like to prioritize for continuation as it is more effective and productive (View expressed in JASTIP Session: Shaping Future Vision of ASEAN-Japan Friendship through Science, Technology and Innovation Coordinators towards 2050, held on 12<sup>th</sup> May 2023)
- Prof. Aquino: JASTIP is a network that can be trusted (*ibid.*).
- Dr. Nga: I found potential complementarity in the nature of JASTIP's work, linking professionals who are able to implement their ideas with researchers who have the basic foundations to work with professionals (*ibid.*).
- Anonymous: Network members have closer collaboration with each other, and this platform or a model of this platform must continue (*ibid.*).

JASTIP has served as an international, interdisciplinary, and transdisciplinary platform and

research incubator for Japan-ASEAN academic collaboration.

- Increasing visibility with government and inter-government agencies

We have expended a substantial amount of effort on this, as mentioned in Section 2.5, as this was one of the aims of JASTIP. We believe this challenge has been successful thus far. One of the main reasons for this success is that we have been able to establish a strong connection with ASEAN-COSTI and its members. This connection has enabled us to jointly organize events, meetings, and programs.

- JASTIP-Net

JASTIP-Net has played a crucial role in all the outstanding achievements mentioned above. It has been a mechanism to connect various stakeholders, find new partners and research topics, incubate new ideas and new approaches, and prepare new proposals. JASTIP-Net has been widely recognized among academic institutions and researchers in ASEAN thanks to the cooperation of ASEAN COSTI and its members.

- Prof. Sumi: Partners suitable for the proposed topics were selected through the JASTIP-Net program. A small network was created to work on common topics (*ibid.*).
- Prof. Sumi: The approach of WP4, which takes a grassroots project approach, allows younger members and local members to apply and create interactive discussions and research work (*ibid.*).

### 3.2 Insufficient achievements

- Academia-private sector collaboration

We provided a significant number of occasions for researchers and the private sector to promote academia-private sector collaboration, and a number of these resulted in successful matchings (see Section 2.7). However, these challenges might have been more productive and efficient if we had worked jointly with the institutions that are specialized in matchmaking between academia and private sector at the national and institute levels.

- Beyond networking

What should be the outcome of the 10 years efforts by JASTIP? This was a serious question for us. We were able to produce a substantial number of research projects and new initiatives, but these cover only a part of what JASTIP attempted to do. We may need to consider broader programs to promote more comprehensive Japan-ASEAN collaboration based on the JASTIP networks.

- Prof. Osaki: The platform formation for research is important, but the integration mechanism is still very weak (*ibid.*).
- Prof. Kano: The task of the consortium is to identify patterns, symptoms, and ‘syndromes’ from various places. The next step is how to bring together related specialists and, if successful, lead to the establishment of a hospital. This is similar to what JASTIP has to do now (*ibid.*).